Journal of the International Society for the Systems Sciences | 67th Meeting of the International Society for the Systems Sciences
J.M. Wilby, Editor.

A SYSTEMIC ANALYSIS OF PARTICIPATORY LAND AND WATER GOVERNANCE IN THE TSITSA RIVER CATCHMENT, SOUTH AFRICA

Anthony Fry
antfry13@gmail.com
Jai Clifford-Holmes
Tally Palmer

Abstract
Participation of diverse stakeholders is essential for adaptive governance of land and water resources, along with the complex social-ecological systems in which the resources are embedded. Local manifestations of participation vary considerably. Successful resource governance requires arriving at compromises and trade-offs. This paper documents the findings from a systemic analysis of participatory governance in the Tsitsa River Catchment in the Eastern Cape of South Africa. A multi-method approach was designed to compare mental models elicited from actors with narratives crafted from participant observation data. Here, we focus on *meaningful* participatory governance that we define as being intelligible and significant to the actors involved as well as relevant to and coherent within a broader, multi-level governance system. The findings suggest that while there are multiple available options for enabling participation, there are also multiple obstacles inhibiting participatory governance. Challenges relate to accessibility and mobility, allocation of governance capacity, change resistance to power sharing, and persistent mental models that perpetuate old habits. Despite widespread support for more participation in governance, the application of participatory approaches should avoid becoming box-ticking exercises that are tokenistic or manipulative. We highlight the importance of context for enabling meaningful participation and the need to pioneer appropriate analysis methods.

Keywords
Participatory governance, systems thinking, land and water governance, rural development, systemic analysis

1 | Introduction
River catchments and other natural resource management contexts are increasingly considered to be complex social-ecological systems (CSESs) in which people and nature are understood to be a dynamic system of interacting elements (Folke & Berkes, 1998; Olsson et al., 2006; Cockburn et al., 2018). Complex social-ecological systems are adaptive and are characterised by mutual dependence, and the governance thereof requires interactions between diverse actors (Defries & Nagendra, 2017; Cockburn et al., 2018).

Actors, including community actors, need to participate in the governance processes that influence their lives (Heinelt et al., 2002; Palmer et al., 2022). This paper focuses on *meaningful* participatory governance that is intelligible and significant to the actors involved as well as relevant to (and coherent within) a broader, multi-level governance system (Cleaver & Whaley, 2018; Fry, 2023). Indeed, the United Nations Declaration on the Right to Development recognises active, free and meaningful participation in governance as a human right (Piovesan, 2013).

Despite being mainstreamed, there are still numerous challenges that undermine participation (Sinwell, 2011), including knowledge asymmetries (Ansell & Gash, 2008), power imbalances (Cleaver, 2012) and epistemic injustices (Fricker, 2007). Meaningful participation is particularly challenging when it includes communities that have been systemically excluded, such as indigenous communities, children and youth, people with disabilities or on the basis of gender (Sinclair, 2004; Ruwhiu & Carter, 2016).

The purpose of this paper is to present the findings from a systemic analysis of participatory governance within the Tsitsa River Catchment (TsRC), a rural region in the Eastern Cape province of SA. The government of South Africa (SA) aspires to foster a participatory democracy. However, progress has been slow and the South African public's trust in their government is at its lowest level since 1994, when SA became a multi-racial democracy (Moosa & Hofmeyr, 2021). The rest of the introduction will describe the research context and provide the key systemic concepts framing the analysis. Thereafter, the multi-method approach is described. A summary of the findings with four examples are then presented, before being discussed.

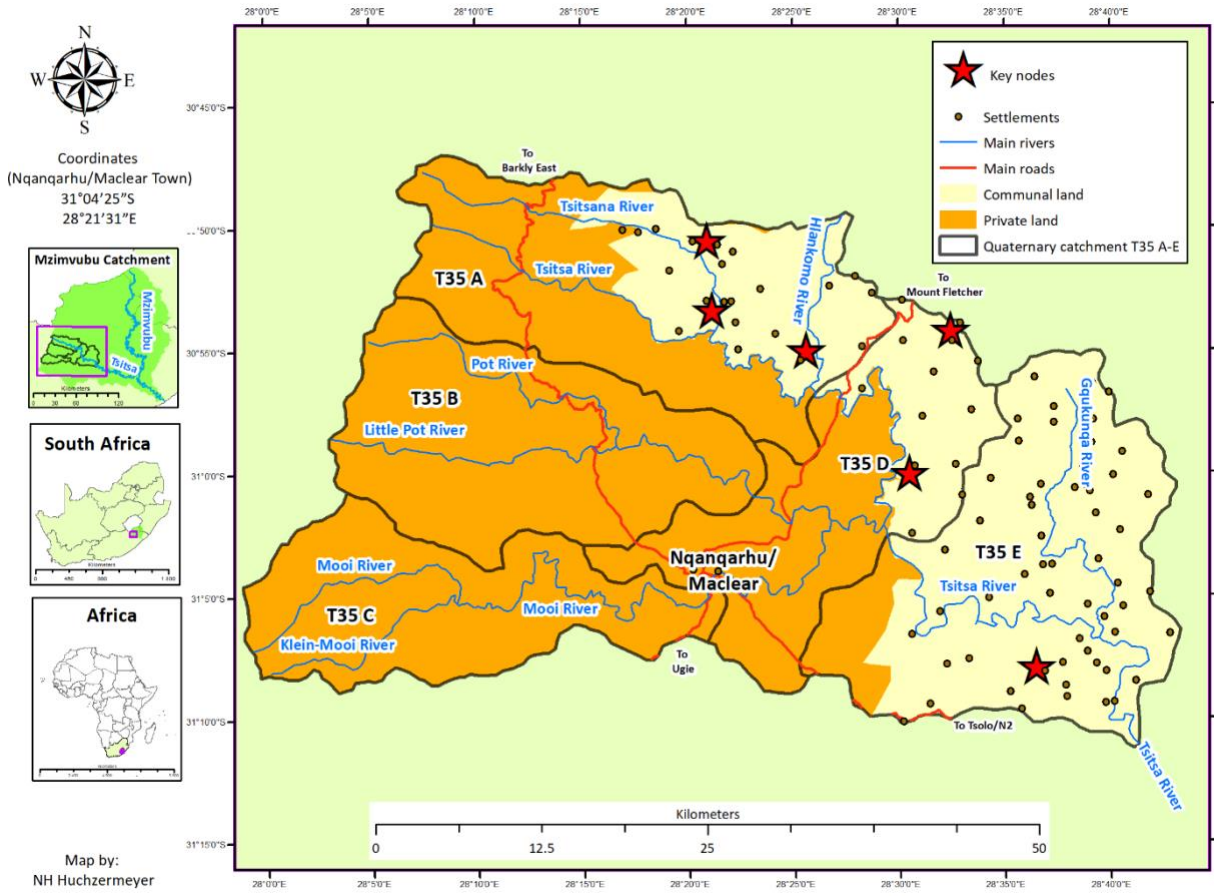
1.1 | Context

The Tsitsa River Catchment (TsRC) holds valuable water resources for the sustainable development of the Eastern Cape of South Africa in which it is situated. The TsRC is a strategic water source area, which are the 'areas that supply a disproportionately large amount of the country's mean annual runoff relative to their surface area while contributing substantially to groundwater recharge' (Selebalo et al., 2021, p.2). Unfortunately, extensive land degradation negatively influences the quality of the water in the river, and threatens the lifespan of any planned water infrastructure on the river (Powell et al., 2018).

The TsRC falls within the former Transkei homeland into which the amaXhosa cultural group were confined (Tapscott, 2017). (The term emaXhoseni, will be used to refer to this area.) Despite substantial pro-poor investment, the former homelands across South Africa remain the worst-performing areas in terms of socio-economic indicators (Kwenda et al., 2020). Land within emaXhoseni is commonly referred to as 'communal land' (Exhibit 1). In the period post-1994, democratic and traditional governance systems overlap and interact within emaXhoseni as the land is now state-owned but administered by traditional leaders – senior traditional leaders, headmen, and sub-headmen (Antonio & Griffith-Charles, 2019).

The mixed social and ecological drivers of degradation in the TsRC led to the Tsitsa Project's initiation by the Department of Forestry, Fisheries and the Environment (DFFE) in 2014. The Tsitsa Project, in which this research is embedded, was established to 'support sustainable livelihoods for local people through integrated landscape management that strives for resilient social-ecological systems and which fosters equity in access to ecosystem services' (Powell et al., 2018, p.84).

Exhibit 1. Map of the Tsitsa River Catchment.



1.2 | Systemic Conceptual Framing

Conventional management is often based on linear thinking and the behaviour (pattern of change) of a single variable, which enables reactivity rather than predictive power (Meadows, 2009). In contrast, thinking systemically can support

the identification of system structure and recurring systemic patterns towards the promotion of systemic transformations (Nguyen & Bosch, 2013; Abson et al., 2017). Identifying the behaviour of variables can provide context for an event, enable insights into how an event occurred, and help to anticipate future events. Studying the combinations of behaviour patterns of interconnected variables can give insight into the structure of a system (Meadows, 1999; Jackson, 2019). These deep system structures interact with people's world views and mental models – mental models being sets of assumptions and observations gained from experience that we use to make sense of the world and to decide on actions (Carley & Palmquist, 1992; Lynam & Brown, 2012). Identifying influential mental models and system structures enables a systems thinker to grapple with *why behaviours reoccur over time*, and therefore help to identify where to intervene to enable desirable change (Meadows, 2009).

Therefore, enabling transformations requires adjusting from a focus on isolated events to the identification of systemic patterns, to the elucidation of systemic structures, and eventually to grappling with the paradigms that shape system functioning (Meadows, 1999). Systems thinkers commonly search for high leverage points, where a small amount of effort could create a significant impact, and attempt to avoid low leverage points, where a large amount of effort could result in little to no impact (Meadows, 1999; Abson et al., 2017).

2 | Method

The methods presented here are embedded in an action research and single case study approach, which is nested in an overarching transdisciplinary and systemic methodology (Meadows, 2009; Lang et al., 2012). The application of this methodology was enhanced by the embeddedness of this research within the transdisciplinary Tsitsa Project (Cockburn et al., 2018). A fuller description of the methods is available in the first author's doctoral thesis.

The multi-method approach combines a systems diagram-based analysis of actor mental models with a narrative-based thematic analysis of observational data (detailed in the sections that follow) to gain multiple perspectives of a complex real-world problem (Mingers & Brocklesby, 1997). Both systems diagrams and narratives can support communicating qualitative data, making sense of complex situations, and exploring causality (Ison, 2017; Toledano & Anderson, 2020; Carnohan et al., 2021).

While we strive to generate explanatory power through an exploration of causality, the method should be understood in the context of complexity, which highlights the need for modest claims and a recognition of our incomplete knowledge of the world (Audouin et al., 2013).

2.1 | Diagram-Based Analysis of Mental Models

Mental models were elicited through fifteen semi-structured interviews with local land and water governance actors from the TsRC. Mental model elicitation involves making implicit actor mental models explicit (LaMere et al., 2020). The interviews were guided by open-ended questions designed to support the exploration of chains of causality.

Mental models were systematically extracted from the interview data and represented as causal loop diagrams using draw.io v14.9.6 diagramming software on Windows 11. Sentences indicating causality included narratives, observed trends, and statements about system functioning. Perceptions of causality can be inferred from narratives, while observed trends and statements about system functioning are more direct descriptions of causality.

Causal loop diagrams (CLDs) comprise variables connected by arrows that attribute cause and effect to form causal chains and feedback loops, and are a qualitative analysis tool (Inam et al., 2015). Creating CLDs helps to break down problem situations, identify key variables and the links between them, and identify reinforcing and balancing effects and possible high leverage places to intervene.

Individual mental models collected from the different participants were then combined into *key variable diagrams*. Key variable diagrams are centred on key variables identified in the data and are designed to be intelligible, to support discussion and feedback and be specific in terms of perspective in order to avoid overly abstracted or generalised models which fail to grapple with the motivations and intentions that shape social systems (Jackson, 2019). The iterative process of combining complementary mental models was informed by CLD integration protocols (Inam et al., 2015; Perrone et al., 2020). Key variable generation involved collecting the individual mental models relevant to a specific key variable and then identifying and combining common and similar variables across the mental models. Diagrams were then simplified by removing peripheral variables and further consolidating similar variables. The final part of the key variable diagramming process included checking the consistency of the diagram (Burchill & Kim, 1993). The first component of consistency is checking that the causality displayed in the diagram is consistent with the individual mental models that informed the key variable mental model. The second check is to go through the diagram and make sure that it *makes sense* and can be understood with little to no explanatory text. The final check is critically to analyse the diagrams along with the other data and the broader literature. The final analysis, as presented in the first author's doctoral thesis, comprised five key variable diagrams.

The collected mental model data exemplifies the observation that people more easily identify reinforcing effects than balancing effects (Meadows, 2009). The key variable diagrams created using the interview data lacked balancing feedbacks. In light of this insight, a further analytical step was conducted that involved *post hoc* identification of balancing feedback loops and effects which were not explicitly identified by interview participants. This analytical step resulted in four *balanced* key variable diagrams, as presented in the first author's doctoral thesis.

2.2 | Qualitative Thematic Analysis of Observation Data

Observation data was collected by the first author during embedded fieldwork as part of the Tsitsa Project between February 2019 and February 2020. Observation sites included formal and informal governance spaces, from government departmental meetings to municipal meetings and Tsitsa Project workshops and field trips, to village-level meetings related to Tsitsa Project activities. Observation data were collected through hand-written notes, audio recordings, and photographs.

The qualitative data analysis followed a thematic analysis approach to identify, review, and describe the research themes (Braun & Clarke, 2006). Each data source was coded inductively and the research themes were identified and refined through an iterative process (Glaser & Strauss, 2006).

Narratives were then crafted from the observation data set. Narratives are a flexible way to organise information while creating coherence and comprehensibility in a complex, changing world (Avraamidou & Osborne, 2009). In the context of action research, narratives (which evolve through telling, retelling, and reflexive engagement) are a way both to communicate individual perspectives and to make sense of situations with others (Toledano & Anderson, 2020). The final analysis, as presented in the first author's doctoral thesis, comprised fourteen narratives.

3 | Findings

This section provides a summary of the findings with four representative examples that explore the range covered by the analysis in order to illuminate how the narratives and diagrams complement each other. The observation data collection supported the analysis of specific participatory interactions while the interview data collection informed the analysis of broader systemic interactions between variables. The diagrams allow for the identification and analysis of specific links while the narratives enable an exploration of contextual nuance. This section presents two out of the fourteen narratives, one narrative from the researcher perspective and one narrative crafted with local informants (Exhibit 2). The section also includes two out of the nine diagrams – one key variable diagram and one *balanced* key variable diagram. Refer to the first author's doctoral thesis for the full presentation of the results.

The findings were divided under six headings which correspond to the six sets of key variables identified in the interview and observation data: (1) accessibility and physical presence, (2) shared understanding and facilitation, (3) governance capacity and resources, (4) community participation and incentives, (5) trust and interpersonal relationships, and (6) buy-in and accountability.

Exhibit 2. Summary of where findings are presented between this paper and the source,

Variable set	Findings presented in paper	Findings presented in the first author's thesis
Accessibility and physical presence		
Shared understanding and facilitation		
Governance capacity and resources		
Community participation and incentives		
Trust and interpersonal relationships		
Buy-in and accountability		

Table Key:	*Narrative:* 	*Key variable diagram:* 	*Balanced key variable diagram:* 

3.1 | Accessibility and Physical Presence

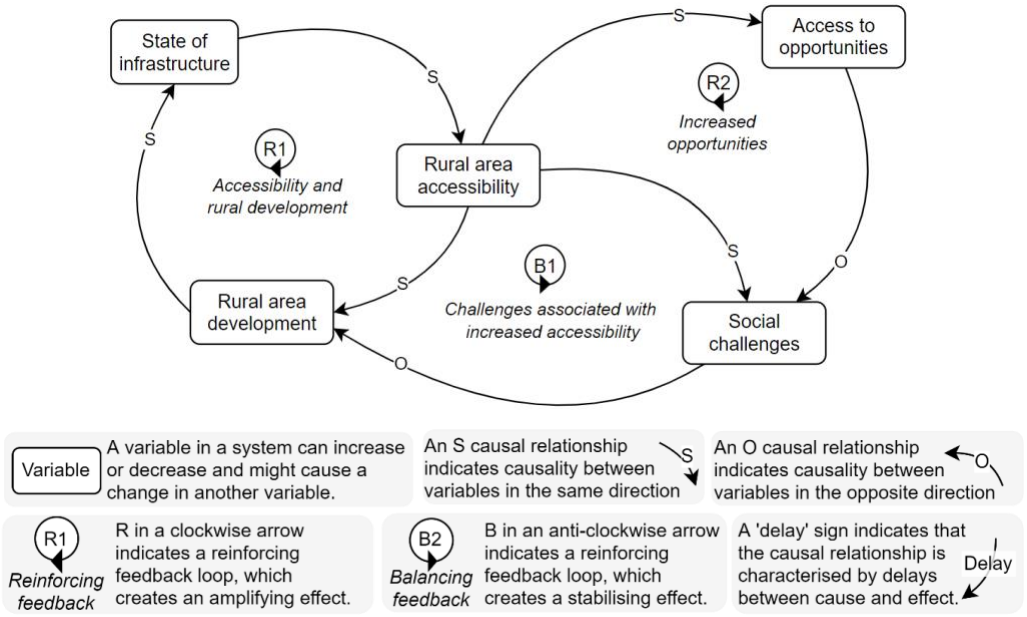
Accessibility refers to how easy or difficult it is for people to use a service. Here, accessibility includes both the accessibility of rural areas to external actors, and the accessibility of participatory opportunities to rural residents. While rural accessibility and increased connectivity are seen as positive means for development in the rural areas of the TsRC and access to opportunities, there are also the negative impacts of increased connectivity – such as the increase in social problems, which are more prominent in urban areas. (These dynamics are explored in the example, Exhibit 3, presented below.)

Stock theft is an example of an intractable challenge faced by rural residents who attempt to use local resources to support their livelihoods. Rural residents rely on livestock as cultural and financial capital, but these assets are vulnerable in the absence of government support, such as law enforcement. Unfortunately, even if rural communities collaborate with local traditional leaders to solve local land and water management challenges, they remain vulnerable to exploitation by an external actor with more resources.

Physical presence refers to actors being together in the same space at the same time. Physical presence accompanied by face-to-face dialogue seems to be an essential part of creating more meaningful connections between rural communities and governance actors in a way that encourages more active buy-in and accountability. However, while the identification of physical presence as a powerful tool is substantive, it can either be used to support trust building or be abused for political gains.

3.1.1 | Key variable diagram exploring rural area accessibility. Exhibit 3 draws on the perspectives of three headmen and three community development workers (CDWs) living and working in rural areas. Headmen and CDWs play a key role in connecting rural communities to governance institutions. Headmen and CDWs have deep experience with the bidirectional nature of accessibility – that is, governance institutions must access rural areas, and rural residents need to access institutions in urban centres. While urban residents have direct access to governance actors, rural residents need support to access institutions. The CDWs describe their work as connecting people to the government or bringing the government closer to people. Headmen state that they are interested in the holistic development of their areas. One headman described his work as enabling people 'to live the way they want to live' – referred to as *rural area development*.

Exhibit 3: A key variable diagram exploring rural area accessibility. Source: the first author's doctoral thesis.



Reinforcing loop *R1: accessibility and rural development* shows *rural area development* and *rural area accessibility* in a reinforcing feedback loop. In a virtuous cycle, accessibility enables development and improved infrastructure, increasing accessibility. However, rural development in the TsRC is stuck in a vicious cycle in which the existing inaccessibility hinders development. Research participants expressed concerns about inaccessibility; the 'ruralness' of the municipality is seen as a barrier to development.

The more rural a community is, the more likely it is that development interventions will neglect it while more accessible areas are selected for projects. It is easier and more cost-effective to design and implement projects in areas that are easier to access. The difficulties of formal governance actors attempting to service rural areas are mirrored by the experience of rural communities being underserviced and neglected. One headman from the upper TsRC said that he had been asking the municipality to service their roads, but the municipality had been unresponsive. The municipality's unresponsiveness to the headman's requests illuminates the bidirectional nature of accessibility and how they interact. In this example, the governance actor's inaccessibility contributes to a rural area's ongoing inaccessibility.

Balancing loop *B1*: *Challenges associated with increased accessibility* is a balancing loop that suggests that increased *rural area accessibility* leads to increased *social challenges,* thus tempering the reinforcing effects of R1 and R2. The most pressing *social challenges* with increased *rural area accessibility* are the increase in substance abuse and associated crime, along with easier access for gangs based in urban centres. With the ongoing lack of *rural area accessibility,* rural areas remain isolated from the influence of crime and drug abuse. *Social challenges* directly impact *rural area development,* as they undermine rural residents' capabilities.

R2: Increased opportunities suggests that increased *rural area accessibility* can increase *access to opportunities.* Increased access can result from more development projects in the area or from rural residents being able to access opportunities in urban centres. Increased *rural area accessibility* enables *access to opportunities* such as jobs or services, such as health care and education, that are often unavailable in a rural space. In a virtuous cycle, *access to opportunities* could reduce the *social challenges* as employment increases and education improves, and so would be less likely to contribute to *social challenges*. High unemployment rates contribute to *social challenges*; therefore, *increased opportunities* can decrease *social challenges*. In a vicious cycle, poor access to opportunities results in increased *social challenges,* which decreases *rural area development.*

This key variable diagram emerged early in the research process and was consistent across many of the early interviews conducted with the deeply embedded local governance actors introduced above. The accessibility challenge is fundamental to understanding the challenges of participatory governance of rural areas.

3.2 | Shared Understanding and Facilitation

Participant engagement is influenced by the language and the terminology used. Differences in knowledge and understanding can create barriers to meaningful participation. These barriers are particularly common when diverse actors are attempting to work together. Key insights with the Tsitsa Project led to the use of a Learning Words workshop that used a collaborative word-cloud generation process co-create a shared understanding of particular words used in natural resource management (Palmer et al., 2022). Some level of shared understanding can enable the transfer of information between actors with relatively few misunderstandings. The 'Learning Words' workshops highlighted the challenges of communicating across language barriers and the low literacy levels among elderly community members. These language barriers inhibited the of the researchers to access to governance interactions between village-based governance actors. Conversely, community members who are not confident to speak and write English have restricted access to higher levels of governance.

Another key variable is the quality of the facilitation of participatory interactions. Facilitation refers to a supportive role played by an actor to help a group to communicate and collaborate (as will be explored in the example narrative presented below).

3.2.1 | Narrative exploring skilled facilitation in a climate change workshop. In January 2020, the first author attended a workshop organised by the Tsitsa Project in collaboration with Department of Forestry, Fisheries and the Environment (DFFE) local government support. The workshop aimed to highlight the urgency of acting to mitigate and adapt to climate change at the local government level and to explore the Tsitsa Project's role. The workshop included representatives of the Tsitsa Project, local and district municipalities, the national DFFE, the provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT), and the Department of Rural Development and Agrarian Reform (DRDAR). During the workshop, climate change was used as a challenge, with cross-cutting impacts that were relevant to several actors to enable cross-departmental collaboration and planning. The workshop was a participatory governance activity that was aimed at enabling future collaboration. This narrative is based on a reflection with the Tsitsa Project's community liaison officers.

At the beginning of the workshop, several participants expressed negative sentiments about the workshop. These participants suggested that the workshop was a waste of time, and that, given the proximity of the financial year-end, it was just an attempt to spend money. Another group of representatives of the provincial DEDEAT, who were responsible for co-ordinating local level climate change adaptation, felt threatened by the meeting because, they suggested, it indicated that they were not doing their job correctly. These negative attitudes towards the workshop and the resultant disruptions meant that most of the Tsitsa Project community liaison officers were unable to concentrate, engage, and learn from the workshop. However, the facilitator showed patience in enabling open dialogue between the organisers and those who felt negative about the workshop, both unravelling the negative attitudes and building a shared understanding of the workshop's purpose.

Relieving the underlying tensions in the workshop was the first positive aspect of open and skilled facilitation. The second aspect was the quality of the pedagogy, which consisted of both quality presentations and various activities that enabled people with different abilities, learning styles, and strengths to engage with the content. Furthermore, the facilitator enabled peer-to-peer learning, and drew on peoples' diverse skills by splitting participants into groups and allowing them to be more comfortable with the subject matter in order to support the learning of the less confident participants. The diversity of participants (different levels of experience and English) in the workshop meant that it was difficult to pitch the content at a level that all participants could understand; however, peer-to-peer learning in the breakaway groups helped to overcome some of the misunderstanding.

This narrative is presented here as an example of a narrative exploring a single interaction. The narrative raises a number of the key research themes related to meaningful participatory governance, including the existing tensions between different government actors, and the challenges of communicating between diverse actors. The interaction was a clear example of how investment in skilled facilitation can overcome some of these most obvious obstacles.

3.3 | Governance Capacity and Resources

Governance capacity is the ability of societal actors to solve collective problems. The interviewed governance actors see the value in proactive strategies such as proactive skills development, planning, and integration of work. However, reactive governance patterns and reliance on external consultants exacerbate vicious reinforcing loops that undermine the quality-of-service provision, project implementation, and the long-term development of local governance capacity.

Capabilities are described as 'what people are effectively able to do and be' (Sen, 2002). Having the capability to enable meaningful participatory governance requires both internal capacities and a conducive external environment. The findings suggest that contextual factors such as corruption, large backlogs, and pressure to produce

short-term benefits that undermine proactive governance activities and the effective realisation of local governance capabilities (these factors are explored in more depth in the discussion Section 4.2 |).

3.4 | Community Participation and Incentives

Rural communities consist of individuals with differing interests and motivations. Divisions within communities are widespread and can undermine externally driven interventions. While local governance actors see community unity and community participation as ways to reduce problems during implementation, it is also important to realise that the history of broken promises has contributed to a loss of faith and an unwillingness to participate, and that there are tangible limits to what can be achieved through participation. Incentives for governance actors organising participatory interactions and community members participating are key tools for attempting to overcome distrust and dissent. It is common for governance actors to use short-term benefits, such as food handouts or part-time work to incentivise buy-in and participation.

The dominant communication channels at the local level are informal and flexible to account for the rural context, but can result in community divisions, thus restricting dissemination. For example, if one social group in an area obtains information about an opportunity, they might not share it with another social group that competes for the same opportunities. The informal information flows mean that (a) the reliability of information is reliant on the capacity of governance actors who are tasked with spreading information, and (b) direct communication from officials with recognised authority can be a powerful means to create trust in that information.

One challenge is that, rather than being a core role, participatory processes are often considered extra add-ons and, therefore, are difficult to prioritise. Furthermore, rather than being generative processes, they become additive in nature, and require additional effort that puts further strain on the available governance capacity.

3.5 | Trust and Interpersonal Relationships

Research participants value trust and there is an expressed desire to build trust and to collaborate. Trust is defined as 'a psychological state in which an entity (a trustor) accepts some level of vulnerability based on a positive expectation of another entity (a trustee)' (Stern & Coleman, 2015, p.119). As in the narrative about a water crisis below, there are many examples of actors coming together with good intentions. However, collaborations falter owing to distrust and other factors, such as rapid staff turnover and instability, which disrupt interpersonal working relationships. These variables are explored in the narrative below.

3.5.1 | Narrative describing a water crisis meeting. In November 2019, towards the end of the dry winter season, a member of the Elundini Chamber of Commerce invited the first author to attend a closed meeting between themselves and the water service providers from Joe Gqabi District Municipality. The invitation directly resulted from spending time in the context, meeting actors informally, and discussing my research interests. The water service provider initiated the meeting to discuss options for alternative water supplies in the town of Nqanqarhu.

The Elundini Chamber of Commerce is a group of mostly white local businesspeople, many of whom formed part of the local government pre-1994 but have since been replaced by black people. The current government, in which black isiXhosa-speaking people hold overtly powerful positions, contrasts with pre-1994 when white people dominated local government. Notably, the changes in government demographics have visibly shifted who holds the practical decision-making power; however, it is more difficult to decipher who holds the covert influence to shape the paradigm in which those decisions are made – for example, the ongoing use of external consultants. The shift in the formal allocation of power was evident in the expressed feelings of disenfranchisement among white residents who have watched service delivery for white people deteriorate as the post-1994 democratic government attempted to extend the supply of services to the previously neglected black population.

At the beginning of the meeting, there was explicit discussion about the 'us versus them' mentality, which disrupts the working relationships between businesspeople and local government, and an expressed desire by both actors to move past the historical conflict. The Chamber of Commerce representatives said that they had helped to fix a few burst pipes, and supported the water services provider, but were not getting any feedback or support in return. There was discussion about previous attempts to increase the town's water storage that had been marred by corruption, resulting in the job not being done. The ongoing experiences of unmet promises and expectations had deepened distrust between the two actors. Even though the meeting was friendly, with good intentions voiced from both sides, the Chamber of Commerce members stated that they were not convinced that anything would change.

This narrative raises a number of key themes related to trust between local governance actors. It also provides important contextual details regarding the history of race relations in the area and the state of local government. Meaningful participatory governance is founded on a sensitivity to contextual nuances.

3.6 | Buy-in and Accountability

A fundamental justification for more participation is the increased accountability that accompanies increased interactions between actors, which can improve information flow and trust in decision-making. Accountability refers to the ability of one actor to ensure that another fulfils a plan or promise made. Upward accountability refers to lower-level actors being held accountable by higher-level actors, while downward accountability refers to the opposite (Ribot, 2002). 'Higher' and 'lower' refers to where actors are located in the governance system; higher actors generally work at larger scales than lower actors. These variables are explored in Exhibit 4 presented below.

The findings related to this key variable reveal how contributions to enabling accountability can be disrupted when actors from higher levels of governance do not buy into lower-level participatory processes, or when participatory processes are not designed to enable meaningful engagement. Furthermore, there are inherent limitations to the amount of time that can be spent together and how much actors in positions of power will be willing to share their decision-making power. (These dynamics are explored in the example, Exhibit 5, presented below.)

3.6.1 | Balanced key variable diagram exploring buy-in and accountability. Error! Reference source not found. Exhibit 4 elucidates the relationship between buy-in and accountability by combining the mental models of four governance actors: a community development worker working within the local municipality, a manager involved in planning within the local municipality, the Tsitsa Project's integrated planning coordinator, and the manager of an implementing agent working under DFFE.

At the centre of Exhibit 4 is buy-in from higher actors and the accountability of higher actors, which are linked by three reinforcing feedback loops. *Buy-in from higher actors* refers to the tendency of actors from higher levels to be present to participate and provide support for lower actors. *Accountability of higher actors* is the ability of lower actors to monitor and influence the actions of higher actors (or downward accountability).

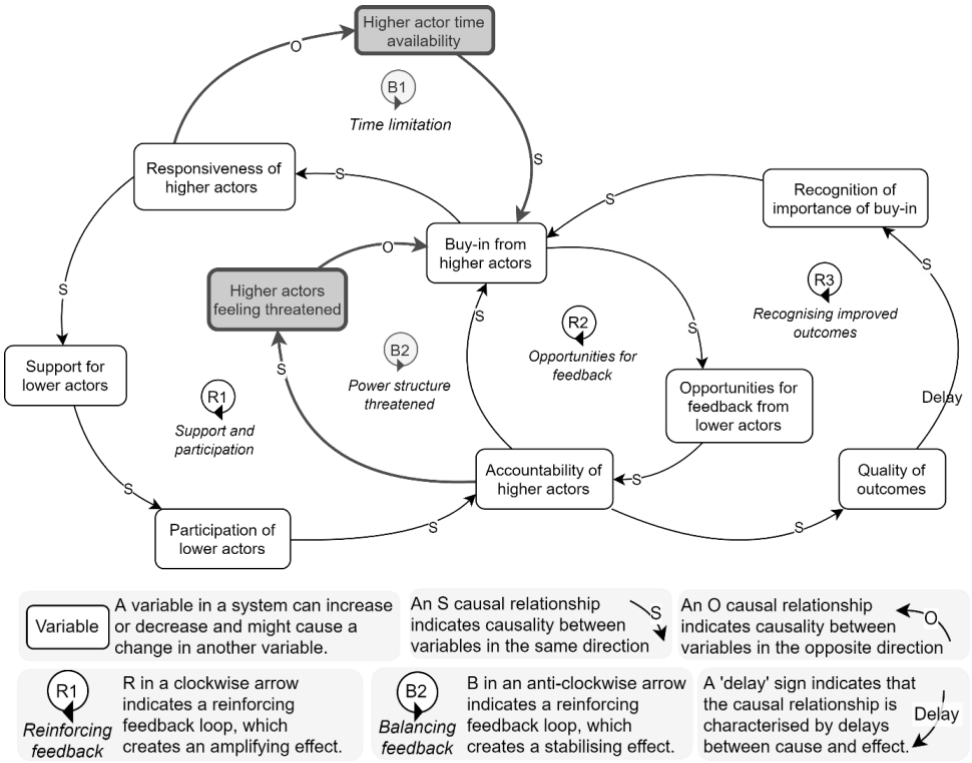
R1: Support and participation suggests that when higher actors buy in and support lower actors lower actors participate more, which supports the *accountability of higher actors (*or downward accountability*).* The findings suggest a prevalence of vicious cycles, rather than virtuous ones, as village-based actors do not feel supported by the municipal officials and department managers, who, in turn, do not feel supported by the provincial and national departments.

R2: Opportunities for feedback indicates that buy-in from higher actors provides *opportunities for feedback from lower actors,* which enables *accountability of higher actors* (the virtuous version). Alternatively, decreased *buy-in from higher actors* reduces *opportunities for feedback from lower actors,* which means fewer opportunities for ensuring accountability, and thus higher actors are less likely to buy in.

R3: Recognising improved outcomes proposes that improved *accountability of higher actors* would improve the *quality of outcomes*, which would result in increasing *recognition of the importance of higher actor buy-in.* Alternatively, a decrease in *accountability of higher actors can* result in reduced *quality of outcomes* and, therefore, no *recognition of the importance of buy-in from higher* actors, leading to *decreased buy-in from higher actors*. The delay in *recognition of the importance of buy-in* would limit the strength of R3, potentially resulting in any improvement in the *quality of outcomes* being mis-attributed.

Exhibit 4 proposes two balancing feedback loops that might limit the potential benefits of the reinforcing loops described above. *B1: Time limitations* indicates that the availability of actors is limited. Any increased *responsiveness of higher actors* would reduce the *higher actor time available*: the more time spent in participatory interactions; the less time actors have to do other work. With reduced time available, the higher actor is less likely to buy in in the future. In *B2: Power structure threatened,* the increased *accountability of higher actors* increases *higher actors feeling threatened* by lower actors. B2 reduces the efficacy of accountability mechanisms in influencing higher actor buy-in.

Exhibit 4. Enhanced Balanced key variable diagram showing balancing dynamics related to buy-in and accountability. Balancing dynamics are shown in grey. Source: the first author's doctoral thesis.



This key variable diagram is significant as it explores the interactions between the multi-level governance system. Both the potential mechanisms for enabling participation across levels as well as the limitations to these efforts. Accountability, both upward and downward, are key mechanisms for ensuring that the actions of actors at one level are meaningful within the broader governance system.

4 | Discussion

Through narratives and diagrams, the findings explore the variables and patterns that influence participation. This section discusses the obstacles and emerging solutions, as well as the trade-offs that need to be considered when searching for meaningful participation that is intelligible and significant to the actors involved as well as relevant to and coherent within a broader, multilevel governance system.

4.1 | Facilitating Access and Enhancing Interactions

Accessibility is a key variable; indeed, recent efforts to enable the participation of people in governance come up against the roots of the apartheid ideology, which sought to remove black people from every aspect of South African society (Tapscott, 2017). For example, the poor physical infrastructure, such as roads and communication infrastructure, make the inclusion of rural residents in governance interactions difficult and expensive (Exhibit 3). Accessibility is necessary for local people to be able to be involved and therefore for participatory processes to fit within a local governance system.

Information communication technology provides one potential mechanism for overcoming the prohibitive costs of bringing people to the same physical location. The use of communication technology in participatory governance increased dramatically during the COVID-19 pandemic. Unfortunately, the digital divide meant that the transition to technology-assisted communication was not as smooth in rural areas as in many of the more developed areas (Kulundu-Bolus et al., 2021). These experiences suggest that a purely technology driven transformation in participation would likely exacerbate the existing exclusion rather than reduce it. Given that the current governance system in the TsRC is reliant on informal channels and the physical presence of governance actors, information communication technology seems unlikely to enable more meaningful participation.

Another challenge is that the use of English as the formal language of governance make formal governance interactions intelligible to rural residents – a key example of the impact of power and knowledge asymmetries. While these accessibility challenges are significant and undermine meaning within participatory processes, the findings also

reveal clear examples of obstacles being overcome. For example, the Tsitsa Project sought to overcome boundaries through a focus on skilled facilitation as in the narrative in Section 3.2.1 | , the inclusion of practitioners from DFFE in research processes (Cockburn et al., 2018), the inclusion of community members in restoration planning, and the implementation of the Leaning Words processes, which built on an acknowledgement of a lack of common vocabulary and the importance of these fundamental building blocks of participation (Palmer et al., 2022). The Tsitsa Project was also able to overcome accessibility problems by hosting participatory planning workshops in rural areas where rural residents and traditional leaders feel comfortable. Similarly, the community development workers interviewed as part of this research highlighted the short-comings of group meetings in central locations where people feel intimidated, and the benefits of going door-to-door to discuss issues with people one-on-one in a space where they feel comfortable. These potential solutions highlight the need for physical presence and time spent together generating shared understanding.

4.2 | Re-prioritising Governance Capacity and Resources

Increasing resource allocation to participatory processes is challenging given the lack of resources and the multiple crises that face local governance actors in the TsRC. Additionally, corruption and financial mismanagement occur at all levels of government in SA, including within local government. For example, the 2017-2018 audit outcomes revealed substantial regression in municipal financial management, with only 8% of municipalities in South Africa receiving clean audits and over R20 billion being wasted by irregular expenditure (Makwetu, 2018). Broader governance problems inhibit local governance processes embedded within a multi-level governance system. Creating separate governance processes may provide short-term gains but need to cohere with the broader system.

Furthermore, the limited local governance capacity is often consumed by reactive problem-solving rather than proactive governance. The tendency to be reactive rather than proactive in governance suggests the existence of what Repenning and Sterman (2001) call the 'capability trap', in which all efforts are directed towards doing work now rather than putting in the time to build better systems and, therefore, more capabilities for the future. The existence of the capability trap has been noted in another study of local water governance in the Eastern Cape (Clifford-Holmes et al., 2015). The capability trap is a typical example of short-term thinking focused on the events.

Substantive participatory governance requires substantial upfront resource investment, and does not fit the paradigm of short-term economic efficiency (Sinwell, 2011). Furthermore, reprioritisation of resources is challenging as it is common to overlook the difficult-to-attribute, long-term benefits of participatory approaches such as relationship- and trust-building and to underestimate the damage of unintended consequences, such as community sabotage owing to lack of trust, the unsustainability of short-term benefits, or high transaction costs as a result of a lack of shared understanding. Simultaneously, there is a pragmatic necessity to achieve real-world goals – the narrative in Section 3.5.1 | explores the detrimental effect of broken promises surrounding the achievement of real-world goals. Tangible intermediate outcomes are crucial, as collaboration and participation without incremental outcomes can be detrimental to trust building and buy-in (Ansell & Gash, 2008). The participation of actors in processes that are unlikely to have desirable outcomes will increase distrust and dissatisfaction.

A further challenge is that participatory governance goes beyond the contained sphere of meetings and workshops and into the even messier real world. Participation happens in the daily activities of governance and in the one-on-one interactions through which relationships are built. The more informal and diffuse aspects of participation are more difficult to study and evaluate and, therefore, provide funding for and support.

Reprioritising time and resources to participation is necessary; however, one cannot advocate reprioritisation with naïve optimism. For example, increased participation suggests an increase in connectivity between separated groups and increase bidirectional connections and feedback mechanisms. Both of these changes imply an increase in information flow – if not the volume of information, then certainly the heterogeneity of that information. Indeed, part of the justification for more participatory approaches is that they support the increased diversity of information sources (Heinelt et al., 2002; Palmer et al., 2022). Ever increasing participation beyond an optimal level would produce excess and potentially meaningless interactions.

Change resistance within the system is another key balancing loop which will act to oppose any changes in system functioning. One insight is the value of being aware of the broader context and political climate in which points of low change resistance (Harich, 2010) or windows of opportunity (Olsson et al., 2006) might emerge in ways that support reprioritization of time and resources that increase meaningful participation.

4.3 | Centralisation And Patterns of Accountability

In South Africa, there have been efforts to transfer of power and resources to authorities who are representative of and downwardly accountable to local populations (Ribot, 2002). However, in general, progress towards decentralisation of land and water governance in South Africa has been slow (Stuart-Hill & Meissner, 2018; Mahlati et al., 2019).

Centralised systems of governance necessarily generate dependence of small systems on central entities that control the institutions and resources through hierarchies characterised by unidirectional connection (Heinelt et al., 2002). The dominant pattern of centralisation manifests in the TsRC as lower actors find themselves upwardly accountable to higher actors, while not being satisfied with the buy-in of those higher actors within the processes designed to facilitate downward accountability. While it is not clear exactly how much higher actors should reasonably buy in to local forums, given the substantial time commitments required (Exhibit 4), it is clear that multi-level coherence may be undermined by the differences between the expectations of lower actors and the reality.

Part of the governance challenge is to find the balance where local-level governance actors can adapt the formal rules to fit the local conditions while being both upwardly and downwardly accountable to the people they are supposed to serve. Middle-ground approaches, such as polycentric governance (Ostrom, 2014), highlight the necessity of capabilities at multiple levels of governance, with less oversight from a central organising body and more feedback from local levels to higher levels. It is likely that, rather than waiting for a trustworthy government, civil society participation and accountable institutions must emerge simultaneously. Building coherence, relationships and trust at multiple levels would likely require accessing the highest-leverage points (Meadows, 1999) and taking 'leaps of faith' that transcend the past patterns and paradigms that perpetuate centralization an segregation – but in the full knowledge that there will be disappointments along the way.

The poverty and the desperation of village-based actors leave them open to manipulation or abuse by external actors. Protest and sabotage are seen by some community members in the TsRC as the only way to ensure accountability, thus mirroring broader trends of unrest and dissatisfaction in South Africa (Bhattacharya & Rach, 2021). While protest and sabotage can be effective, indeed, protest is likely a result of the presence of rational distrust held by community members because of past broken promises. However, protest can also add to uncertainty and antagonism, and the gains can be short-lived if unrelated to established institutions. There is also the inherent potential for violence, and the potential for protests to be captured by a group or individual with nefarious purposes.

In the TsRC, a setting characterised by communal forms of land use and ownership, the pessimism of a small group looking to benefit themselves can destroy an intervention. Local governance actors asserted that uniting a community behind an intervention is a way to limit the problems during implementation created by unhappy community members. The underlying assumptions of homogeneity within this assertion is at odds with the recognition of the depth of engagement required to conduct a land- and water-focused intervention in a shared landscape. Fracturing in communities and micro-politics are the norm (Cleaver, 2012). In this context, protest can break trust and so exacerbate the view of a community as homogeneous or non-rational, rather than encouraging an external governance actor to invest in substantive engagements.

Despite the many people who have disengaged, have lost faith, or are actively antagonistic towards external interventions, there is still a substantial willingness to engage, suggesting either hope and resilience in the face of serious challenges or a level of vulnerability that leaves few other choices. A combination of hope and vulnerability likely influences motivations to participate.

4.4 | Persistent Mental Models

A core part of the systemic structures that create systemic inertia are the mental models of actors in the system who perpetuate what they know, have experienced, and are comfortable with (Meadows, 1999; Nguyen & Bosch, 2013). An individual's mental models emerge in response to stimuli to which they are exposed; therefore, change to a mental model requires new stimuli (Jones et al., 2011).

South Africa is a young democracy and many of its citizens have not experienced governance spaces designed to foster meaningful participation. Lotz-Sisitka and Burt's (2006, p.13) observations, in the context of water resource management, remain relevant today: *'For most people in South Africa, no matter what their status, democracy is a new system and South Africans are still developing their understanding of this system. A personal and group responsibility for water management that will lead to meaningful participation is something that needs to be encouraged and developed in almost every South African citizen, from rich white farmers to rural dwellers to the urban middle class to DWAF [Department of Water Affairs and Forestry] employees. One cannot, therefore, assume that participation will take place by simply calling a meeting.'*

It is crucial that we pioneer new ways of participating and support the development of new mental models with regard to how participation can happen. However, new participatory methods should assert the value of existing knowledge and practice by building on existing institutions rather than intervening through formal authority and incentive structures that 'tend to overlook the complex dynamic nature of local institutions' (Cleaver, 2012, p.2), and that might act to delegitimise existing, less formal participatory mechanisms (Cornwall, 2008). By borrowing from the old institutions, participants need not process completely new rituals and rules, thereby minimising the mental energy required to participate (Cleaver, 2012). As Harich (2010) suggests, imposing new ideas and structures is bound

to lead to change resistance; therefore, interventions should build on existing institutions and that relate to matters of interest to local people.

4.5 | Reflections on the Multi-Method Approach

A feature of the analysis is the two methods to explore the same phenomenon: the mental model elicitation with diagram-based analysis, and the observations with thematic analysis. The multi-method approach created the opportunity for creating more reliable insights by enabling the comparison of researcher experiences with those of other governance actors. While the data were overlapping and supportive, the different data sets focused on distinct aspects. The participant observation data allowed for insight into specific participatory interactions and into the internal dynamics, as illustrated by the narrative example. The governance actors' mental models, in contrast, provided details of the broader system, such as the dynamics related to accountability as shown in Exhibit 4. These broader are difficult to observe, as they play out predominantly 'behind the scenes'.

The use of both diagrams and narratives enabled complementary modes of enquiry. The diagram-based analysis supports process tracing, in which chains of causality are generated from detailed descriptions (Tomoaia-Cotisel et al., 2022). The diagramming conventions place a focus on the logic and consistency that require detailed and iterative analysis. The thematic analysis complements the diagram-based analysis by providing a way to organise a large volume of qualitative data. Through coding and theme generation, the thematic analysis supports synthesis, which is expressed through narratives. While the narratives do not provide the same level of detail and causal exploration as the diagrams, they provide context, and support the elucidation of a fuller picture of the complex real-world problem situation.

Both methods can be adaptively applied. The key variable diagramming method is adaptable and can draw on interview data or existing documentation. The method is applicable in contested contexts where many participatory approaches (such as group model-building) are difficult to undertake and even interviews might be particularly limited.

The multi-method approach foregrounded the importance of iteration in generating rigorous and coherent findings; indeed, iteration is valued in action research and in transdisciplinary research more broadly, and is specifically valued in systemic action research and systems thinking (Clifford-Holmes et al., 2015; Ison, 2017). However, iteration has challenges, as each iteration inevitably reveals nuances and new areas to explore. This desirable feature of iteration can become a problem, as endless iteration can cause an engaged and transformative study to become time-consuming and detached. The recognition of the challenge of relying on iteration highlights the need to design a study carefully.

5 | Conclusion

The systemic analysis of participation revealed key variables, elucidating patterns, structures, and mental models through diagrams and narratives. The findings suggest that limited meaningful participatory governance is currently being practised in the TsRC, thus aligning with the literature on land and water governance in South Africa. Inaccessibility, barriers to understanding, mismanagement, a drive for short-term gains, distrust in formal actors, and conflicts over buy-in and the inefficacy of formal accountability mechanisms are some of the identified problems undermining the realisation of meaningful participatory governance that is intelligible and significant to the actors involved as well as relevant to and coherent within a broader, multi-level governance system. Despite the problems, the analysis also reveals potential solutions for finding new pathways for participatory governance. It is key that governance actors experience first-hand instances of positive and meaningful participatory processes so that their mental models may shift.

The findings are drawn from a single case study and are therefore should be generalised with care and attention to difference in context, however, they do contribute to a growing literature that assert the value of embedded governance systems that fit the local context as well as the broader governance system (Cleaver & Whaley, 2018; Bussu et al., 2022). The analysis highlights the importance of physical accessibility and cognitive accessibility of participatory processes that can be enabled by actors spending time together or through investment in quality facilitation and translation. It is also key to acknowledge a diversity of perspectives and seek to actively surface mental models and building shared understandings towards meaningful communication. Beyond the interactions which constitute the system of participatory governance, processes can become more coherent within a governance system by promoting *interpersonal relationships* within and between levels of governance or by *higher-level actors supporting* interactions that are organised by lower-level governance actors.

Despite widespread support for more participation in governance, the application of participatory approaches should avoid becoming tokenistic or manipulative. We assert the importance of context for enabling meaningful participation and hope that our analysis has contributed empirically and methodologically to the engaged and systemic study of governance systems embedded within complex social-ecological systems.

Acknowledgements

This paper is based on the first author's doctoral thesis in water resource science from Rhodes University.

We are grateful for the financial support from the Department of Forestry, Fisheries and the Environment (DFFE) through the Tsitsa Project, as well as the transdisciplinary research environment created by the project. In particular, we acknowledge the supportive role of the Tsitsa Project's governance community of practice in which this research was embedded. We appreciate the multiple contributions made by all of the people living in the Tsitsa River Catchment, in particular, the interview participants and the Tsitsa Project's community liaison officers. Further, we acknowledge the support of the National Research Foundation through our involvement in the Social Learning Community of Practice.

References

Abson, D. J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., von Wehrden, H., Abernethy, P., Ives, C. D., Jager, N. W., & Lang, D. J. (2017). Leverage points for sustainability transformation. *Ambio*, *46*, 30–39. https://doi.org/10.1007/s13280-016-0800-y

Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, *18*(4), 543–571. https://doi.org/10.1093/jopart/mum032

Antonio, W., & Griffith-Charles, C. (2019). Achieving land development benefits on customary/communal land. *Land Use Policy*, *83*, 124–133. https://doi.org/10.1016/j.landusepol.2019.02.005

Audouin, M., Preiser, R., Nienaber, S., Downsborough, L., Lanz, J., & Mavengahama, S. (2013). Exploring the implications of critical complexity for the study of socialecological systems. *Ecology and Society*, *18*(3). https://doi.org/10.5751/ES-05434-180312

Avraamidou, L., & Osborne, J. (2009). The Role of Narrative in Communicating Science. *International Journal of Science Education*, *31*(12), 1683–1707. https://doi.org/https://doi.org/10.1080/09500690802380695

Bhattacharya, S., & Rach, T. (2021). Social Strife of South Africa in 2021 Fueled by Economic Issue than Political Instability. *International Journal of Research in Engineering, Science and Management*, *4*(8), 38–40. https://journals.resaim.com/ijresm/article/view/1148

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2). https://doi.org/10.1017/CBO9781107415324.004

Burchill, G., & Kim, D. H. (1993). *Inductive Systems Diagrams: an Empirically Based Theory Generation Technique* (Sloan Working Paper No. 93).

Bussu, S., Bua, A., Dean, R. J., & Smith, G. (2022). Introduction: Embedding participatory governance. *Critical Policy Studies*, *16*(2), 133–145. https://doi.org/10.1080/19460171.2022.2053179

Carley, K., & Palmquist, M. (1992). Extracting, Representing, and Analyszing Mental Models. *Social Forces*, *70*(3), 601–636.

Carnohan, S. A., Clifford-Holmes, J. K., Retief, H., McKnight, U. S., & Pollard, S. (2021). Climate change adaptation in rural South Africa: Using stakeholder narratives to build system dynamics models in data-scarce environments. *Journal of Simulation*, *15*(1–2), 5–22. https://doi.org/10.1080/17477778.2020.1762516

Cleaver, F. (2012). *Development through Bricolage: Rethinking Institutions for Natural Resources Management*. Routledge: Taylor and Francis Group.

Cleaver, F., & Whaley, L. (2018). Understanding process, power, and meaning in adaptive governance: A critical institutional reading. *Ecology and Society*, *23*(2). https://doi.org/10.5751/ES-10212-230249

Clifford-Holmes, J. K., Slinger, J. H., Mbulawa, P., & Palmer, C. G. (2015). Modes of Failure of South African Local Government in the Water Services Sector. *Proceedings of the 33rd International Conference of the System Dynamics Society*, 1–17.

Cockburn, J. J., Palmer, C. G., Biggs, H. C., & Rosenberg, E. (2018). Navigating Multiple Tensions for Engaged Praxis in a Complex Social-Ecological System. *Land*, *7*(4), 129. https://doi.org/10.3390/land7040129

Cornwall, A. (2008). Unpacking "Participation" Models, meanings and practices. *Community Development Journal*, *43*(3), 269–283. https://doi.org/10.1093/cdj/bsn010

Defries, R., & Nagendra, H. (2017). Ecosystem management as a wicked problem. *Science*, *356*(6335), 265–270. https://doi.org/10.1126/science.aal1950

Folke, C., & Berkes, F. (1998). *Understanding dynamics of ecosystem-institution linkages for building resilience* (The Beijer Institute of Ecological Economics & Royal Academy of Sciences Discussion Paper No. 112).

Fricker, M. (2007). *Epistemic Injustice: Power and the Ethics of Knowing*. Oxford university Press. https://doi.org/10.1093/acprof:oso/9780198237907.001.0001

Fry, A. (2023). *Leverage Points for Meaningful Participatory Governance: Lessons from the Tsitsa River Catchment, South Africa. Doctoral Thesis.* Rhodes University.

Glaser, B. G., & Strauss, A. L. (2006). *The Discovery of Grounded Theory: strategies for qualitative research*. AldineTrasaction: A division of Transaction Publishers.

Harich, J. (2010). Change resistance as the crux of the environmental sustainability problem. *System Dynamics Review*, *26*(1), 35–72. https://doi.org/10.1002/sdr.431

Heinelt, H., Getimis, P., Kafkalas, G., Smith, R., & Swyngedouw, E. (2002). Participatory Governance in Multi-Level Context: Concepts and Experience. In H. Heinelt, P. Getimis, G. Kafkalas, R. Smith, & E. Swyngedouw (Eds.), *Participatory Governance in Multi-Level Context*. Springer Fachmedien Wiesbaden GmbH. https://doi.org/10.1007/978-3-663-11005-7

Inam, A., Adamowski, J. F., Halbe, J., & Prasher, S. (2015). Using causal loop diagrams for the initialization of stakeholder engagement in soil salinity management in agricultural watersheds in developing countries: A case study in the Rechna Doab watershed, Pakistan. *Journal of Environmental Management*, *152*, 251–267. https://doi.org/10.1016/j.jenvman.2015.01.052

Ison, R. L. (2017). *Systems Practice: How to Act In Situations of Uncertainty and Complexity in a Climate-Change World* (2nd ed.). Springer, London.

Jackson, M. C. (2019). *Critical Systems Thinking and the Management of Complexity*. John Wiley & Sons Ltd.

Jones, N. A., Ross, H., Lynam, T., Perez, P., & Leitch, A. M. (2011). Mental models: An interdisciplinary synthesis of theory and methods. *Ecology and Society*, *16*(1). https://doi.org/10.5751/ES-03802-160146

Kulundu-Bolus, I., Chakona, G., & Lotz-sisitka, H. (2021). *Stories of collective learning and care during a pandemic: Reflective research by practitioners, researchers and community-based organisers on the collective shifts and praxis needed to regenerate transformative futures*. Grahamstown: Transforming Education for Sustainable Futures (TESF) and the Environmental Learning Research Centre (ELRC). https://doi.org/10.5281/zenodo.5704833

Kwenda, P., Ntuli, M., & Mudiriza, G. (2020). *Former Homeland Areas and Unemployment in South Africa : A Decomposition Approach* (Institute of Labor Economics Discussion Paper Series No. 12941).

LaMere, K., Mäntyniemi, S., Vanhatalo, J., & Haapasaari, P. (2020). Making the most of mental models: Advancing the methodology for mental model elicitation and documentation with expert stakeholders. *Environmental Modelling and Software*, *124*(November 2019). https://doi.org/10.1016/j.envsoft.2019.104589

Lang, D. J., Stauffacher, M., Swilling, M., Wiek, A., Moll, P., Bergmann, M., Thomas, C. J., Martens, P., Stauffacher, M., Martens, P., Moll, P., Swilling, M., & Thomas, C. J. (2012). Transdisciplinary research in sustainability science: Practice, principles, and challenges. *Sustainability Science*, *7*, 25–43. https://doi.org/10.1007/s11625-011-0149-x

Lotz-Sisitka, H., & Burt, J. (2006). *A critical review of participatory practice in integrated water resource management*. http://wrc.org.za/Knowledge Hub Documents/Research Reports/Project_1434_01_06.pdf

Lynam, T., & Brown, K. (2012). Mental models in human-environment interactions: Theory, policy implications, and methodological explorations. *Ecology and Society*, *17*(3). https://doi.org/10.5751/ES-04257-170324

Mahlati, V., Hall, R., Karaan, M., Kriek, D., Mabasa, B., Moagi, T., Ngcobo, T., Ngcukaitobi, T., Serfontein, N., & Sihlobo, W. (2019). *Final report of the presidential advisory panel on land reform and agriculture: for his excellency the president of South Africa*. Republic of South Africa.

Makwetu, K. (2018). *Consolidated General Report on the Local Government Audit Outcomes*. Auditor- General, South Africa.

Meadows, D. (1999). *Leverage Points: Places to Intervene in a System*. The Sustainability Institute in Hartland VT.

Meadows, D. (2009). *Thinking in Systems - A Primer*. Earthscan.

Mingers, J., & Brocklesby, J. (1997). Multimethodology : Towards a Framework for Mixing Methodologies. *Omega, International Journal of Management Science*, *25*(5), 489–509.

Moosa, M., & Hofmeyr, J. (2021, August). South Africans' trust in institutions and representatives reaches new low. *Afrobarometer Dispatch*, *474*, 1–17.

Nguyen, N. C., & Bosch, O. J. H. (2013). A Systems Thinking Approach to identify Leverage Points for Sustainability: A Case Study in the Cat Ba Biosphere Reserve, Vietnam. *Systems Research and Behavioral Science*, *30*, 104–115. https://doi.org/10.1002/sres

Olsson, P., Gunderson, L. H., Carpenter, S. R., Ryan, P., Lebel, L., Folke, C., & Holling, C. S. (2006). Shooting the Rapids: Navigating Transitions to Adaptive Governance of Social-Ecological Systems. *Ecology & Society*, *11*(1), 18. https://doi.org/10.2307/26267806

Ostrom, E. (2014). A polycentric approach for coping with climate change. *Annals of Economics and Finance*, *15*(1), 97–134.

Palmer, C. G., Fry, A., Libala, N., Ralekhetla, M., & Mtati, N. (2022). Engaging society and building participatory governance in a rural landscape restoration context. *Anthropocene*, 100320. https://doi.org/10.1016/j.ancene.2022.100320

Perrone, A., Inam, A., Albano, R., Adamowski, J. F., & Sole, A. (2020). A participatory system dynamics modeling approach to facilitate collaborative flood risk management: A case study in the Bradano River (Italy). *Journal of Hydrology*, *580*, 124354. https://doi.org/10.1016/j.jhydrol.2019.124354

Piovesan, F. (2013). Chapter 6: Active, free and meaningful participation in development. In *Office of the High Commissioner for Human Rights. Realizing the Right to Development: Essays in Commemoration of 25 Years of the United Nations Declaration on the Right to Development.* (pp. 103–108). United Nations Publications.

Powell, M., Biggs, H. C., & Braack, M. (2018). Ntabelanga and Lalini ecological infrastructure project. *A Better World*, 83–87.

Repenning, N. P., & Sterman, J. D. (2001). Nobody Ever Gets Credit for Fixing Problems that Never Happened: Creating and Sustaining Process Improvement. *California Management Review*, *43*(4), 64–88.

Ribot, J. C. (2002). *African Decentralization: Local Actors, Powers and Accountability* (UNRISD Programme on Democracy, Governance and Human Rights Paper No. 8).

Ruwhiu, D., & Carter, L. (2016). Negotiating "meaningful participation" for Indigenous peoples in the context of mining. *Corporate Governance*, *16*(4), 641–654. https://doi.org/10.1108/CG-10-2015-0138

Selebalo, I. M., Scholes, M. C., & Clifford-Holmes, J. K. (2021). A Systemic Analysis of the Environmental Impacts of Gold Mining within the Blyde River Catchment, a Strategic Water Area of South Africa. *Water*, *13*(3), 301. https://doi.org/10.3390/w13030301

Sen, A. (2002). *Development as freedom*. Oxford University Press.

Sinclair, R. (2004). Participation in Practice: Making it Meaningful, Effective and Sustainable. *Children and Society*, *18*(2), 106–118. https://doi.org/10.1002/chi.817

Sinwell, L. (2011). Rethinking South Africa's Transition: From Transformative to Mainstream Approaches to Participatory Development Rethinking South Africa's Transition: From Transformative to Mainstream Approaches to Participatory Development. *African Studies*, *70*(3), 359–375. https://doi.org/10.1080/00020184.2011.628798

Stuart-Hill, S. I., & Meissner, R. (2018). *Lessons Learnt from the Establishment of Catchment Management Agencies in South Africa*. Water Research Commission, Pretoria, RSA (Report No. 2320/1/18).

Tapscott, C. (2017). South Africa in the Twenty-First Century: Governance Challenges in the Struggle for Social Equity and Economic Growth. *Chinese Political Science Review*, *2*(1), 69–84. https://doi.org/10.1007/s41111-017-0055-1

Toledano, N., & Anderson, A. R. (2020). Theoretical reflections on narrative in action research. *Action Research*, *18*(3), 302–318. https://doi.org/10.1177/1476750317748439

Tomoaia-Cotisel, A., Allen, S. D., Kim, H., Andersen, D. F., & Chalabi, Z. (2022). Rigorously interpreted quotation analysis for evaluating causal loop diagrams in late-stage conceptualization. *System Dynamics Review*, *38*(1), 41–80. https://doi.org/10.1002/sdr.1701