CIVIL SOCIETY ENGAGEMENT WITH WATER GOVERNANCE AT A LOCAL GOVERNMENT SCALE IN SOUTH AFRICA

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By

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DEDICATION

I dedicate my thesis to the memory of Jay O'Keeffe,

my co-supervisor, mentor and friend.

ABSTRACT

The South African state's ideological commitment to a participatory approach to managing water resources and delivering services in a way that includes all stakeholders warrants critical analysis. Realising this ideological commitment has proved challenging, due largely to the complex historical, political, social, and environmental context of integrated water resource management (IWRM) in South Africa. The overarching aim of this study was to explore and expand the learning of civil society participating in water governance processes at a local government scale.

To address this aim a single, in-depth, four-year case study into civil society participation in water governance in the Makana Local Municipality in the Eastern Cape Province of South Africa was conducted between 2014 and 2018. The case study comprised two research phases. Both phases of the research were conducted using an adaptive transdisciplinary and participatory action research approach underpinned by General Complexity Theory. Located at the research-practice interface, the study sought to be transformative and advance both scientific research and societal goals. Qualitative research methods and inductive and deductive modes of inference were used to collect and analyse the data respectively.

In the first phase of the study, a Communities of Practice theoretical framing was adopted to investigate the emergence, practice and learning of a civil society organisation (CSO), Water for Dignity (WfD), in response to household water service delivery issues in the municipality. This phase served to build an understanding of factors that enabled and constrained the practice of WfD in addressing local water service issues, and of their role as social learning agents in building water-related knowledge in their community. As participation with the first civil society organisation fragmented, the opportunity arose for local government, the National Department of Water and Sanitation and civil society to co-engage. This opened up the second phase of the research during which the role of a multi-stakeholder platform, the Makana Water Forum (MWF), in enabling democratic water governance was investigated. The MWF was South Africa's first catchment management forum with an integrated water service and water resource management agenda. In this phase, the study drew on interventionist methodology, Change Laboratory, from Cultural Historical Activity Theory (CHAT) to 1) describe the historical development, composition and shared purpose of the MWF multi-activity system constellation; and to 2) guide participants through seven learning actions (expansive learning cycle) to identify, analyse, model and implement remedial actions to problematic aspects (contradictions) of the MWF practice. Participants of the Change Laboratory workshops built their individual and collective transformative agency (deliberate actions to transform a problematic

situation) as they navigated the expansive learning process. The development of this agency was identified through a micro-analysis of agentive talk. The two phases served to advance the exploration of civil society participation from informal participation to address water issues, to formal participation in water governance processes at a local government scale.

Findings from the first phase of the research revealed that dedicated and sustained support of partners with distributed expertise and the highly motivated core members of WfD enabled the practice and emergence of the civil society organisation. However, factors such as poor internal leadership, power dynamics between supporting partners, socio-economic constraints and a deeply embedded lack of agency were found to be key constraining factors to WfD's practice. Findings revealed that learning at WfD team level occurred in four ways, through learning as belonging, learning as doing, learning as experiencing and learning as becoming. The WfD CSO was able to catalyse social learning related to personal water rights; and best practices for improving water quality and water conservation in their wider community of practice. Social learning was fostered mainly through structured citizen engagements offered by WfD. The research provides evidence that civil society organisations can play an important role in bridging water-related knowledge gaps and can foster active citizenship in South African communities. However, despite significant inputs of support and resources through the engaged transdisciplinary research process, the practice and learning outcomes of WfD had a marginal transformative impact on improving the citizen's every-day water service experiences.

Findings from the second phase of the study revealed the MWF to resemble a multi-activity system constellation with a multiple, partially overlapping interests related to the management of water. The establishment, function and contradictions constraining the function of the MWF were influenced by past cycles of participatory water governance-related activity and practice at national and local scales. Through the Change Laboratory process, 25 contradictions were identified that appeared to constrain the ability of the MWF to enable inclusive and meaningful participatory water governance. Through a process of expansive learning, participants sought to overcome three sets of contradictions grouped as Problem Themes: lack of clear focus of the MWF; representation, representivity and non-attendance; and the MWF relationship with the Makana Local Municipality. Remedial actions modelled and those enacted have improved aspects of the function of the MWF (such as diversified modes of engagement and a more focussed agenda) but have only resulted in incremental shifts towards enabling improved participatory practice, most markedly in building a collaborative relationship and trust between the MWF members, municipal and government officials. The micro-analysis of agentive talk revealed seven different expressions of transformative agency. Constraining socio-economic and political conditions and the limited capacity of the coordinating committee of the

MWF hindered the development of transformative agency to the extent to which concrete actions were implemented. Findings further revealed that contextualising a Change Laboratory process within the adaptive cycle of a complex social-ecological system, and the particular opportunity context the system presents, could inform the enactment of agency and its potential impact on the transformation of the system. The intervention with the MWF was too short a process to clearly observe the effects of transformative actions on the sustainability of the Makana Local Municipality water system. However, long-chain transformative agency through the development of one-on-one engagements, learning journeys and a reflexive component to the MWF engagements could support transformative pathways to sustainability in the municipality and water management system.

The study contributes in-depth insight into the key role of learning as a catalyst in transformative processes. Learning improves the collaborative and adaptive capacity of people, and therefore, water management institutions, to manage explicitly for the complexity inherent in "complex" social-ecological systems. It provides empirical evidence as to what enables and constrains "real" participation and learning in grass-roots water governance processes in the context of a shifting national drive towards a more adaptive and developmental Integrated Water Resource Management approach. It further provides methodological contributions to 1) the application of the Change Laboratory method with multi-activity system constellations in developing world contexts and 2) value and limitations of extended and engaged transdisciplinary research. Lastly, it provides practical recommendations to the establishment and sustainable function of both community-based CSOs and multi-stakeholder platforms engaging in water governance processes.

DECLARATION

This thesis is my own original work and has not been submitted in part, or in full, for any degree or examination at any other university. It contains no material previously published or written by other individuals, except where due reference is made and/or acknowledgements are provided in the text. This thesis is submitted for the degree of Doctor of Philosophy in the Institute for Water Research at Rhodes University, South Africa.

27 March 2019

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ACRONYMS

AI	**Appreciative Inquiry**
CDW	**Community Development Worker**
CHAT	**Cultural Historical Activity Theory**
CL	**Change Laboratory**
CMA	**Catchment Management Agency**
CMF	**Catchment Management Forum**
CMS	**Catchment Management Strategy**
CoP	**Community of Practice**
CRC	**Citizen Report Card**
CSES	**Complex Social-Ecological System**
CSO	**Civil Society Organisation**
DWA	**Department of Water Affairs**
DWAF	**Department of Water Affairs and Forestry**
DWR	**Developmental Work Research**
DWS	**Department of Water and Sanitation**
ECWC	**Eastern Cape Water Caucus**
IDP	**Integrated Development Plan**
IWR	**Institute for Water Research**
IWRM	**Integrated Water Resource Management**
KSG	**Khulumani Support Group**
LM	**Local Municipality**
MLM	**Makana Local Municipality**
MobiSAM	**Mobile Service Accountability Monitor**
MSP	**Multi-stakeholder Platform**
MT CMA	**Mzimvubu to Tsitsikamma Catchment Management Agency**

MWF	**Makana Water Forum**
NGO	**Non-Governmental Organisation**
NPO	**Non-Profit Organisation**
NWA	**National Water Act**
RSA	**Republic of South Africa**
SES	**Social-ecological System**
ToR	**Terms of Reference**
TPNP	**Towards a New Paradigm Project**
UKWSCMF	**Upper Kowie Water Sanitation and Catchment Management Forum**
WESSA	**Wildlife and Environmental Society of South Africa**
WfD	**Water for Dignity**
WMA	**Water Management Area**
WMI	**Water Management Institution**
WRM	**Water Resource Management**
WSA	**Water Services Authority**
WSD	**Water Service Delivery**
WSDP	**Water Services Development Plan**
WSP	**Water Services Provider**

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PREFACE – A STORY OF AN ACTIVE CITIZEN

Residents living in Grahamstown, the main urban centre of the Makana Local Municipality in the Eastern Cape of South Africa, have been struggling with water service issues for decades. Issues range from in-house access to water, frequent water outages, leaking pipes, water that comes out of the pipes brown, green or opaque, over-flowing sewage pipes and polluted streams. These issues are hardest felt by people living in Grahamstown East, the historically disadvantaged suburbs or township of Grahamstown, where many residents are poor and often lack the necessary financial and social capital (Esau, 2008) to overcome water challenges. Many residents are frustrated when their calls for help through their local ward committee member, or ward councillor fall on deaf ears. In 2013 some residents rallied together as the Unemployed People's Movement and marched onto the City Hall in protest to demand that the Makana Local Municipality urgently address a number of community concerns, among them the water service issues they faced. In response, the Makana Local Municipality affirmed their commitment to addressing community concerns. However, remedial action and progress by the municipality has been slow and in 2018 many of the issues remain. Realisation that the municipality could not solve, or even address all the community concerns unassisted, sparked some citizens to take matters into their own hands.

Mbulelo Lipile, a citizen of Grahamstown East, decided to act. He refused to rely solely on the municipality to solve all of his community's water issues. He went around mending broken taps and leaks in people's houses, phone the municipality to send their water tankers to provide residents with water during outages and investigate whether this water was distributed fairly. Mbulelo stayed up until the early hours of the morning reading a small smart phone with a cracked screen, trying to decipher the complicated legal texts of South Africa's water legislation and fully understand his rights. People of his community listened to him when he spoke of water issues and injustices and came to him for help with their grievances. Mbulelo realised that the existing public participation channels to engage with the municipality such as ward committees and councillors rarely or never yielded results. Today (mid 2018), the leaking sewage pipe still runs past Mrs Dubazi's house, Mr Xoxo's water has been cut, his water bill is in the tens of thousands, he doesn't know why and he cannot afford to pay. Consequently, he and many other community members are disappointed time after time and are tired and frustrated with the municipality's inability to solve these basic issues. A different approach was required.

Mbulelo had a vision of building community capability and collective action to address water service issues that Grahamstown East residents faced. He talked to local community members in dusty

community halls, encouraging them to work together to address water issues facing their community. He said, “We need to develop a people’s water science to build a people’s water movement”. He raised the futility of blaming the municipality by saying, “For every one finger pointing to cast blame on the municipality there are three pointing back at you. So, let’s chop off the pointing finger and start finding solutions to our problems”. He realised that for things to get done, community members must mobilise as best they could and work together to address some of the issues that plague Grahamstown East.

South Africa has many people like Mbulelo, people that have activism in their blood but lack the support, social and financial capital (Esau, 2008) and access to effectively functioning engagement channels where their efforts can impact governance processes towards improving local situations.

An alternative participatory water governance space did emerge in Grahamstown, a multi-stakeholder platform that became known as the Makana Water Forum. This platform, given the right timing could have been the ideal avenue to channel the efforts of Mbulelo and his team’s water service activism. However, when the window of opportunity crated by the establishment of the Makana Water Forum opened, the resources that fuelled supported Mbulelo and his team had dried up. They lived in incredibly difficult socio-economic conditions and needed to move on to other income generating opportunities.

The South African National Water Act (Act 36 of 1998, Preamble) makes provisions to “…enable everyone to participate…” in water resource management processes. Public participation in water resource management and service delivery is enshrined in much of the legislation promulgated and policy developed for the post-apartheid dispensation and is the foundation of democratic water governance (DWA, 2013; DWAF, 2004; RSA, 1997a, 1998b). However, there is a gap between passionate citizens such as Mbulelo, who are willing to engage and contribute to water governance and the realisation of meaningful, effective and equitable engagement in water governance spaces so as to enable truly democratic water governance.

The Water for Dignity team planning their field work for the day.

1 Chapter **One – General Introduction**

In this thesis I explore civil society engagement with issues, processes and governance of water services and water resource management in the Makana Local Municipality in the Eastern Cape province of South Africa. The research follows the journey of Mr Mbulelo Lipile and a civil society organisation (CSO), Water for Dignity, that emerged to address water service delivery issues in the Makana Local Municipality. The thesis further examines civil society engagement in water resource management through the development and function of a participatory water forum. Through a transformative intervention approach, this thesis explores the establishment and development of a stakeholder engagement platform that sought to enable deliberation on issues relating to water services and water resource management.

1.1 Water law reform in South Africa towards improved democratic water governance

The transition from apartheid to a democratic state triggered a complete redrafting and reform of South Africa's water law to be appropriate for the social, economic and hydrological context of South Africa. The reform sought to guide the development of effective water resource management and water supply in an environmentally sustainable manner, with a strong emphasis on water re-allocation and equitable access, to redress social inequities of the past (Dent, 2012).

Pre-1994 the water law was conceptually based on the water-rich climatic conditions of countries in Europe, and was ill-suited to South Africa, which is water stressed, with 90% of its land classified as arid, semi-arid or sub-humid (Schreiner, 2013). Emphasis was placed on the development of large-scale, state-owned water infrastructure to support the agriculture-mining-manufacturing economy, controlled by the white minority population with little consideration of environmental consequences (Van Koppen & Schreiner, 2014). The social engineering effect of the oppressive apartheid policies limited the majority of South Africans, the black population, from access to water resources, land, meaningful education and state governance processes, effectively maintaining the marginalised black status quo.

The riparian principle of water resource access, coupled with land ownership legislation, meant that people who owned land alongside rivers had full access to the surface and ground water (Muller, 2014), while black and coloured South Africans were precluded from being land owners (Godden, 2005), and water access and allocation privileged the white minority population. Non-landholders could apply for water access from the Water Court, however, if access was granted, use could not interfere with

existing water allocations (Quinn, 2012). Even though the State classified watercourses as either private or public access, productive agricultural regions were predominantly under white ownership (Quinn, 2012). The result was that the black majority population were restricted to either living in rural areas with limited agricultural potential or in townships (slum-like suburbs in which black residents were forced to live during the apartheid regime) neighbouring cities and towns. These areas had rudimentary or no developed water access for domestic or commercial use and residents had no legal standing to contest for improved water access.

The African National Congress (ANC) came into power in 1994 and drafting of the South African Constitution (Act 108 of 1996) resulted in the enshrinement of the principle of equity and a drive to rectify and redress social and economic inequalities of the past (Woodhouse, 2008; National Planning Commission, 2012; Quinn, 2012). Chapter Two of the Constitution outlines the Bill of Rights which makes provision for human access to water (RSA, 1996, sec. 27). However, many other rights are inextricably linked and depend on access to water of sufficient quantity and quality. For example, the right to life and to live a dignified life requires access to adequate clean water (RSA, 1996, sec. 10 and 11), the right to sufficient food (RSA, 1996, sec. 27 1b) requires water for agriculture and livestock, and the right to a healthy environment (RSA, 1996, sec. 24) depends on effective management of our catchments and river systems and human pollution impacts on the quality of water resources. Furthermore, the Constitution stipulated that open, participatory processes be established to mediate people's rights.

The democratic transition also initiated a drastic water law reform process in which public participation played an important role (Munnik, Wilson, Pereira, Lotz-Sisitka & Burt, 2014). Extensive public participation was evident during the consultative process that resulted in the development of the National Water Policy for South Africa (Republic of South Africa (RSA), 1997b) and drafting of the progressive and internationally lauded National Water Act (Act 36 of 1998) (DWAF 1996) to replace the 1956 Water Act (Act 54 of 1956).

The promulgation of the NWA saw a departure from the entrenched riparian ownership and centralised, state management of water resources (Quinn, 2012), to a paradigm of decentralised water resource management at a catchment level with a strong emphasis on public participation (Pollard & du Toit, 2008). Decentralisation of water resources management and water services was based on the subsidiarity principle, which called for, "where appropriate, the delegation of management functions to a regional or catchment level so as to enable everyone to participate" (RSA, 1998b, p.1). Consequently, authority for water services was devolved to local spheres of government: metropolitan, district and local municipalities. The authority to manage water resources was to be

gradually devolved from the State at a national level, to catchment management agencies (CMAs) at a regional level (du Toit & Pollard, 2008) (**Figure 1.1**).

South Africa is complex and has a diverse social, economic, hydrological and bio-physical context. Additionally, the country faces social issues related to unemployment, poverty, health and food security. This all lends itself to the potentially positive outcomes of an Integrated Water Resource Management approach (Allouche, 2016). Water management crosscuts all sectors of society and therefore requires an integrated approach. The window of opportunity for IWRM adoption into South African water policy was wide. South Africa was transitioning into a democratic state and with it, a near complete legislation reform, including the drafting of the new progressive, rights-based Constitution with heavy emphasis on equity, redress and social-economic development. The development and discourse of IWRM was at its peak in the early 1990s with its inclusion under Agenda 21 (United Nations, 1992) and incorporation of principles from the Dublin Conference in 1992. The Dublin principles, which culminated from a thorough international consultation process, were supported universally as guiding principles to underpin IWRM. These principles strongly influenced the formalisation and interpretation of IWRM in South Africa during the water policy reform process. Two of the four Dublin principles make explicit reference to the importance of participation: "Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels", and "Women play a central part in the provision, management and safeguarding of water"
(http://www.dwaf.gov.za/iwrm/contents/about/principles.asp).

The IWRM approach sought to maximise social and economic development without compromising environmental sustainability (Funke, Oelofse, Hattingh, Ashton & Turton, 2007; Giordano & Shah, 2014) and informed the guiding principles of the NWA: equity, efficiency and sustainability.

Integrated Water Resource Management was internationally regarded as a leading approach to address critical challenges associated with catchments (Allouche, 2016). Challenges facing South Africa's catchments included: the over-allocation of water resources, which are unevenly distributed across the country; high pollution from strategic industry and overburdened municipal waste water systems; and a national water supply system that closely reflected historical conditions of inequity and resource capture by the elite (Colvin et al., 2008). The IWRM approach aimed to address water security at a catchment scale and thereby:

- empower historically disadvantaged communities;
- provide adequate water and sanitation provision for all;
- provide water to enable sustainable social and economic development; and

- promote effective cooperative governance, stakeholder inclusion and ownership of water service delivery and water resource management (DWA, 2013; Quinn, 2012).

Key to achieving these goals was the progressive decentralisation of both water service and water resource management responsibility from the state to a local level. The IWRM ideology included water services as an aspect of IWRM. However, South Africa developed separate legislation and governance institutions for water resource management (WRM) and water services. Although participation is central to all forms of water governance, formal channels for participation in WRM and water services differ. This divergence stems from the early water law reform process:

> In the water law reform process between 1995 and 1998, only one Act was envisaged. However, the water services aspects were ready for drafting slightly earlier and there was advocacy for earlier promulgation: Water Services Act (No 105 of 1997). The National Water Act (No 36 of 1998) was promulgated a year later and was always meant to be the overarching legislation. However, the separate legislation became the foundation of the confused and separate water resources and water service delivery management process (personal communication, Palmer August 2018. Palmer was a member of the water law review panel (1995-1996) and committee (1997-1998)).

After 1994, the first and second edition of the National Water Resource Strategies (2004 and 2013) were developed based on the principles of Integrated Water Resource Management (IWRM) (Colvin et al., 2008).

The following two sub-sections outline the rationale of a participatory approach (Section 1.1.1) and introduce the institutional arrangements supporting participation in water resource management (Section 1.1.1) and water services (Section 1.1.2).

1.1.1 Public participation for sustainability in water resource management

The IWRM ideology views people as inextricably connected to the water resource. Equal and sustainable use and development can only be ensured by involving those most affected in water resource management (Palmer & Munnik, 2018). In addition IWRM assumes that through developing a sense of responsibility for the management of water resources, people are more likely to take ownership of the resource and its management as well as advocate for sustainable practices (du Toit & Pollard, 2008; Lotz-Sisitka & Burt, 2006).

A further benefit of promoting participation is the potential collective management, expertise and capacity it affords. Environmental issues such as those related to catchments are complex in nature and are influenced by interlinked social, political and economic issues that manifest at varying spatial and temporal scales (Rogers et al., 2013; Tàbara & Chabay, 2013; Biggs et al., 2015). Managing this complexity and addressing associated complex environmental problems is beyond the capacity of government alone. There is an increasing recognition that adaptive management and multi- and/or transdisciplinary approaches are required (Lang et al., 2012; Angelstam et al., 2013). It was hoped that

through decentralisation and the diverse human resources civil society participation could offer, complex sustainability issues associated with natural resources could be addressed at a local scale (du Toit & Pollard, 2008).

Participation was further envisioned as a means of redress, providing millions of citizens, previously marginalised from water resource management processes during the apartheid era, with the opportunity to engage in and influence governance processes on issues that directly affect their well-being. However, as argued by Lotz-Sisitka and Burt (2006), the social engineering legacy of apartheid left the majority of South Africans without the capacity, basic skills, material resources and information required to participate meaningfully in water resource management processes.

The National Water Act mandated for Water Resource Management decentralisation through the division of South Africa into hydrologically-bound water management areas (WMAs) (**Figure 1.1**). The first edition of the National Water Resource Strategy outlined 19 WMAs (DWAF, 2004). These were later amalgamated to nine WMAs in mid-2012 (**Figure 1.5**). In some cases, WMAs encompass a single catchment, e.g. the Olifants, Orange and Vaal Rivers. In other cases, such as along the east and southern coast of South Africa, where rivers run parallel to the Indian Ocean, WMAs comprise multiple catchments exhibiting a wide range of bio-physical and ecological characteristics (**Figure 1.1**). Catchment management in coastal WMAs is complex and therefore particularly suited to decentralised management. Each WMA was to be governed by a catchment management agency (CMA), which has an important role to play in enabling participatory water governance (RSA, 1998b).

Figure 1.1: Location of the original 19 Water Management Areas (WMAs) in South Africa. These WMAs were subsequently consolidated into 9 WMAs in July 2012 (Figure 1.5). Figures and arrows depict the direction and amount of water (Mm3 per year) translocated from one WMA to another. Source: King & Pienaar, 2011.

Chapter Seven of the NWA deals with the establishment, function and operation of CMAs and states that: "[the] purpose of establishing these agencies is to delegate water resource management to the regional or catchment level and to involve local communities. . . . Catchment management agencies therefore, are designed to play an important role in promoting civil society participation in water resource management processes". Chapter Seven, Part 3 of the NWA further outlines the initial functions of CMAs as, "the development of a catchment management strategy and the promotion of community participation in water resource management". Further functions of CMAs are outlined in section 80 of the NWA: "Subject to Chapter Two and section 79, upon the establishment of a catchment management agency, the initial functions of a catchment management agency are . . . (e) to promote community participation in the protection, use, development, conservation, management and control of the water resources in its water management area". To achieve these civil society participation objectives the Minister instructed the establishment of stakeholder engagement

platforms in the form of catchment forums as stipulated in the NWA Chapter Seven, section 90: "the Minister may make regulations ... (b) requiring the establishment of consultative forums and determining their composition and functions".

Catchment management forums (CMFs) (also catchment forums) are non-statutory platforms, open to all stakeholders, particularly previously disadvantaged groups, and are the primary participatory channel for people to engage in local water resource management decision making processes (Munnik, Barnes, Burt, Ashe & Motloung, 2015). Guidelines to the establishment of CMFs outline generic roles including:

- to facilitate stakeholder consultation and participation around the establishment and functioning of the CMA and to support the development and implementation of the CMS [catchment management strategy];
- to develop institutional capacity in the WMA during the period prior to CMA establishment, and possibly the consolidation period following CMA establishment;
- to promote integrated planning and cooperative resource management between the CMA and other organs of state and role players; and
- to support the WRM operation of the CMA, by performing activities and implementing projects under the auspices of the CMS (DWAF, 2001, p.xii).

The guideline further emphasises the envisioned character of the CMFs:

> Facilitating stakeholder participation in WRM (particularly around the development of a CMS) is a catchment forum's core role. To this end, catchment forums should: be stakeholder consultative (participatory) bodies, representing multiple (multi-lateral) viewpoints, which are water sector (particularly water resources management) interest-based, organised to operate in a participatory manner, and exist to enable stakeholders to participate to achieve agreed objectives (DWAF, 2001, p.xii).

Although water services are an aspect of IWRM, its linkage has yet to be drafted into law or realised in practice. Catchment management forums operate at the interface of water resource management and water service delivery and consequently provide an opportunity to showcase the integrated nature these two components and the principles of IWRM in practice (DWAF, 2001).

Decentralised catchment management in WMAs that comprise single, large catchments (such as the Olifants, Vaal and Orange WMAs), is simpler than in coastal WMAs which are delineated as regions. These coastal WMAs can comprise upwards of 50 radically different catchments. As representatives of each of these catchments in coastal WMAs, CMFs enable the CMA to understand local realities and effectively coordinate multiple, catchment-scale water resource management processes.

Catchment Management Agencies are also responsible for overseeing the establishment and function of Water User Associations (previously Irrigation Boards during apartheid). Water User Associations are statutory, catchment-scale associations responsible for coordinating and managing water use activities for the mutual benefit of individual water users (RSA, 1998b; DWA, 2013). Water User Associations primarily represent those who use water for productive use (other than for domestic

purposes) and therefore, are not representative of all water stakeholders. Catchment management forums however, serve the interests of all water stakeholders.

1.1.2 Effecting public participation in water service delivery

Public participation, decentralisation and the principle of subsidiarity are echoed in the Constitution (RSA, 1996) and the policy context of developmental local government, which assigns power and responsibility to local government. Section 1 of the Constitution mandates local government to: a) provide democratic and accountable government for local communities; b) ensure the provision of services to communities in a sustainable manner; c) promote social and economic development; d) promote a safe and healthy environment; and e) encourage the involvement of communities and community organisations in the matters of local government. Developmental local government requires that municipalities "work with citizens and groups within the community to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives" (RSA, 1998c, sec. B). Furthermore, developmental local government should primarily focus on marginalised or excluded individuals and communities such as the very poor, women, and disabled people (Republic of South Africa (RSA), 1998c).

In this policy context, decentralisation of water service authority to local government saw the establishment of Water Service Authorities (WSA) with oversight responsibility and Water Service Providers (WSP) with delivery responsibility (RSA, 1997). Municipalities acting as WSAs either contract a WSP to deliver water services to residents or, as in most cases, play a dual and self-regulatory role of WSA and WSP. The majority of municipalities lack the required capacity personnel, financial and material capacity to efficiently deliver services as well as self-regulate (Clifford-Holmes, Palmer, de Wet & Slinger, 2016).

The ward committee system is the primary avenue for public participation in water service matters (**Figure 1.2**). Ward committees, legislated in the Municipal Structures Act of 1998 and the Municipal Systems Act of 2000, were introduced in 2004 as government structures to enable a participatory democracy in South Africa (Piper & Deacon, 2009). The ward committee system was envisaged by the government to allow ground-up participation escalated from individual residents, via their ward committee members and ultimately through their ward councillor (Smith & de Visser, 2009).

Typically, each ward committee is convened and chaired by a ward councillor, who is responsible for either referring community issues to relevant municipal portfolio committees or in the case of more severe issues, refer issues on to the municipal council. Ward committees play a role in developmental governance by facilitating civil society participation in local government planning processes, including

the development of a municipality's Integrated Development Plan (IDP), Water Services Development Plan (WSDP) and Spatial Development Plan (**Figure 1.2**).

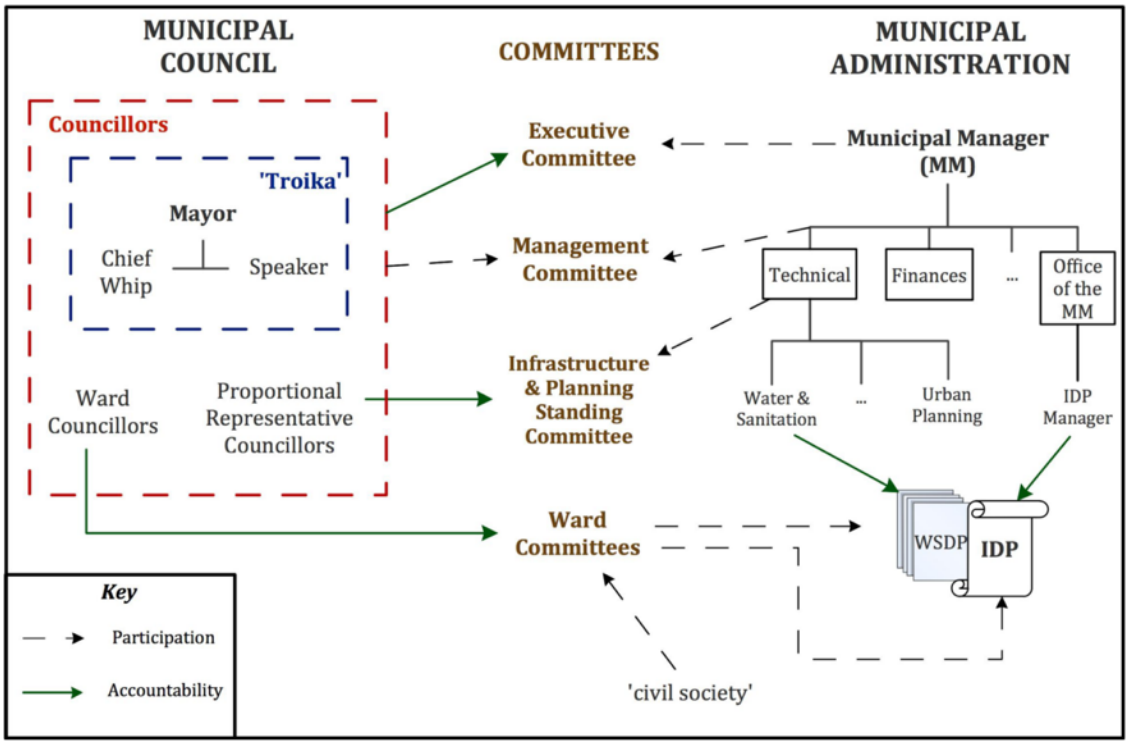


Figure 1.2: A systems diagram depicting the institutional structure, actors and decision-making pathways within a typical local municipality in South Africa. The diagram shows the relationship between the political oversight by the municipal council and various committees over the municipal administration responsible for carrying out the water service delivery responsibilities of the municipality. The participatory relationship between civil society and ward committees to contribute to developmental government planning is depicted. (WSDP – Water Services Development Plan; IDP – Integrated Development Plan) (Clifford-Holmes, 2015, p.143).

Water resources and water services were primarily treated as separate domains since 1994 but, as suggested in the NWRS2 and subsequent policy reform processes, there is a current process to review, update and merge the National Water Act and the Water Services Act as well as ongoing development of a coherent Water and Sanitation Master Plan. Although the importance of seeing water resource management and water services as interconnected is gaining credence (DWA, 2013; DWAF, 2001; Giordano & Shah, 2014; Van Koppen & Schreiner, 2014), current channels for public participation are different (**Figure 1.3**).

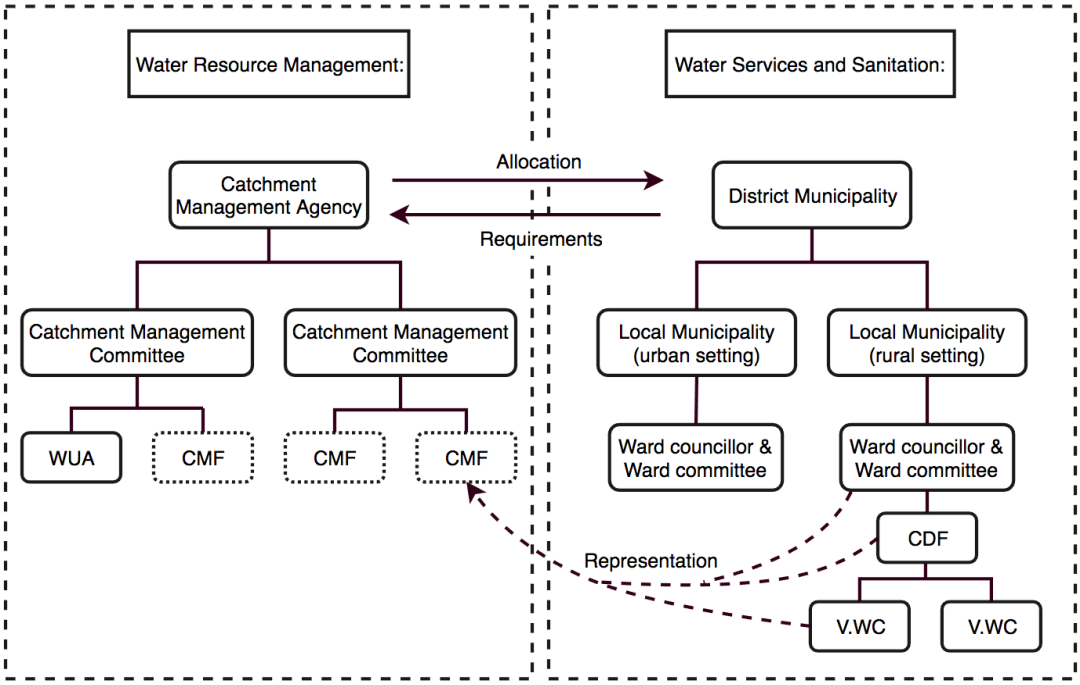


Figure 1.3: Interrelationship between institutional structures responsible for water service delivery and sanitation and water resource management. Participatory institutions encircled with a dotted line. Abbreviations: CDF = Community development forum, V.WC = Village ward committee, WUA = Water user association, CMF = Catchment management forum (adapted from Lotz-Sisitka & Burt, 2006).

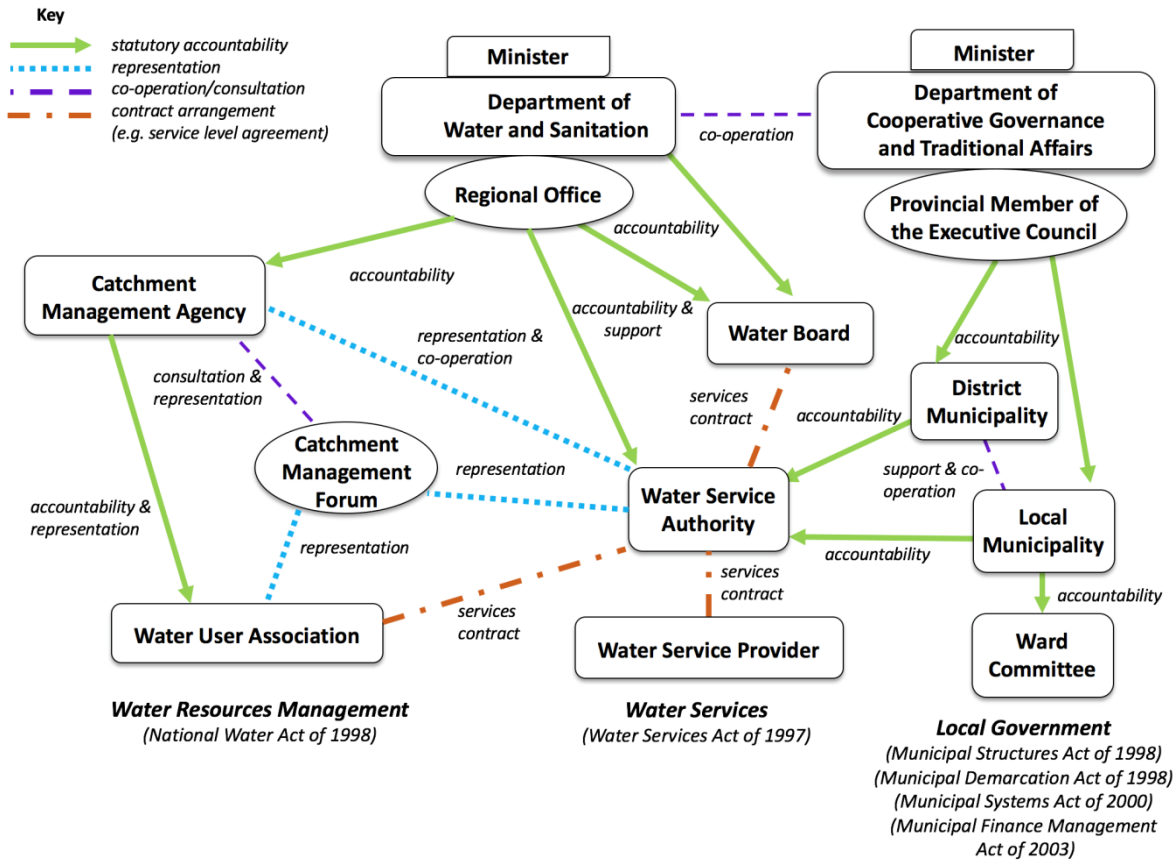


Figure 1.4: Arrangement of and inter-relationships between South African water sector institutions and actors. The arrows depict the direction of accountability from superior to subordinate institutions. Legislation specific to institutions responsible for different aspects of water governance are provided. Source: adapted from Clifford-Holmes, 2015 and Pegram & Mazibuko, 2003.

Catchments and their associated network of water resource and water service management institutions from complex social-ecological systems (Palmer & Munnik, 2018; Pollard, du Toit, & Biggs, 2011). The different interacting water management institutions operating at different spatial scales and guided by different legislation contributes to the complex nature of water management in South Africa. Figure 1.4 provides an outline of the water management institution landscape described in previous sections. Challenges within institutions and their interrelationships have made achieving decentralised and participatory water governance difficult.

1.1.3 Decentralisation and participatory water governance, is it working?

Decentralisation and participation in water resource management

South Africa may have progressive water legislation but effecting IWRM in practice has been challenging (Schreiner & Van Koppen, 2002; Van Koppen & Schreiner, 2014; Denby, Movik & Mehta, 2016). Water management institutions such as CMAs, Water User Associations and CMFs, operate and are being established in a complex and constantly changing institutional, political, socio-economic and

bio-physical landscape, influenced by multiple institutions and individuals at different spatial scales (Rogers, Roux & Biggs, 2000). As a result, the establishment and function of these water management institutions has been slow, intermittent and often confusing (du Toit & Pollard, 2008; Van Koppen & Schreiner, 2014).

Enabling decentralisation and participatory water governance hinges on the establishment and effective function of Catchment Management Agencies. However, twenty years after the NWA was published, only two of the reduced nine CMAs were functioning. The transition of Irrigation Boards to Water User Associations has yet to be completed – the initial six month timeframe as stipulated in the Act has been substantially exceeded (Schreiner, 2013). Issues related to funding, technical skills and expertise, regulation and oversight and administrative demands associated with effectively managing the planned 19 WMAs (**Figure 1.1**), triggered the Department of Water Affairs (DWA, now Department of Water and Sanitation (DWS)) to amalgamate and consolidate the number of WMAs and their respective CMAs to nine in March 2012 (Meissner, Funke, Nienaber & Ntombela, 2013) (**Figure 1.5**).

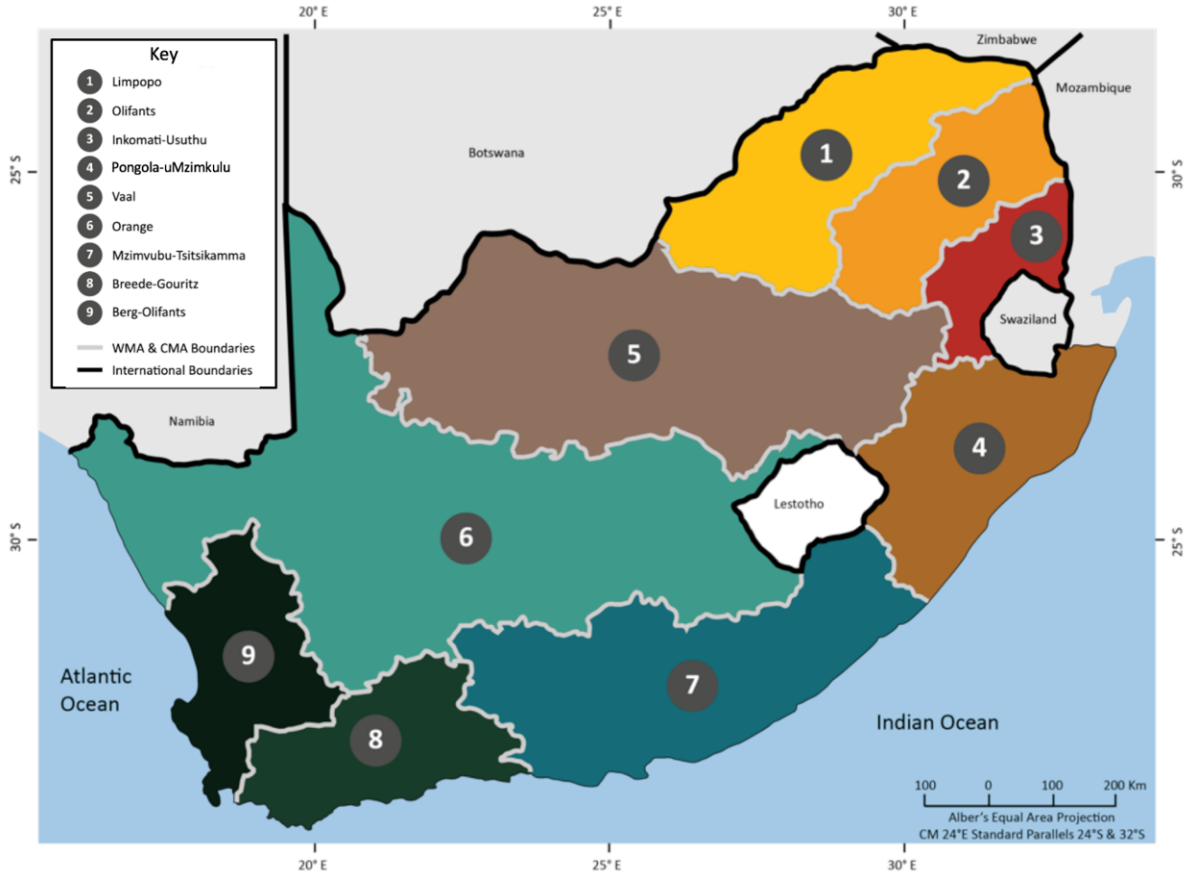


Figure 1.5: Location of the nine Water Management Areas (WMAs) in South Africa, reduced from the previous 19 WMAs in July 2012. Source: DWS, 2016.

These nine CMAs were at different stages of establishment and function when the DWS placed a moratorium on the further establishment of CMAs in 2017 (**Table 1.1**).

Table 1.1: Status quo of the establishment of the nine Catchment Management Agencies (CMAs) in South Africa when the moratorium on CMAs was declared in 2017 (DWS, 2017). Catchment Management Agencies still in the establishment phase are known as proto-CMAs and are managed by the respective regional offices of the Department of Water and Sanitation (Meissner, Stuart-Hill & Nakhooda, 2017). CMAs that are established or are gazetted as proto-CMAs have developed and had their business cases approved by the Minister of the DWS. WMA = Water Management Area.

WMA number and CMA name	CMA establishment and operational status
WMA 1 - Limpopo	Proto-CMA gazetted (2014)
WMA 2 - Olifants	Draft CMA business case developed (2015), proto-CMA not gazetted
WMA 3 - Inkomati-Usuthu	CMA established (2006), well-functioning
WMA 4 - Pongola-uMzimkulu	Proto-CMA gazetted (2014), ready for CMA establishment
WMA 5: Vaal	Proto-CMA gazetted (2016), ready for CMA establishment

WMA number and CMA name	CMA establishment and operational status
WMA 6: Orange	Draft CMA business case developed (2015), proto-CMA not gazetted
WMA 7: Mzimvubu-Tsitsikama	Draft CMA business case developed (2015), proto-CMA not gazetted
WMA 8: Breede-Gouritz	CMA established (2012), well-functioning
WMA 9: Berg-Olifants	Proto-CMA gazetted (2016), ready for CMA establishment

Continuing administrative and political leadership challenges led the DWS to consider a further reduction of the number of CMAs to one in 2017 (DWS, 2017; Naidoo, 2018).

Difficulties experienced in the high-level CMA establishment are echoed within water management institutions at a catchment level. Although the majority of published literature on water management institution challenges exclude catchment management forums (CMFs) (Meissner et al., 2013), given the similar multi-stakeholder nature of CMFs, it is likely that they would be susceptible to similar challenges. These challenges include:

- operational constraints – high financial and time costs of running multi-stakeholder institutions,
- conflicting power relations – entrenched power imbalances between stakeholders,
- lack of authoritative power and mechanisms of water management institutions – the ability of water management institutions to hold decision makers and stakeholders to account,
- imbalanced and inadequate representation of key stakeholders – e.g. historically disadvantaged stakeholders, local government sector and industry,
- questionable representivity of participating stakeholders, and
- inadequate engagement capacity of stakeholders to meaningfully engage in water management institutions – particularly historically disadvantaged individuals and resource-poor farmers (Schreiner & Van Koppen, 2002; Swatuk, 2005; Pollard & du Toit, 2008; Quinn, 2012).

Given the challenges that the DWS already faces, it has even less human and financial resource capacity to address challenges constraining the function of grassroots participatory water management institutions. Therefore, even less support is available to build the required engagement capacity of stakeholders, particularly historically disadvantaged stakeholders to participate meaningfully in water governance processes (Meissner et al., 2013). The result is that water resource management is being driven back towards a centralised governance system and threatens democratic principles of inclusivity and equity that underpin South Africa's water legislation.

Decentralisation and participation in water services

Local government has struggled to overcome the backlog of providing water services to millions of people who previously had no access (Muller, 2014). Local government is responsible for addressing this significant service backlog, however, it has been handicapped by chronic inadequacies of technical and administrative capacity (Haigh, Fox & Davies-Coleman, 2010; Clifford-Holmes, 2015). Consequently, although great strides have been made in surmounting this backlog, maintaining the provision of sufficient, quality water services has proved a challenge to many municipalities (Nleya, 2011; Van Koppen & Schreiner, 2014).

In theory, civil society engagement in water service delivery matters is facilitated through the ward committee system (RSA, 1998a). However, this system is far from functional in many South African municipalities (Esau, 2008). Critical challenges have constrained the effectiveness of ward committees and resulted in limited participation of the poor (Piper & Deacon, 2009). Challenges facing ward committees can be grouped under seven main themes: representivity, powers, skills, functionality, access to information, influence on decision making and relationship to other structures (Smith & de Visser, 2009). The combination of these challenges has made it difficult for every day citizens, particularly marginalised groups and individuals, to raise their water-related (and other service) concerns to the attention of municipal decision makers. Furthermore, rejection of these state structures in many marginalised communities has manifested in numerous service delivery protests between 2004 and 2016, a strategy commonly used during the apartheid era (Valodia, Habib & Ballard, 2015).

Decentralisation sought to enable equal participation of all to meaningfully engage in cooperative governance processes. However, the white elite still control the economy to a large extent, and with it seats of power, skills, bargaining power and legal means to maintain the status quo (Schreiner, 2013). On the other hand, the black majority have little, or none of, these bargaining tools and remain hamstrung by the apartheid legacy of limited education and material resources (Lotz-Sisitka & Burt, 2006; Kemerink, Ahlers & Van der Zaag, 2011; Price & Lotz-Sisitka, 2016) and therefore are unable to effectively challenge the status quo. The result is that, despite over two decades of democracy, access to agricultural land, water resources and water services continues to be skewed along lines of race and class – in this regard, little has changed from apartheid.

1.2 Problem statement

There are two fundamental issues of concern pertinent to this study: 1) the capacity and agency of people, particularly marginalised communities and individuals, to engage with water issues and influence water governance decision making as a means to improve their well-being, and 2) the

effectiveness of catchment management forums as institutional structures to promote and enable meaningful, fair and effective participation in water governance processes.

In 2018, nearly two and a half decades into democracy, South Africa still experiences severe water resource and water services challenges. There remains a backlog in reliable, quality water and sanitation service provision (Hedden, 2016). Freshwater sources are fully allocated, in some cases over allocated, largely over-utilised and often polluted (Meissner et al., 2013). South Africa adopted an Integrated Water Resource Management and a developmental approach to local government with an emphasis on decentralisation and public participation to combat these challenges and manage water equitably, effectively and sustainably and redress past social injustices.

Although channels for civil society participation in local government planning and to a less extent in IWRM have been established, in many cases equitable, representative and meaningful participation has yet to be realised (du Toit & Pollard, 2008; Piper & Deacon, 2009). Regardless of the slow and halting progress in the establishment of water management institutions (CMAs, CMFs and water user associations), water issues remain, and water resource management must continue. In many water WMAs, CMF establishment has continued with confidence that CMAs will eventually be established to better support them. However, structures for grassroots participation in water resource management and water services, experience numerous difficulties and apart from CMFs, these difficulties are relatively well documented (Piper & Deacon, 2009; Smith & de Visser, 2009; Meissner et al., 2013). A further constraint to participation is that a large percentage of the South African population is historically disadvantaged and resource-poor and lacks the social (and financial) capital to effectively engage in and influence democratic processes as a means to improve their well-being. It is therefore important to understand processes of participation more deeply.

For multi-stakeholder water management institutions to enable democratic and collaborative decision making concerning scarce and contested resources such as water, it is essential that capabilities and resources of participating stakeholders be developed to ensure engagement on an equal footing of power and knowledge (Sherwill et al., 2007). Attention needs to be paid, not only to developing human and resource capacity of stakeholders, but also to the way these platforms are run so as to be conducive to diverse and representative engagement. Although the responsibility of building stakeholder capacity falls largely on the shoulders of government (Piper & Deacon, 2009), it is too large a challenge for government to address alone. For the dream of true democratic water governance to be realised, existing participatory spaces such as catchment management forums need to be strengthened and other, complementary avenues for building engagement capacity in these spaces are required.

1.3 Introduction to the study context

This study is situated in the Makana Local Municipality in the Eastern Cape (**Figure 1.6**) and seeks to explore the bottom-up role and potential of civil society organisations in contributing to improved democratic water governance and progressing towards achieving the NWA goals of equity, efficiency and sustainability. The city of Grahamstown, the urban centre of the Makana Local Municipality, was in the process of undergoing a name change to Makhanda towards the end of my writing of this thesis. Although the official name of the city is now Makhanda, I have maintained the use of the name Grahamstown throughout the thesis as during the time of this research it was known as Grahamstown.

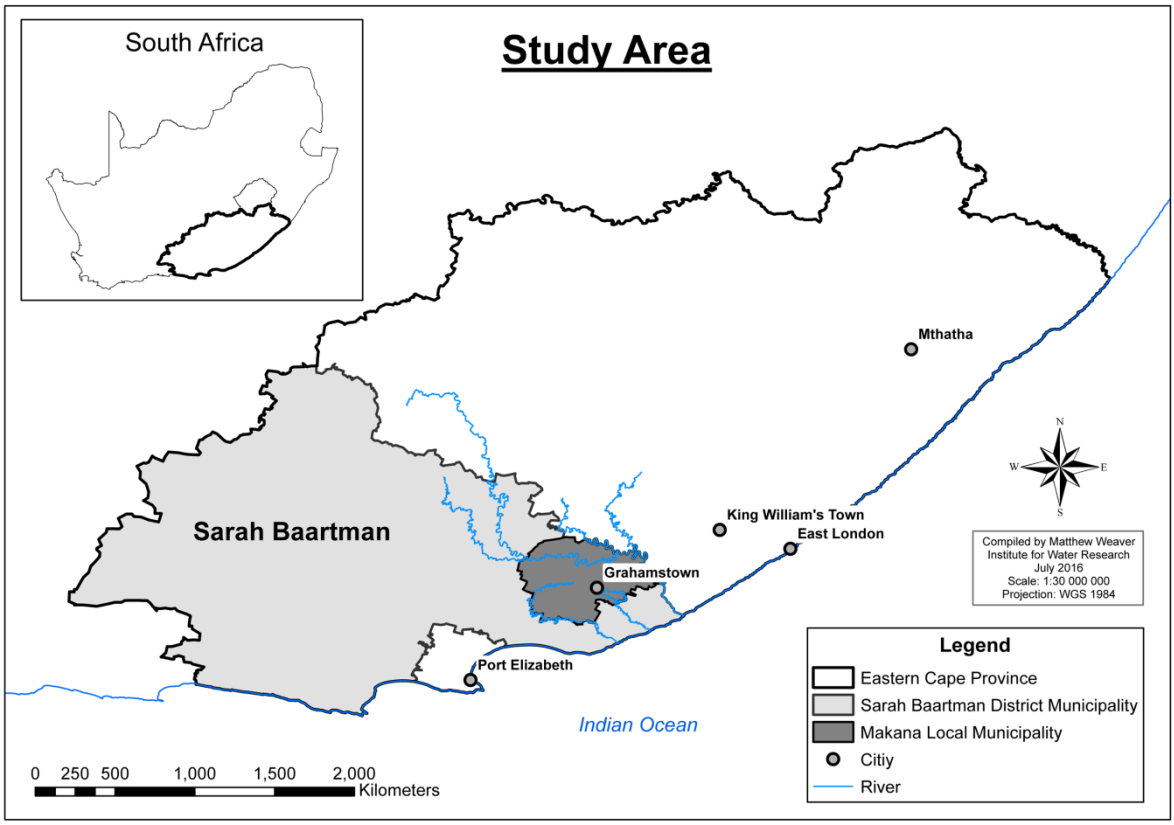


Figure 1.6: Map locating the study area in the Makana Local Municipality, particularly the urban centre, Grahamstown. Rivers flowing through the municipality are indicated as well as other significant cities in the Eastern Cape Province.

The boundaries of the Eastern Cape and WMA 7 co-inside almost exactly. The CMA is called the Mzimvubu to Tsitsikamma CMA (MT CMA). The establishment of a CMA for the MT WMA was initiated in 2012 (official proposal for the establishment was published as a formal Government Notice (No.80 of 2016) on the 29th of January 2016).

The regional office of the Department of Water and Sanitation in the Eastern Cape drove the establishment process as a proto-CMA (a CMA that is yet to be formally established) which entailed drafting a business case for the MT CMA and establishing and strengthening institutions for public participation to facilitate WMA-wide stakeholder engagement.

> The national water Department did not ever attend to, or finalise, the mandates and delegations to i) regional offices, and ii) CMAs. There were underlying human resources and labour union issues. This is a second driver of post-1994 water governance confusion (personal communication CG Palmer, August 2018).

Historical factors that contributed to the current social, economic and environmental characteristics of the Eastern Cape posed a great challenge to the establishment of the MT CMA and subsequent management of its water resources in accordance with the NWA. The Eastern Cape (EC) is the second largest province in South Africa covering 169 000 square kms or 13.9% of the country's land area (Stats SA, 2014).

Much of the province is rural, encompassing two former Bantustans, the Ciskei and Transkei (land reserves demarcated exclusively for black Africans during the apartheid regime) (Westaway, 2012). The Eastern Cape is South Africa's poorest province with the highest unemployment rate (35.6% compared to the 26.7% national unemployment rate) (Stats SA, 2018) and much of the population, especially in the former Bantustans, relies on social welfare. The primary language spoken is isiXhosa, followed by Afrikaans then English (Stats SA, 2011). Many of the municipalities of the EC have governance challenges (Clifford-Holmes et al., 2016), which in turn reflect poor levels of basic service provision such as education facilities, healthcare, water and sanitation. Water for agriculture and urban use for a significant portion of the eastern half of the Province is supplemented through the Orange-Fish River Inter-basin Transfer Scheme. The Province boasts rich biodiversity and contains all eight of South Africa's biomes (Hamann & Tuinder, 2012). Environmental threats, including water scarcity and land degradation are worsening (Shackleton, Shackleton & Cousins, 2001; Hamann & Tuinder, 2012).

It was in this challenging landscape that the Mzimvubu to Tsitsikamma proto-CMA was being established and required to function in. The establishment process of the MT proto-CMA formed the ideal opportunity to investigate the challenges facing communities and management authorities engaging in IWRM. This study engaged adaptively with elements of this establishment process at a local government scale, in the Makana Local Municipality over five years from March 2014 to December 2018.

1.4 Adaptive research process

Integrated Water Resource Management (including water services) in the Makana Local Municipality occurs within a complex social-ecological system (described in detail in Chapter Two). One of the

characteristics of a complex system such as the Makana water social-ecological system is non-linearity, in that elements in the system respond in an often, unpredictable way (Cilliers, 2000). Consequently, engaged research in a CSES requires an adaptive research approach**.** In exploring civil society activism and engagement with water issues and the effectiveness of decentralised participatory water governance processes in the Makana Local Municipality, this research adapted its focus through time (**Figure 1.7**). The following section outlines the manner in which the research was adapted in response to unanticipated changes in the social and political nature of the Makana Local Municipality.

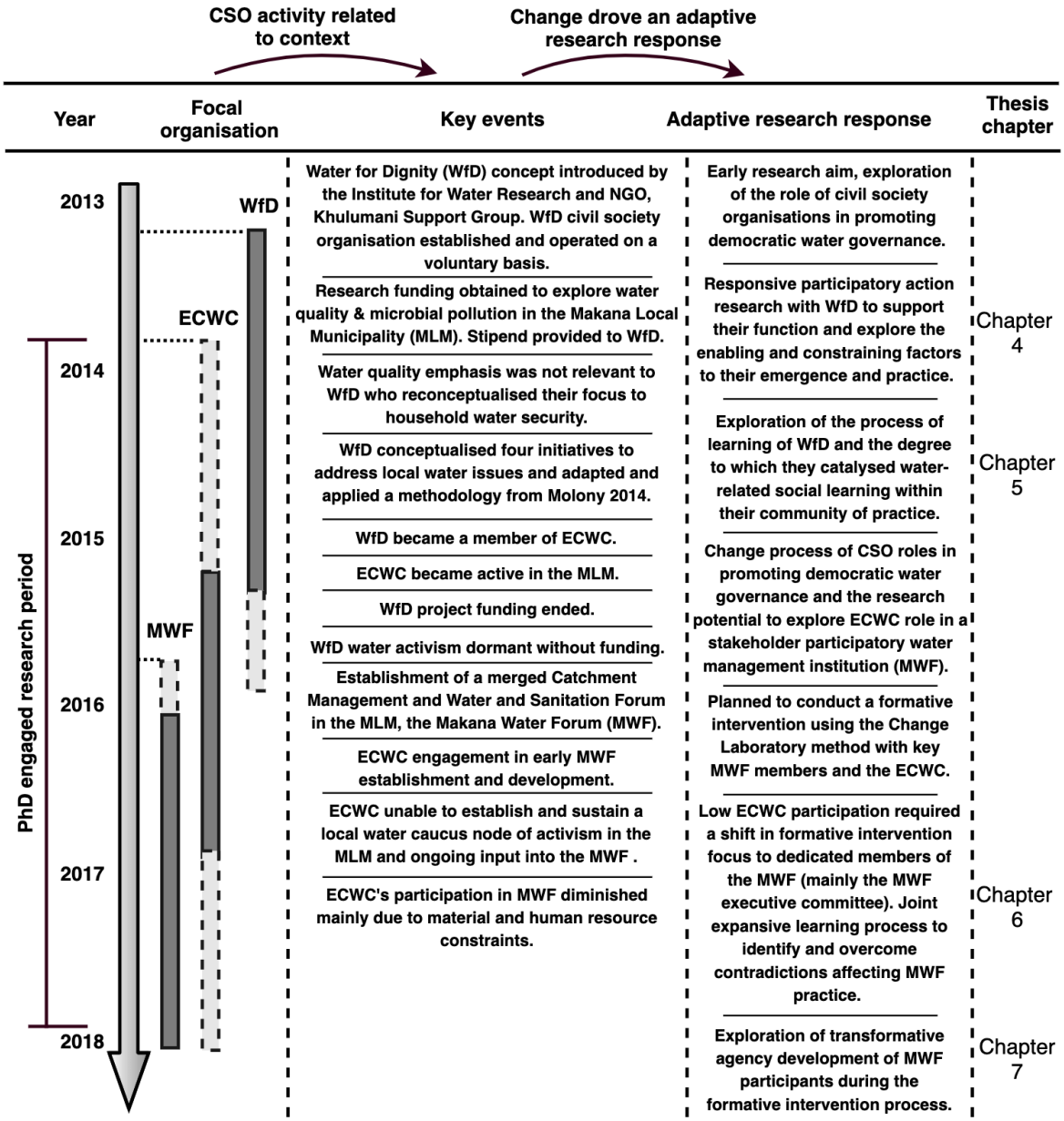


Figure 1.7: Timeline of the adaptive research process of the doctoral study. Active engaged research began at the end of 2014 and ended in December 2017. Of interest to this study was the sequential activity of two civil society organisations (CSOs), Water for Dignity (WfD) and the Eastern Cape Water Caucus (ECWC) and their overlap and engagement with the multi-stakeholder water governance platform, the Makana Water Forum (MWF). The degree of overlap and engagement of WfD and the ECWC with the establishment and function of the MWF is depicted (dark shading indicating high intensity of activity and light shading in dashed box depicting low intensity of activity). The MWF was initially a catchment management forum then transformed into a water forum which implied the inclusion of water and sanitation services and water resource management. Key events pertaining to the two CSOs that influenced the research process are described. The adaptive research response required as a result of the changing activity of the focal organisations is described and related to the relevant data chapter in the thesis. Note: This figure is repeated in Chapters Four to Seven for ease of reference.

2014 – 2015: A focus on civil society engagement with water service delivery challenges

The progressing establishment of the Mzimvubu-Tsitsikamma proto-CMA in the Eastern Cape provided the potential to conduct engaged research into the role of civil society organisations (CSOs) in contributing to democratic water governance in the Eastern Cape. An opportunity to conduct engaged research with a CSO, Water for Dignity (WfD), in the Makana Local Municipality emerged late in 2013 (**Figure 1.7**). Water for Dignity was a group of active citizens, passionate about addressing water issues in their community, known as Grahamstown East (the township area of Grahamstown). The formation of WfD into an organised CSO was greatly supported by the Institute for Water Research (IWR) and an NGO, Khulumani Support Group (KSG). The IWR and KSG formed a partnership to support the establishment, function and practice of WfD. The IWR had available funding to support and explore citizen-based research by WfD into water quality (microbial water pollution) and associated health incidents surfacing in local clinics (Palmer & Munnik, 2018).

Water for Dignity were more interested in more pressing water-related issues, particularly household water security, and subsequently developed a practice to address these issues. Engaged research with WfD was envisioned as an opportunity to explore the role of CSOs, not only addressing local water issues, but their potential to promote democratic local water governance. This was the first "adaptive" step in the research (**Figure 1.7**) – WfD charting the research process (Hamer et al., 2018).

Civil society organisations have the potential to serve as intermediaries in building social capital and as social learning hubs to enable and facilitate robust participation in water governance processes (Munnik et al., 2014). Much of civil society is marginalised and effectively excluded from democratic water governance processes (Brown, 2011; Joy, Kulkarni, Roth & Zwarteveen, 2014). Civil Society Organisations can be one vehicle to enable historically disadvantaged communities to engage meaningfully in water governance processes. It is therefore important to understand how CSOs emerge and practice, and the enabling and constraining factors to CSO practice.

Furthermore, it is useful to understand the process of learning in CSOs. Learning opens up doors to development, effective practice and transformation (Ison, 2010). Capacity building through processes of learning builds human agency to engage in, and have influence on, democratic processes (Pelenc, Bazile & Ceruti, 2015; Sannino, Engeström & Lemos, 2016) so as to improve individual and collective situations and well-being (i.e. realisation of water-related needs) (Palmer, Biggs & Cumming, 2015).

2015 – mid-2016: The role of Civil Society Organisations in enabling democratic water governance

In this study the exploration of CSO emergence, practice and learning was conducted at a local government scale but did not involve engagement with specific local governance processes. The study

engages with a foundational understanding and exploration of CSO engagement in formal (although non-statutory) water governance platforms, catchment management and service delivery forums (**Box 1.1**).

Civil society organisations were identified as potential avenues to build community capacity to meaningfully engage and address water issues and support the imagined transition of social-ecological water systems to greater equity and sustainability. As a result, a follow-up research question emerged out of the participatory research process with WfD: In what way can CSOs enable civil society participation in water governance processes so as to improve equitable and sustainable water services and resource management? This research question was the second significant adaptive moment in the study (**Figure 1.7**).

Within the Makana Local Municipality (MLM), institutional development had not progressed to the establishment of water management institutions such as catchment management forums, in which civil society could participate. The lack of formal engagement platforms for WfD to engage in water governance processes limited the opportunity to explore the beneficial roles that CSOs could play in such engagement platforms. It was imagined that WfD would develop into a functional CSO with the ability to represent and build the capacity of its constituents to meaningfully participate in water governance processes.

At the time when WfD was most active, there were no institutions to facilitate civil society participation in water governance processes in the MLM (**Figure 1.7**). The establishment process of a catchment management forum in the MLM (**Box 1.1**) was subsequent to the period of activism of WfD (detailed in Chapter Four). Consequently, WfD effectively ceased to be active before a CMF was formally established in the MLM. Despite severe, recurring water issues in the Municipality, the members of WfD shifted their efforts away from the domain of water and onto enterprises that offered them better earning opportunities. Another CSO network was seemingly becoming more active in the MLM, the Eastern Cape Water Caucus (ECWC).

The ECWC, a provincial branch of the larger South African Water Caucus, established in 2008 and was a CSO network that focussed on social and environmental justice (Munnik et al., 2016). In 2015 the ECWC was becoming increasingly active in the Makana LM and other Municipalities in the Eastern Cape. One of the explicit objectives of the ECWC was to participate in and play an influential role in established and establishing CMFs in the home municipalities of its member CSOs (Munnik et al., 2016). Between late 2014 and mid-2015, WfD were active members of the ECWC and although their activity subsequently diminished, part of their water-related activism in Makana was taken up by members of the ECWC. The activism of the ECWC in water governance processes in Makana presented an

opportunity to support the previously imagined WfD role of enabling civil society participation in local water governance processes. This relationship supported the ongoing engaged research endeavour into CSO engagement in water governance. Water issues had not diminished and as a result there was an ongoing civil society response to address these issues.

The window of opportunity (sensu Olson 2004) to explore the role of CSOs as agents or vehicles to build community capacity and agency to meaningfully participate and influence water governance processes opened with the establishment of the Makana Water Forum (MWF) (**Box 1.1**). The ECWC was increasingly active in the MLM during the time that the MWF was being established and showed intent to build and support the organisation of local activists to play an active role in the development of the Forum (**Figure 1.7**). I imagined that the MWF might serve as the lens through which to better understand the role of CSOs (specifically the ECWC), in enabling meaningful participation of civil society (particularly historically disadvantaged communities) in water governance processes. Furthermore, CMFs that promote inclusive, equitable and meaningful participation where participating stakeholders take ownership of the CMF are more likely to persist and promote sustainable catchment management. More inclusive and meaningful participation in spaces such as CMFs are prerequisites of true democratic water governance that South African water law aspires to. A shift in focus from WfD to the ECWC engagement in the MWF was the third significant adaptive research moment in the study (**Figure 1.7**).

Box 1.1: Brief description of the emergence and development of the Makana Water Forum.

Two separate stakeholder engagement forum establishment processes were initiated by the Minister of Water and Sanitation (then Nomvula Mokonyane) in 2015. The first was the drive to establish a catchment management forum (CMF) through the CMF Establishment and Revitalisation Programme. The purpose of the CMF was to enable stakeholder engagement in water resource management in local catchment areas and was named the Upper Kowie Catchment Management Forum. The second was part of the national drive to establish Community Water and Sanitation Forums. These forums were envisioned to bring improve communication and collaboration between municipalities and communities so as to support Municipal service delivery and reduce resultant tension, unrest and protests prevalent in many municipalities experiencing service delivery challenges. The overlap of similar stakeholders and government actors participating in the establishment of the two forums and the inextricable link between water resource management and water and sanitation delivery motivated for the establishment of one merged Upper Kowie Water, Sanitation and Catchment Management Forum. In late 2017 this name was changed to a more accessible and less cumbersome name of Makana Water Forum (MWF).

Ultimately the ECWC were unable to become organised fully in the MLM, so they did not maintain constant and significant participation in the establishment and function of the MWF. The main activists that carried the ECWC were not based in the MLM, but in villages more than two hours' drive away. Having limited resources, these ECWC stalwarts only managed sporadic participation in the MWF engagements. The distributed nature of the ECWC network across the Eastern Cape was the

motivation for the establishment of local water caucus nodes to champion water and environmental justice activism at a local municipality or village scale and reduce dependence on the ECWC coordinators.

The Makana LM was identified as a promising site for the establishment of the Grahamstown Water Caucus as a local water caucus node. Water for Dignity, as a historical member of the ECWC, was envisioned by the ECWC coordinators to be a key driving CSO of the Grahamstown WC. With the activism of Water for Dignity waning, they had limited capacity and motivation to drive and sustain the development of a local WC node and it was left to the provincial ECWC coordinators to push water caucus activity in Grahamstown. Without a self-sufficient local WC node, the ECWC were unable to maintain a strong participatory presence in the emerging Makana Water Forum. The result was limited participation of organised civil society within the MWF and therefore, little opportunity to fully explore the role of the ECWC as a representative CSO capacity-building agent in the MWF. Limited ECWC participation in the MWF prompted further research adaptation and was the fourth significant adaptive research moment (**Figure 1.7**).

Mid-2016 – 2018: The development of participatory water governance in the Makana Water Forum

From the outset, engaged research with the ECWC and the MWF aimed to be transformative in nature. Through an interventionist approach I intended to initiate a developmental process with the ECWC and key MWF members with the intention of transforming the MWF into a more inclusive, equitable and democratic stakeholder engagement platform.

Drawing on the field of developmental work research (Engeström, 2000) a formative interventionist research process (Engeström, 2011) was conducted with the Makana Water Forum. A particular type of formative interventionist research known as Change Laboratory (Virkkunen & Newnham, 2013) was employed with the MWF. The Change Laboratory method stems from Cultural Historical Activity Theory (Engeström, 2001) (explained in detail in Chapter Six, Section 6.3).

Interventionist research has a developmental agenda in that it aims to catalyse organisational change in an activity by overcoming or loosening researcher (and practitioner) identified tensions and contradictions affecting a collective human activity. The interventionist researcher mediates participant reflection on contradictions through a process of expansive learning. Initially the formative intervention was envisioned to include the ECWC and other key MWF stakeholders in a series of Change Laboratory workshops. The ECWC and the MWF had overlapping visions, at a basic level, both endeavoured to enable stakeholder participation in water governance processes. This common ground was a prerequisite for a formative interventionist process to take place with the ECWC and MWF.

Sporadic participation of the ECWC within the MWF (**Figure 1.7**) meant that the ECWC were unable to commit the required time to participate in a series of planned Change Laboratory workshops.

Limited ECWC participation in the MWF required that I adapt my interventionist research target and shift the focus of intervention to the stakeholders engaging most frequently within the MWF, the MWF executive committee (the fourth significant adaptive research moment, **Figure 1.7**). The investigation into the MWF therefore, shifted away from a specific focus on the participatory role of CSOs in water governance processes to a broader focus on the nature of civil society participation in water governance. I therefore decided to conduct an interventionist research process with the MWF executive committee as representatives of the Forum. Two people elected onto the executive committee were Makana LM based members of the Grahamstown Water Caucus and therefore could partially represent the ECWC concerns and their agenda of improving inclusive and equitable civil society participation in water governance processes (particularly marginalised communities) during the interventionist process.

1.5 Research aims and questions

The overarching aim of the study is to explore the nature of civil society participation in water governance at a local government scale. There were two main phases of the research, the first related to the engaged research process with the civil society organisation, Water for Dignity, as they developed a practice to address pressing domestic water service challenges in Grahamstown East. The second phase builds on Phase 1, and related to the emergence and function of the MWF and subsequent formative intervention to address critical challenges facing the Forum.

Phase 1 aims:

- To describe the process of emergence and practice of a township-based, water-centred civil society organisation, Water for Dignity.
- To describe the factors that enabled and constrained the practice of the civil society organisation, Water for Dignity.
- To explore the learning process of the civil society organisation, Water for Dignity, as they developed personal and collective identities, and shared meaning and practice.
- To explore the degree to which learning was transferred from the WfD to the wider social context in which WfD practiced.

Phase 2 aims:

- To understand the historicity of the Makana Water Forum activity system and its evolving water-related purpose.

- To understand and describe the key activity systems comprising the Makana Water Forum activity system.
- To understand and surface contradictions affecting the functioning of the Makana Water Forum activity system, and its ability to enable participatory water governance.
- To report on the development of remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function.
- To determine the extent and forms of transformative agency that emerged through the interventionist process in the Makana Water Forum.

These research aims serve to answer the following research questions:

Phase 1 question:

- What are the factors that enabled and constrained the emergence, practice and learning of a civil society organisation?

Phase 2 questions:

- What cultural historical phenomena led to the formation of the Makana Water Forum activity system and its object (purpose or motive) of activity?
- What is the nature of the activity system network that comprises the Makana Water Forum activity system?
- What are the key contradictions evident in the Makana Water Forum activity system?
- How can a Change Laboratory interventionist process into the Makana Water Forum affect democratic water governance at a local government scale?
- To what extent and what forms of transformative agency were developed through the Change Laboratory workshops with the Makana Water Forum?

1.6 Thesis roadmap

This section presents the outline of the whole thesis (**Figure 1.8**) and briefly describes the contents of each chapter.

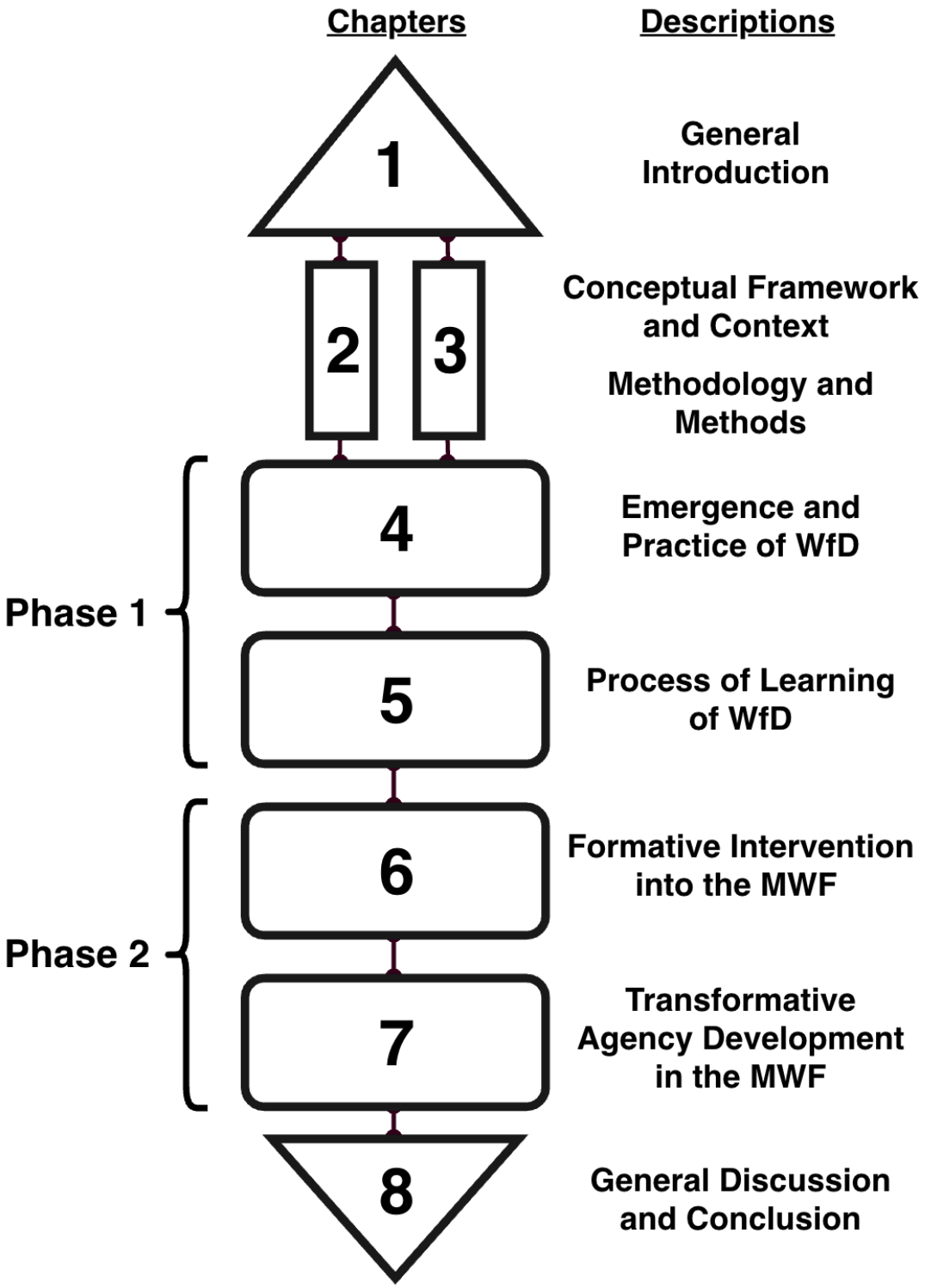


Figure 1.8: Conceptual diagram outlining the scaffolding of the two research phases, the thesis chapters and their abbreviated titles. WfD = Water for Dignity; MWF = Makana Water Forum.

Chapter One (**General Introduction)** provides an overall context of the study by sketching the development of a legislative framework for the application of Integrated Water Resource Management in South Africa and the emphasis on and motivation for public participation in water

management processes. The research problem is outlined and the adaptive research journey out of which the research aims of the study emerged is presented.

Chapter Two (**A Systemic Conceptual Framing)** introduces key theoretical and conceptual foundations underpinning the study, including general Complexity Theory and complex social-ecological systems. Using a systems thinking approach, this chapter presents a complex social-ecological systems (CSES) inquiry to describe and analyse the context of the Makana Local Municipality water management CSES. It was out of this CSES that the focal organisations of the study, the civil society organisation, Water for Dignity and the Makana Water Forum emerged and practiced. This chapter was published in Water SA in 2017 under the title: Water service delivery challenges in a small South African municipality: Identifying and exploring key elements and relationships in a complex social-ecological system (Weaver, O'Keeffe, Hamer & Palmer, 2017).

Chapter Three (**Conceptual Framing and Methodology)** builds on the use of complex social-ecological systems as an ontology of the study and its adoption of the systems thinking approach introduced in Chapter Two. The chapter then outlines additional key concepts informing the study, transdisciplinarity and participatory action research. Data generation methods, data management, indexing and analysis common throughout the data collection period are described in this broad Methodology chapter. Steps to promote the validity and trustworthiness of the research and ethical considerations are presented.

Chapters Four to **Seven** are presented as stand-alone chapters and each presents the relevant theoretical framing, methodology and methods in more detail.

- Chapters Four and Five - Communities of Practice Theory framed within social learning theory literature is used as an ethnographic lens to understand the emergence, practice and learning of Water for Dignity.
- Chapters Six and Seven - Cultural Historical Activity Theory (CHAT) and the CHAT-informed Change Laboratory method is used to understand and support the development of the Makana Water Forum (Chapter Six) and build the transformative agency of Forum members (Chapter Seven).

In **Chapter Four** (**The emergence and practice of a civil society organisation responding to community water supply: a community of practice perspective**) a Community of Practice (CoP) lens is used as an analytical and conceptual framework to describe Water for Dignity as a CoP and analyse their emergence and practice through a sequence of developmental phases. The chapter further explores the enabling and constraining factors to the emergence and practice of WfD and distils a set of principles to inform CSO function. This chapter was submitted to Geoforum and is under review.

The title is: **Exploring a civil society organisation response to water service delivery issues in South Africa: Part 1, Emergence and practice, (Weaver, M., O'Keeffe J., Hamer, N. and Palmer C.G. (under review)).**

Chapter Five (The learning process of the civil society organisation, Water for Dignity) explores the process of learning of Water for Dignity as they developed and implemented their water-related practices. As a learning theory, Communities of Practice theory was used to explore the different forms of learning evident within the WfD CSO: learning as belonging, learning as doing, learning as experiencing and learning as becoming. Furthermore, the impact that the practice of Water for Dignity had on catalysing social learning processes within the community in which they practiced and within the donor organisation that partially supported them is also explored. This chapter was submitted to Geoforum and is under review. The title is: **A civil society organisation response to water service delivery issues in South Africa drives transformative praxis: Part 2: Knowledge building, learning and active citizenship, (Weaver, M., O'Keeffe J., Hamer, N. and Palmer C.G. (under review)).**

Chapter Six (Engaging with participatory water governance in the Makana Local Municipality) explores the emergence and development of the stakeholder water management institution, the Makana Water Forum (MWF). Cultural Historical Activity Theory is used as a theoretical, methodological and analytical lens through which to: 1) understand the past cycles of participatory water governance-related activity that informed the establishment and function of the MWF; 2) describe the human activity system (CHAT unit of analysis) network the MWF comprised of; and 3) through a formative intervention using the Change Laboratory method, identify, understand and develop remedial actions to tensions and contradictions evident in the MWF practice.

Chapter Seven (The development the Makana Water Forum through an interventionist approach: transformative agency formation during the expansive learning process) draws on the expansive learning and transformative agency components of Cultural Historical Activity Theory and explores the types and the degree to which transformative agency was developed through two multi-session Change Laboratory workshops.

Chapter Eight (**General Discussion and Conclusion**) synthesises the key findings of the study and discusses them in the context of the literature. A reflective review of the research process and recommendations for further research are presented.

2 Chapter Two – A Systemic Contextual Framing

The chapter gave rise to a paper published in Water SA as: **Weaver, M., O'Keeffe, J., Hamer, N. & Palmer, C. G. (2017). Water service delivery challenges in a small South African municipality: Identifying and exploring key elements and relationships in a complex social-ecological system. Water SA, 43(3), 398–408.** As the lead author, I conducted the majority of the work including, research design, data collection and analysis, manuscript drafting and submission. My primary and co-supervisor were listed as last and second author respectively and provided conceptual input to the research process and reviewed the manuscript prior to submission. The third author similarly provided feedback on the manuscript prior to submission. All authors were part of the multidisciplinary engaged research team that partnered with a civil society organisation, Water for Dignity (essentially forming a transdisciplinary team), and supported their emergence and practice in the Makana Local Municipality.

2.1 Introduction

For at least two decades, the fair provision of adequate water services to all, in an ecologically sustainable and economically efficient manner has been a high priority in South Africa (RSA, 1998; DWA, 2013). Water management systems are complex (Cilliers, 2000, 2001) as they comprise environmental, human, economic and technological elements (Pahl-Wostl, 2007; Slinger et al., 2011) with non-linear interactions, inherent feedbacks, scale-sensitive processes and emergent outcomes. Water management is therefore not conducive to reductionist problem-solving approaches (Cilliers et al., 2013). Consequently, negotiating a 'just transition' (Swilling & Annecke, 2012) from an unjust apartheid system to a situation where household water supply is reliable, sustainable and equitable has been a challenge faced by many South African municipalities and requires a shift from past, unsuccessful approaches (Folke, 2003; Biswas, 2008) to more novel approaches (Rogers et al., 2013; Hamer et al., 2018; Palmer & Munnik, 2018;).

As a result, some researchers, policy makers and managers engaging with these complex problems are increasingly adopting integrated and systems approaches (Pollard & du Toit, 2008; Ison, 2010; Pollard, du Toit & Biggs, 2011; Lang et al., 2012) and developing and taking on useful concepts such as strategic adaptive management (Rogers and Luton, 2011) and complex social-ecological systems thinking (Berkes, Colding & Folke, 2003; Biggs et al., 2015). Despite the burgeoning growth in complex social-ecological systems (CSES) theory and thinking (Berkes et al., 2003; Rogers et al., 2013; Biggs et al., 2015;), there is less focus in the literature on translating this theory into practice. Ison (2010; 2017) has gone some way to review and present systems practice in the context of social-ecological challenges related to global climate change. This chapter seeks to set out important initial steps for researchers engaging in complex social-ecological systems (CSES) inquiry, steps that are not made clear in the literature. I demonstrate a methodology for initial steps in engaging in CSES inquiry in the context of household water service delivery in the case of the Makana Local Municipality in the Eastern Cape of South Africa.

The chapter has two specific aims: (i) to demonstrate a methodology for defining the bounds and identifying key elements and relationships in a CSES; and (ii) to demonstrate this methodology through the example of a case study. The second aim is addressed through a rich contextual description and analysis of the Makana Local Municipality water management system (from here on referred to as the MLM CSES). The case study provides the foundation for addressing pertinent questions related to practice, learning and transformation associated with household water supply in the MLM CSES.

2.2 A Systems Thinking Approach

To understand, measure and (or) evaluate change-oriented interventions into challenged CSESs, it is important to have a basic understanding of the complex system itself. A systems approach allows an exploration of inter-relationships (key to understanding the behaviour of a system), diverse and novel perspectives (for example, insights into people's behaviour in a system) and for establishing study boundaries (decisions regarding who and what is included and, therefore, who benefits and who loses out at a defined scale of decision making, what should be focussed on and what should not so as to improve understanding of a specific issue at a specific scale and to ultimately enhance the effectiveness of an intervention) (Williams & Van't Hof, 2016).

Defining a situation of interest is an important starting point for a systems inquiry and can be a general area of interest, a problem of interest or a potential solution to a problem (Williams & Van't Hof, 2016). The general situation of interest described here is unreliable household water service delivery at a local government scale. This situation can be viewed as the purpose of a system, which Ison (2010, p.44) describes as 'a collection of entities that are seen by someone as interacting together to do something'. Related entities or elements can be grouped into sub-systems, each comprise their own interacting elements. For example, the situation of household water service delivery is a function of a water management social-ecological system that comprises interdependent:

- Human systems – water-related organisations and management institutions, technical specialists, commercial water users and residents
- Technical infrastructure – including dams, reticulation piping, pumps and water and sewage treatment works
- Ecological systems (or ecological infrastructure (Bristow, Marchant, Deurer & Clothier, 2010)) – including physical components such as the hydrological cycle, physical catchments as well as biological components such as aquatic, riparian and terrestrial ecosystems within a catchment, and biogeochemical components driving processes in the water system

As complex systems are impossible to understand in their entirety, it is more effective to focus on a limited number of components (Cilliers et al., 2013). Deciding what falls within and out of a "system

of interest" is the next important step in a systems inquiry. Ison (2010; 2017) emphasised the importance of subjectively bounding a system, in order to focus on certain sub-systems of interest. Bounding the system is guided by the situation of interest and shows what the observer believes to be important components of the system. Accordingly, there are multiple ways that a system could be understood, depending on the perspective of the observer and the particular understanding sought by the study. The next step in a systems inquiry is identifying key elements and relationships in a system. Understanding the relationality between elements in a system, more so than the nature of elements, is fundamental to systems inquiry and change (Palmer et al., 2015).

This chapter demonstrates the foundational steps of a systems inquiry through the case of the Makana Local Municipality water management CSES: defining the situation of interest, bounding the system, identification of key elements and relationships, and describing key problematic relationships. These steps are supported with a sequence of diagrammatic heuristics and supporting descriptions that contribute to a rich interpretation of the MLM CSES. Heuristics comprise a method of reducing cognitive effort to enhance decision making (Shah & Oppenheimer, 2008). Systems diagrams, maps and multiple cause or causal loop diagrams are heuristics that capture the understanding of a systems practitioner and serve as a useful mediating tool to communicate this understanding with others (Ison, 2010).

An emergent outcome of this CSES analysis was the development of a systems overview heuristic of the MLM CSES. It was the engagement in the systems inquiry process (sustained time engaged in the system, observing changing social relationships, practice and understanding) and process of defining and articulating the MLM CSES that resulted in the emergent development of the MLM CSES heuristic.

2.3 Case Study: The case of Makana Local Municipality water management complex social-ecological system (MLM CSES

> High level of detail of the context and history of the MLM CSES framed according to VSTEEP characteristics (values, social, technological, economic, ecological and political characteristics) are provided in Appendix A.

To understand issues related to household water supply at the local scale of the Makana Local Municipality it was important to understand the national scale context of water service delivery. In South Africa, the fundamental principles for protecting and managing water resources are: equity, sustainability and efficiency (RSA, 1998). These principles guide the core objective of water service management systems – to reliably supply users with sufficient quality and quantity of water (RSA, 1997). The Department of Water and Sanitation (DWS) put this objective eloquently with their early slogan – 'some for all, forever' – that captured the principles for equitably distributing a finite resource

while redressing historical imbalances (King & Pienaar, 2011). Although this was a national slogan and commitment, the Constitution of 1996 deemed the responsibility for ensuring water service delivery realisation in practice, to be local government: metropolitan, district and local municipalities (RSA, 1996). Municipalities throughout South Africa that are most challenged with the responsibility of household water supply are 'local' or Category B2 municipalities (Clifford-Holmes, 2015), which are defined as local municipalities with large towns as their core (MDB, 2013). Townships, which refer to urban sections of towns that during apartheid were set aside for Black residents and received minimal service provision infrastructure, are particularly challenged in terms of water service delivery (WSD) (Jürgens, Donaldson, Rule & Bähr, 2013). Through a systems thinking lens, townships can viewed as sub-systems of cities and towns.

The MLM is a clear example of a WSD-challenged Category B2 municipality. This case study focussed on WSD in the township area of the city of Grahamstown (the urban core of the MLM), locally known as Grahamstown East (**Figure 2.1**). It is in Grahamstown East that water service delivery failure is hardest felt as it harbours the majority of Grahamstown's population, many of whom are poor and lack the capacity (financial and social capital) to mitigate against water supply shortfall.

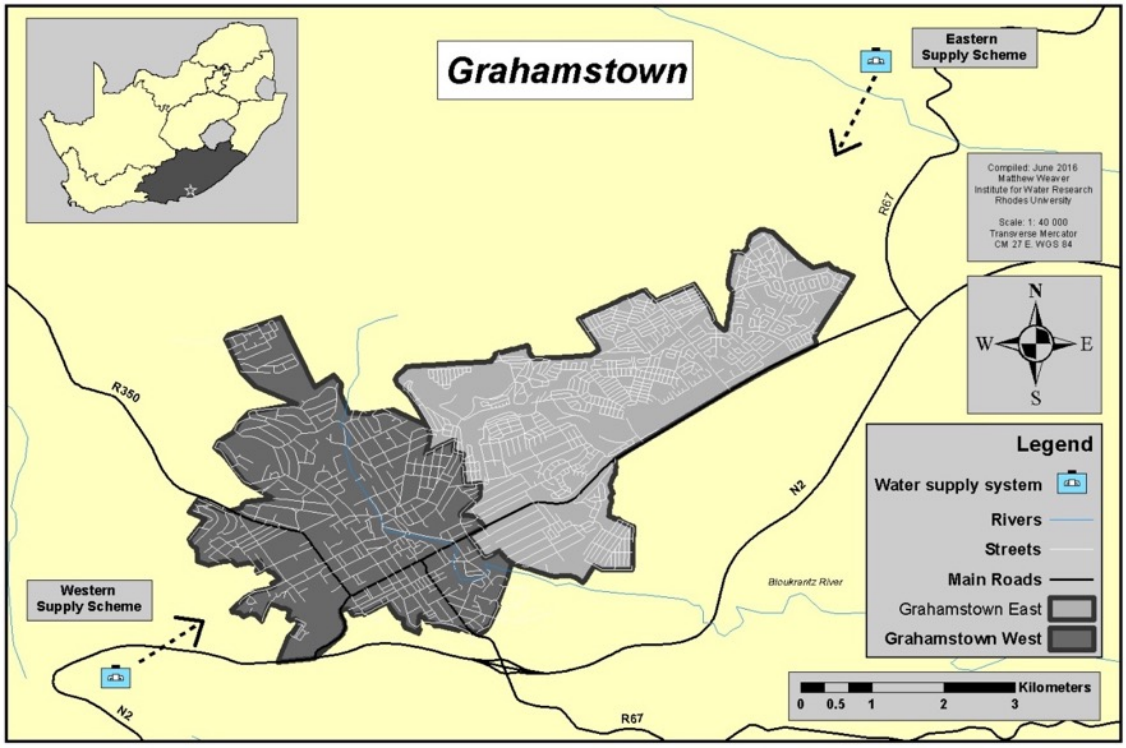


Figure 2.1: Map of Grahamstown depicting the two recognised areas: Grahamstown West, receiving water from the western supply system and the former township, Grahamstown East, receiving water from the Orange/Fish River inter-basin transfer scheme via the eastern water supply system

Contributing to the complexity of WSD in the MLM are the municipality's responsibilities to several other smaller urban centres outside of its high-population urban core, Grahamstown. These other

centres all require municipal support but are often neglected as the municipality focuses much of its attention inwards on Grahamstown's numerous challenges, of which water supply and quality are particularly prominent. Although water quality is a significant issue in its own right, it is beyond the scope of this study, which concentrates on water supply.

The MLM has experienced repeated water supply issues over the past two decades; in fact, historical records show that water supply issues have plagued Grahamstown since the inception of the town in 1813 (Mullins, 2011). Water outages, in conjunction with public perceptions of poor water quality, have resulted in increasing public frustration, and a breakdown of trust between the public and the MLM, culminating in a number of service delivery protests, peaking in August 2013 (Grant, 2014) with the MLM subsequently branded as dysfunctional by the Provincial Government (Dayimani, 2015; PSAM, 2015). The MLM 'water crisis' (Office of the Administrator, 2015) drew the attention of the Office of the President and led to an intervention by the Presidential Infrastructure Coordinating Committee to investigate issues and diagnose solutions (Yako, 2015). This was followed by the implementation of the Makana Water Intervention coordinated by the DWS. The water crisis was one emergent manifestation of the dysfunctional MLM system that contributed to the municipality being placed under political administration in October 2014 and in the care of a provincially appointed Administrator.

The WSD challenges in the MLM can largely be attributed to a suite of interconnected and multivariate historical, technological, political, institutional, social, economic and hydrological issues (Yako, 2015). Indeed the combination of these issues has resulted in the emergence of a complex problem (Cilliers et al., 2013) with no single solution, such that the MLM was unable to resolve the issue without additional assistance.

The Institute for Water Research at Rhodes University conducted the Makana Case Study as part of a larger Water Research Commission-funded project, entitled 'Practising Adaptive IWRM (Integrated Water Resources Management) in South Africa' (Palmer & Munnik, 2018). The project sought, among other things, to develop different forms of praxis to improve integrated water resource management processes in South Africa. The participatory action research process conducted with the civil society organisation (CSO) Water for Dignity (WfD) was the main research focus of the Makana Case Study. The perspective guiding the systems inquiry of the MLM CSES presented here, is that of WfD. I present the process of addressing household water supply issues in Grahamstown East through the lens of the WfD members (WfD does not exist outside of its members) (**Box 2.1**).

Box 2.1: Description of the civil society organisation Water for Dignity (WfD).

Water for Dignity is a civil society group that at its most active comprised five members, and emerged and practised in Grahamstown East in response to WSD issues. Their emergence was facilitated, and practice

supported, by the Institute for Water Research and Khulumani Support Group (a social justice non-governmental organisation) partners. This support ranged from advice, participation and collaboration to financial support in the form of stipends. The WfD group conceptualised four initiatives to address prominent water service delivery issues facing Grahamstown East residents. These included:

- Citizen Report Cards: household surveys exploring water service delivery experiences of Grahamstown East residents.
- Community Water Forums: water-related neighbourhood-based communication hubs serving as information pathways between the MLM and Grahamstown East residents.
- Emergency Water: installation of water storage infrastructure (5 000 L street tanks and 210 L barrels) on streets and households to serve as an emergency water supply during instances of water supply shortfall.
- School Water Forums: awareness raising and encouraging best practices relating to hygiene, water conservation and catchment health.

2.4 Showcasing a Systems Inquiry Methodology

The following section uses the MLM CSES case study to outline the analytical process of conducting a systems inquiry. The key steps outlined include, defining the situation of interest and bounding the system, identifying elements and relationships, and describing problematic relationships in a system.

2.4.1 Defining the situation of interest and bounding the system

Systems practitioners are restricted by constraints of knowledge, priorities, resources, motivations and perspectives and therefore cannot truly conduct a fully holistic systems inquiry or solve all the problems (Williams & Van't Hof, 2016). It is therefore important to define a situation of interest and then negotiate the boundaries of the system of interest (decide which aspects to consider at a defined scale as well as decide which aspects will not be considered). The situation of interest guiding the systems inquiry into the MLM CSES is household WSD in Grahamstown East. With the situation of interest defined, the observer can bound the system, including relevant components, into a system of interest – the MLM CSES. There are key social (institutional arrangements such as the Water Service Provider and the Water Board) and ecological components (quaternary and quinary catchments) important to household WSD that should be included in the MLM CSES (indicated in the shaded area in **Figure 2.2**). The MLM CSES is an open system in that it is affected by and affects components of the larger complex social-ecological system that fall outside of its boundary (Ison, 2010). Components outside of the boundary that still interact with components within form part of the wider environment (Ison, 2010). The interaction between system components and the environment can influence the behaviour of the system of interest.

In CSESs there is typically a mismatch between varying social and ecological scales (Pollard & du Toit, 2008). In this case, the boundaries of the various catchments do not align with administrative

boundaries responsible for their management. This mismatch adds additional complexity to water management systems (**Figure 2.2**).

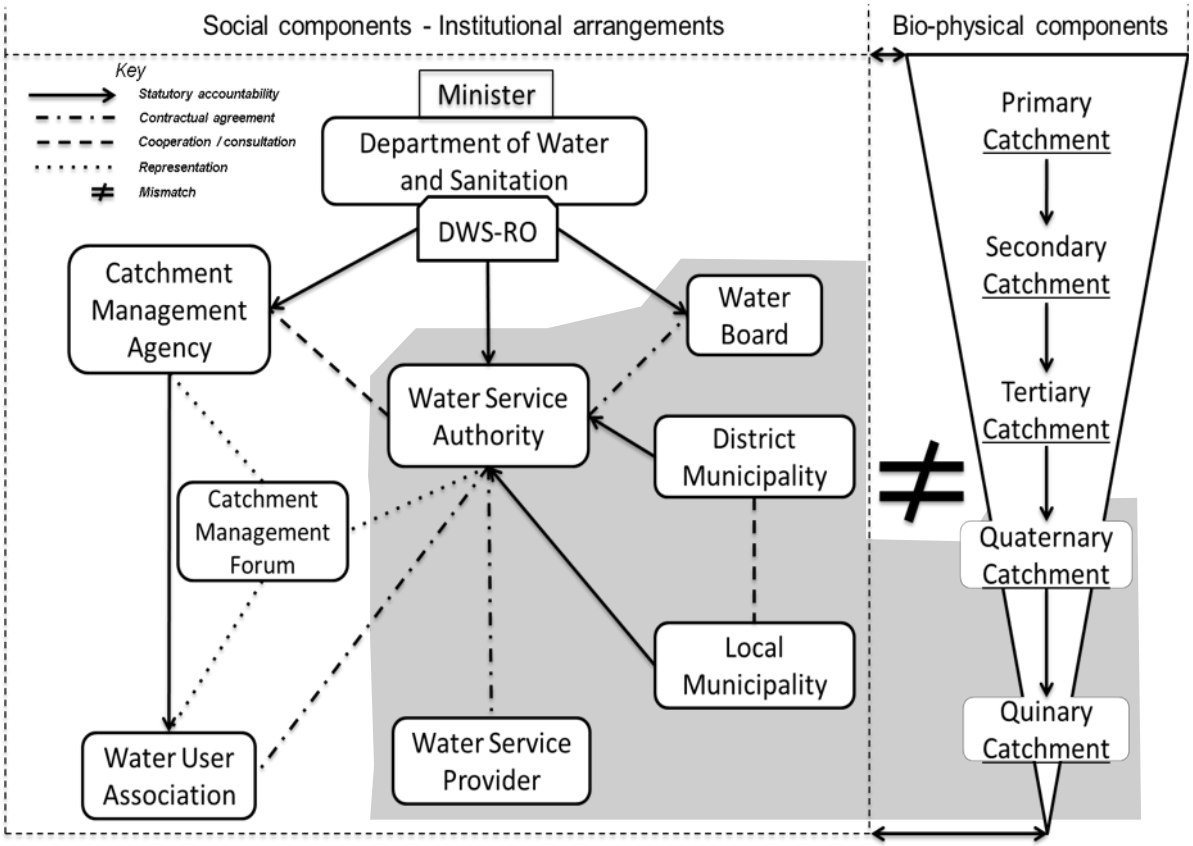


Figure 2.2: A conceptual heuristic of selected social and ecological components of the South African water management system. Relationships between institutional actors are indicated. The scales at which the institutional arrangements and the ecological scales occur do not align neatly (adapted from Pegram & Mazibuko, 2003). This figure is based on Figure 1.4 but is adapted to define the water management system in this study. The institutional arrangements and catchment scale relevant to this case study are shown as a shaded area.

The particular sub-system of interest for this systems inquiry relates to water service delivery in Grahamstown East; therefore, it is useful to further bound the MLM CSES specifically within the urban water cycle (**Figure 2.3**). Once the situation of interest has been identified and the system of interest has been bounded, the important elements and their relationships can be identified. The boundaries of a system of interest are constantly re-negotiated as the perspectives, knowledge and priorities of different observers are considered.

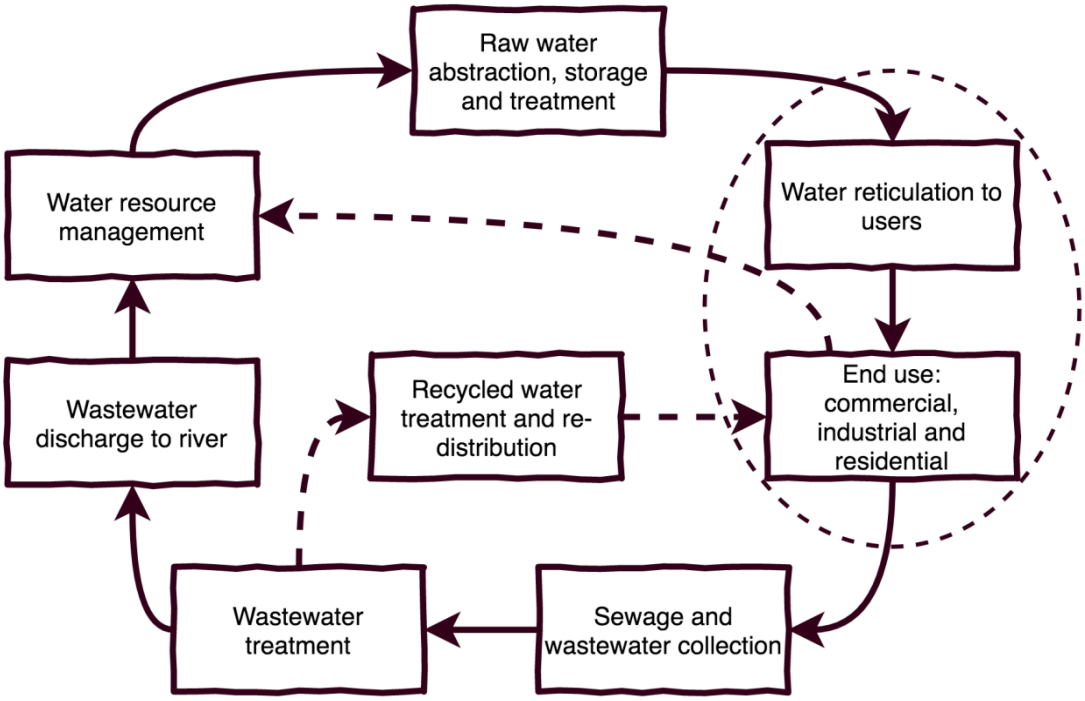


Figure 2.3: A typical urban water system. Although the Makana Local Municipality lacks the capacity, ideally wastewater is treated to a level that can then be recycled for reuse by consumers (dashed line). In some instances, there is occurrence of lawful and unlawful discharge by users directly into water sources (dashed line). Of particular interest to this study is household water service delivery (encircled).

2.4.2 Elements and relationships evident in the Makana Local Municipality water management complex social-ecological system

The systems inquiry process then moves to defining the key elements, grouped into sub-systems that are relevant to the situation of interest. Typical relationships between elements are described, taking care to link relationships described to theory, or to notice where theoretical relations are not evident in practice. The Rogers and Luton (2011) VSTEEP categories (values, social, technological, economic, environmental/bio-physical and political) were used as a check for providing a full contextual description. Government, technical, civil society and research were identified as relevant sub-systems, each with specific elements and relationships related to WSD in the MLM CSES.

Government sub-system – oversight and administration of household WSD

The local government has the primary responsibility for providing household water services (RSA, 2000). In the MLM CSES the African National Congress is the political party that governs the MLM and is ultimately responsible for overseeing water service delivery to Grahamstown households. The MLM

here has dual roles as Water Services Provider and the self-regulatory role of Water Services Authority. The institutional structure, actors and relationships within the MLM are depicted in **Figure 2.4**.

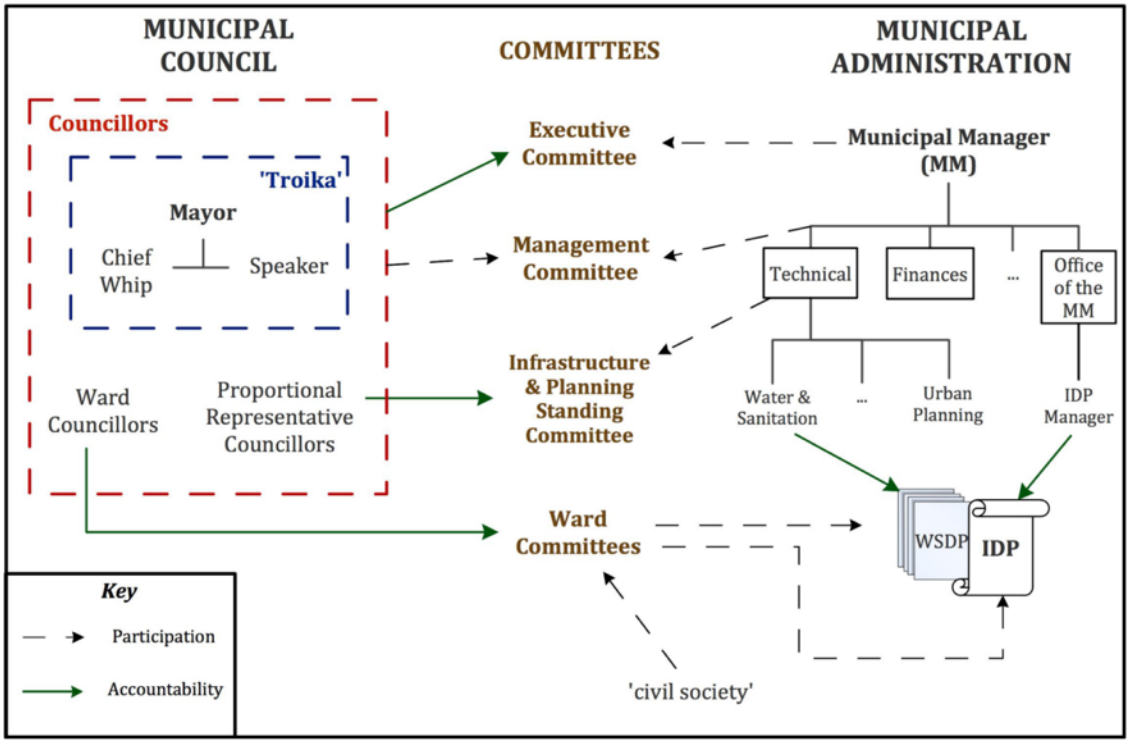


Figure 2.4: A systems diagram that depicts the institutional structure, actors and decision-making pathways within most local municipalities, the Makana Local Municipality included. The diagram shows the relationship between the political oversight by the municipal council and various committees over the municipal administration responsible for carrying out the water service delivery responsibilities of the municipality. (WSDP – Water Services Development Plan; IDP – Integrated Development Plan) (Source: Clifford-Holmes, 2015, p.143).

Relationships between elements that are depicted in the systems heuristic (**Figure 2.5**) are referenced in the sub-system narrative as codes in brackets according to the sub-system they apply to (e.g. Government (G), Technical (T), Civil Society (CS) and Research sub-systems (R). For example, G1 refers to the advisory relationship between Municipal Workstreams and local government actors responsible for water service delivery related issues in Grahamstown East).

To carry out their responsibilities, the MLM has different relationships with other key elements (**Figure 2.5**):

- The Municipal Workstreams – temporary stakeholder engagement platforms implemented by the Administrator via the Makana Water Intervention (Yako, 2015), with advisory capacity to MLM and statutory accountability to the Administrator as the intervening authority (G1, G4).
- Sarah Baartman District Municipality (DM) – oversight, support, consultation, cooperation and statutory accountability (G3)

- Eastern Cape Provincial Government – support, consultation, cooperation and statutory accountability (G4)
- Department of Cooperative Governance and Traditional Affairs (CoGTA) – support, consultation and funding (G5)
- Department of Water and Sanitation (DWS) – oversight, support and statutory accountability (as WSA) (G6)

Technical sub-system – water supply system

- Technical infrastructure (dams, water and waste water treatment works, reservoirs, pipes, valves, meters and taps) – maintained and operated by the MLM and Amatola Water (T1)
- Two water supply systems: (i) The Orange-Fish River Inter-Basin Transfer (IBT) Scheme run by the DWS who are under a contractual agreement to supply raw water (3 000 ML/d allocation). Water is treated and stored for reticulation in reservoirs (18.5 ML capacity) mainly to service Grahamstown East (78% of the population) (with the capability of supplementing Grahamstown West when necessary). (ii) The western water supply system, which services Grahamstown West (22% of the population) from MLM-owned dams and reservoirs (11.76 ML capacity) (Desai, Mallory & Ballim, 2012) – Amatola Water (the regional Water Board of the Eastern Cape) has a services contract with the MLM to maintain and operate local components of the two supply systems (T3, T4, T5, T6, T7)
- Amatola Water – contractual agreement (services contract) with the MLM acting as the Water Services Authority to manage bulk water supply (S2, T4)
- Technical consultants MBB Engineering – intermittent contractual agreements with the MLM (T2)

Civil society sub-system – water consumers

Grahamstown East and West are two areas receiving different water supplies (**Figure 2.1**). All residents can participate in municipal stakeholder engagement processes (**Section 1.1.2**), and have a statutory accountability to pay for municipal services that they receive, unless they qualify for free basic service allowances (RSA, 2000). The two Grahamstown areas are viewed as separate elements:

- Grahamstown East: 'township' area comprising mostly black residents (99.3%) with a high poverty and unemployment rate (49%) (Stats SA, 2011) (CS1)
- Grahamstown West comprises the town's central business district and economic hub, has a low unemployment rate (9.4%), and contains the majority of the town's affluent residents, 97.3% of the White population and an increasing number of Black residents (now 62.5% of Grahamstown West residents) (Stats SA, 2011) (CS1)

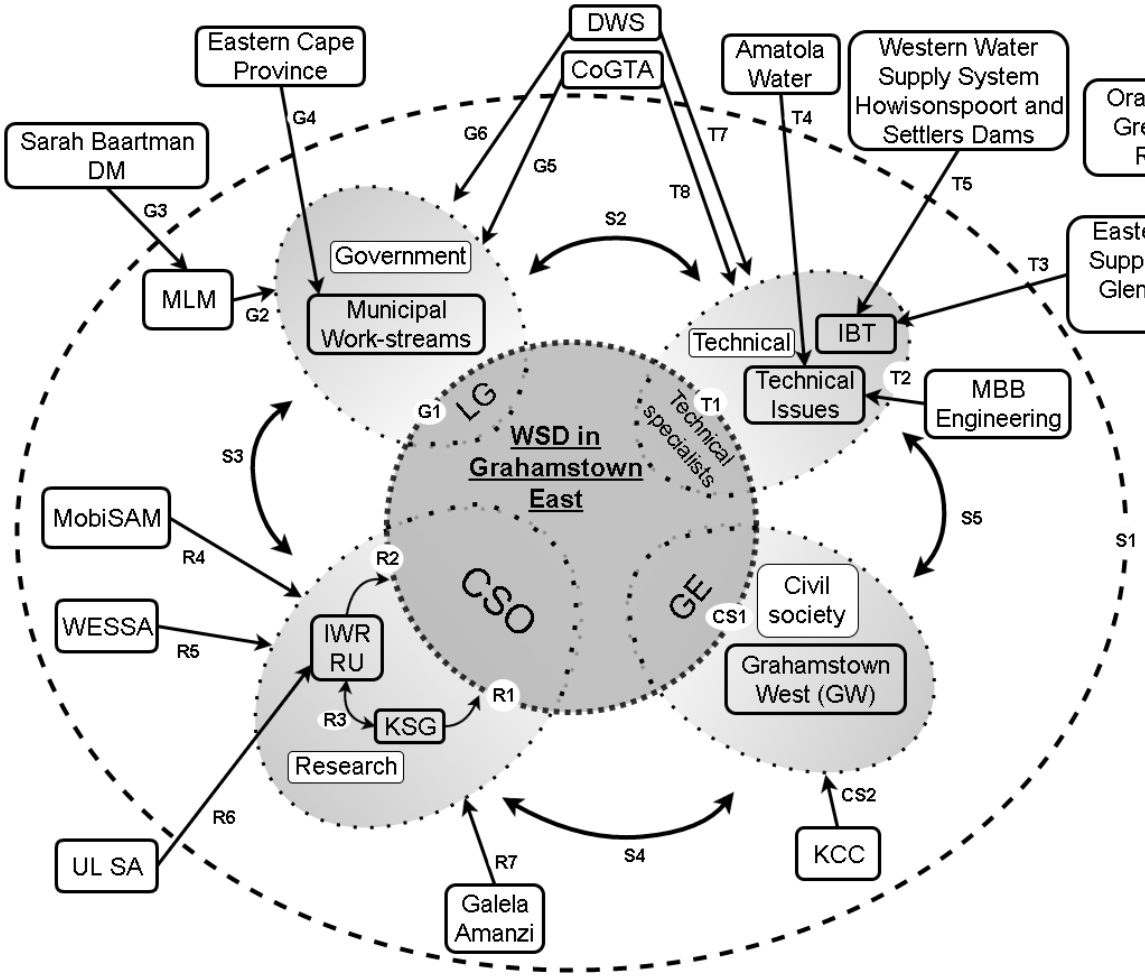
- Of relevance was the Kowie Catchment Campaign, an active CSO in Grahamstown West, which participated in MLM catchment-related processes and addressed local catchment health-related issues (CS2)

Research sub-system – research related to household WSD

Research was a key sub-system in the MLM CSES, since understanding the role of CSOs in addressing local WSD was the research focus that this systems description informed. The key elements included:

- The CSO, Water for Dignity – who collaborated with multiple other actors to improve water service delivery to households in Grahamstown East (**Box 2.1**) (R1, R2)
- The Institute for Water Research (IWR) within Rhodes University (RU) – researchers conducted research into and participated in water-related processes in the MLM (S3); and conducted participatory action research into, as well as supported, collaborated and participated in WfD practices (R2)
- Khulumani Support Group – a non-governmental organisation that partnered and collaborated with WfD (R1)
- Unilever South Africa – contributed financially to particular IWR and WfD projects (R6)
- Other societies, groups and organisations that had relationships with WfD: Wildlife and Environmental Society of South Africa (WESSA) – funding, participation and collaboration (R5); Galela Amanzi, a student activist group – collaboration (R7); and MobiSAM, a RU Computer Science project – collaboration (R4)

To better understand and conceptualise the MLM CSES, we found it helpful to combine the cumbersome, but necessary, narrative description of the system with a systems heuristic (**Figure 2.5**). This systems heuristic was developed as an emergent outcome of engaging in the MLM CSES description to better conceptualise the sub-systems, elements and their inter-relations. In addition, its development proved a fundamental step to understanding and bounding the system and to guide further research relating to CSO engagement in WSD in Grahamstown East.



Key	
CoGTA:	Department of Co-operative Governance and Traditional Affairs
CSO:	Civil Society Organisation
DM:	District Municipality
DWS:	Department of Water and Sanitation
GE:	Grahamstown East
IBT:	Inter Basin Transfer
IWR RU:	Institute for Water Research, Rhodes University
KCC:	Kowie Catchment Campaign
KSG:	Khulumani Support Group
LG:	Local Government
MLM:	Makana Local Municipality
UL SA:	Unilever South Africa
WESSA:	Wildlife and Environmental Society of South Africa
WRM:	Water Resource Management
WSD:	Water Service Delivery

Figure 2.5: Systems heuristic of the MLM CSES, depicting an overview of actors and their relationships (arrows and relationship codes referenced in the narrative description in brackets) when engaging in the common interest of water service delivery in Grahamstown East. Oval rings are the four identified sub-systems. The central ring indicates the focus of this case study – CSO engagement in WSD issues in Grahamstown East. The outer ring bounds the system of interest within and the environment without (Source: own design).

2.4.3 Problematic relationships evident in the Makana Local Municipality water management complex social-ecological system (Figure 2.5)

The WSD complex problem in the MLM CSES can partly be attributed to relationship-issues between system elements (**Figure 2.5**). For the MLM water management CSES to effectively fulfil its responsibility of supplying potable water to households, 'healthy' relationships are needed to occur within and between these elements. These relationships have been grouped into problematic socio-economic, technological, economic and political relationships.

Problematic socio-economic relationships include high unemployment (39.3% in 2011) and poverty (39.4% in 2010) rates (Stats SA, 2011). As a result, many residents are unable to pay for water services (S5) (**Figure 2.5**). Makana has poor revenue collection due to non-payment and a dysfunctional billing system (Yako, 2015; N. Hamer personal communication, February 5, 2016) (S5). A revenue collection deficit and inefficient collection systems restrict the MLM's ability to support staff and pay contractors to operate, maintain and upgrade the reticulation system (Yako, 2015) (T1 – 5, S2). The MLM indigent register is not up to date (Makana Municipality, 2012). Poor households are referred to as 'indigents' in local government language (DWA, 2010). Once registered as indigent, these households are eligible for the range of Free Basic Services that their municipality offers (Clifford-Holmes, 2015). The number of registered indigent households determines the proportion of funding allocated by the National Treasury to municipalities to support Free Basic Services (DWA, 2010). This funding is referred to as the Equitable Share Grant. Challenges lie with poor people not registering and employed people who are able to pay for services claiming indigence (Mngxitama-Diko, 2012) (CS1). Reconstruction and Development Programme (RDP) houses require household water connections, and this places additional demand on the already overstretched water supply system (S5). Housing and water service delivery are not concurrently implemented (S5).

Problematic technological relationships include those between: the MLM and the institutions they depend upon to operate and maintain the water reticulation system (e.g. mounting debt to water supply contractor, Amatola Water) (S2, G6, T1, T4); and the ecological and bio-physical characteristics of the catchment (e.g. variable rainfall and intermittent droughts), and the water supply systems (T3, T5, T6) (**Figure 2.5**). Furthermore, the lack of proper mapping, regular maintenance and upgrading of the ageing reticulation system and loss of institutional knowledge within the MLM (T1, S2), has resulted in recurring infrastructure failure (Mullins, 2011; Makana Municipality, 2012). The high salinity of the water from the Orange/Fish River Inter-basin Transfer Scheme incurs high treatment costs and therefore economic implications (Office of the Administrator, 2015) (T3, T6). This salinity also has socio-political implications – e.g., the perception that Grahamstown East receives poorer

quality ‘salty’ water and Grahamstown West receives good quality, ‘sweet’ water (S5, CS1). The topography of Grahamstown resembles a large bowl, skirted by mountains to the south, south-west and north. This topography causes water supply challenges. Water from the eastern and western supply systems is pumped up to two separate high-level reservoirs on each side of the city (**Figure 2.1**) (T3, T5). Water is then gravitated into the city which, due to the different elevation of each supply zone, leads to large pressure differences which are managed with complicated valve systems (T1). Difficulties with managing this system in the context of aged infrastructure often leads to further pipe bursts and water reticulation system failure.

Problematic economic relationships are linked to poor financial management within the MLM (G2) such as, difficulties with paying salaries to municipal staff and creditors such as the DWS (for raw water received from the Orange/Fish IBT) (G6), Amatola Water and MBB Engineering (Yako, 2015); poor management of the Indigent control system (Mngxitama-Diko, 2012); and several failed Auditor General reports (Yako, 2015) (**Figure 2.5**). These relationships are important in securing external funding through governmental grant applications and water tariff collection from consumers. Contributing factors to this financial mismanagement include the lack of sufficient financially-qualified staff, underspending on budgets (Yako, 2015) and corruption (Kabuso, 2014). Mismanagement of funds leads to less money being available to maintain, upgrade and operate the water reticulation system (S2).

Problematic political relationships, both within and outside the MLM, relate to the lack of effective political oversight which MLM councillors should provide to the municipal administration responsible for fulfilling municipal functions (G2) (**Figure 2.5**). This ultimately resulted in the MLM being placed under political administration in 2014 (Yako, 2015) (G4). The poor performance of the MLM staff and processes is evident in the self-assessment facilitated by the DWS in 2014 (**Table 2.1**).

Table 2.1: Makana Local Municipality Annual Municipal Strategic Self-Assessment 2014 (Source: Office of the Administrator 2015, p.4). Low vulnerability (75–100%), moderate vulnerability (60–75%), high vulnerability (50-60%), extreme vulnerability (0–50%).

Indicator description	Score
Management skill level (technical)	35%
Staff skill levels (technical)	40%
Infrastructure asset management	10%
Operation and maintenance (O & M) of assets	40%
Financial management	30%
Revenue collection	15%

The political arm of the MLM (**Figure 2.5**) is further influenced by the Sarah Baartman DM (G3), the Eastern Cape Provincial Government (G4) and the National Government, particularly the DWS (G6) – maintaining effective communication channels and relationships between these spheres enables effective integrated governance. The relationship between the MLM and citizens is formally facilitated through ward committees (RSA, 1998b). In the MLM many of the 14 wards do not have functional ward committees for reasons ranging from: lack of communication equipment; trust breakdown between citizens, ward councillors and ward committee members; and poor capacity and motivation of ward staff; to internal political infighting (Office of the Administrator, 2015; Yako, 2015) (G1,G2) (**Figure 2.5**). The resultant communication breakdown has alienated a large proportion of the community, leading to distrust and the general lack of support for existing municipal processes (Yako, 2015) (G1). Furthermore, this communication breakdown has also restricted the MLM's ability to communicate successful and positive actions that have improved local water supply.

This system description is by no means comprehensive, but it does provide a rich picture of the elements and relationships within the MLM CSES and the greater environment within which it falls. A systems description is always subjective and is at best a simplified model of reality that, among other things, enables action towards positive change in a situation of interest. The description has also highlighted some of the problematic relationships in the system that contributed to the complex WSD problem in the MLM.

2.5 Discussion

This chapter motivates for a systems approach to addressing complex social-ecological problems such as municipal water service delivery. Moreover, it describes a useful methodology for conducting a

systems inquiry, methodological steps that are often assumed in much of the literature. The first aim of this chapter was to provide a clear exposition of this methodological sequence: defining a situation of interest, bounding a system of interest and identification of elements and relationships. The application of this methodology through the example of the case study of the underlying water service delivery problems in the Makana Local Municipality satisfied the second aim. Developing a systems understanding of a CSES context is an important step to enable better access to research questions into various aspects of a system of interest. The example provided in this chapter guided and supported research into the emergence, practice (Chapter Four) and process of learning (Chapter Five) of the CSO, Water for Dignity. This systems understanding helped to focus CSO research and informed the evaluation of the impact the CSO had on household water supply in Grahamstown East. This understanding also supported the exploration of civil society participation (Chapter Six) and agency development (Chapter Seven) in the Makana Water Forum, a multi-stakeholder engagement platform which established in the Makana Local Municipality in 2016 (**Box 1.1**).

The systems description and the emergent systems heuristic is essentially a model of the MLM CSES, a 'good enough' representation of the real-world system (Ison, Blackmore & Iaquinto, 2013). The chapter recounts a systematic approach to conceptually modelling a CSES using the case of the MLM CSES.

The purpose of undertaking a systems description (e.g. to inform the situation of interest – research into CSO practice to address household WSD) ultimately guides the research process, and determines the extent of understanding required (Cilliers et al., 2013). The extent of this description was at the MLM level, smaller yet at the scale of Grahamstown East. With this purpose as the guiding thread, it was useful to consider the landscape scale and define the water resource management environment in which the system of interest, the MLM CSES, exists. This environment included the institutional water resource management landscape and the bio-physical catchment landscape, both inherently complex, interlinked and occurring at different scales (not always aligned, **Figure 2.2**) (Pollard & du Toit, 2008). As it is only possible to focus on limited characteristics of a complex system (Cilliers et al., 2013), it is useful to bound, or frame a system of interest, in this case, household water supply in the MLM CSES. This bounding does not ignore the larger system environment, as complex systems are open systems (Cilliers, 2000) – behaviour evident in the system of interest may be in response to relationships from the environment/larger system, e.g., high treatment costs of Grahamstown bulk water due to the high salinity of water emanating from the Orange/Fish River transfer scheme. These inter-relations need to be acknowledged.

Disaggregating the MLM CSES involved highlighting and describing sub-systems (government, technical, civil society and research) and the interacting elements they comprise. Understanding how

the system functions lies in the interactions or relationships between elements (Palmer et al., 2015), the state and health of which determine the functional efficiency and sustainability of the system. This is evident in the MLM CSES where the combination of multiple, 'unhealthy' relationships between sub-systems and elements resulted in water supply challenges. The systems description showed these relationships to range from technological (ageing infrastructure and lack of maintenance), socio-economic (unemployment and non-rate payment), economic (financial mismanagement and non-payment of creditors) and bio-physical (variable rainfall and intermittent droughts) to political (lack of sufficiently qualified and motivated municipal staff and councillors as well as the lack of collaboration between political actors and partners). Nkhata et al. (2008) provide a conceptual premise for understanding and analysing long-term social relationships key to effective, collaborative CSES management.

Consequently, WSD in the MLM CSES that has no single or simple solution; in addition any solution would inevitably cause further, possibly problematic, changes (Cilliers, 2000). Although this systems description did not offer potential interventions that could alleviate the WSD problem in the MLM CSES, it does provide the foundation for designing interventions. Adopting a systems thinking approach and doing the initial systems inquiry steps towards understanding the system provides an effective foundation from which to intervene and influence the system towards an improved state (Berkes et al., 2003; Ostrom & Cox, 2010; Audouin et al., 2013; Binder, Hinkel, Bots & Pahl-Wostl, 2013; Rogers et al., 2013).

Human limitations to comprehensively understand a complex system (cognitive ability, time, financial resources, etc.) make it necessary to focus on the level of detail necessary to inform decision making. This was achieved by bounding the system to include and describe four key sub-systems relevant to WSD in Grahamstown East. Conceptualising this reduced level of detail so as to inform decision making (e.g. defining which questions, elements and relationships to interrogate) is greatly enhanced through the use of effort-reduction tools, or heuristics (Shah & Oppenheimer, 2008). Simon (1990), who conducted seminal work on heuristics, described them as 'methods for arriving at satisfactory solutions with modest amounts of computation'. The heuristic depicting the MLM CSES (**Figure 2.5**) was an emergent property of effort placed into developing an understanding and description of the system. The process of emergence is consistent with the complex nature of SESs (Cilliers, 2000; Rogers et al., 2013). In combination with the deeper narrative, the heuristic provided: a useful conceptual overview of the system; an accessible tool to bring different perspectives to bear and form a common understanding of the system (Cilliers et al., 2013); and, importantly, a guide for future CSO-related research.

This system's description was conducted from the perspective of a few researchers embedded in the MLM CSES, who were interested in a local CSO. The knowledge created was relevant to that interest. Despite this, incorporating different perspectives into the systems description process would likely have resulted in a richer, more complete systems understanding.

The work of providing a rich understanding of the CSES context of the MLM water management system provides an important base for the investigation of other questions. For example, this MLM CSES description provided the basis from which to investigate the mechanisms, elements and relationships that supported and constrained the emergence, practice and process of learning for the CSO, Water for Dignity, in response to WSD issues in the MLM (Chapter Four). Another question that resulted from this description related to the role of CSOs in enabling improved democratic water governance at a local government scale. Furthermore, this understanding highlights problematic relationships in the MLM CSES as potential research focal areas and points of intervention where household water supply may be improved.

In addition, the systems approach taken can be extended to answer deeper questions regarding transformation at a local government scale. Ison (2010) suggests that the combination of people's changes in practice and changes in understanding in relation to a situation of interest (e.g. household water supply) results in an improved situation and transformation. Given the complexity of the MLM SES, following chapters will use this description as a base to deepen the understanding of the roles that other sub-systems (civil society, technical, political and research) play in improving WSD within the CSES.

The systems inquiry methodology presented can be applied to other municipal contexts. Indeed, problems associated with complex water management systems apply to many South African municipalities and have elicited reactionary or firefighting responses (Clifford-Holmes et al., 2016) as opposed to proactive management responses. Decision makers responsible for the management of water service delivery systems are often overwhelmed by the complexity and multitude of problems that manifest in these systems. Adopting the key foundational steps of a systems inquiry approach to define and understand a complex water management system provides a manageable way for decision makers to make informed interventions to improve the function and effectiveness of a system. Furthermore, a systems inquiry process can eliminate silo-thinking by: bringing multiple perspectives to bear, developing a common understanding of the system and key problems, promoting the co-creation of interventions, and promoting mutual accountability of decision makers.

This methodology was derived from a single case study. To further test the applicability and usefulness of this methodology it would be valuable to apply it in multiple case studies at different local

government scales and contexts. The next chapter goes through my conceptual framing and methodologies used throughout my research journey.

2.6 Conclusion

In this chapter, I expand on the concept of complex social-ecological systems as an ontology to explore civil society engagement with water issues in the Makana Local Municipality. I outlined a systems thinking approach and demonstrated a systems inquiry methodology to describe and analyse the case of the Makana Local Municipality Water Management CSES. The methodology consisted of defining a situation of interest, bounding a system of interest and identifying comprising elements and relationships of the system. This demonstration served a dual purpose. Firstly it provided the conceptual, methodological and theoretical underpinning for a systems inquiry into complex social-ecological phenomena in the Makana Water Management CSES. Secondly, it provided a detailed contextual description and analysis of the comprising elements and relationships pertinent to my case study. This description provided a foundation for addressing questions related to emergence, practice, learning and transformation associated with civil society engagement with household water supply in the Makana Local Municipality. Only theory and methodology pertinent to providing a systemic contextual profile of my study were presented in this chapter. The next chapter (Chapter Three) provides a comprehensive account of the rationale, theoretical and conceptual framing and methodological approach used to conduct the two engaged research phases of my study.

3 Chapter Three – Conceptual Framing and Methodology

3.1 Introduction

This chapter provides a theoretical and conceptual framing for the whole thesis in relation to the methodology and methods. Chapters Four to Seven are designed for publication and some material in this chapter is repeated in a following chapter. The aim of this chapter is to provide a single coherent framing before the specifics of each chapter. I explain the theoretical underpinnings and justify the selection of each component of the theoretical, conceptual, methodological and analytical framing in this chapter and briefly outline components in subsequent data chapters. Theoretical foundations for each data collection method are given and the manner in which each was used. The relationship between the theories, methodologies, data collection and analytical methods I employed in the study are presented in **Figure 3.1**. Data management, organisation and analysis are described. Lastly, the manner in which the validity of the research was ensured and the ethical considerations upheld during the study are described.

3.2 Conceptual framing

The following theoretical, methodological and analytical framing guided the research process (**Figure 3.1**).

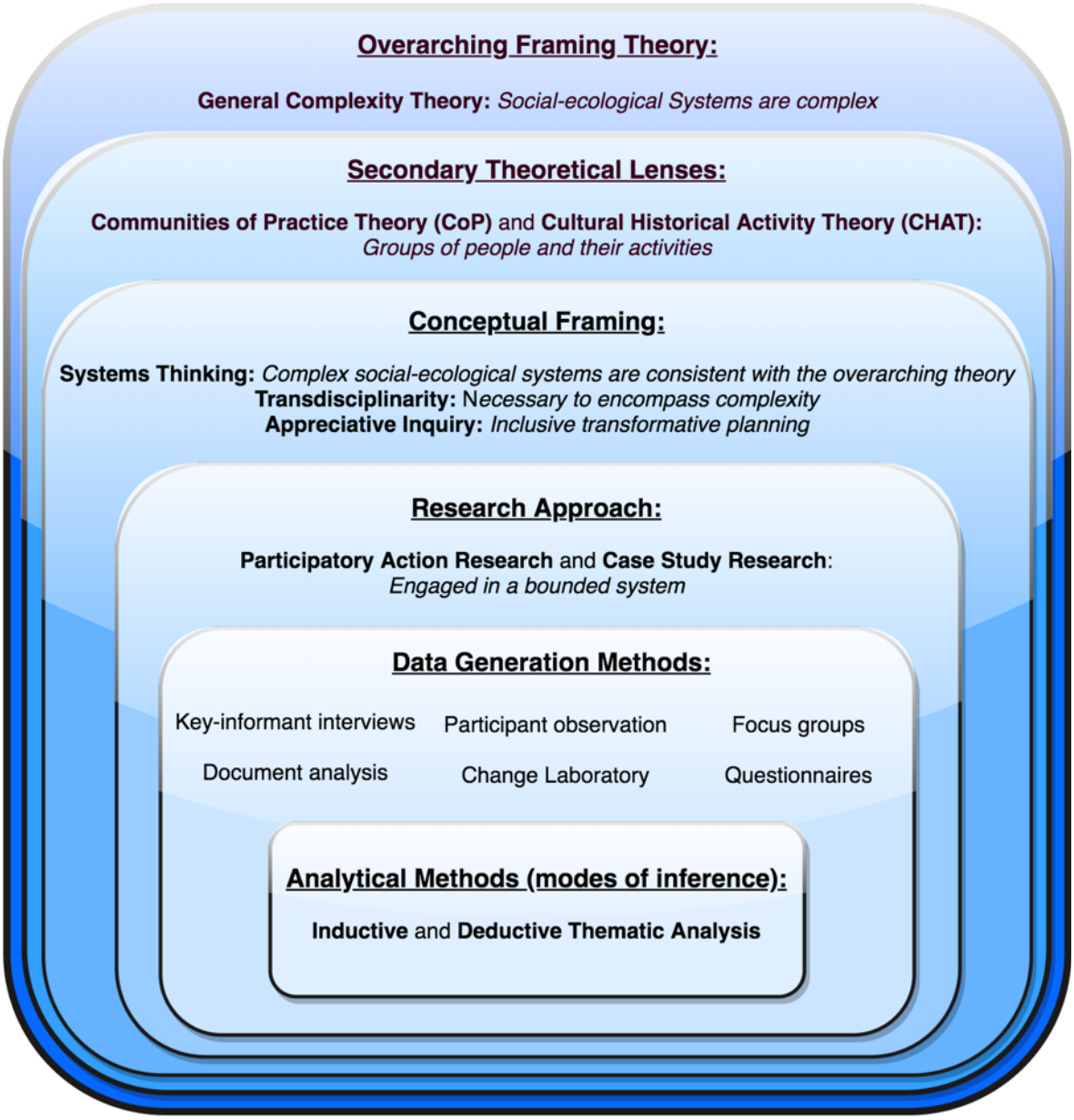


Figure 3.1: A nested box heuristic of the theoretical, conceptual and methodological framing guiding the study. Each element is introduced in the context of the literature in subsequent sub-sections.

Although most of the theoretical, methodological and method detail is provided in this chapter, some descriptions are provided in greater detail in specific chapters. **Box 3.1** serves as a guide to where (in which chapter) each of the theoretical, conceptual and methodological elements of the study are described in detail, and where the elements are simply referenced.

Box 3.1: Guide to the chapter location of the deep theoretical underpinnings and description of each theory, conceptual framing, research approach, and data generation and analytical methods employed in the study.

Chapter location of the description of theories, methodologies, and data collection and analysis methods used in the study

Overarching framing theory:

General complexity theory (GCT): Theoretical underpinning and rationale for selecting General Complexity Theory as an overarching framing is provided in this chapter. Limited detail of GCT is provided in Chapter Two where it is used to frame a systems inquiry into a complex social-ecological system, the Makana Local Municipality complex water management system. General Complexity Theory is mentioned in Chapters Four to Six. In Chapter Six, GCT is further discussed in congruence with Cultural Historical Activity Theory.

Secondary theoretical lenses:

Theoretical underpinning and rationale for selecting Communities of Practice (CoP) theory and Cultural Historical Activity Theory (CHAT) is briefly outlined in this chapter. Substantive theoretical underpinning of the two theories is provided for CoP in Chapters Four and Five, and for CHAT, in Chapters Six and Seven.

Conceptual framing:

Systems thinking: Theoretical underpinning and rationale for adopting a systems thinking approach is briefly outlined in this chapter. Substantive theoretical underpinning of a systems thinking approach is provided in Chapter Two and further mentioned in Chapters Four to Seven.

Transdisciplinarity: Theoretical underpinning and rationale for the selection of adopting a transdisciplinary approach is described in this chapter. My adoption of a transdisciplinary approach is mentioned in Chapters Four to Seven.

Appreciative Inquiry: Theoretical underpinning, rationale for selecting and degree to which Appreciative Inquiry was used is provided in this chapter. Appreciative Inquiry is briefly described Chapters Four and Five as a guiding framework for the design of Appreciative Inquiry workshops.

Research approach:

Participatory Action Research (PAR): Theoretical underpinning and rationale for selecting PAR is detailed in this chapter. PAR is also discussed in the context of related concepts: engaged research, Participatory Action Learning Action Research (PALAR), learning and interventionist research. PAR is mentioned in the research design sections of Chapters Four and Five. Chapters Six and Seven showcase how interventionist research was employed as adapted form of PAR.

Case study research: Theoretical underpinning and the rationale for selecting a case study research approach is detailed in this Chapter and mentioned in Chapters Four to Seven.

Data generation methods:

Theoretical underpinning and rationale for selecting each of the data generation methods is provided in detail in this chapter. The manner in which data generation methods were applied is briefly outlined in relevant chapters. Data generation methods included: key-informant interviews (Chapter Four and Five), Participant observation (Chapters Four, Five and Six), Focus groups (Chapter Five and Six), Document analysis (Chapter Four and Six), Questionnaires (Chapter Four). The theoretical underpinning informing the application of Change Laboratory workshops, used during engaged research with the Makana Water Forum, are mentioned in this chapter and described in detail in Chapters Six and Seven).

Analytical methods:

Theoretical underpinning and description of the two modes of inference, inductive and deductive thematic analysis are provided in this chapter. The specific analytical process in which thematic analysis was applied to address each research aim is described in their respective chapters.

3.2.1 Overarching framing theory

My way of understanding reality, my ontology, and the overarching theoretical framing that I adopted for this study, is General Complexity Theory (Cilliers, 2000; Cilliers et al., 2013; Preiser, Cilliers & Human, 2013). This ontology assumes that the world is comprised of social and bio-physical elements. These living and non-living elements interact and collective elements and their interactions comprise

complex systems (Audouin et al., 2013). Complex systems occur at multiple spatial and temporal scales, recognisable from a microscopic cellular level to planet-wide communities.

The field of complexity science is still developing and, as in all theories, disputes between theorists have resulted in slightly different interpretations of complexity theory. There are however, certain key characteristics of complex systems that are widely accepted by complexitivists. Drawing on Cilliers (2000, 2001) the characteristics of complex systems can be summarised as comprising:

- many interacting elements;
- interactions between elements and components that are non-linear processes;
- feedbacks between elements and processes;
- varying scale (both temporal and spatial) that influences process feedbacks;
- small changes to the system can lead to large effects (e.g. temporally and/or spatially) and vice versa;
- emergent, mostly unpredictable properties; and
- a context and history which shape its behaviour.

A recognition of complexity shapes any research approach seeking to understand and transform human interactions with the bio-physical world (Palmer & Munnik, 2018).

In the last two decades, complexitivists have increasingly employed complex (adaptive) social-ecological systems (CSESs) as an epistemological framing (**Figure 3.2**) to address complex human-linked environmental problems including, climate change (Ostrom & Cox, 2010), water scarcity (Cilliers et al., 2013; Rogers et al., 2013) and land degradation (Armitage, 2005). These problems are multi-faceted, interconnected, socially complex, and difficult to define and grasp intellectually. The problems are dynamic and therefore cannot be solved and are not amenable to “solutions”, but rather should be managed and loosened. They are what Rittel and Webber (1973), in their classic paper in 1973, characterised as “wicked problems”. Problems associated with water and catchments, such as water security, service delivery and resource management are complex in their own right, but their complexity is escalated due to their interdependencies, resulting in typical examples of wicked problems. Complexity and the notion of the complex social-ecological systems provide suitable theoretical grounding to frame and understand catchments, the people who depend on them and the wicked problems that emanate from them. This study focusses primarily on social systems and their transformation to improve the sustainability of water services and resources in catchments.

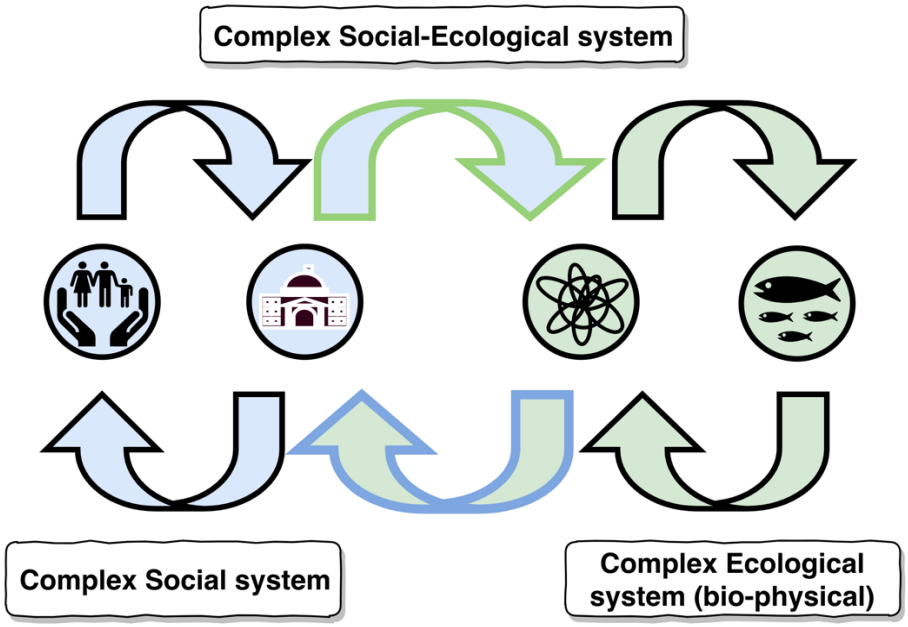


Figure 3.2: The interrelationship between complex social systems and complex ecological systems that comprise a complex social-ecological system (CSES). Source (adapted from Palmer & Munnik, 2018).

This research is a qualitative study of complex social phenomena that took place within the Makana Local Municipality water management system. The system comprises social and bio-physical components which can be characterised as a complex social-ecological system (CSES) (Chapter Two, Section 2.3). The qualitative study itself comprises components that interact to form an integrated whole, and does not follow a linear, reductionist research design (Maxwell, 1998). Qualitative research is referred to as "rich and thick", and addresses dynamic social phenomena that cannot be adequately investigated by a question and answer-type inquiry (Colton & Covert 2007). As the research unfolded, and data was collected and analysed, the research questions and aims were adapted and refocussed in response to feedback from the research environment. The adaptive research response to feedback from the research environment is consistent with emergent transdisciplinary research (van Breda & Swilling, 2018).

3.2.2 Secondary theoretical lenses

Two secondary theoretical lenses were used to understand the qualitative phenomena of interest that took place within the MLM water CSES: Communities of Practice (CoP) Theory and Cultural Historical Activity Theory (CHAT). Communities of Practice theory was used to understand the emergence, practice and learning of Water for Dignity. Cultural Historical Activity Theory was used to understand, and inform, an intervention into the Makana Water Forum.

Communities of Practice Theory (CoP)

Communities of practice theory, coined by Lave and Wenger (1991), aligns well with systems thinking and practice as it is a social theory driven by the assumption that people learn from each other by practising in a social system or community of practice (CoP). A CoP is defined by Wenger as a group of "… people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (2011, p.1). I used CoP theory as an epistemological and analytical lens through which to: 1) describe and understand the emergence of the WfD group; 2) describe and understand the practice of the WfD group; and 3) describe and understand the process of learning of the WfD group. Greater detail into CoP theory and its application as an analytical lens is provided in Chapters Four and Five.

Cultural Historical Activity Theory (CHAT)

Cultural Historical Activity Theory is a practice-based, future orientated learning theory developed by Engeström drawing on the work of existing activity theorists Vygotsky (Vygotsky, 1978) and his colleagues Luria (Luria, 1976) and Leont'ev (Leont'ev, 1981). Essentially, CHAT provides a theoretical framework to explore the relationship between the human mind and action, what people think and what people do. Engeström (1987) expanded on earlier social learning theory, contending that the way in which people learn and act in their specific contexts is mediated by the community with which they interact and is influenced by the cultural and historical context from whence they come. Cultural Historical Activity Theory further offers a process-based methodology, Change Laboratory, for mobilising learning and individual and collective agency for positive transformation of human practice (Sannino & Engeström, 2017).

Cultural Historical Activity Theory is a living and rapidly growing theory and is finding international traction as a social learning theory to analyse and enable development in practical social activities particularly through the Change Laboratory method (Avis, 2007; Engeström & Sannino, 2016; Gutiérrez, Engeström & Sannino, 2016; Lotz-Sisitka, Mukute, Chikunda, Baloi & Pesanayi, 2017), which is a type of formative intervention (Engeström, 2011). Formative interventionist research differs from conventional action research in that the researcher-interventionist purposefully introduces conceptual tools stemming from CHAT to stimulate participants' agency and volitional action (Sannino, Engeström & Lahikainen, 2016). The Change Laboratory method is based on the theory of expansive learning (Engeström, 1987) in which the end results of learning outcomes are not predetermined by the interventionists, researchers or practitioners. The outcomes are designed by the participants as they work out expansive solutions to developmental contradictions in their activity systems (CHAT unit of analysis) (Engeström, 2001). Contradictions are historically evolving tensions

that occur within or between interacting activity systems that manifest as problems observable in activity system practice (Warmington et al., 2005; Engeström & Sannino, 2011). Contradictions bound potential for expansive learning, potential that is purposefully unlocked through the Change Laboratory method (Engeström & Sannino, 2010).

General Complexity Theory and CHAT dovetail well as complementary theories to understand and engender positive change in social systems. Several commonalities between General Complexity and CHAT support this theoretical congruency, including: a focus on social collectives rather than isolated individuals; the importance of relationality between system components to understand behaviour and inform change – that the whole is more than a sum of its parts; the dynamic nature of systems is a result of its history; the importance of multi-voicedness and diverse perspectives to build a comprehensive systems understanding; and the capacity of systems to learn, knowledge is embodied within components and their inter-relationships (**Box 3.2**).

Box 3.2: The congruency between General Complexity Theory and Cultural Historical Activity Theory (CHAT) that support my adoption of these two theories as a theoretical and conceptual framing for my study.

Commonalities between General Complexity Theory and CHAT

- Both theories focus on collectives, and maintain that individuals and collectives can only be understood dialectically, through their cultural historical relation to one another. Complexity science emphasises that humans can only be understood as part of social systems and other systems in which they are embedded (McMurty, 2006). Furthermore, both activity theory and complexity science view systems and their elements as units of analysis. In CHAT the unit of analysis is an object-oriented activity system, which is a move away from the focus on individuals to "a collective, artefact-mediated and object-orientated activity system, seen in its network relations to other activity systems … [in which] individual and group actions, are subordinate units of analysis, eventually understandable only when interpreted against the background of entire activity systems" (Engeström, 2001, p.136).
- Complex systems are greater than the sum of their parts (Cilliers, 1998). Similarly activity systems "[are] collective practices … not reducible to sums of individual action; they require theoretical conceptualisation in their own right" (Engeström, Miettinen & Punamäki, 1999, p.11). Complexitivists particularly stress the importance of relationality between parts that provide meaning to the system (Cilliers, 1998; Palmer et al., 2015) and that "in 'cutting up' a system, the analytical method destroys what it seeks to understand" (Cilliers, 1998, p.2). Complex systems have emergent properties that cannot be predetermined by analysing individual components in isolation or in a non-linear manner. The parts derive their meaning according to their relationality to other components in an activity system. In complexity theory, the relationships between elements imbue and give meaning to the individuals and their role in a system (Palmer et al., 2015). The relationality of systems in both theories are seen as important in determining transformation. In particular, CHAT emphasises that discontinuities, tensions and contradictions within these relationships are potential sources to enable expansive learning (learning what is not yet there) and transformation (Engeström, 2016; Haapasaari, Engeström & Kerosuo, 2016; Sannino & Engeström, 2017).
- McMurty (2006) purports that complex systems have the capacity to learn. Knowledge is not only held in individuals but is also embedded within and enacted through the interactions and relationships between system components, essentially making up a complex learning system.

Commonalities between General Complexity Theory and CHAT

- Multi-voicedness and multiple perspectives are required to understand a complex system. Parts of a complex system are rarely aware of the whole system in which they form part. Individuals in an activity system may have different views of the activity system and its object depending on their individual histories, accumulated knowledge, tenure and hierarchical position in the system (Engeström, 2001).
- Like complex systems, activity systems develop and transform over time, and can only be understood in the context of this historicity (Engeström, 2001). Cilliers (1998) reminds us that all complex systems have a history and that "any analysis of a complex system that ignores the dimension of time is incomplete, or at most a synchronic snapshot of diachronic process" (p.4).

CHAT has common ground with Wenger's (1998) Communities of Practice (CoP) theory, in that both theories enable the understanding of distributed learning, particularly social dynamics relating to groups of people engaging in joint practice. I found CoP useful as an ethnographic lens to understand the social structure and dynamics of emergence, practice (Chapter Four) and learning (Chapter Five) of Water for Dignity. However, CHAT can be used as both a descriptive and interventionist theory and in this study proved a more robust conceptual lens to: 1) frame, describe and understand the interactions between different groups of people associated with the Makana Water Forum, and 2) provide me with the appropriate conceptual, methodological and analytical tools: the second and third-generation activity system model (Chapter Six, Section 6.2.1), theory of expansive learning (Chapter Six, Section 6.2.5) and the Change Laboratory method (6.3) to understand and intentionally effect a change process within the MWF.

I provide greater theoretical depth into my application of CHAT as a descriptive and interventionist methodological framing in Chapters Six and Seven. In Chapter Six I outline the five key principles of CHAT that guided my engaged research into the MWF (Chapter Six, Section 6.2). I also outline the theory of expansive learning and its application to inform the formative intervention conducted with the MWF, using the Change Laboratory method (Chapter Six, Section 6.3). In Chapter Seven I outline the concept of transformative agency and its emergence during the formative intervention process with the MWF.

3.2.3 Conceptual framing

Systems thinking

Systems thinking is a natural accompaniment to an ontology that views the world as comprised of multiple complex social ecological systems at different spatial and temporal scales. The main premise of systems thinking is that the whole is greater than the sum of its parts (Ison, 2017). Systems are

dynamic, therefore systems thinking emphasises the inter-relationships and their effect on the behaviour of the system over time rather than focussing on individual components as a snapshot in time. Proponents of systems thinking aim to overcome the shortcomings of linear, cause and effect-based approaches of by focussing on feedbacks and relationships over time (Cilliers, 2000; Ison, 2010). Furthermore, these proponents recognise the importance of history and context in understanding the behaviour of a system (Ison, 2010; Cundill, Cumming, Biggs & Fabricius, 2012; Rogers et al., 2013; Ison, 2017).

Water management systems within catchments are Complex Social-Ecological Systems (Biggs et al., 2015). All research into a system intervenes, no matter how objective a researcher aims to be (Engeström, 2011). Systems thinking explicitly includes the researcher as a component of a system. The researcher's research process/intervention in a system causes feedbacks that influence the behaviour of the system and vice versa (Ison, 2010; 2017). I found systems thinking useful when trying to understand and describe the Makana Water CSES (Chapter Two) and my research process and its influence within it. Systems thinking provided me with the conceptual tools to delineate the boundaries of my research focal area (Williams & van't Hof, 2016), through a process of bounding my system of interest (Chapter Two). In this way I was able to delineate a system of interest in a way that was conceptually manageable, given the time and resources available to me, while still acknowledging the connections of my system of interest to the environment of systems it was nested within.

Transdisciplinarity

Transdisciplinarity (TD) is a research approach well suited to addressing wicked problems associated with complex social-ecological systems (Klein, 2008; Roux, Stirzaker, Breen, Lefroy & Cresswell, 2010; Lang et al., 2012; Jeder, 2014; Popa, Guillermin & Dedeurwaerdere, 2015). The breadth of complexity inherent in wicked problems extends beyond the capability of a single discipline to address (Bammer, 2013). A TD approach aims to integrate and synthesise different ways of knowing and methods across different disciplines to produce a more comprehensive and accurate understanding of the wicked problem of interest. Two definitions of TD by Lang et al., (2012) and Jahn, Bergmann and Keil (2012) resonated with me and informed the TD approach I adopted in this study:

> Transdisciplinarity is a reflexive, integrative, method-driven scientific principle aiming at the solution or transition of societal problems and concurrently of related scientific problems, by differentiating and integrating knowledge from various scientific and societal bodies of knowledge (Lang et al., 2012, p.5).
>
> Transdisciplinarity is a critical and self-reflexive research approach that relates societal with scientific problems; it produces new knowledge by integrating different scientific and extra-scientific insights; its aim is to contribute to both societal and scientific progress; integration is the cognitive operation of establishing a novel, hitherto non-existent, connection between the distinct epistemic, social–organizational, and communicative entities that make up the given problem context (Jahn et al., 2012, p.8).

Wicked problems are best addressed by integrating the expertise of TD teams that include academics, non-academics, practitioners, and government actors (Lang et al., 2012). In the two phases of my doctoral research I participated in two different TD teams, but with some overlap in members. Through a collaborative process, both TD teams drew on and co-produced knowledge in context, which is a fundamental characteristic of transdisciplinarity (Max-Neef, 2005; Wickson, Carew & Russell, 2006).

In the first phase of my doctoral research I participated as a member in a TD research team engaged in a broader Water Research Commission-funded research project entitled: Towards Practicing a New Paradigm: Practicing Adaptive IWRM (Integrated Water Resource Management) in South Africa (the TPNP project) (Palmer & Munnik, 2018). The TPNP project was a five-year, multiple case study research project. The project teams of the three TPNP case studies adopted a TD approach, where stakeholders and researchers from multiple disciplines sought to co-develop and re-imagine ways of realising adaptive, integrated water resource management (IWRM) in practice (Palmer & Munnik, 2018). I formed part of the Makana Case Study TD team, situated at a local government scale. A member of an NGO, Khulumani Support Group and the WfD group (non-academic community practitioners) were the other members of the first TD team.

In the second phase of my doctoral research I participated in a TD team that included researchers and students from the Institute for Water Research and the management committee of the MWF. The MWF committee comprised community members interested in water issues, academics, government officials, a political councillor from the Makana Local Municipality, and officials from the Department of Water and Sanitation. In the course of the research period I was both a committee member and served a period as the interim chairperson of the MWF.

In addition to learning from my participation within these TD teams, my TD approach evolved through my participation in monthly TD research group meetings facilitated by the Institute for Water Research at Rhodes University (Wolff et al., under review).

Principles of a transdisciplinary approach, first developed by Palmer et al. (2008), served as a guide to the transdisciplinary research approach adopted by the TD research team engaging in the Makana Case Study. These principles were well suited to both Appreciative Inquiry and Participatory Action Research and approaches (Section 3.2.4), and as part of this TD team, I applied them to the engaged research processes of my doctoral study.

Box 3.3: The principles of transdisciplinary practice. Source Palmer, Biggs & Cumming, (2015).

Principles of transdisciplinary (TD) practice

- Tolerate and even welcome discomfort and unresolved tensions; they are often gateways to knowledge and trust.
- Be sensitive to "aha!" moments or insights and note that irritation and conflict often signal moments of insight and a learning opportunity.
- Engage with balanced generosity; listen and share.
- Practice tolerance, build integrity and mutual trust.
- Be sensitive to "arrivals" of both people and ideas.
- Create and use reflective opportunities.
- Manage discontinuities (people come and go, and arrangements change suddenly).
- Sustain enquiry (keep going when it is tough).
- Be conscious that everyone involved in the process is a whole, multi-dimensional person, with the potential to engage with their whole self and many ways of knowing.

Appreciative inquiry

Appreciative Inquiry (AI) is derived from participatory action research, and is an approach based on positive psychology that involves the collaborative search of strengths and assets of people, organisations and their situation of interest (Chevalier & Buckles, 2013). Its core assumption is that "… every living system has many untapped and rich and inspiring accounts of the positive" (Cooperrider & Whitney, 2001, p.3). Cooperrider and Whitney (2001, p.3) further maintain that by linking this core energy and positivity to any change agenda – "changes never thought possible are suddenly and democratically mobilized". Appreciative Inquiry played a dual role in my research: firstly, as an orientation to govern research engagements with research participants (both with WfD and the MWF), as it encourages the shift from a traditional problem identification and solving mind-set, to a positive developmental mind-set in order to move people, situations or organisations towards effective change. This mind-set involves acknowledging and building on people's existing social capital (knowledge, skills, relationships of trust) and agency so as to move towards a collaboratively envisioned future (Cooperrider & Whitney, 2001). Secondly, AI played an important role in the first phase of the doctoral research as a framework for structuring AI workshops. These workshops served to negotiate, plan and reflect on WfD practice as well as build relationships and trust between all stakeholders involved in the practice (Appendix B1).

3.2.4 Research approach

The broad research approach of both phases of my doctoral research was engaged research, characterised by meaningful interactions with stakeholders in problem identification, research design

and co-production of knowledge that is both useful and used in the research context. Bowman, Morris and Adshead (n.d., p.2) describe engaged research as:

> a wide range of rigorous research approaches and methodologies that share a common interest in collaborative engagement with the community and aim to improve, understand or investigate an issue of public interest or concern, including societal challenges. Engaged research is advanced with community partners rather than for or about them.

I conducted engaged research through participatory action research within a case study.

Participatory action research

Participatory action research (PAR) is a vein of action research where the researcher actively participates in a change situation (McTaggart, 1991). Specifically, PAR has a critical emancipatory agenda (Wood & Zuber-Skerrit, 2013), which often comes in the form of a collective inquiry by community members as well as researchers, into a common situation of interest (Minkler, Vásquez, Tajik & Petersen, 2008). Chevalier and Buckles (2013 p.3) maintain PAR:

> mobilizes the living knowledge of people connected to each other and their environment and weaves a collective understanding of ways to act for the common good. It is a practical engagement of mind with the world that invites us to reason carefully, with rigor, while caring for others and the world we live in.

The aims of PAR align closely with the applied aims of a TD and AI approach (Section, 3.2.3) and are similarly imbued within the interventionist component of CHAT and the Change Laboratory method (Section 3.2.2). Through the Change Laboratory method, interventionist researchers similarly seek to enable the collaborative transformation of activity systems in crisis through a process of expansive learning (Section 3.2.2). In these three approaches (CHAT, TD and AI), research agendas and questions typically address real-world problems that participating community members face in their communities.

Participatory action research was an appropriate methodological approach for this research as engaged research with the civil society organisation, Water for Dignity, and members of the MWF aimed to promote learning, build capacity and ultimately improve their sustainability and effective practice. The emphasis on promoting active learning, on improving my research practice reflexively, and engaging with research participants aligned my PAR approach closely to an emerging field of action research in South Africa: participatory action learning and action research (PALAR) (Wood & Zuber-Skerrit, 2013).

The research followed the principles of PAR where researchers and research participants were instrumental in the design, participation, analysis and application of the results of the research. This approach also values the knowledge within all participants (Kidd & Kral, 2005; Knudson, 2015), particularly the local and experiential knowledge of by community-based participants. For example,

WfD's knowledge of Grahamstown East and knowledge of water-dependant ritualistic practices of traditional healers.

Case study approach

Both transdisciplinarity and participatory action research aim to address societally relevant problems grounded in real problem situations. Case study research is consistent with transdisciplinary and PAR approaches as it enables the researcher to explore a "contemporary phenomenon within its real-life context" (Yin, 2009, p.17). In addition, case study insights can be tested and adapted in real practices associated with the phenomena of interest (Flyvbjerg, 2006), thereby strengthening the intellectual project and addressing the social need.

Yin (2009, pp.47–48) describes three rationales supporting a single case study approach:

1. When dealing with a critical case (in order to test a well-formulated theory);
2. When dealing with an extreme or unique case; and
3. When the case is a typical or representative case.

The Makana Local Municipality Water complex social-ecological system (Chapter Two, Section 2.4.1) was the focus of this case study and exhibited characteristics which could be both constituted as extreme and representative. Prior to and during the study period, water service delivery issues in the MLM escalated to the extent that disgruntled citizens and high-profile stakeholders (e.g. Rhodes University) resorted to protests (Yako, 2015). Several interventions were initiated to rectify the municipal disfunction and address service delivery failure from multiple scales, including the Makana Water Crisis intervention led by the Presidency, bulk water provision contracted to Amatola Water, and the Eastern Cape Provincial Government taking administrative control of the MLM from October 2014 to July 2015. The MLM is also representative of many of the 27 Category B2 municipalities (local municipalities with a large town as its core) of South Africa that function poorly (Koma, 2010), exhibiting issues related to financial mismanagement, high unemployment, and poor service delivery (CoGTA, 2009). Furthermore, a large percentage of the population in these municipalities are poor and with little capacity to engage meaningfully in water governance processes (Lotz-Sisitka & Burt, 2006).

Engaged research requires extended relationships and contact in the study context, both of which involve significant intellectual and financial resources. It is also argued that transdisciplinary research requires a long-term investment of time (five to ten years) and resources that if not committed to, may undermine the research process and yield poor results (Roux et al., 2010). As such, a single, sustained, in-depth case study approach was explicitly chosen for this study rather than spreading limited resources over several case studies.

This research is a four-year case study that explored the practice and learning of civil society actors engaging with water governance issues in the Makana Local Municipality. In the first stage of the case study I explored the practice and learning of a civil society organisation, Water for Dignity, as they intervened to address water service delivery issues in Grahamstown East. In the second stage, my research focus explored the participation, learning and agency development of stakeholders that engaged in a multi-stakeholder water governance platform, the Makana Water Forum. Although case studies can provide opportunities to recount meaningful narratives, sound information gathering is dependent on thoughtful and rigorous data collection methods. A description of these methods follows.

3.2.5 Data generation methods

I employed qualitative data collection and analysis methods for the case study (Maxwell, 2012; Miles, Huberman & Saldaña, 2014), collecting primary data through participant observation, interviews, focus groups, workshops and a questionnaire (Merriam & Tisdell, 2015; Miles et al., 2014). I also conducted a literature and document analysis of WfD and MWF-related grey literature as secondary data sources. I used QSR NVivo software to aid data management, transcription and analysis (Bazeley, 2007).

Interviews

I conducted two forms of interviews during the study: semi-structured and unstructured interviews. I primarily conducted semi-structured interviews during the first phase of my research (Appendix C). These were with key informants such as WfD members and a WfD partner from the NGO, Khulumani Support Group. Semi-structured interviews enable the researcher to pose preconceived questions to research subjects in order to deepen meaning-making and understanding as well as to provide clarification on other data collected (Maxwell, 1998; Merriam, 2002). These interview data provided rich historical contextual profile data of WfD members and the Khulumani Support Group partner. Contextual profile data contributed to the production of a narrative of membership of the WfD group. Interviews additionally enabled me to probe and clarify specific events that occurred during the study period.

Consent and terms of participation were discussed before each interview. Interviews were recorded and transcribed, and a summary of each was made and verified with the interviewee in order to confirm that the information transcribed was indeed accurate. Examples of the interview schedule and transcripts of key-informant interviews are provided in Appendices D1 and D2.

In the second phase of my research I mainly conducted unstructured interviews, also referred to as informal interviews, with participants of the MWF executive committee. These interviews served to

complement data I collected through participant observation during MWF engagements to identify possible contradictions and tensions evident in the MWF activity system. I captured informal interviews as field observations and entries into my personal observation journal.

Participant observation

To gain a deeper understanding, depth and nuance of the social dynamics and forces at play in the study required that I embed myself in the research (Chapter Two, Section 2.4 and Appendix A). Therefore, data collected through participant observation provided valuable insight that enabled me to better understand the social dynamics within the CSES. Participant observation is a method employed in qualitative research drawn from ethnography for collecting data regarding people and social-cultural processes (Kawulich, 2005). Observation is an important method for filling in the gaps left by other data collection methods such as interviews and focus groups (O'Leary, 2004). The limitations of participant observation include the danger of over-involvement in the social processes of case study and neglect of thorough research duties (Maxwell, 2012). In addition, there is the danger of biasing processes under investigation towards the preconceived preferences of the researcher (Merriam & Tisdell, 2015). In-depth involvement in the social processes can lead to dependencies and complications when the researcher withdraws their active involvement. Both my AI and TD approach (inclusive planning in AI workshops and TD principles of engagement (**Box 3.3**)), where the inclusive role of research participants in guiding the transformative process that my engaged research aimed to induce, helped me minimise the bias effect of my in-depth involvement in the case study. My disengagement as an active engaged researcher involved in both the WfD practice and the MWF to meet my research output obligations (analysing and writing up the thesis), required careful and timely negotiation with my research participants. Offloading my support work role to other members of the TD teams greatly assisted in this disengagement process.

I conducted participant observation throughout the two phases of the study. During the first phase (March 2014 to June 2015), I conducted participant observation by participating in formal planning meetings and implementing WfD's water-related initiatives (the Citizen Report Card initiative, Community Water Forums, Emergency Water initiative, and School Water Forums) and informally in unplanned engagements. During the second phase of the study (October 2015 to December 2017), I conducted participant observation during 18 formal MWF engagements, including: 13 MWF meetings (four committee meetings, four general MWF meetings open to the public, and five closed meetings focussing on specific issues); five workshops; and two field trips.

Observations during, or shortly after these engagements with the WfD group and the MWF, were recorded in a participant observation journal and provided supplementary data to address my

research questions (Appendix E1 & E2). Using a reflexive journal can provide rich narrative descriptions of events, feelings and underlying stories (O'Leary, 2004). Photographs taken during participant observation enriched observation data (Liebenberg, Didkowsky & Ungar, 2012) (prior consent was obtained from research participants to take photographs Section 3.7). A selection of photographs pertinent to the study is provided in Appendix F.

Besides my participant observation journal, I reflected on my research journey in my personal reflection journal. Entries were made after practice engagements, supervision meetings, both formal and informal conversations with research colleagues and research participants and personal reflections regarding the research. An extract of my personal reflection journal is provided in Appendix G. Extracts from my personal reflection journal were a data source, and analysed as "documents".

Initially, personal research journals were provided to WfD members with the intention of collecting reflexive data on WfD member experiences post practice engagements. However, the lack of motivation of WfD members to regularly log journal entries limited the use of personal research journals as a data collection source. In retrospect, recorders could have been more appropriate. Fitt (2017, p.1) suggests recorders provide a user-friendly medium for research participants to capture reflective entries "and can avoid the stifling effects of self-editing in written diaries".

Focus groups

Focus groups differ from interviews in that they involve a number of people who interact with one another concurrently with the researcher, thereby building an often rich discussion, as varying points of view are offered and commented on (Kitzinger, 1995; Merriam & Tisdell, 2015). Skilful facilitation and posing thoughtful, discussion-prompting questions are important for encouraging meaningful dialogue during focus groups (Redmond & Curtis, 2009; Ritchie, Lewis, Nicholls & Ormstron, 2013). Focus groups were conducted after reviewing data obtained through the document analysis of meeting minutes, participant observation and key-informant interviews.

Data from focus groups were analysed to address the learning-related aim of the first phase of the research (to explore the degree to which learning was transferred from the WfD to the wider social context in which WfD practised). Focus groups were designed to uncover evidence of learning both within the WfD group and learning that occurred within social groups that WfD engaged with. In total, four focus groups were conducted, one with the WfD members and one each with CRC respondents; relatives, neighbours and friends; and Unilever South Africa, WfD's sponsor community (Appendices H1, H2, H3 & H4).

In the second phase of the research, I conducted "research and learning sessions" with committee members and general members of the MWF. These sessions were informed by the focus group

method and served as early stages of the formative intervention with the MWF and preparation for Change Laboratory workshops (Chapter Six, Section 6.4).

Discussions in focus groups were stimulated using prompt questions and mirror data. Mirror data are previously collected material from primary data collection that are presented back to participants to stimulate reflexivity on issues, probe specific subjects and invite deeper discussion (Engeström, 2011). Data mirrored in focus groups and subsequent reflexive discussions also served to validate and substantiate previously collected data.

Document analysis

Documents can provide historical and contextual information that deepens an understanding of the study context (Cohen, Manion & Morrison, 2007). Furthermore, documents can complement and validate other data sources by providing varying perspectives and additional insight. A variety of documents were analysed for predefined themes that were further analysed to inform all the research questions guiding the study.

In the first phase of the research, relevant documents included: meeting minutes, Appreciative Inquiry workshop reports and WfD practice reports, outputs and reflections, deliverables for the Makana Case Study component of the greater Water Research Commission-funded research project (Palmer & Munnik, 2018), among others (Appendix B; complete list of documents related to WfD). These documents provided contextual information relating to the study area and insight into different stakeholders and the nature of their participation in WfD practice. Meeting minutes provided detailed information relating to the various initiatives of the WfD team and opened a window into the nature of WfD practice and learning.

In the second phase of the research, documents included: minutes from MWF engagements such as meetings, workshops and field trips; MWF documents such as the MWF Terms of Reference; grey literature, such as reports and news articles; and entries from my field personal reflection and participant observation journals. I analysed these documents to build a historical and present contextual profile of the MWF and to surface potential contradictions affecting the MWF practice.

Questionnaires

Questionnaires are a quick and cost-effective method well suited to collecting data that is unique to individuals (Ritchie et al., 2013). They are, however, prone to issues such as dishonest responses, misinterpretation of questions, and superficial responses (Rowley, 2014). I restricted my use of questionnaires to obtain personal profile information about a WfD member who joined the group late into its establishment. The WfD member preferred to answer a questionnaire than participate in a

key-informant interview. Prompt questions used in the key-informant interview were used to develop a closed-style questionnaire (Appendix C).

3.2.6 Data analysis

Data analysis is the process of organising data to uncover pertinent information that can be displayed as research findings and enable discussion in relation to the research questions (Maxwell, 1998). I analysed the data from both phases of my research process through thematic analysis (Braun, Clarke & Terry, 2014).

Coding is the analytical process where data relevant to the research questions of a study are identified (Merriam, 2002). Defining analytical themes or categories was the first stage of my thematic coding process. I derived categories through two modes of inference: deduction (drawing categories from existing theory) and induction (categories emerge from thorough reviewing of the data) (Braun & Clarke, 2006; Merriam & Tisdell, 2015).

Effective storage, management and analysis of the large, diverse dataset produced in this study was achieved through the use of QSR NVivo 11 software which made possible efficient analytical categorisation and thematic coding of data. It is important to note that QSR NVivo 11 is an analytical tool and cannot analyse data on its own (Bazeley, 2007). I used the QSR NVivo 11 to identify data signifiers for further analysis. Appendix I provides an indication of how the software was used to analyse the data.

Induction

Inductive analysis is used to carefully review data for patterns inherent in the raw data, relevant to research questions, without influence from pre-existing theoretical or methodological lenses (O'Leary, 2004; Saldaña, 2015). Generalisations and theories are developed through a ground-up analysis of the raw data (O'Leary, 2004). Emergent patterns are then organised into categories or themes, within which appropriate raw data are grouped. This process was useful as a first phase of analysis to reduce large volumes of data into manageable sub-sets (themes and categories) that were applicable to my research questions.

In this study, categories were hierarchical subordinates to themes and were developed through iterative stages of inductive thematic coding (Bazeley, 2009). Coding is the process of assigning segments of raw data, such as segments of text, to a significant word or phrase (Saldaña, 2015). For example, in the second phase of the research I analysed raw data for evidence of underlying contradictions in the MWF in two steps. In the first step I coded raw data for themes such as Manifestations of contradictions in the Makana Water Forum, and Solutions to manifestations of

contradictions in the Makana Water Forum. In a second stage of data analysis, data under each theme was further organised into subordinate categories. For example, under the theme, “Manifestations of contradictions in the Makana Water Forum”, several different categories (or sub-themes) were identified, including, “capacity of the Forum”, “lack of Municipal buy-in” and “lack of focus” among others.

Generalisations I made through the inductive coding process were assumed to be representative of broader, unobserved phenomena. To limit false representation and interpretation of these phenomena it was important to validate generalisations with research participants (Saldaña, 2015). Validation was achieved through triangulation with other data sources and member checking (Section 3.5). In the first phase of the research, I sent interview transcripts to research participants (WfD and Khulumani Support Group) for member checking. Furthermore, my use of mirror data during focus groups in the first phase of the research, and in the formative intervention process during the second phase of the research, served as member checking. Here member checking was achieved as participants engaged with and validated the mirror data that I presented. Validation during Change Laboratory workshops with the MWF was particularly encouraged when presenting my researcher interpretations and summarised data as mirror data to participants for deliberation.

Deduction

Deductive thematic analysis is the process of analysing data by applying preconceived codes derived from existing theory (Braun et al., 2014). I used this mode of inference in both phases of the research. I drew on the conceptual framings from Communities of Practice (CoP) theory and Cultural Historical Activity Theory (CHAT).

In the first stage of the research, I used deductive category selection to code the data and describe the WfD structure as a CoP and to explore WfD processes of emergence, practice and learning. Categories were drawn from Wenger's (1998) theory of Communities of Practice (CoP) and social learning theory (Reed et al., 2010). Categories were grouped into analytical memos (data groupings collated under a common category) which were analysed for patterns. Meaning emerged through analysis of these patterns and was subsequently raised for critical discussion. Deeper descriptions of the analyses of each research question are in Chapters Four to Seven.

In the second phase of the research I used CHAT and the theory of expansive learning (Engeström, 1987) as theoretical lenses to analyse and re-construct the data through deduction. The second-generation activity system model of CHAT provided a useful theoretical framework to re-define the network of key social collectives (e.g. government departments, CSOs and commercial and resource-poor farmers) engaging in participatory water governance in the Makana water social-ecological

system as a multi-activity system network. Through deductive analysis I described the MWF as a central activity system, its sub-activity systems and other key activity systems with which it interacted. The elements of the second-generation activity system model – the subject, object, tools, rules, division of labour and community – served as categories guiding the raw data coding process. I used the results from the deductive analysis process to develop mirror data to present during the formative intervention with the MWF. Manifestations of contradictions identified during the primary inductive coding process were then re-conceptualised into deeper seated contradictions and tensions affecting the MWF. Detailed deductive analysis of data using the theory of expansive learning was not conducted, but will be the focus of future research and journal article publication.

3.3 Ethical considerations

Rhodes University provided ethical clearance for the research (Appendix J). In addition, steps were taken to ensure that research participants were respected and valued and to ensure the truthfulness and trustworthiness of the research. I presented the research focus, aims, objectives and methods to research participants (Water for Dignity and members of the Makana Water Forum management committee) at the outset of the research process, followed by discussion and verbal consent from participants. Discussion and feedback from research participants served to validate my proposed research design and ensure that the research aligned with the interests of the participants. Furthermore, I informed participants of adaptations to the research design, and delineated my role and scope of participation within the WfD practice. Being clear up-front in the research process reduced misunderstandings regarding my research commitments and responsibilities to the WfD work plan in the first phase of the research, and the MWF in the second phase of the research. Because of the inherent inclusive and participatory nature of my study, the research participants were constantly involved in and aware of the progress of the project.

Consent was also elicited before each scheduled interview or focus group, verbally for WfD members, and written for focus group participants. Participants and interviewees were made aware of the option to have the consent form read out to them before commencement of the interview or participation activity. The aims, objectives and methods of the research project were outlined in the consent form. My contact details were provided to the research participants, who were made aware of the option to withdraw from the research process at any point. Examples of ethical considerations taken in the study are provided in Appendix J.

Care was taken during interviews and focus groups not to influence a participant's responses by suggesting possible answers. Accurate transcription of audio recordings reduced the chance of researcher bias and participants were given an opportunity to validate what was said.

Truthfulness of the study was enhanced by using a range of data collection methods and sources. Triangulation of data from different data collection methods and across sources enabled cross-checking for trustworthiness.

Water for Dignity was an intimate group of six members and ensuring anonymity and confidentiality could not be guaranteed. I therefore discussed the anonymity challenge with WfD members and the partner from Khulumani Support Group. It emerged that participants preferred to be explicitly identified in the research outputs. However, anonymity was upheld by using pseudonyms for research participants outside of WfD and for members of the MWF.

Research participants were acknowledged for recordings and ideas that they produced and they understood that, after their input and collaboration, these would be incorporated into the research write-up. In addition, Water for Dignity members co-authored a publication (Hamer et al., 2018) and reviewed and were acknowledged in two publications included in this thesis and submitted to Geoforum (Weaver et al. Part 1 (under review); Weaver et al. Part 2 (under review). The value and dependability of the final research output depended on the contribution of the research participants, therefore a continuous reflexive feedback approach, often stimulated through mirror data, was adopted throughout the research process. Participant engagement with mirror data not only served to validate presented data but also showed participants that their contributions were being heard and included.

3.4 Validity

The validity and trustworthiness of my research was promoted through several steps and processes which included peer review, careful data management, creation of a data audit trail from claim to the raw data source, and an ongoing reflexive research practice between theory, research process and my research questions.

In both phases of the research, being part of a TD team enabled ongoing peer review as team members and I reflected on my research process and outcomes. My supervisor and co-supervisor, as well as the lead researcher in the TPNP Makana Case Study, were members of the TD team active during the first phase of my research. To a varying extent, they participated in WfD engagements and practices, which experience allowed them to validate the findings and claims that I have made. Reflective discussions conducted with the lead researcher after WfD engagements, provided an additional perspective and complemented my interpretations of research experiences. The first phase of my research contributed to successive deliverables and the final report of the Towards Practicing a New Paradigm (TPNP) project (Palmer & Munnik, 2018). Regularly reflecting on research experiences by keeping a personal research journal (Appendix G) served as a constant reflexive record of these experiences.

Furthermore, I was a research participant in the PhD research of a fellow member of my TD research team. Part of this research involved facilitated reflection through two-hour interviews and Dance Movement Psychotherapy sessions (Copteros, Karkou & Palmer, 2017). Reflections were about my personal TD research process with Integrated Water Resource Management.

My research has undergone peer review through presentations to fellow students and researchers at the Institute for Water Research, at local and international conferences, and in publication in accredited peer-reviewed journals. I presented my research on five occasions at local, and twice at international conferences between 2014 and 2018. I have published one paper and have two submitted and under review. The first is included as Chapter Two (Weaver et al., 2017), and the second and third are included as Chapters Four and Five (Weaver et al., Part 1 (under review); Weaver et al., Part 2 (under review)).

An accurate audit trail of the data enhanced the validity and trustworthiness of the research. Claims were validated by referencing the raw data sources that supported them, enabling the reader to trace and confirm claims. Furthermore, the use of QSR NVivo 11 software reduced the chance of inconsistency during the data storing, organising and analysis phase of the research. I provide inventories of data analysed for the first and second phases of the research in Appendices K and L.

Correct application of methods alone cannot ensure research validity; conclusions drawn from methods must adhere to the context and purpose of the study (Maxwell, 1998). Constant reflection back to the research questions supported validity in relation to the purpose of the study. Continuous alignment of the research process with the theoretical framework similarly supported theoretical validity.

3.5 Conclusion

In this chapter I outlined the rationale, theoretical and conceptual framing, and methodological approach used to conduct the two phases of my study, the first with a civil society organisation, Water for Dignity, and the second with the Makana Water Forum. I adopted General Complexity Theory as an overarching ontology to explore social phenomena within a complex social-ecological system. I applied two secondary theoretical framings to understand and analyse these phenomena, Communities of Practice theory in the first phase and Cultural Historical Activity Theory in the second phase of my research. I conducted participatory action research and adopted a systems thinking, transdisciplinary and appreciative inquiry research approach within a single case study. I outlined and motivated for my choice of data generation methods employed in both phases of the research process. These included interviews, participant observation, focus groups, document analysis and a questionnaire. A description of the analytical process explained how data was indexed and analysed

through inductive and deductive thematic analysis, a process which was facilitated through the use of QSR NVivo 11 computer software. Lastly the ethical considerations pertaining to the study and the steps taken to promote the validity of the study were detailed.

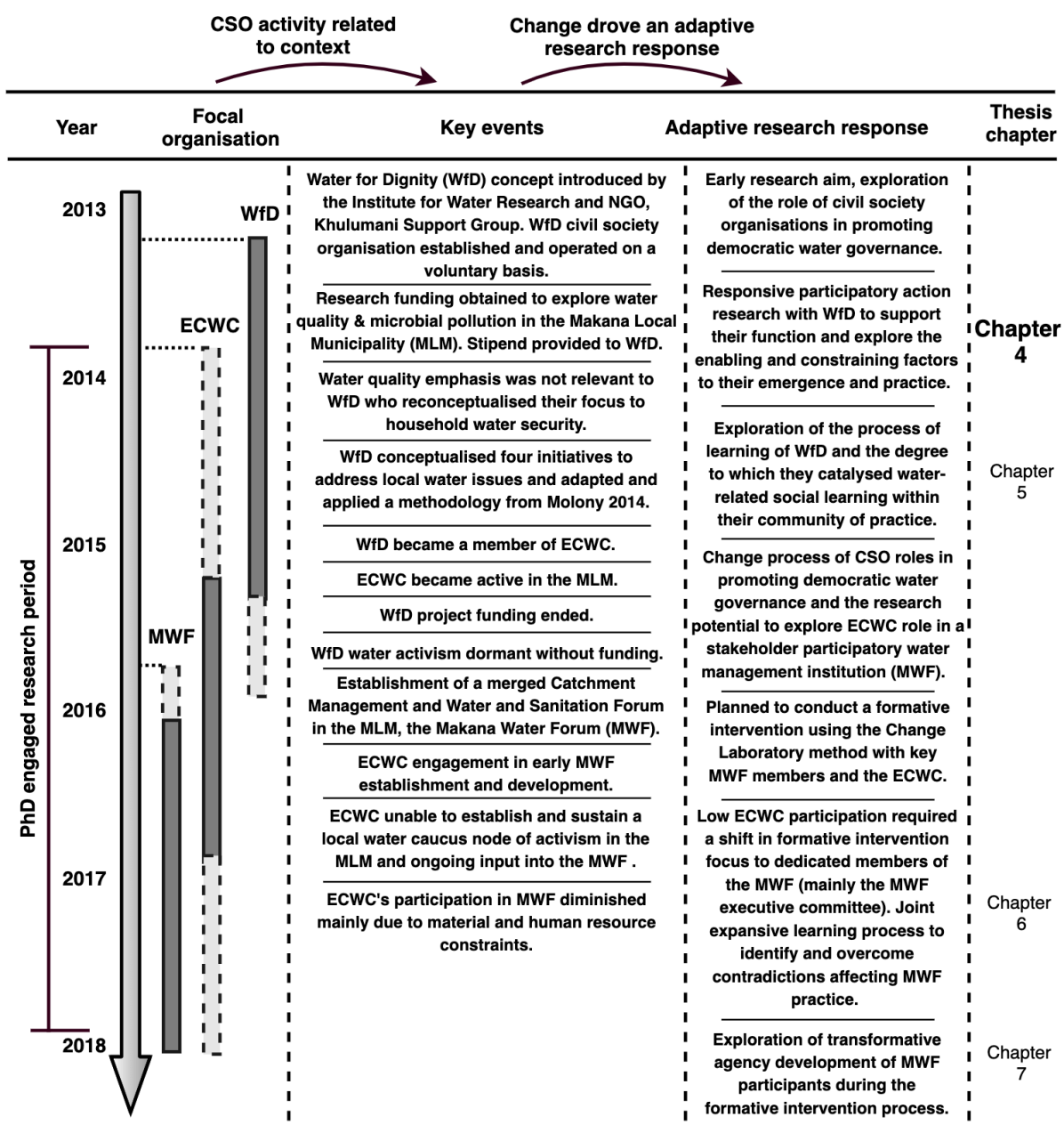
The next chapter (Chapter Four) explores the emergence and practice of a civil society organisation, Water for Dignity, and how they responded to issues relating to their community water supply.

4 Chapter Four – The emergence and practice of a civil society organisation responding to community water supply: a community of practice perspective

The chapter gave rise to a paper: **Weaver, M., O'Keeffe J., Hamer, N. and Palmer C.G. (under review). Exploring a civil society organisation response to water service delivery issues in South Africa. Part 1: Emergence and practice. Geoforum.** There are four authors listed in the submitted manuscript. As the lead author, I conducted the majority of the work, including, research design, data collection and analysis, manuscript drafting and submission. My primary and co-supervisor were listed as last and second author respectively and provided conceptual input to the research process and reviewed the manuscript prior to submission. The third author was a member of the Institute for Water Research team that partnered with Water for Dignity and participated in the engaged research process. The third author similarly provided feedback on the manuscript prior to submission. All authors were part of the engaged research team that partnered with Water for Dignity and supported their emergence and practice in the Makana Local Municipality. Comments from three external reviewers for Geoforum were considered in the revision of the paper and have been included in this chapter. In the paper and chapter the authors are referenced as "we".

Mbulelo Lipile's passion to transform local water service situations in Grahamstown East was infectious and touched many of those he engaged with (Photograph by Jane Berg).

Box 4.1: Repeat of Figure 1.7 as a reminder of the research timeline in relation to Chapter Four. Timeline of the adaptive research process of the doctoral study.



Repeat of Figure 1.7: Timeline of the adaptive research process of the doctoral study. Active engaged research began at the end of 2014 and ended in December 2017. Of interest to this study was the sequential activity of two civil society organisations (CSOs), Water for Dignity (WfD) and the Eastern Cape Water Caucus (ECWC) and their overlap and engagement with the multi-stakeholder water governance platform, the Makana Water Forum (MWF). The degree of overlap and engagement of WfD and the ECWC with the establishment and function of the MWF is depicted (dark shading indicating high intensity of activity and light shading in dashed box depicting low intensity of activity). The MWF was initially a catchment management forum then transformed into a water forum which implied the inclusion of water and sanitation services and water resource management. Key events pertaining to the two CSOs that influenced the research process are described. The adaptive research response required as a result of the changing activity of the focal organisations is described and related to the relevant data chapter in the thesis. Note: This figure is repeated in Chapters Four to Seven for ease of reference.

4.1 Introduction

South Africa has adopted a developmental state agenda (Turok, 2010) and has recognised civil society organisations (CSOs) as important actors in enabling deepening the reality of democratic governance and the equitable, sustainable and efficient management of natural resources (NPC 2011). Civil society organisations are viewed as important intermediaries between civil society and the state in developmental processes (Davids, Theron & Maphunye, 2014), including those related to water services and resource management (DWA, 2013). However, there is little literature on the fundamentals of how CSOs emerge, function and build capacity, and how CSOs can be supported to improve their effectiveness and sustainability. This chapter and Chapter Five aim to contribute towards closing this literature gap as well as setting the foundation for understanding civil society participation with water governance (this thesis). This chapter explores the mechanisms of and the enabling and constraining factors to the emergence and practice of a CSO. Chapter Five explores the learning process of a CSO during its engagement with water service issues at a local government scale.

The South African Constitution (RSA, 1996), National Development Plan (NPC, 2011) and the National Water Act (NWA) (RSA, 1998) are all consistent with, and supportive of, the South African developmental state policy agenda which is characterised by developmentally driven political purpose, objectives and institutional structures (Leftwich, 2000). Kuye and Ajam (2012) caution that despite adoption of the developmental state agenda and ideology in political discourse, there are characteristics of the South African state that are barriers to a developmental state reality. These characteristics include, inter alia, weak political leadership, poor capability and accountability of the state, corruption and patronage, and a politically repressed civil society (Swilling, 2008; Kuye & Ajam, 2012). Hence the National Development Plan acknowledged these barriers and outlined the remedial process of building a capable, democratic developmental state to achieve developmental outcomes and socio-economic transformation in South Africa (NPC, 2011).

In this chapter we take the position that in the face of real barriers, South Africa aspires to a future where state interventions around water intentionally support the developmental NWA principles of equity and sustainability. South African water law (NWA) and strategy (National Water Resources Strategy 2 (DWA, 2013)) explicitly makes provision for public participation in water-related issues. We argue that participation and effective citizen agency are an essential component of the developmental state – where state structures and functions intersect with people on the ground. This is in support of the National Development Plan and Kuye and Ajam (2012) which emphasise that citizens should understand their rights and responsibilities, and engage collectively to shape their developmental futures, rather than be passive recipients of government services. In this chapter, we explore the ways

in which a small civil society organisation emerged. It traces the constraints they faced, and the enabling circumstances of their engagement with issues of water services delivery.

South Africa is experiencing significant social, economic and ecological change in the post-Apartheid, and post-Mandela eras (Friedman, 1999). These transitions include the early development of internationally renowned and robust water law, and the decentralisation of water service delivery from the central state to local spheres of government (Nastar & Ramasar, 2012; Van Koppen & Schreiner, 2014). The National Water Act (No. 36 of 1998) recognises the complex and interconnected nature of water within an economic, social and ecological context and therefore the need for an adaptive, integrated water resource management approach (Palmer & Munnik, 2018). The integrated nature of water management is exemplified through the concept of the Reserve which the NWA defines as:

> The quantity and quality of water required – (a) to satisfy basic human needs by securing a basic water supply, as prescribed under the Water Services Act, 1997 (Act No. 108 of 1997), for people who are now or who will, in the reasonably near future, be (i) relying upon; (ii) taking water from; or (iii) being supplied from the relevant water resource; and (b) to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource (RSA, 1998, Section 1(1)(xviii)).

The Reserve is an important link between the National Water Act and the Water Services Act (No 108 of 1997) and a baseline management objective of Integrated Water Resource Management. Civil society participation is central to integrated and decentralised water resources and services management and therefore, to meeting the requirements of the Reserve. However, beside the inferred link of the Reserve, legislation to govern the two components of water management and the loci for public participation are separate (**Figure 4.1**).

The second National Water Resource Strategy makes explicit mention of community forums and civil society organisations (CSOs) as important citizen participation avenues to facilitate Integrated Water Resource Management (DWA, 2013). Bottom-up participation in water resources management was enabled through the establishment of catchment management agencies which in turn were informed by local stakeholder-driven catchment management forums (Dent, 2012) (**Figure 4.1**). Catchment management forums provided windows of opportunity (Olsson et al., 2006; Biggs, Breen & Palmer, 2008;) for civil society to influence water resource management processes.

The formal structure for citizens to influence service delivery processes (e.g. water and sanitation services) is through ward committees (Raga & Taylor, 2005) (**Figure 4.1**). The ward committee system was envisaged to support democratic local governance, enabling citizens to escalate concerns from a street-level through ward committee members via their ward councillor who represents issues to the relevant portfolio committee or the municipal council (Piper & Deacon, 2009). Engagement in these spaces, through ward committees or non-statutory community forums, catchment management

forums and CSOs, allows citizens to express their views, and influence decision-making processes that directly affect their lives (Boakye & Akpor, 2012). Active citizen participation could further the goals of the developmental state such as development that is meaningful to communities, poverty eradication, redress, legitimising policies and strategies, and strengthen citizen responsibility and accountability (du Toit & Pollard, 2008).

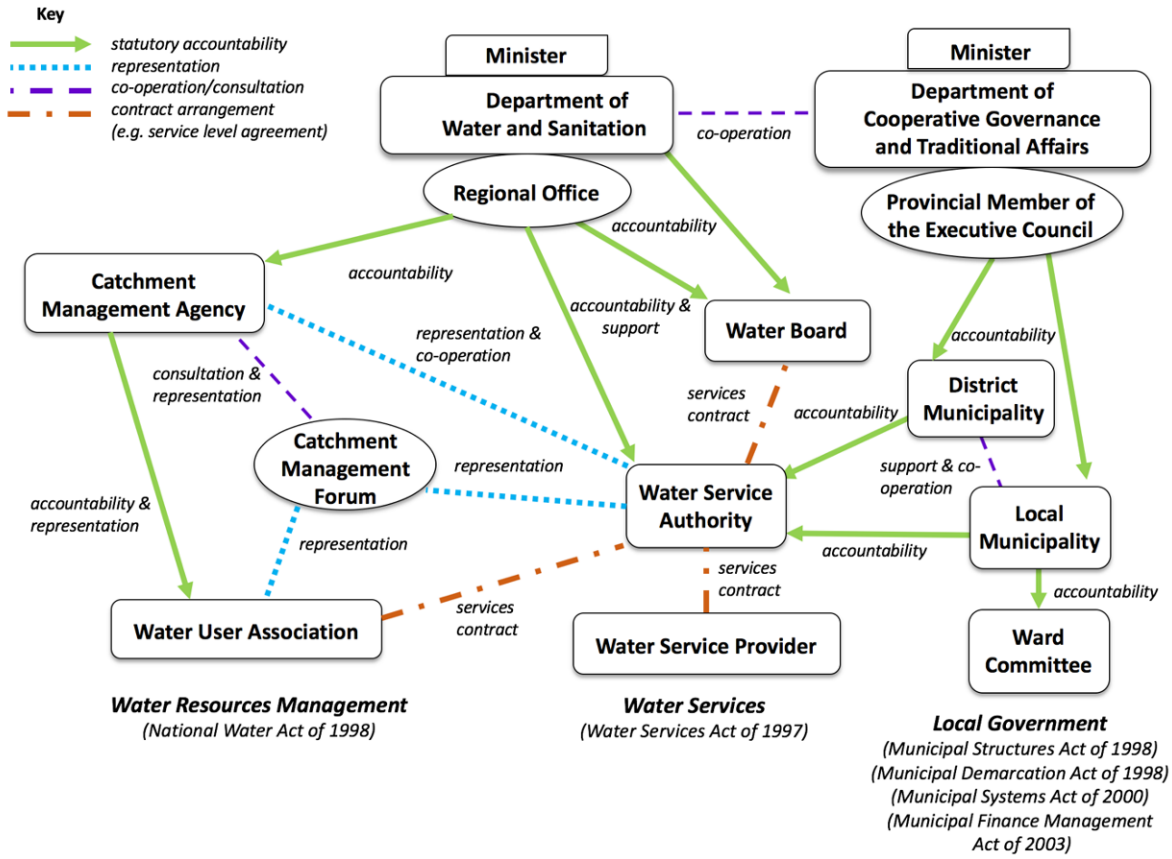


Figure 4.1: This is a repeat of Figure 1.4. Here is serves as an accessible reminder of the arrangement of and inter-relationships between South African water sector institutions and actors. The arrows depict the direction of accountability from superior to subordinate institutions. Legislature specific to institutions responsible for different aspects of water governance are provided. Source: adapted from Clifford-Holmes (2015) and Pegram and Mazibuko (2003).

Notwithstanding the recognition of the importance of civil society participation in water governance, participation is often perfunctory and unrepresentative in practice (Brown, 2011; Boakye & Akpor, 2012). In reality, civil society participation in water resource management processes has been limited to the more influential users such as commercial farmers, mining and industry and other well-resourced organisations, leaving the voices of the majority of the population, particularly the poor, largely unheard (Meissner, Funke & Nortje, 2016). Civil society organisations are an important vehicle to enable representative and meaningful participation in water governance decision making,

particularly participation of those that were and often still are marginalised (Munnik et al., 2014). In addition to promoting participation, CSOs have contributed to the water sector in several roles, including: as watchdogs (e.g. Duzi Umgeni Conservation Trust,www.duct.org.za); making contributions to policy (e.g. South African Water Caucus (SAWC) contributions to the National Water Resource Strategy 1 and 2 (Munnik et al., 2014)); community capacity development (e.g. SAWC and various NGOs) and citizen science (e.g. through mini-SASS (South African Scoring System) river health biomonitoring [www.minisass.org]). Furthermore, due to their proximity to communities, CSOs have been acknowledged as valuable service delivery partners to government, particularly with respect to facilitating community involvement (DWA 2012).

Despite noteworthy contributions of CSOs in the water sector, various challenges have affected their function and impact. For instance, CSO contributions in water governance decision making and policy development are not always taken seriously by decision makers (Munnik et al., 2011). Beneficial relationships built between influential departmental officials and governmental support is disrupted or discontinued due to significant leadership turnover in government (DWA, 2012) and CSOs (Munnik, 2011). An example here is the maladministration of European Union-based funding for CSO support through the Masibambane Programme (DWA, 2012), where funding failed to reach target CSOs (Burt & Berold, 2012).

The relationship between ward committees and CSOs is not always cooperative. This constrains the impact of CSOs on water service delivery processes. Government officials have excluded CSOs from service delivery processes, on the basis that citizen participation is only legitimate if facilitated through the ward committee system (Munnik et al., 2014). However, the political agenda of the ward councillor, rather than the concerns of citizens, typically dictate the actions of their ward committee and resource flows into the community (Smith & de Visser, 2009; Aylett, 2010). As a result, election politics often takes precedence over the facilitation of fair citizen participation in service delivery.

Despite the chequered history of the impact of CSO engagement in the water sector, CSOs are still regarded as influential actors in developing equitable, sustainable and effective water resource management (DWA, 2013). Civil society organisations should be strengthened to enhance participation and deepen the reality of democracy in the water sector.

If CSOs could deepen democracy, then understanding the conditions to support them is important. Particularly in early democracies, government needs to be held to account (Alexander, 2003). Civil society organisations have a role to play in deepening the reality of democracy. For example, CSOs were involved in holding mining companies accountable and being issued fines for their impact on the environment (Munnik et al., in press). There is little evidence in the literature of how CSOs emerge

and practice, particularly the enabling and constraining factors to emergence and practice. Building this understanding in a South African local government context is important, to inform the effective function of CSOs and how supporting organisations (such as NGOs and academic institutions) could nurture the emergence and function of partner CSOs.

This study explores the case study of a township-based CSO, which self-identified as Water for Dignity (WfD). The WfD group focussed on addressing prominent water service delivery issues in Grahamstown, the urban centre of the Makana Local Municipality (Makana from hereon) in the Eastern Cape Province of South Africa.

The specific aims of this chapter are: 1) to describe the process of emergence and practice of a township-based CSO, Water for Dignity (WfD), and 2) to describe the factors that enabled and constrained the practice of WfD. From this analysis of emergence and practice principles guiding effective and sustainable CSO function have been distilled so as to inform the function of CSOs practicing in other contexts. The potential for the developmental role of CSOs is discussed.

4.2 Conceptual and theoretical framing – Wenger's Communities of Practice theory

The concept of Communities of Practice (CoP) emerged in the context of social and workplace learning as a means of understanding and enabling professional identity and learning development (Brown & Duguid, 1991; Lave & Wenger, 1991; Orr, 1996). The subsequent evolution of the CoP concept was largely driven by Etienne Wenger and his colleagues (Lave & Wenger, 1991; Wenger, 1998a; Wenger, McDermott & Snyder, 2002). A CoP is defined as a group of people with a common interest, who together develop a shared practice and learn how to improve their practice with increasing mutual engagement in the practice (Wenger, 1998a). Subsequently, CoPs have become increasingly popular in the business and education sectors due to the knowledge application management utilities in organisational management contexts (Wenger et al., 2002; Preece, 2003; Steven & Kerno, 2008; Wegner & Nückles, 2013). Communities of Practice theory also provides a useful conceptual and analytical framing with which to explore CSO emergence and practice (Anil, Tonts & Siddique, 2015).

A CoP exhibits three key characteristics: a domain (the common area of interest), a community (the people who focus on and share this area of interest) and a practice (the coordinated action of practitioners as they address this area of interest).

We used a CoP lens in terms of the three CoP characteristics in order to understand the organisation structure, inter-relationships, purpose and practice of the WfD group (**Figure 4.2**). Wenger-Trayner (2011) differentiated different degrees of member participation in a CoP: core, active, occasional and transactional.

I. Domain – household water service delivery in Grahamstown East;

II. Community – WfD members (core participants); a doctoral student and researcher from the Institute for Water Research at Rhodes University; and a senior member of an NGO, the Khulumani Support Group (Khulumani from now on) (active participants); two senior researchers from the Institute for Water Research (IWR) (occasional participants); various interested Makana stakeholders (peripheral participants); and the sponsor community Unilever South Africa (transactional participants) (in this study we use WfD CoP when referring to all members participating in the CoP and WfD/WfD group/WfD members when referring to the core members of the WfD CSO); and

III. Practice – three initiatives, of which the Citizen Report Card (CRC) initiative described in this chapter, entailed conducting household surveys to investigate and analyse water service experiences of Grahamstown East residents (Palmer & Munnik, 2018).

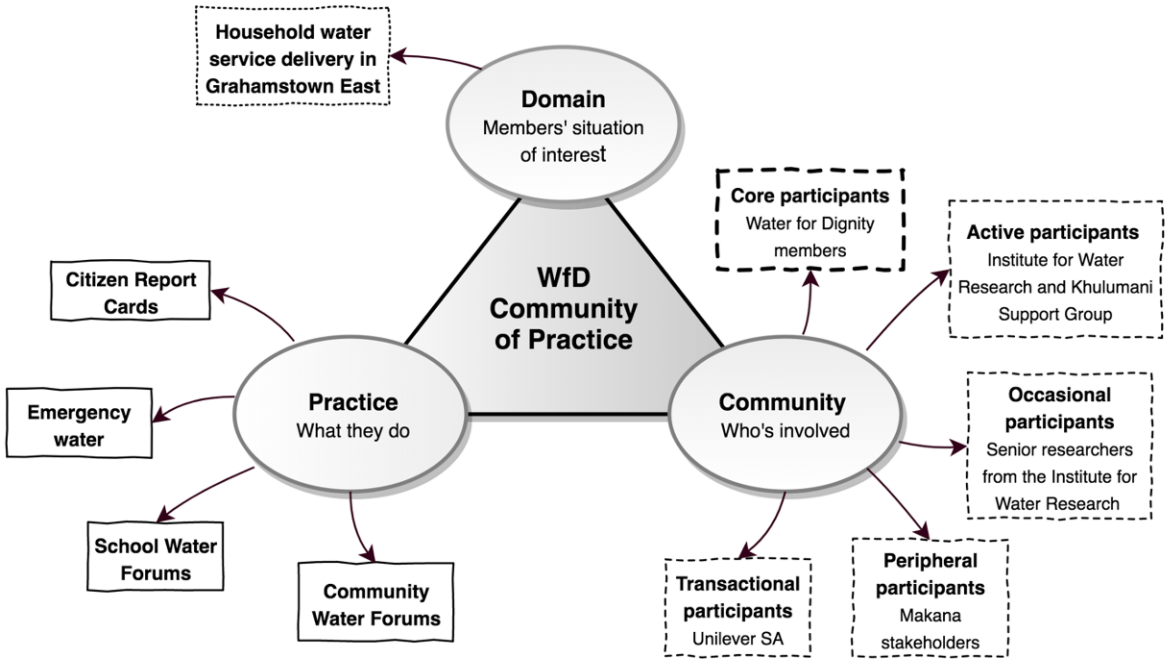


Figure 4.2: The characteristics of the WfD community of practice – the domain is what the members of the CoP are interested in; the community are those who engage to address the domain; and the practice is the shared practice that WfD members engage in to address their domain. Drawn from CoP theory (Wenger 1998a).

Wenger (1998) further elaborates on the practice of a CoP as comprising three interconnected dimensions: joint enterprise (its focus as understood by and constantly re-negotiated by its members); mutual engagement (relationships between members that govern the pursuit of their joint enterprise); and shared repertoire (the resources of a CoP such as artefacts, tools, language, routines

and methods developed and accumulated through learning in practice, over time). A CoP operates at its highest potential when all these dimensions are well developed (Wenger, 1998c, 2010).

Much of the critique of CoP in the literature addresses constraints and challenges related to the operationalisation of CoPs in organisations (Roberts, 2006; Steven & Kerno, 2008). Of relevance to this study is critique related to the application of CoP as an analytical lens or sense-making theory to inform collective human practice. To this end we explore issues related to the concepts such as community, practice and issues of power within CoPs.

An ambiguity in the conceptualisation of the terms "community" and "practice" has led to a wide range of interpretations (Cox, 2005). Cox (2005, p.537) reviewed four seminal works on CoP and compared their use of the term "community" as:

> A group of people involved in a coherent craft or practice, e.g. butchers – [citing Lave & Wenger 1991]
>
> An informal group of workers doing the same thing or similar jobs – [citing Brown & Duguid 1991]
>
> A set of social relations and meanings that grow up around a work process when it is appropriated by participants – [citing Wenger 1998]
>
> An informal club or Special Interest Group inside an organisation, set up explicitly to allow collective learning and cultivated by management action – [citing Wenger, McDermott and Snyder 2002]

It is suggested that this ambiguity and the different interpretations of the meaning of "community" and "practice" has enabled the wide application of CoP theory across a range of contexts. Communities of practice theory has been critiqued for the implying that communities are harmonious, positive entities, and romanticising the meaning of "a community". The critical argument is that the effect of power relations within communities can greatly influence or even dictate the negotiation of meaning thus constraining the freedom of the CoP to negotiate creative and original meaning (Roberts, 2006). Wenger countered that CoPs are inherently fraught with power dynamics – and that in some cases conflict and power dynamics in a CoP, if facilitated effectively, are essential for negotiation of meaning (Wenger et al., 2002). However, this does not imply that all CoPs are functional or effective, among other factors; power dynamics can result in a CoP that is dysfunctional, harmful or ineffective e.g. street gangs (Wenger, 1998a) or different popularity groups in schools (Eckert & Mcconnell-ginet, 1995).

In addition Cox (2005) argues that the term "practice" has caused confusion, firstly whether it refers to one specific practice or enterprise (e.g. conducting household surveys in Grahamstown East) or that of people relating over similar practices (e.g. anyone conducting household surveys). Secondly, practice ranges from specific and often localised practice, such as a work task, to something more

general, such as the practice of Integrated Water Resource Management. Practice in this study refers to the specific enterprise of the CSO, Water for Dignity.

Wenger (1998b) suggested that CoPs evolve through five successive transformative stages. At first there is potential, where people have similar interests, issues and needs but are not yet collaborating. People realise these commonalities and coalesce to form a community. The community enters the maturing stage where it develops an identity and practice. With the community established, it enters a stewardship stage where it takes charge of its domain and sustains its practice. Finally, the community enters a legacy stage, when either it starts outliving its usefulness and its members disengage, or the domain of the CoP shifts, members come and go and the CoP transforms or is re-invented. Wenger's (1998b) initial concept of CoP development stages in organisation has been adapted and employed as a conceptual and analytical framing to inform CoP development, particularly in organisational settings (McDermott, 2000; Gongla & Rizzuto, 2001; Bettoni, Endress & Schneider, 2002; Wenger, McDermott & Snyder, 2002; Cambridge, Kaplan & Suter, 2005).

The typical stages of development of a CoP provide a framework to understand the temporal progression of the emergence of the WfD group and the development and implementation their practice.

4.3 Research design and methods

The study was conducted as a single case study (Yin, 2014) with a participatory action research approach (Kidd & Kral, 2005). Participatory action research aims to address societally relevant problems grounded in real problem situations (Chevalier & Buckles, 2013). Case study research is consistent with action research approaches as it enables the researcher to explore "contemporary phenomenon within its real-life context" (Yin, 2009, p.17). Also, case study insights can be tested and adapted in real practices associated with the phenomena of interest (Flyvbjerg, 2006), thereby strengthening the intellectual project and addressing the social need.

The research combined the goals of developing the capacity of the WfD group and contributing to the effectiveness and sustainability of the WfD practice, with the intellectual project of exploring the dynamics of CSO emergence and practice. The knowledge held by all participants was valued, especially with regards to local and experiential knowledge (sensu Knudson 2015). The WfD group emerged in April 2013, however active participation in, and observation of the group is reported here for the 16-month period between March 2014 and July 2015.

Data generation methods to explore the emergence of WfD primarily included document analysis, key-informant interviews (Maxwell, 1998; O'Leary, 2004) and participant observation (Kawulich, 2005). Documents included published and unpublished project documents, WfD meeting minutes,

WfD event reports and reports of Appreciative Inquiry workshops (informed by Cooperrider & Whitney, 1987) (Appendix B1). Six key-informant interviews were conducted, one with each of the WfD group members and one with a member of the partner NGO, Khulumani Support Group (Appendix D2). Participant observation of the WfD practice was employed throughout the study period (Appendix E). Regular personal communication (Maxwell, 1998; Pepper & Wildy, 2009) with collaborating researchers from the Institute for Water Research contributed additional contextual insight.

Communities of practice theory (Wenger, 1998a) provided an appropriate lens to analyse and interpret the data. The theory also provided a useful epistemological language to discuss the enabling and constraining factors to the emergence and practice of the WfD group. Besides the utility value of CoPs as an organisational knowledge management tool, structurally, CoPs are seen as a mechanism for promoting organisational coherence and longevity (Wenger et al., 2002). Hence, the five stages of development of a CoP (sensu Wenger et al. 2002) were suitable to guide the analytical process and representation of the narrative of the emergence and practice of the WfD group.

The data were analysed using deductive thematic analysis (Ritchie et al., 2013). We derived categories from CoP theory (e.g. joint enterprise, mutual engagement, shared repertoire and enabling and constraining factors to practice (Wenger, 1998a; Wenger et al., 2002)), which we applied to the raw data. Computer-aided data analysis software, QSR NVivo 11 assisted data management and the coding process.

Although the research followed and was compliant with the Rhodes University ethics code, Water for Dignity members preferred to have their identities disclosed. Data sources were indexed into source codes to allow referencing in text e.g. KII Mbulelo = Key-informant interview with Mbulelo.

4.4 Case study and water supply context

The research was located in Grahamstown, the urban centre of the Makana Local Municipality (Makana) in the Eastern Cape Province of South Africa. Hamer et al., (2018) (in which I was a co-author) and Weaver et al., (2017) provide extensive geographical and historical detail of Grahamstown and its water supply system (Chapter Two, Section 2.4). Here we only supply contextual detail poignant to the emergence and practice of WfD group.

The WfD group lived in, emerged from and practised in the township, Grahamstown East (**Figure 2.1**). In South Africa, a township or location is similar to slums in the developing world, refers to an underdeveloped urban area, typically on the edges of a town or city that during the apartheid government, was reserved for citizens of black, Indian and coloured ethnicity (Jürgens et al., 2013). Townships were typically associated with poor service delivery (electricity, water, sanitation, access

to education and public health) and contained limited formal infrastructure (e.g. banks, hospitals, shops and schools) (Mahajan, 2014). Although post-Apartheid saw prioritisation and substantial investments in addressing service delivery infrastructure backlogs, there remains a significant service delivery gap between townships and neighbouring urban areas (Nleya, 2011).

Grahamstown East is typical of many South African townships. It has a high population (78% of the Grahamstown's 67 264 residents), mainly comprises black citizens (89.3%), many of whom are unemployed (49%), poor and depend on social welfare (Stats SA, 2011) (**Figure 2.1**). Although, basic water and sanitation access has improved in the post-apartheid period, in Grahamstown East 45.2% of the residents still rely on yard taps, 12.6% on communal street taps, and 22% do not have access to waterborne sanitation and rely on pit latrines and to a small extent, bucket toilets (Stats SA, 2011). In contrast, Grahamstown West has a small population (12% of the town's population), 97.7% of the town's white population, a low unemployment rate (9.4%) and many affluent residents (Stats SA, 2011) (**Figure 2.1**).

In Makana, the municipality is both the water service authority and the water service provider (**Figure 4.1**). The municipality has struggled to carry out this dual responsibility partly due to the complex nature of the Makana water management system (Hamer et al., 2018; Weaver et al., 2017). Water service failure has been instrumental in the municipality being declared as dysfunctional and placed under the care of a provincial government-appointed administrator (Yako, 2015).

Over the years the reticulation system within Grahamstown has been subject to numerous failures caused by lack of maintenance and failure to upgrade technical infrastructure; ageing infrastructure; and vandalism among others (Yako, 2015). Growing population and increased demand resulted in Grahamstown securing an additional eastern water supply system by tapping into the Orange-Fish River Inter-Basin Transfer Scheme. The East and the West come with slightly different water supply challenges. The West sources water from local dams prone to drought and had ageing infrastructure that frequently breaks (Weaver et al., 2017). Infrastructure in the East is newer than the West therefore most water outages are due to demand outstripping supply and infrastructure vandalism. These failures are hard felt in Grahamstown East, where the majority of residents are poor and have less financial and engagement capacity, to withstand water service delivery failures.

It is out of this context that the WfD group emerged and establish a range of initiatives to address water service delivery issues in Grahamstown East. The process of emergence and practice of WfD can be described according to their stages of development (sensu Wenger et al. 2002).

4.5 Development stages of Water for Dignity

4.5.1 Potential stage (Figure 4.3)

The seed of the emergence of WfD occurred through the collaboration between two institutions, the Institute for Water Research (IWR) and the non-governmental organisation (Khulumani) with common interests (overlapping domains). This is contrary to the typical formation of a community of practice (CoP), which self-organises as people with similar interests come together to develop and learn about a common practice (Wenger, 1998a). In this instance, WfD was engineered into formation by outside institutions (IWR and Khulumani). The IWR was interested in transforming Integrated Water Resource Management towards supporting social-ecological justice at multiple institutional (governance) and bio-physical (catchment) scales, of which water service delivery at a local government scale was one. The primary focus of Khulumani was addressing human rights violations (Khulumani Support Group, 2013) and in that instance, the violation of Grahamstown East residents' right to adequate clean water (SAHRC, 2013). The overlapping domains of the IWR and Khulumani provided the strategic base for their partnership. The IWR subsequently created a WfD component within their existing research projects and Khulumani situated the WfD concept into their Victim Empowerment for Active Citizenship Programme (Khulumani Support Group, 2013; www.khulumani.net). The Institute for Water Research received funding from Unilever South Africa, some of which was harnessed to support the WfD CoP Emergency Water initiative (**Table 4.2**).

4.5.2 Coalescing stage (Figure 4.3)

Utilising existing social networks and the involvement of a passionate community champion as a member of WfD, played an important role in the coalescing of the WfD CoP. Marjory, a powerful person within Khulumani, had an engagement history with active citizens in Grahamstown East and drew on these relationships in bringing together the core WfD members.

Drawing on experience from previous Khulumani research on victimhood and water rights violations, Marjory facilitated the drafting of the Water for Dignity project concept document. This document served as important starter material for the proposal of the WfD project to the "passionate community champion", Mbulelo. "Marjory came back with the WfD pamphlet … when we read it we said we are very interested, we need to have it" (KII Mbulelo, 2014/10/14).

Mbulelo played a central role in establishing the WfD group. He drew on his social network in Grahamstown East to enlist other interested members, "I targeted people that were close to me" – Liyema, Mbulelo's wife, two fellow church members, Xolelwa and Siya and a neighbourhood

acquaintance, Thabo. In collaboration with Khulumani, the five citizens engaged to discuss current local water-related challenges in Grahamstown East.

> "We had a long conversation … then we decided all of us that we needed to get on board. Talking and trying to understand, what is this document and how will it help us in this situation and how will it help us solve this water situation, and what power do we have and what do we have to do in terms of making this document work? When we fully understand what is happening we said no, it's fine, we are going for it." (KII Mbulelo, 2014/10/14)

Together, Grahamstown East citizens, researchers and a student from the Institute for Water Research and a member of Khulumani Support Group formed the main members of the Water for Dignity community of practice (WfD CoP) (**Table 4.1**). Some Grahamstown stakeholders and Unilever South Africa are acknowledged as peripheral and occasional-transactional members respectively as they had limited involvement in the WfD CoP. Unilever SA provided funding to the IWR, some of which was used to support WfD CoP initiatives. The WfD CoP can be classified as an intimate CoP (Wenger et al., 2002), due to its small size (less than 15 members) and close interpersonal relationships.

Table 4.1: Background, positionality and monetary compensation for time spent of members of the Water for Dignity Community of Practice (WfD CoP). Positionality includes the level of participation and primary contribution of members to the WfD CoP.

Water for Dignity CoP Member	Background, positionality, monetary compensation in WfD CoP
WfD group – core members	Six Grahamstown East residents. They were isiXhosa speaking but could all communicate effectively in English. They had little formal training and only two had completed secondary school. The group comprised a coordinator (Mbulelo) and five field operatives (Liyema, Xolelwa, Siya, Phumza, and Thabo). Monetary compensation for time spent: stipends. Role in CoP: conceptualisation and design of the CoP practice, field work, data management and presenting results.
Researchers – active and occasional members	Two senior researchers with extensive combined experience in the water sector (environmental flows, water policy and ecology), one junior researcher, with a social and environmental science background. Researchers were based at the Institute for Water Research. All lived in Grahamstown West. Monetary compensation for time spent: contracts. Role in CoP: financial (project running costs and later, member stipends), conceptual and advisory support, access to technology (computers, internet and telephones) and facilities.
Doctoral student – active member	I was a doctoral student based at the Institution for Water Research and lived in Grahamstown West. Monetary compensation for time spent: bursary. Role in CoP: conceptual and advisory support. Facilitated support provided by the Institute for Water Research.
NGO member – initially active then occasional member	Senior member of the NGO, Khulumani Support Group. Marjorie lived in Grahamstown West but relocated to Gauteng Province in 2015. Monetary compensation for time spent: salary. Role in CoP: conceptual, advisory, operational, resource management support to core WfD members.
Sponsor – occasional-transactional members	Representatives of Unilever South Africa based in Durban. Involvement linked to their corporate social responsibility. Monetary compensation for time spent: salary. Role in CoP: provided funding for equipment and supplies for the Emergency Water initiative (Table 4.2) and to a lesser extent advisory support.

In collaboration with Marjory (Khulumani), WfD identified key water-related challenges and proposed remedial actions (**Table 4.2**), which were then formalised into a WfD work plan. Although there were four initiatives that comprised the WfD practice (**Table 4.2**), there is only scope for the analysis of the CRC initiative in this chapter. The CRC initiative was selected for two reasons: i) it was the longest running initiative with significant amount of action researcher participation and therefore yielded a feasible amount of data was collected on it as opposed to other initiatives (the emergency water initiative was the subject of another publication (Hamer et al., 2018), and ii) during an Appreciative Inquiry workshop WfD identified the CRC initiative as their priority initiative.

Table 4.2: Prioritised water service delivery challenges in Grahamstown East and the remedial actions proposed by the WfD group to address them.

Identified WSD Challenge	Potential Actions
The lack of accurate information regarding the state of, and related experience of water and sanitation services of residents in Grahamstown East.	Citizen Report Card (CRC) initiative Household surveys to investigate water access and water service experiences of residents in Grahamstown East. Approximately 200 surveys were conducted by WfD members over the project period.
The lack of communication between the MLM and citizens regarding water service issues experienced by citizens in Grahamstown East such as water outages, poor water quality and unrealistic water bills.	Community Water Forum initiative Establishing ward-based forums to facilitate transparent water service delivery (WSD) related information sharing between Makana Local Municipality and the community members in each ward.
The lack of emergency water provision to Grahamstown East residents during the frequent water outages.	Emergency Water initiative Installation of 210L personal barrels and/or 5000L street tanks to provide emergency water access during water outages.
The poor state of hygiene and sanitation in schools and a lack of awareness of the implications thereof.	School Water Forum initiative Generating an understanding about water issues and the catchment through empowering learners to raise awareness about and monitor water use, hygiene and sanitation in schools.

During the research, social welfare was the only regular source of cash income received by the families of WfD members. This low economic security made supporting their families and sustaining their practice a constant challenge. Stipends were provided for WfD from an IWR externally-funded project (Hamer et al., 2018; Palmer & Munnik, 2018). The stipend contributed significantly to their household income but was only available for the duration of the research project (2013 – 2016). Stipends included allocation for income and for, transport and communication expenses, however the latter were invariably used to supplement basic income, resulting in communication and logistical difficulties. The WfD lack of reliable access to basic financial resources was a major challenge to the group. This greatly affected their productivity as money was required for transportation and communication among group members and with their supporting partners. The group's practice took them throughout Grahamstown East, distances that were not quickly covered on foot. As none of the members had access to a vehicle, they relied on public transport (not always reliable) or travelled on foot. As a result, they were either unable to get where their practice required them to be, or spent much of their work time walking, leaving limited time for meaningful practice. In addition, difficulties with communication, and limited access to printing facilities, restricted the group's ability to plan, coordinate, monitor and feedback on their practice. The result was that progress in any form of practice was erratic and slow.

It is difficult to truly grasp the kinds of challenges associated with working in the context of a township like Grahamstown East. Challenges such as crime, safety, security, and lack of basic facilities are common and were compounded when the township was racked with xenophobic violence (April 2015), service delivery protests and lengthy, repeated, water outages.

4.5.3 Maturing stage (Figure 4.3)

The maturing stage was characterised by relationship building between the WfD core group, Khulumani Support Group and the Institute for Water Research. The WfD CoP comprised members with different skill-sets. Researchers and NGO partners had formal training in research methods and project management. Although the WfD group had limited formal training they had equally valuable tacit skill-sets built through experience such as leadership, multi-lingual communication and networking. Different skill-sets were valuable for different aspects of the WfD CoP practice and were increasingly brought to bear as the CoP sustained their engagement, built relationships and developed their joint enterprise. Members engaged and practiced on a voluntary basis for the first three months. The WfD group began attending monthly transdisciplinary research group meetings hosted by the IWR, which entailed exploring the nature of transdisciplinary research within catchments (Wolff et al., under review). In these meetings the WfD group engaged with a diverse group of academics and students from different departments, in what was typically an open-style discussion space. The meetings served as important boundary-crossing spaces for the development of relational agency of WfD CoP members (Edwards, 2011). Frequent meetings with the Khulumani partner, Marjory, and monthly meetings with the IWR assisted in clarification and advice on initial progress on activities in the work plan. Sustained engagement among WfD members built personal relationships and trust, and Mbulelo developed his internal leadership role as the coordinator of the group. This was an important period for building team cohesion. The downside of the structured meetings facilitated by the IWR and Khulumani was that WfD members considered themselves to be under the employ of the IWR and Khulumani. This perceived relationship resulted in WfD only taking ownership of, and initiative in their practice once it was made explicit that they were in charge of their practice and that the IWR and Khulumani were available in a supportive capacity. This is an example the control-autonomy paradox that many created CoPs face (Probst & Borzillo, 2008; Borzillo, Aznar & Schmitt, 2011).

Although WfD members were volunteers, it soon became apparent that sustaining activity required resources.

> "It was not about the stipend first, it was about doing good and changing the situation … but when we look on the document [work plan] and see how big the work is to be done. We say how will we operate without the fuel?" (KII Mbulelo, 2014/10/14).

The IWR allocated research project funds for WfD stipends and running costs. These were not salaries, and WfD members remained essentially volunteers.

The development of the identity of the WfD group was significant during this stage, beginning with their ownership of their name Water for Dignity and the development of their group philosophy, which emphasised the collaborative approach of the group:

> "To chop off the pointing finger…to stop from just complaining about the problem and start becoming a part of the solution" (Pers. Com. Mbulelo, 2014/02/25).

Here "the pointing finger" alluded to the practice of blame within and between the community and the Makana Local Municipality. Part of the "solution" was to start by ground-truthing the water service delivery status and experiences of residents in Grahamstown East, by conducting Citizen Report Card (CRC) surveys.

4.5.4 Stewardship stage (Figure 4.3)

This stage was characterised by the implementation of the CRC-related activity, the intensity of which fluctuated constantly.

The description and analysis of the Citizen Report Card (CRC) initiative was described using an event timeline. Event timelines are useful heuristics to describe and analyse practice and are used to effectively emphasise sequential meaning (e.g. Pollard et al., 2008, p.44). Primary analysis of the CRC practice was conducted using an event timeline that comprised 31 key events (archived data) 12 representative events are used illustratively in **Figure 4.3**.

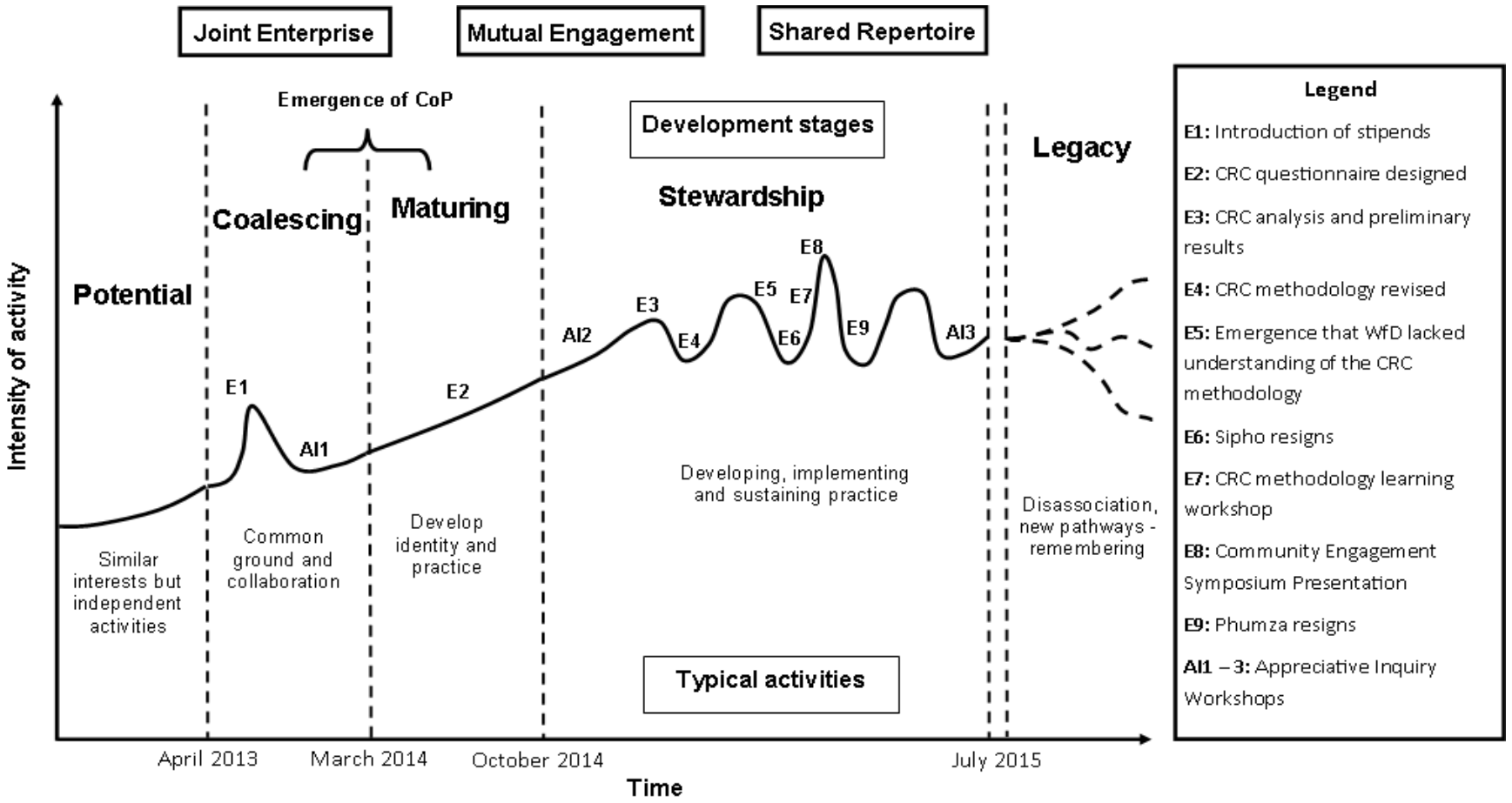


Figure 4.3: Stages of development of the Water for Dignity community of practice (WFD CoP), representing the emergence and practice of the WfD group and the typical activities associated with each stage (adapted from: Wenger et al. (2002)). A selection of 12 key events (E1-9 and AI1-3) provide a representative sample of the Citizen Report Card practice. The peaks in the solid, "process" line depict the variation of the intensity of activity over time (hours spent on WfD CoP related practice). Researchers in the WfD CoP facilitated the third Appreciative Inquiry workshop (AI3) partly to provide planning support for the WfD group beyond the project funding period, when stipends were no longer available.

The function of the WfD CoP can be understood as the nexus of the three comprising dimensions of practice, joint enterprise, mutual engagement and shared repertoire. Each dimension of practice is characterised by certain elements e.g. negotiated enterprise, mutual accountability and a shared motive are all elements of joint enterprise; engagement, engaged diversity and relationships are elements of mutual engagement; and artefacts, tools and styles are elements of shared repertoire. Similarly CoP literature highlight enabling and constraining factors to practice. These elements and factors are important to the functioning of a CoP (Wenger, 1998a) and identifying their prevalence in the CRC initiative provides a way of understanding the dynamics of the WfD practice.

To develop this understanding, a secondary analysis was conducted on the complete event timeline (archived data). Events were analysed using a deductive CoP lens – by applying the elements of dimensions of practice (drawn from Wenger, 1998a; Wenger et al., 2002) as themes to events (i.e. evident in an event or not) (**Table 4.3**). Events were similarly analysed for evidence of enabling and constraining factors to practice (**Table 4.4**) (factors were drawn from Probst & Borzillo, 2008; Wenger-Trayner & Wenger-Trayner, 2011). These elements are important to the functioning of a CoP (Wenger, 1998a) and identifying their prevalence provides a way of understanding the dynamics of the WfD practice and the chances of CSO persistence or evolution.

Table 4.3: Explanation of the dimensions of practice of the Citizen Report Card (CRC) initiative (Wenger, 1998b, p.2). Elements related to each dimension of practice are highlighted (italicised and underlined with explanations of elements provided in brackets) and a brief interpretation provided.

Dimension of practice	Evidence of dimension in the CRC initiative
Joint Enterprise: "What it is about – the common area of interest that members agree to focus on and what it is they do to address it"	Mutual accountability (to each other and commitment to the goals of the CoP), shared motive (that matters and inspires members to participate), renewed interest (in the domain) and renegotiation of joint enterprise (if the domain is no longer shared or relevant) were prevalent elements, while adapting to changing circumstances, and renewed interest were least prevalent during the CRC initiative. The pressing issue of the lack of understanding of household water service delivery related information in Grahamstown East motivated WfD members to conceptualise and implement the CRC practice. This issue drove the conceptualisation of the CRC surveys to explore among other things – water access, water and sanitation service delivery experiences and water usage.
Mutual Engagement: "How it functions – members working together and their binding relationships that enable them to address their enterprise"	Engaged diversity (related to relational agency (Edwards, 2011) and distributed cognition (Jonassen & Land, 2012), engagement (face-to-face social interactions) and (interpersonal) relationships were elements most prevalent, while membership (solidification and expansion) and maintenance (CoP self-care) were least prevalent during the CRC initiative. As WfD engaged with people interested in their enterprise, they built relationships which promoted collaboration in addressing their enterprise. Building relational agency (Edwards, 2011) contributed to the success of the practice as WfD engaged with and drew upon people of different expertise (e.g. researchers experienced in field work and the scientific method). Appreciative Inquiry workshops proved to be important spaces for deepening relationships and trust, reflecting on and renegotiating the joint enterprise, renewing interest in practice as well as to strategise future CRC practice. Learning workshops brought people of diverse expertise together and served as rich spaces for building the effectiveness of specific aspects of the CRC practice (e.g. data collection and analysis).
Shared Repertoire: "What capacity has it produced – members develop tools, methods, languages, styles etc. as they practice together that help them improve their practice"	Artefacts and tools (co-created concrete objects), styles (embodied ways of doing things e.g. approaches, methods and language) and joint activities (shared routines) were elements most prevalent, while shared resources and a shared history of learning (tacit and explicit knowledge associated with the CoP) were least prevalent during the CRC initiative. Together the WfD members and partners progressively developed a shared repertoire, elements of which included: artefacts and tools (including the CRC questionnaire, data logging sheets, reports, maps among others), joint activities (regular meetings, group CRC sampling) and styles (their sampling methodology) all of which enabled them to better conduct the CRC practice. CRC findings included issues related to water billing discrepancies, the culture of non-payment of bills, emergency water storing practices among others (Hamer et al., 2018)). As long-standing members of the Grahamstown East community, the WfD core group had developed a shared history of experience and knowledge of local water service challenges.

The dimensions of practice, joint enterprise, mutual engagement and shared repertoire have been widely used as concepts to provide a basic-level description of learning structures in organisations and institutions (Lee, Suh & Hong, 2010; Pausigere, 2014; Nicolini, Scarbrough & Gracheva, 2016) and networks (Cousin & Deepwell, 2005; Pesanayi & Weaver, 2016). However, there has been less application of detailed elements of these dimensions to provide a deeper understanding of CoP

function. The deeper level analysis of the WfD CoP enabled us to better understand and highlight enabling and constraining factors to the practice of the CoP.

Table 4.4: Explanation of the enabling and constraining factors to the Citizen Report Card practice (constraining and enabling factors are italicised and underlined).

Evidence of enabling factors to practice in the CRC initiative
Support from stakeholders and partners of diverse expertise. The passion and energy of the WfD group as well as their passion for domain, addressing real-world issues, promoted their sustained engagement in the CRC practice. A focus on practice saw WfD members focus on doing by participating in actions that address real issues, rather than being paralysed by the way things "should be" in theory. High expectations of the outcomes and the value of the CRC process made it worthwhile for partners to engage in and support the CRC process. Participation in some events was valuable due to their relevance to CRC practice. Ownership of agenda by WfD was enabled through their key role in conceptualising the CRC initiative, ownership that was reinforced through AI workshops. Although less prevalent but equally important: personal touch (incorporation of WfD local knowledge into further CRC survey adaptation); learning trumps power (despite inherent power differences, WfD and research partners aimed to prioritise collaborative learning e.g. in the CRC methodology learning and AI workshops); continuity (repeated CRC surveying); and sponsorship and support (provision of shared resources e.g. computers to enable data processing).
Evidence of constraining factors to practice in the CRC initiative
Lack of time due to inadequate planning and commitments to other practices resulted in leader neglect, where the coordinator, Mbulelo, encouraged the fast-tracking of the CRC process by neglecting the agreed-upon methodology, therefore compromising the quality of CRC data. Turnover of WfD members at critical times resulted in knowledge loss in the core group, required additional time spent and the fast-tracking of the training of new members which resulted in poor quality CRC surveying. Occasionally a focus on events not related to CRC practice detracted WfD attention and interrupted practice continuity. Logistics and IT issues were evident in the lack of a resourced central office space to plan daily fieldwork. Command and control occurred when, despite the WfD group wishing to continue CRC practice, strong accountability to the IWR, Khulumani and Unilever required that they address other water issues.

The primary WfD champion, Mbulelo had tremendous energy to drive the WfD practice, and to catalyse the participation of other WfD members (**Table 4.4**). This inherent passion combined with the domain of pressing WSD issues in Grahamstown East played a critical role in sustaining WfD practice (**Table 4.4**). However, overdependence on a champion can lead to burnout and leader neglect (Anil et al., 2015) (**Table 4.4**), which negatively affects CSO function. For instance, Mbulelo, although responsible for much of WfDs success, tended to overcommit himself, which resulted in him being unable to effectively coordinate other WfD members. Mbulelo's dominant personality both inspired participation and had negative effects of dampening innovation from other group members, a group dynamic that contributed to two resignations (**Table 4.4**). Knock on effects of leader neglect seen in the WfD example included inadequate planning and therefore lack of time to carry out CRC sampling efficiently (**Table 4.4**).

An Appreciative Inquiry approach was used to guide interactions within the WfD CoP and was particularly useful in lessening the command-and-control influence (**Table 4.4**). This approach differs from typical problem-solving approaches, by valuing and nurturing existing human strengths and assets as a means to achieve a shared vision and in doing so, overcome problems (Cooperrider &

Whitney, 2001). Annual Appreciative Inquiry workshops with the WfD CoP further enabled practice reflexivity, vision-setting and joint planning (Hamer et al., 2018; Palmer & Munnik, 2018).

The impact of WfD in transforming water service delivery in Grahamstown during the study period was limited. However, subsequent to their active participation, findings related to citizens' water service experiences have fuelled the drive to establish the Makana Water Forum in 2016 (Hamer et al., 2018; Palmer & Munnik, 2018). The MWF (a type of catchment management forum, depicted in **Figure 4.1**) was a formal participatory platform in which government officials, water users and other interested stakeholders engaged to address issues related to water, sanitation and catchment health in the Makana Local Municipality. This MWF provided an avenue for the possibility of democratic water governance to be realised.

4.6 Discussion

South Africa has adopted the discourse and policy of becoming a capable and developmental state (NPC, 2012). Yet (Kuye & Ajam, 2012) draw attention to the tensions of concurrent constraining and enabling conditions of this pathway. We suggest that civil society agency, and effective civil society participation in the governance and management of vital resources such as water, is an important intersection of scale (local and national) in the journey towards developmental equity and sustainability. Achieving authentic sustainable development and transformation at a grassroots level requires public participation that encourages social learning, empowerment and self-reliance (Davids et al., 2014). The results reported here demonstrate clearly the complex factors enabling and constraining civil society engagement with water supply issues at the local scale.

The importance of civil society participation in water resource management is enshrined in the preamble of the National Water Act which recognises that achieving integrated management of the multiple aspects related to water resources requires that management functions be delegated to a regional or catchment level thereby providing everyone the opportunity to participate (RSA, 1998). However, in practice, civil society concerns rarely impact policy maker decision making due to, among other factors, lack of capacity of civil society to engage meaningfully compounded by inexperienced and/or disinterested political facilitators (Lotz-Sisitka & Burt, 2006; Warner, 2006; Munnik et al., 2014). Civil society organisations play a diverse and important role in the water sector as civic educators, water resource and service delivery issue watchdogs, implementing agents and mediators of new technology in communities; they are also are often well placed to understand local realities, enhancing the power and legitimacy of local voices and building solidarity around issues of concern (Lotz-Sisitka & Burt, 2006; Munnik et al., 2014; Burt & Wilson, 2015; Wilson et al., 2016).

Despite a growing establishment of participatory water governance structures such as catchment management forums, marginalised community members remain poorly represented (Emmett, 2010; Burt & Wilson, 2015). Existing channels for civil society to engage in and improve service delivery issues such as ward committees rarely yield tangible results (Piper & Deacon, 2008). We suggest civil society organisations 1) are potential vehicles to improve meaningful civil society engagement in water resource management and service delivery processes; and 2) can, through their practice, contribute to improving service delivery and water resource management. We suggest that CSOs are a strong potential interface between the scales of national development intention and local reality. It is therefore important to understand the ways in which CSOs emerge and practice, and to identify the enabling and constraining factors to this process. This study specifically explored the emergence and practice of a South African township-based CSO, Water for Dignity, using their Citizen Report Card (CRC) initiative to explore local scale CSO development.

4.6.1 Emergence of Water for Dignity

Successful CSO emergence and establishment depends on available windows of opportunity. The alignment of an identified problem, a potential solution and a receptive political environment created what Olsson et al. (2006) and Biggs et al. (2008) refer to as a window of opportunity, that enabled the emergence of the CSO, Water for Dignity (WfD). Factors included: the urgent issue of poor water service delivery to residents in Grahamstown East; the coinciding timing of a research project that had available funding and objectives to explore better approaches to Integrated Water Resource Management at different scales, and a relationship with an established and reputable NGO, that had existing connections in Grahamstown East. To transition from a seized window of opportunity to a transformed situation, the political environment must be receptive (Olsson et al., 2006). In the case of WfD, the Makana Local Municipality (MLM) was neither receptive nor sufficiently functional to support civil society practice (Weaver et al., 2017). After several attempts to collaborate with the MLM had failed, the WfD group resorted to practicing in relative isolation, which limited the impact of their practice.

The window of opportunity was therefore constrained, but still evident in the needs of local people for a more reliable water supply. Critical enabling factors included taking ownership of, and passion for, their interest in local water equity, sustained engagement with supporting partners (IWR and Khulumani), and the availability of diverse spaces for engagement. Grahamstown East residents have faced acute water service delivery (WSD) issues for over a decade with little or no concerted effort from residents to amend the situation. Citizen activism has been mostly limited to social protest, demanding that local government address the situation (Grant, 2014). Despite the opportunity for the

development of a civil society practice to address WSD issues, without the initiation and support from resourced institutions such as the IWR and Khulumani, it was unlikely that any form of water-activist group would have formed. The beneficial role of partnerships between CSOs and well-resourced institutions, is similarly evident in sustaining provincial chapters of the South African Water Caucus (Munnik et al., 2014). Therefore a social need alone is not enough to spark the emergence of a CSO – skilled facilitation and active support is required.

The CRC initiative was relatively successful in that WfD members, with the support of their partners, developed a survey questionnaire, interviewed approximately 200 households in Grahamstown East, processed and analysed the data and surfaced interesting findings relating to local water service delivery (Hamer et al., 2018). The WfD CRC practice was characterised by the Wenger et al. (2002) dimensions of practice; joint enterprise, mutual engagement and shared repertoire were all evident, suggesting an active CoP despite the engineered formation of the group. The WfD CoP gradually built these dimensions through the course of their stages of development. Wenger (1998a) went on to define key elements relating to each dimension that contribute to a healthy CoP. We go on to discuss these elements in terms of their enabling and constraining factors.

4.6.2 Practice of Water for Dignity

Joint enterprise was developed in the potential, coalescing and maturing stages of WfD development, where time and energy was spent defining the general focus of WfD – improving household water service delivery to Grahamstown East residents. Bridging the information gap about community WSD experiences through the CRC surveys was seen as a priority initiative. Consequently, members focussed on carrying out the CRC practice, largely at the expense of internal issues such as their operating procedures, principles, formal and informal rules, roles and responsibilities. This is contrary to typical CoP development where much initial energy is invested in establishing the community, or well-established CoPs, where their norms and principles are well understood (Preece, 2003). A strong community foundation is required for practitioners to effectively address issues of their domain.

The development of the joint enterprise of WfD was true to pure community-based participatory research (sensu Horowitz et al., 2009): community members are involved in the practice planning, research design, implementation of practice from the outset. However, our study supports other literature suggesting that skills, experience and intermittent leadership input of partners such as universities (Hart & Wolff, 2006) and NGOs (Munnik et al., 2014) are invaluable to the establishment and ongoing sustainability of CSOs. Successful CoPs require a good relationship and regular interactions between CoP leadership and the sponsor organisation (Probst & Borzillo, 2008).

Social capital (Esau, 2008) of the community was developed through building relationships and trust in the diverse social network of WfD and their engagement with other partners such as the IWR and Khulumani. Trust, empathy and reciprocity were enhanced during AI workshops which strengthened the relationship. Preece (2003) notes how relationships serve as conduits for the sharing of knowledge and promotion of learning which was evident in the safe and enabling environment provided in the AI workshops (Chapter Five).

During the maturing and stewardship stages, WfD developed a shared repertoire where they developed their capability to better conduct and sustain their practice. Routines, a common language, tools and artefacts were the key capabilities developed. WfD members derived meaning from their participation in developing these key capabilities and had a deeper understanding of what they were doing and why they were doing it.

Wenger (1998a) argues that a healthy CoP strikes a balance between participation and reification (making things real). An example of this was balancing the process of conducting household interviews with the production CRC outputs through the analysis of data and documentation of findings. Similarly, reified tools and artefacts served as mediums that supported discourses, reflection and learning about the CRC practice (the social learning of WfD is explored in Chapter Five).

4.6.3 Enabling and constraining factors to Water for Dignity's practice

Township-based civil society organisations (often community-based organisations) struggle to sustain effective practice without support from external partners (McEwan, 2003; Munnik et al., 2014). The challenging socio-economic and political context typical of most South African townships makes it difficult for township-based CSOs to sustain and conduct effective and meaningful practice unassisted. Competent intermediaries are required to foster network development and enable active citizenship (Esau, 2008). It is naïve to assume that community groups inexperienced in research, project management, financial management, project planning, will be able to carry out these tasks effectively from the outset and without support. For instance, provincial chapters of the long-standing CSO network, the South African Water Caucus, are all supported by anchor organisations, typically NGOs (Moore, Munnik & Sibiya, 2011; Munnik et al., 2014). Therefore, leadership, advisory, financial and material input and support from partners such as the role played by the IWR and Khulumani in supporting WfD, is important and necessary to promote effective CSO practice. However, care should be taken not to support in a way that undermines the agency of or disempowers the CSO.

The control and autonomy paradox is a challenge common to constructed CoPs (Borzillo et al., 2011). The command-and-control influence of the IWR and Khulumani on WfD, although not intentional, was identified as a constraint to WfD agency, and increased their dependency on their partners. It is likely

that stipend provision contributed to this sense of dependency. In the stewardship phase of the WfD CoP the research partners became increasingly alert to this sense of dependency and its debilitating effect on WfD agency. Research partners used team meetings and Appreciative Inquiry workshops to discuss this dependency and thereby encourage WfD to take primary responsibility of their CSO. We note that the sustainability of a CSO can only be promoted by building on existing CSO agency, and active ownership of their CSO-centred agenda.

Financial incentives are recognised as important to sustaining township-based CSOs (Munnik et al., 2011) and community-based research partners (Horowitz et al., 2009). Self-emergence of CSOs may be limited to groups with sufficient (financial) capacity, not the most marginalised. Given the socio-economic context of poverty in Grahamstown East, WfD members relied heavily on the stipend provided to support their living costs. It is likely that other potential township-based CSO groups would need to pay attention to financial sustainability at an early stage of development. Although stipends were necessary, their provision created a sense of dependency and influenced interactions. Furthermore, the three-year duration of stipend funding failed to catalyse actions leading to the financial sustainability of WfD. The role of the limited stipend budget may have constrained the CSO membership expansion and the potential outcomes of their practice in terms of scaling up and outwards. During the three years of stipend provision, no member of the CSO secured employment in the water sector, or successfully engaged in the entrepreneurial opportunities that arose (Hamer et al., 2018). This raises the question of the inherent capacity for agency of the members – or simply highlights the burden of low-income township life.

Many CSO practices fail due to the lack of passionate, energised drivers on the ground (Cleaver, 2005; Horowitz et al., 2009). Findings from the WfD CoP indicated both beneficial and constraining influence of a champion on CoP function. On the one hand, champions are critical to motivate and catalyse concerted action and sustain practice. However, in small CoPs, such as the WfD CoP, over-reliance on the champion can dampen the agency of less dominant members and limit the overall capacity of the CoP to act. Furthermore, if the champion leaves or is indisposed, the CoP may collapse.

Grahamstown East is a microcosm of most townships in South Africa, where everyday life is hard. Factors such as high crime rates, lack of safety, family crises, health issues, housing displacement and debt were real challenges that affected WfD members and greatly constrained their CSO effectiveness and sustainability. Without the relative satisfaction of these basic human needs citizen participation to address community issues and CSO-led transformation will be rudimentary at best. Cleaver (2005) notes the challenge of the poor and other marginalised people that lack sufficient social capital to participate effectively in processes so as to improve their well-being. Understanding the context of township-based CSO practice landscapes has implications for CSO-partner relationships and should be

considered when setting CSO and partner expectations. The key learning of the WfD process includes the ambiguity of stipends as enabling or constraining, and the time commitment of the CSO and supporting partners. Did IWR and Khulumani require too much "meeting and planning" time that could have been more productively used in activities? Were the external funding and its requirements of IWR researchers too strong a driver – reducing agency? Or was the whole enterprise at a too small a scale to thrive? These and many other questions remain.

We suggest a set of principles distilled from the analysis of the emergence and practice of the WfD CoP. Although by no means exhaustive, these principles could guide the establishment and sustainable practice of other CSOs (**Table 4.5**).

Table 4.5: Key practical principles developed from this study to promote effective civil society organisation function.

Principle	Description
Enable engaged diversity in practice	Active participation in practice of people or members with different expertise. Occasionally integrate participation from people with relevant expertise who are outside of the core CSO group. Outsider participation should be carefully negotiated and facilitated to not dominate or subjugate core member interests but rather add value to their practices.
Enable diverse skillset support in practice	A CSO requires support in the form of expertise, leadership input, coaching, infrastructure, finding sponsors, strategizing, reflecting on progress and negotiating beneficial relationships. Practice in the township can be difficult due to lack of access to resources that supporting partners such as academic institutions and NGOs have access to. Issues of power should be considered so that partner CSOs are supported and not dominated.
Nurture internal leadership	Committed, knowledgeable people who drive practice and in turn nurture and sustain the CSO.
Provide safe engagement spaces	Physical (e.g. meeting rooms) and virtual spaces (e.g. online communication platforms) where hierarchical power differences of participants are set aside. Here participants can ask the hard questions without fear of retribution from superiors. Engagement in safe spaces can enable relationship and trust building, reflexivity and co-conceptualisation of practice plans and strategies. Different meeting settings should be considered e.g. in the community or at a university (formal setting may increase sense of belonging, ownership, provide credence to findings, objectivity and erudition).
Encourage regular reflective processes	Strive for a balance between practice (actions that address real issues) and reflection (important for learning and improving practice).
Enlist champions	Passionate, motivated and energised members serve as champions that drive practice and promote the sustainability.
Encourage ownership of agenda	Members are more likely to sustain their practice if they have a sense of ownership of practice and direction of the CSO.

4.7 Conclusion

This chapter has explored the emergence and practice of a small CSO through Wenger's (1998a) community of practice (CoP) lens. The WfD CoP did not align with the typical emergence of a traditional CoP (self-organisation driven by common interest or purpose (Wenger-Trayner, 2011)), but rather its emergence was driven by outside agencies (the Institute for Water Research and Khulumani Support Group). Nonetheless, WfD's lifecycle did align with the typical stages of development of a CoP, which provided a useful framework to describe and understand the dynamics of emergence and practice of the WfD CSO. Our study contributes to existing literature on the application of CoP theory as a conceptual and analytical lens and provides additional depth to the use of elements of Wenger's (1998a) dimensions of practice and factors enabling and constraining CoPs.

The lack of effective citizen participation in South African water issues at the local scale is a barrier to citizens meeting the state in development initiatives. The concept of establishing a WfD group to engage with water service delivery challenges in a citizen-based manner was an exciting proposition driving the WfD initiative. The initial belief was that passionate local residents applying local experience and knowledge to identify problems, conceive, implement and sustain initiatives would transform situations for the better. Strategic partnerships were made, funding was harnessed through the Water Research Commission and Unilever and high expectations were developed by all involved. However, the study shows that realising these expectations in the socio-economic and political context of the MLM was not easily achieved in practice. The principles distilled provide some guidance for supporting the emergence and enabling effective function of small CSOs in other municipalities exhibiting similar challenges to the Makana Local Municipality.

Effective CoPs display varying combinations and degrees of the three dimensions of practice: joint enterprise, mutual engagement and shared repertoire. We suggest that CSOs and their partners should be mindful of these dimensions and actively promote them in practice so as to encourage the effectiveness and sustainability of practice. Additionally, to increase the chance of CSO practice having a transformative impact on a domain or situation of interest, it is important to be aware of and seize potential windows of opportunity, when problems, solutions and the political climate align with the practice of a CSO.

Civil society organisations have potential to harness the energy of active citizens and contribute to the deepening of democratic water governance. In South Africa the current drive from the Department of Water and Sanitation to establish participatory water governance platforms, including catchment management forums and municipal stakeholder service delivery forums (Palezweni, 2016), are making the political environment more receptive, thereby opening up new potential windows of

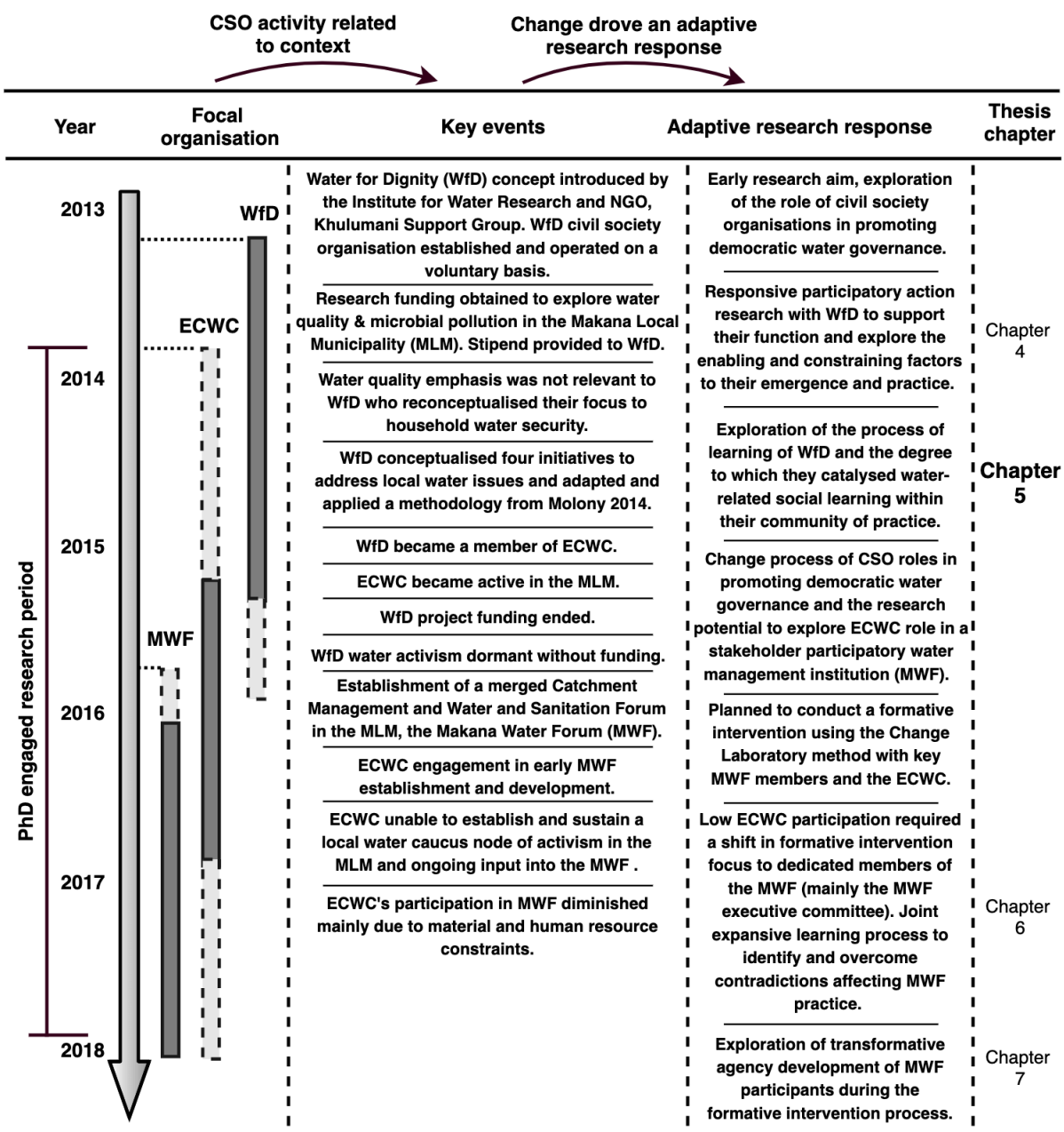
opportunities for CSO impact, and for citizen and government engagement to drive the developmental agenda.

5 Chapter Five – The learning process of the civil society organisation, Water for Dignity

The chapter gave rise to a paper: **Weaver, M., O'Keeffe J., Hamer, N. and Palmer C.G. (under review). A civil society organisation response to water service delivery issues in South Africa drives transformative praxis. Part 2: Knowledge building, learning and active citizenship. Geoforum.** There are four authors listed in the submitted manuscript. As the lead author, I conducted the majority of the work including, research design, data collection and analysis, manuscript drafting and submission. My primary and co-supervisor were listed as last and second author respectively and provided conceptual input to the research process and reviewed the manuscript prior to submission. The third author was a member of the Institute for Water Research team that partnered with Water for Dignity and participated in the engaged research process. The third author similarly provided feedback on the manuscript prior to submission. All authors were part of the engaged research team that partnered with Water for Dignity and supported their emergence and practice in the Makana Local Municipality. Comments from three external reviewers for Geoforum were considered in the revision of the paper and have been included in this chapter. In the paper and chapter, the authors are referenced as "we".

A social learning focus group with community respondents to the Water for Dignity's Citizen Report Card household survey.

Box 5.1: Repeat of Figure 1.7 as a reminder of the research timeline in relation to Chapter Five. Timeline of the adaptive research process of the doctoral study.



Repeat of Figure 1.7: Timeline of the adaptive research process of the doctoral study. Active engaged research began at the end of 2014 and ended in December 2017. Of interest to this study was the sequential activity of two civil society organisations (CSOs), Water for Dignity (WfD) and the Eastern Cape Water Caucus (ECWC) and their overlap and engagement with the multi-stakeholder water governance platform, the Makana Water Forum (MWF). The degree of overlap and engagement of WfD and the ECWC with the establishment and function of the MWF is depicted (dark shading indicating high intensity of activity and light shading in dashed box depicting low intensity of activity). The MWF was initially a catchment management forum then transformed into a water forum which implied the inclusion of water and sanitation services and water resource management. Key events pertaining to the two CSOs that influenced the research process are described. The adaptive research response required as a result of the changing activity of the focal organisations is described and related to the relevant data chapter in the thesis. Note: This figure is repeated in Chapters Four to Seven for ease of reference.

5.1 Introduction

Integrated Water Resources Management (IWRM) is widely accepted as the key approach to managing water for long-term sustainability (Allouche, 2016; Denby et al., 2016; Mehta, Bolding, Derman & Manzungu, 2016). The South African National Water Act (No. 36 of 1998) recognises the need for an integrated approach to manage all aspects of water resources and the delegation of management functions across spatial scales (from national, regional and catchment, to local scale) so as to enable the participation of all stakeholders (Chapter One, Section 1.1.1 and Chapter Four, Section 4.1). Furthermore, for state-supported institutions (e.g. water user associations, catchment management forums and the ward committee system) to effectively support IWRM in the context of South Africa's adoption of a developmental state agenda (NPC, 2012; Chapter Four, Section 4.1), meaningful public participation in these spaces is essential (Muller, 2009).

The key to IWRM is the integration of stakeholder participation and collaboration in promoting equitable water resource management (Jønch-Clausen & Fug,l 2001; Pahl-Wostl et al,. 2007; Burt & Berold, 2012). South Africa water law and policy recognise the need for public participation, particularly at a local government and community level where water service delivery (WSD) issues are hardest felt (Denby et al., 2016). Meaningful and productive public participation requires the engagement of a civil society that is capable, innovative and knowledgeable (Swilling & Annecke, 2012). However, much of the South African population is economically (and/or socially) historically disadvantaged due to the Apartheid system (a government regime where the ruling White minority population segregated, marginalised and oppressed the black majority population). The majority of the historically disadvantaged population live in township areas and lack sufficient water-related knowledge capacity to meaningfully participate in IWRM processes (Lotz-Sisitka & Burt, 2006). The extent, rate and scale of community participation in IWRM at a local government scale is thus limited, making the goals of IWRM hard to achieve.

It is thus important to understand the manner in which water-related knowledge is exchanged and how capacity can be built in marginalised communities. Research conducted by Burt and Berold (2012) into the flow of water-related knowledge into communities explained how, despite the wealth of available water resource learning materials, most failed to reach their target audiences due to dissemination failures and the inaccessible nature of materials.

Various efforts have been employed to bridge the knowledge gap required for meaningful engagement of marginalised communities in service delivery processes. For example, local municipalities communicate water-related information to civil society through platforms such as imbizos (traditional government-led meetings), information published on municipal websites and local

media platforms including newspapers and community radio (Haigh et al., 2008). Such communication and information dissemination strategies are typically top-down and unidirectional and provide limited opportunity for extensive engagement that better fosters learning and enables meaningful stakeholder engagement with water issues. Other complementary pathways to fostering water-related learning and building community capacity are therefore required.

Effective mediation of knowledge resources is important, where water-related knowledge is contextualised in an accessible and conducive manner to foster community learning (Burt & Berold, 2012). Such learning has the potential to foster bottom-up participation and to enable residents to communicate their WSD needs, expectations and experiences to water resource management staff who are in a position to improve the residents' situation (Munnik et al., 2011).

Various water knowledge mediators exist, including government departments, research institutions and civil society organisations (CSO's) such as Non-Governmental Organisations (NGOs). The aim of this chapter is to explore the process of learning of a township-based CSO, Water for Dignity (WfD), as they tried to foster citizen knowledge building and participation to improve household water service delivery in the Makana Local Municipality in Eastern Cape of South Africa. The background and water supply context to the Makana Local Municipality is provided in Chapter Two and summarised in Chapter Four.

This chapter specifically explores:

1. The learning process of the whole social entity, the WfD group, as they developed personal and collective identities, and shared meaning and practice.
2. The degree to which learning was transferred from the WfD to the wider social context in which WfD practiced.

We first introduce the civil society organisation, Water for Dignity and their involvement in water service delivery issues in Grahamstown East. We then provide a brief review of social learning theory relevant to situated practice and in the context of natural resource management. We frame WfD as a Community of Practice, before outlining the research design of the study. The analysis and discussion have been integrated and structured as two phases. The first phase explores the process of learning of the WfD group using learning concepts drawn from Communities of Practice theory. The second phase explores the social learning induced by WfD through interactions with their practice communities. We conclude the chapter with reflection on the relevance and limitations of our findings and suggestions for future research.

5.2 Background to Water for Dignity

Water for Dignity (WfD) is a township-based CSO established in 2013 as a citizen science response to increasing water supply and management problems in Grahamstown (Weaver et al., 2017), the main urban centre of the Makana Local Municipality in the Eastern Cape province of South Africa. The formation of WfD was driven by collaboration between two key actors, the Institute for Water Research (IWR) at Rhodes University and an NGO, the Khulumani Support Group (Khulumani) (Chapter Four, Section 4.5.1). The IWR and Khulumani shared a common interest – addressing issues of social-ecological justice in the context of water (Chapter Four, Section 4.5.1). In alignment with the vision of the IWR and Khulumani, WfD's main focus was addressing water service delivery issues in Grahamstown East (the former township of Grahamstown). Water service delivery challenges were hardest felt in the township where most residents lacked the capacity, resources and agency to adapt to water supply interruptions, or to effectively engage with the Makana Local Municipality to assert their rights to water (Clifford-Holmes et al., 2016; Hamer et al., 2018; Palmer & Munnik, 2018). WfD therefore developed practices to address pressing water service delivery (WSD) issues in Grahamstown East (Chapter Four, Section 4.5.2). This study sought to analyse the process learning of WfD and understand the constraining effects on learning.

Learning outcomes from the following WfD practices were considered in this study: Citizen Report Cards (CRC), household surveys to collect WSD-related data to better understand residents experiences of WSD in the township; establishment of Community Water Forums to act as communication hubs serving as pathways for conveying WSD-related information between residents and the municipality; establishment of School Water Forums to promote dignified schools, hygienic practices and catchment health awareness within Grahamstown East schools; and the Emergency Water initiative, to develop community owned water storage infrastructure to cater for water supply shortfall (Chapter Four, Section 4.5.2).

The WfD group also had a strong capacity development and learning agenda, which was reflected in their vision "to create a people's water science for a people's water movement" (Mukopadhyay, 2013). From the outset, WfD members worked to develop their individual WSD-related capacity to better grapple with water issues. This enabled WfD to inform and develop WSD-related capacity of Grahamstown East residents, thereby equipping residents to engage effectively in WSD processes and assert their rights to water.

5.3 Process of learning

The notion of learning pertinent to this study is the socially situated process of learning grounded in people's everyday lives. Situated learning occurs as diverse people interact with the social and bio-

physical world which results in possibilities for dissonance or social cohesion which can spark creativity (Lave & Wenger, 1991; Wals, Hoeven & Blanken, 2009; Nicolini et al., 2016).

To this day, much of governance and institutional approaches to information dissemination and many education systems align with early cognitivist views of learning (Handley, Sturdy, Fincham & Clark, 2006; Lotz-Sisitka, Wals, Kronlid & Mcgarry, 2015; Korthagen, 2017). Traditionally, learning was viewed purely as an internal, cognitive process, where knowledge as the outcome was seen as valuable and something that could be acquired and manipulated (Gee, 2004; Malloch, Cairns, Evans & O'Connor, 2011). This view failed to acknowledge the relational influence of the social, cultural and bio-physical context on the process of learning (Jonassen & Land, 2012; Korthagen, 2017) and gave rise to a new perspective of learning, social learning (Wals et al., 2009; Blackmore, 2010).

Social learning can be described as the development of meaning by individuals or groups of people through shared social interactions with each other and the environment (Reed et al., 2010; van der Wal et al., 2014). Social learning has increasingly been viewed as an important process in addressing complex problems associated with natural resource management (Armitage, 2005; Pahl-Wostl et al., 2007; Van Bommel, Roling, Aarts & Turnhout, 2009; van der Wal et al., 2014). Van der Wal et al. (2014 p.2), similar to Reed et al., 2010, define social learning as a "convergent change in the stakeholders' perspectives on the problem and its possible solutions and risks, as well as on their own and other stakeholders' position and responsibility with regard to solving the problem".

Social learning theories advocate that learning should be viewed as emergent and occurring through participation in a community of practice (Handley et al., 2006; Lave & Wenger, 1991). Wenger (2011, p.1) describes communities of practice as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly". The concept of learning through participation in a community of practice (CoP) was useful for understanding the process of learning of WfD as a social entity (Wenger, 1998a). Four components are identified by Wenger (1998a) as characteristics of learning as social participation: learning as belonging, learning as doing, learning as experiencing and learning as becoming.

Learning as belonging relates to the competence required to be recognised as a member of a CoP. Wenger (2010) refers to members developing a "regime of competence" over time which includes: understanding the joint enterprise and its importance, the ability and acceptance to engage with other CoP members and having sufficient competence to use the shared repertoire developed by the CoP. Learning as doing involves the development of tacit knowledge (Lam, 2000) as practitioners engage in work activities of a CoP. Practitioners learn from more experienced CoP members as they move from the periphery to the core of the CoP through what Lave and Wenger (1991b) termed legitimate

peripheral participation. Tacit, or capability-based knowledge development (Hsiao, Dun-Hou Tsai & Lee, 2006) is an important process in practitioners progressive mastery of the regime of competence of the CoP (e.g. ways of talking, know-how, procedures, styles and roles) (Lam, 2000; Wenger, 2010). Learning as experiencing pertains to the members' evolving ability to derive and negotiate meaning from individual and collective experiences. In essence, meaningful participation in practice gives rise to experiences, and the gap between what is already known and these new experiences allows for learning as experiencing to occur (Wenger, 1998a). Learning as becoming entails the evolving identity of CoP members, how they perceive themselves and how they are perceived by others. The identity of practitioners develop as they build their capacity in relation to the regime of competence, negotiate meaning together and in doing so, build a shared history of learning. Through the process of becoming accepted as a member of a CoP, members develop their personal identity, they develop an understanding of who they are (Handley et al., 2006). The identity of a CoP as a whole develops in conjunction the collective identity development of its members.

5.4 Water for Dignity as a Community of Practice

Communities of Practice provide a flexible theoretical and conceptual framing that has both been used instrumentally as knowledge management tool within organisations (Gongla & Rizzuto, 2001; Ison, Blackmore, Collins, Holwell & Iaquinto, 2014; Anil et al., 2015; Nicolini et al., 2016; Woods, Cashin & Stockhausen, 2016), and as a epistemological lens to understand joint human practice and learning (Boud & Middleton, 2003; Preece, 2003; Mayer, Woulfin & Warhol, 2014; Jagasia, Baul & Mallik, 2015; Nicolini et al., 2016). Describing WfD as a CoP provided an epistemological and analytical lens through which to understand the learning process of WfD. The WfD group can be described as a CoP according to three characteristics (**Figure 5.1**):

- Domain – its focus on water service delivery issues in Grahamstown East;
- Community – the people who together participated in addressing the domain; and
- Practice – the four practices conducted to address the domain.

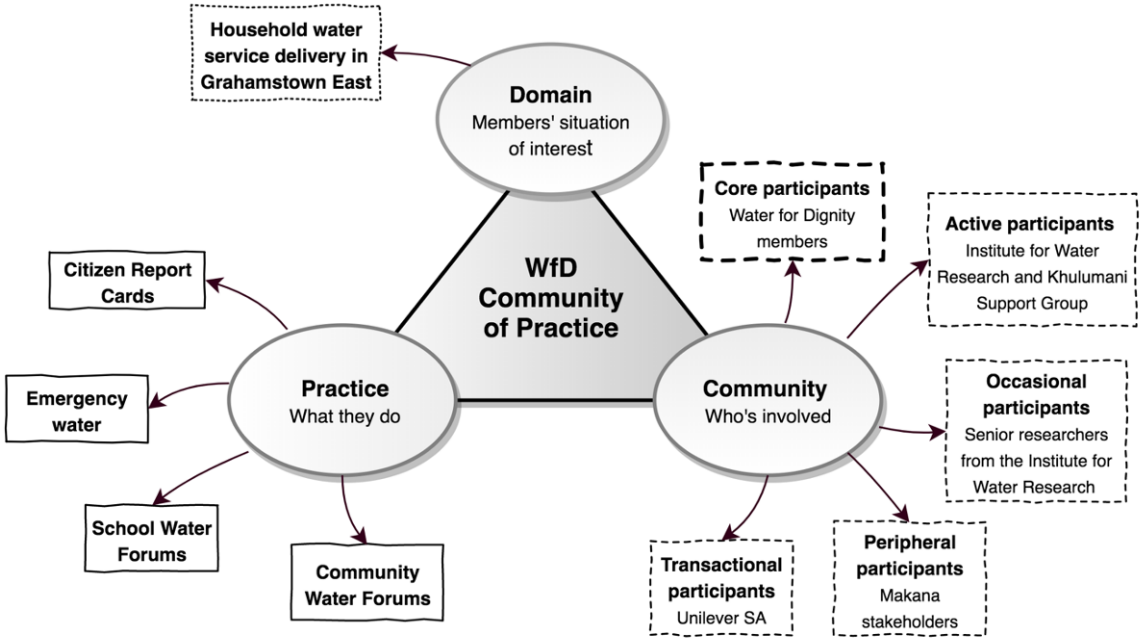


Figure 5.1: The characteristics of the WfD community of practice – the domain is what the members of the CoP are interested in; the community are those who engage to address the domain; and the practice is the shared practice that WfD members engage in to address their domain. Drawn from CoP theory (Wenger, 1998a).

It was within the active functioning of the WfD CoP (**Figure 5.1**), through social interactions and consequent experience gained from each practice, that learning had the potential to occur. Although learning was likely experienced by members throughout the WfD CoP (within active, occasional and transactional participants (**Figure 5.1**)), this study focuses on the process of learning of the core members of the WfD CoP. I provide detail on the background and role of each member of the WfD CoP in Chapter Four.

5.5 Research design and methods

The study was conducted as a single case study (Yin, 2014) with a participatory action research approach (Kidd & Kral, 2005) (Chapter Three, Section 3.3 and Chapter Four, Section 4.3). We explored learning through the retrospective analysis of qualitative data collected during the engaged research process with WfD between March 2014 and July 2015 (**Box 5.1**).

The process of learning as experienced by the WfD group was investigated in two phases:

1. Phase one: learning of the WfD group – analysis of learning through Wenger's (1998) social theory of learning in a community of practice. Data used in this analysis were from a collection of WfD practice outputs (**Figure 5.1**).
2. Phase two: learning of others from the WfD group – an investigation of social learning by the application of social learning theory employed in natural resource management literature

(Reed et al., 2010). Data used in this analysis were generated from a series of learning focus groups conducted with key social groups with whom WfD engaged (**Figure 5.2**).

Learning investigated in phase one utilised Wenger's (1998) social theory of learning as an analytical lens. Wenger describes learning as comprising four components:

- Learning as belonging: the competence members' associate as requirements for belonging to the community e.g. basic skills and knowledge.
- Learning as doing: learning occurring as members engage in the day to day practice of the CoP.
- Learning as experiencing: members' changing ability to experience the world and the meaning they attribute to these experiences.
- Learning as becoming: pertains to a member's identity, how they perceive themselves and are perceived by the community in which they practice.

These components served as themes that were identified in the qualitative data through a deductive thematic coding process (Ritchie et al., 2013) (**Figure 5.2**). Data analysed included: key-informant interviews, questionnaires, a personal research journal and participant observation journal, project documents such as the Citizen Report Card (CRC) questionnaire, School Water Forum River day reports, CRC analysis reports, meeting minutes, Appreciative Inquiry workshop reports, Learning workshop reports, TPNP project deliverables (research outputs from a project entitled "Towards Practicing a New Paradigm" funded by the South African Water Research Commission (Palmer & Munnik, 2018)), and the WfD WhatsApp Social Network log (the group included the core and active members of the WfD CoP - WfD members, the Khulumani and researchers from the IWR) (**Figure 5.2**). The Appreciative Inquiry process (Cooperrider & Whitney, 2001) played a key role in the emergence and practice of WfD (Chapter Four). These workshops were not designed as a method to explore learning but rather as reflexive planning spaces to support WfD practice evaluation, strategising and objective setting (Hamer et al., 2018; Palmer & Munnik, 2018; Chapter Four, Section 4.6.3). The workshop reports were however, analysed as data to explore learning.

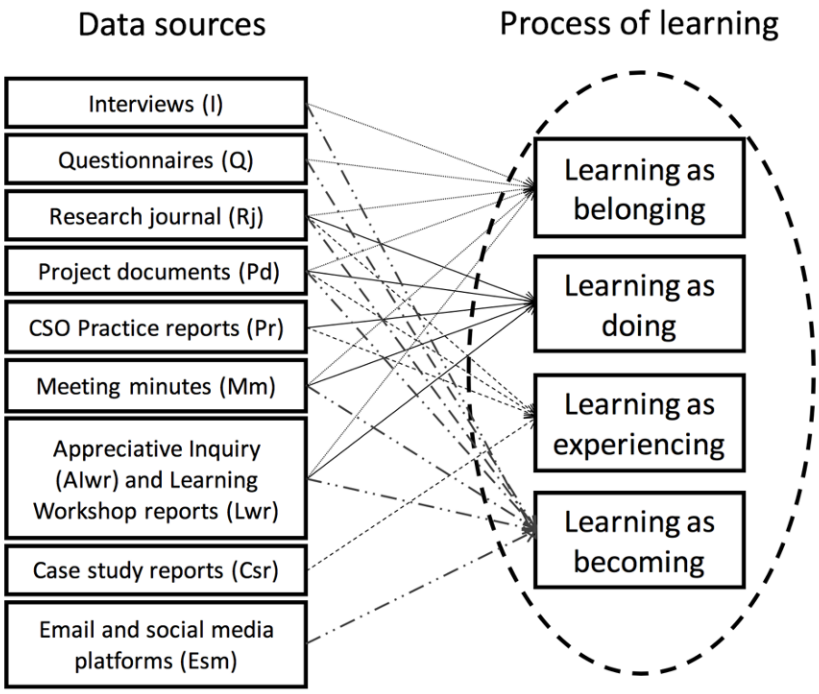


Figure 5.2: Conceptual diagram depicting phase one analysis of the process of learning of the WfD CoP. Different data sources were analysed thematically and informed four components of learning to different degrees (solid and dotted arrows). Data source codes (in brackets) are used to connect data sources to findings depicted in Table 5.1, 5.2, 5.3 and 5.4. The dotted circle depicts the integrated nature of the four components of learning.

Phase two of the investigation of the process of learning in the WfD CoP explored evidence of social learning that occurred during the practice of the CoP, specifically between WfD members and the social groups with which they actively engaged. These groups were:

1) Citizen Report Card respondents;
2) relatives, neighbours and friends; and
3) the WfD sponsor community, Unilever South Africa.

Social learning in these groups was investigated through focus groups (Redmond & Curtis, 2009). A preliminary focus group was conducted with WfD members to assess their learning and the extent to which they felt they had shared their knowledge with the three social groups with which they interacted (**Figure 5.3**). The preliminary focus group was followed by separate focus groups conducted with social group 1 and 2, as well as a teleconference focus group with social group 3. The focus groups and teleconference assessed the extent to which evidence of learning originating from WfD became situated in these social groups and the manner in which this learning took place.

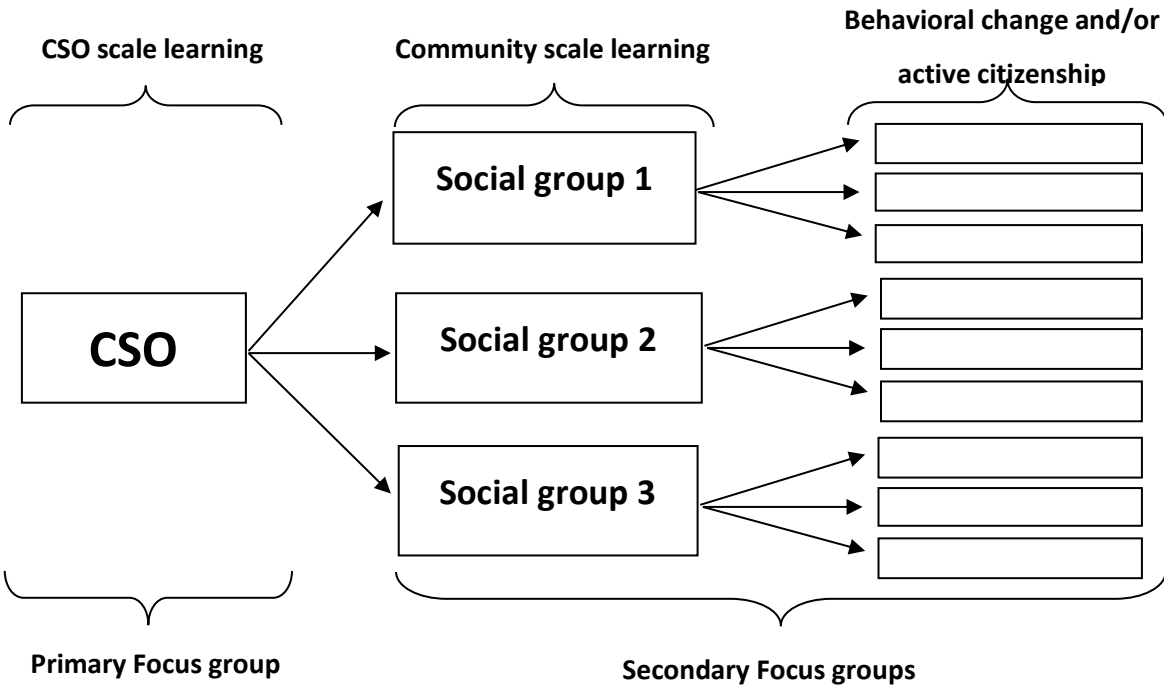


Figure 5.3: Phase two of the process of learning depicting the social learning that occurred as a result of the practice of a CSO (WfD) community of practice. Arrows depict the movement of learning through social interactions.

Evidence of social learning was explored by analysing the focus groups in relation to three criteria that constitute social learning according to natural resource management literature (sensu Reed et al., 2010):

1) a change in understanding must occur at the individual or group level;
2) there must be evidence that this learning has been taken up within a wider community of practice, beyond the individual; and
3) transfer of learning occurred through some form of social interaction.

These criteria guided the thematic coding process of the social learning phase of the study.

5.6 Findings and discussion

5.6.1 Phase one, the process of learning of the Water for Dignity group

Phase one of the analysis of the process of learning of the WfD group focussed on learning at a team level according to learning as: belonging, doing, experiencing and becoming.

Learning as belonging that occurred in the WfD group related to the development of the basic competence required to be recognised as a member of the WfD CoP (**Table 5.1**).

Table 5.1: Learning as belonging of the WfD group, analysis of the how members learnt the basic competence associated with membership. Data source codes (Figure 5.2) are provided in brackets.

Learning as belonging	
Learning (What)	**Learning mechanism (How)**
WfD members began to associate themselves with the four main practices that they drove – Citizen Report Cards, Community Water Forums, Emergency Water and School Water Forums. (I, Q, Pd, Mm, Rj)	Formal engagement spaces – various WfD CoP meetings proved important spaces for the mutual engagement of WfD members about their practice.
Development and strengthening of WfD relationships, understanding social configurations, building trust and team cohesion, developing principles of engagement and defining roles and responsibilities. (AIwr, Mm)	Institute for Water Research (IWR) facilitated Appreciative Inquiry workshops.
Co-negotiation of WfD principles e.g. Active listening. (AIwr, Mm, Rj)	Appreciative Inquiry workshops. Formal engagement spaces with IWR researchers.
Knowledge of available WfD common resources e.g. WfD email, WfD WhatsApp group, WfD workstation at the IWR, WfD central office hub. (Mm, Rj, Esm)	Formal engagement spaces and informal engagements with IWR researchers.

Structured participative spaces are important to provide opportunities for citizens, particularly those from marginalised and less politically powerful communities, to build civic knowledge, adaptive capacity and promote citizenship (Ensor & Harvey, 2015; Baud, Pfeffer & Scott, 2016). The varying social configurations that characterised different engagement spaces enabled input from WfD CoP members with different expertise and perspectives. These spaces served as a platform for the enactment of relational agency (Edwards, 2007). Learning can occur through physical and virtual engagement spaces (Hart & Wolff 2006). Collective experiences in physical spaces (meetings and workshops) and virtual spaces (emails and WhatsApp messenger) resulted in the learning of WfD members on their path to mastering the regime of competence of the WfD CoP (**Table 5.1**). Moreover, these spaces played an important role in building member identity (Wenger, 2010) and sense of belonging. Achieving competence in WfD practice did not enhance agency to the extent that the livelihoods of the WfD members markedly improved.

Appreciative Inquiry (AI) is an approach based on positive psychology that involves the collaborative search of strengths and assets of people, organisations and their situation of interest (Chevalier & Buckles, 2013). Workshops guided by the AI approach were important physical spaces to negotiate, plan and reflect on WfD practice as well as to build relationships and trust between WfD CoP members.

Situated learning through members participating in a shared practice within the context of Grahamstown East resulted in learning as doing (**Table 5.2**).

Table 5.2: Learning as doing of the WfD group, evidence of learning that occurred while engaging in the WfD practice. Data source codes (Figure 5.2) are provided in brackets.

Learning as doing	
Learning (What)	**Learning mechanism (How)**
Accuracy in data collection improved as WfD members conducted more surveys, refined their survey method and learnt about the importance of rigorous data collection to produce reliable and representative findings. (Mm, Rj, Lwr)	Repetition of practices e.g. conducting 200 Citizen Report Card surveys. Through a practice-reflection cycle, WfD members refined their practice.
Repeatedly harnessing skilled support of stakeholders to improve the effectiveness and success of practice events. E.g. Skilled contributions from stakeholders such as local environmentalist NGOs, contributed to successful School Water Forum events. (Rj, Pr, Lwr)	Reflection on factors that promoted the success of practice events; and repeated engagement with key contributors.
Project management and implementation e.g. budgeting, finance, procuring transport and event venues. (Mm, Rj)	Repeated engagement with institutional structures and procedures, as well as WfD running and documenting their own meetings independently.
Practice methodology, and data collection, management and basic analysis. (Lwr, Pj)	Formalised learning workshops facilitated by the IWR.
Adoption of an Appreciative Inquiry approach when conducting practice (positive, asset-based approach to engagement). (Lwr, Mm, Pj)	Exposure and practice at Appreciative Inquiry workshops and subsequent application in the field.

Members learnt to adapt their practice by following a typical action, reflection and modified action cycle. This cycle is similar to Kolb's Experiential Learning Model (Cassidy, 2004), in that WfD members practiced together, reflecting (informally in the field and formally in meetings and workshops) on what worked and what did not, and modified their practice accordingly. In addition, WfD fine-tuned their practice by responding to feedback from the social environment in which they practiced (**Table 5.2**). For example, initial suspicion and lack of responsiveness of Citizen Report Card (CRC) respondents was overcome by WfD interviewers spending time describing their background and aims, which in turn built trust and increased responsiveness.

WfD members learnt through repeated practice, learning by doing, to navigate the bureaucratic structures of the IWR that enabled them to perform certain aspects of their practice (e.g. booking vehicles and claiming for project expenses). WfD members similarly learnt which skilled stakeholders to rely on for running successful events. This learning contributed to what Edwards (2011) called the relational agency of the WfD group, acknowledging that there is distributed expertise in the WfD CoP and other stakeholders, and knowing who to rely on for what support.

Practicing an AI approach in the field (initially learnt in AI workshops), enabled WfD members to engage more constructively and positively with people regarding water service delivery (WSD) issues.

Water for Dignity's AI approach encouraged responsiveness, cooperation and in some cases solidarity with the WfD initiatives, such as willingness of community members to join Community Water Forums (CWFs).

Practice outputs such as results and findings that contributed to the goal of improving WSD issues in Grahamstown East resulted in meaning-making (the process of how people make sense of experience, knowledge, relationships and the self (Ignelzi, 2000)) experiences for WfD members and resulted in learning as experiencing (**Table 5.3**).

Table 5.3: Learning as experiencing of the WfD group, evidence of learning relating to experiences perceived as meaningful to WfD members. Data source codes (Figure 5.2) are provided in brackets.

Learning as experiencing	
Learning (What)	**Learning mechanism (How)**
Meaningful findings derived from practice: Citizen Report Card (CRC) surveys revealed: water service delivery challenges in Grahamstown East, water tariff billing discrepancies, residents' enthusiasm to participate in water initiatives, residents' lack of basic water knowledge. (Pr, Csr)	Participating in formal community engagements such as CRC surveys, School Water Forum days, Community Water Forum meetings and Emergency water meetings. Reification of situated practice by producing and reflecting on codified project outputs e.g. CRCs, CRC reports, media articles and practice stories, which consolidated the knowledge of lived experiences, providing empirical findings.
The perception of the value of WfD practice findings, e.g. CRC results relating to non-payment of water tariffs and the lack of understanding of citizen water rights. (Pj, Csr)	Inclusion of results in recognised academic deliverables to the Water Research Commission (CG Palmer & Munnik, 2018), and presentations at national and international conferences, symposiums and formal dialogues.
Impact of practice on the target community e.g. the meaningful experience of observing a WfD installed emergency water tank effectively supply water to residents during a water outage. (Pj)	WfD members observing or receiving feedback on positive results of their practice.

Meaningful contributions included the outputs of the WfD CoP, such as preliminary results generated from CRC surveys, functional emergency water tank sites, successful SWF River days and groundwork made to encourage community solidarity and accountability by aiming to establish Community Water Forums. Practice outputs were perceived as meaningful by the Khulumani Support Group and academic partners at the Institute for Water Research. Both partners published accounts of these outputs on different platforms: 1) on the Khulumani website (http://www.khulumani.net/active-citizens/water-for-dignity.html), 2) in South African Water Research Commission-funded IWR research reports (Palmer & Munnik, 2018), and 3) presented at various national and international academic conferences.

Wenger (1998, 2010) emphasised the importance of reification (the act of making something real or tangible) of practice experiences through the creation of tools and artefacts around which learning

can be encouraged. The reification of WfD practice experiences into accessible codified documents, website material and presentations served as points of reference around which reflection and learning occurred. This recognition of the value of WfD outputs beyond the WfD CoP bolstered the meaning perceived by WfD members and made them feel that they were making a real difference in local WSD. These meaning-making experiences in turn played an important role in the development of their individual and collective identities.

The full potential of the impact of practice outputs (e.g. CRC findings) and therefore the potential for meaning-making experience was not realised. Citizen Report Card findings were never formally presented to the Municipality or community members. Although the preliminary CRC findings surfaced interesting findings that resulted in learning, WfD members (and the IWR and Khulumani) were unable to utilise the findings to effect WSD change in the community.

The development of the identity of WfD members, learning as becoming, was interlinked with the development of the WfD CoP identity (**Table 5.4**), both of which evolved over time. As members use, contribute to and master the regime of competence of the CoP the more they associate their individual identities with the evolving identity of the CoP (Wenger, 2010). In well-established CoPs, with a well-developed regime of competence, individual identity of members varies from new-comers who have much to learn and weaker identity association to the CoP to experienced, competent members with a strong identity association to the CoP (Akkerman & Bakker, 2011). In the WfD CoP, WfD members pioneered the development of the regime of competence.

Table 5.4: Learning as becoming of the WfD group, evidence of identity development of WfD as perceived by WfD members themselves and how the WfD group are perceived by others. Data source codes (Figure 5.2) are provided in brackets.

Learning as becoming	
Learning (What)	**Learning mechanism (How)**
Personal identity perceptions of WfD first engaged in water-related issues as "active citizens" then "citizen scientists" contributing to Institute for Water Research projects and ultimately seeing themselves as "citizen-based research partners". (I, Q, Rj, Pr, Mm, AIwr, Lwr)	This progression coincided with members' progressive development of their practice, their individual and collective competence, their gaining of experience and building of relationships with other key stakeholders.
Becoming an independent self-governing group. Initially WfD considered themselves to be under the authority of their key supporting partners (IWR and Khulumani), but later in the project they gained independence as their confidence grew. (Mm, Rj, AIwr)	Facilitated reflexive dialogue during Appreciative Inquiry workshops and monthly meeting spaces with partners.
WSD decision makers and stakeholders regarded WfD as important water activists. Some Grahamstown East residents regarded WfD as "people to go to for help with water issues". (Rj, Pr, AIwr)	Word of mouth, sustained engagement in WSD-related practices in the community and residents' experiences of WfD practice outputs. Regular attendance of WfD members in WSD meetings and forums hosted by other water actors.

Individual identity development of WfD members coincided with the development of their competence and experience through their sustained engagement in WSD-related practices. As WfD members learnt about WSD, increased their competence to perform their practice, built their relational agency and gained experience through participating in the WfD CoP, their identities developed. This development was evident in the progression of the WfD members' identity from volunteer active citizens participating in an IWR and Khulumani project, to ultimately viewing themselves as citizen-based research partners in a joint enterprise with the IWR and the Khulumani. As citizen-based research partners, WfD members' perceived themselves as meaningful contributors to IWR research and increasingly as owners of the WfD CoP practice. Furthermore, developing their identity as citizen-based research partners aligned strongly a key aim of the WfD group – "to develop a people's science for a people's water movement" (Mukopadhyay, 2013).

Initially, the strong supportive role provided by the IWR and Khulumani, both in financial and advisory capacities, led the WfD members to regard themselves as under the authority of the Khulumani and IWR. This perception detracted from WfD's autonomy and hindered their agency to act independently. Recognising the debilitating effect that this perception had on WfD autonomy, the IWR actively encouraged WfD to lead their practice and draw upon their partners at their own discretion. Learning to develop ownership of the agenda is an important factor contributing to the successful function and sustainability of a CoP (Wenger et al., 2002). However, despite Khulumani and IWR encouragement and support, WfD struggled to sustain their practice without support and leadership intervention. This

hints at the deeply embedded lack of agency of the WfD members, which required more careful and purposeful actions to build.

Over time many Grahamstown residents and institutions that engaged in water issues came to recognise WfD as important WSD activists. Meaningful contributions of the WfD CoP to WSD in Grahamstown East, such as knowledge building in Vukani (a suburb in Grahamstown East) through CRC interviews, WSD problem identification, successful School Water Forum (SWF) River Days and emergency water provision through functional emergency water tanks, resulted in the development of their identity as perceived by residents outside of the WfD CoP. Grahamstown East residents, WSD staff of the municipality and environmental activists in Grahamstown West came to perceive the WfD members as local experts on issues relating to WSD in Grahamstown East, and particularly by Grahamstown East residents as people who could assist with water issues.

5.6.2 Phase two, the social learning induced by Water for Dignity

There was evidence that social learning (sensu Reed et al., 2010) occurred between WfD members and all three social groupings investigated – the Citizen Report Card (CRC) respondents (**Table 5.5**); relatives, family and friends (**Table 5.6**); and the sponsor community, Unilever SA (**Table 5.7**).

Learning focus groups revealed that the deepest learning occurred between WfD members and the two Grahamstown East based social groups, CRC respondents and relatives, neighbours and friends. Here learning related mainly to general water knowledge, water conservation practices, care for stored water, water rights and municipal and citizen responsibilities with regards to water.

Table 5.5: Social learning evident in the Citizen Report Card (CRC) respondent social group.

Citizen report card respondents		
Learning through engagement with WfD	**Learning mechanism**	**Behavioural change and/or active citizenship**
Best practice relating to safe water storage	Structured CRC survey; informal conversation; and gathering stories in a systematic way, including the use of story prompts	Improved water storage practice
Citizen responsibilities with regards to water	Structured CRC survey	Increased reporting of water service delivery issues to Makana Local Municipality e.g. reporting a leaking pipe
The importance of household of water conservation practices	Informal conversation	Practiced and encouraged water conservation practices in households e.g. irrigated with buckets; grey water utilisation; used less water for laundry

Citizen report card respondents		
Learning through engagement with WfD	**Learning mechanism**	**Behavioural change and/or active citizenship**
Awareness of Constitutional rights relating to water	Structured CRC survey	No evidence
Water reticulation system knowledge	Informal conversation	No evidence
Municipal responsibilities with regards to water	Structured CRC survey	Reported neighbourhood water leaks to the municipality

Table 5.6: Social learning evident in the relatives, neighbours and friends social group.

Relatives, neighbours and friends		
Learning through engagement with WfD	**Learning mechanism**	**Behavioural change and/or active citizenship**
Best practice relating to safe water storage	Informal conversation	Improved practice
General water learning e.g. water scarcity in South Africa, need for surface water conservation, water quality impacts, Municipal reticulation issues, sources of water for Grahamstown (Great Fish River and Kariega River catchments)	Informal conversations with WfD regarding their practice	No evidence
The importance of household of water conservation practices	Informal conversations	Practiced and encouraged water conservation practices in households and in neighbourhoods
Understanding of Constitutional rights relating to water	Informal conversation	None (enabled required competence for meaningful engagement in IWRM processes)
Raw water treatment process	Engagement in a structured WfD field trip	No evidence
Water quality biomonitoring method (Mini-SASS)	Engagement in structured WfD river day events	No evidence

Higher levels of learning in the first two social groupings (**Figure 5.3, Tables 5.5 and 5.6**) could be attributed firstly, to the high frequency of face-to-face engagements (learning opportunities) with WfD during their formal practices. Secondly, due to the difference in the water-related knowledge capacity between WfD members and Grahamstown East residents, these opportunities proved to be

rich learning spaces. Knowledge building occurs in the relationship between new information received from environmental stimuli and what is already known (Young, 2015). Indeed the degree to which learning occurs lies in the difference in competence (what an individual knows) and new experiences (Wenger, 1998a). Wenger (1998a) argued that if the competence-experience gap is too great, learning is inhibited as information is less accessible or relatable, too small a gap and there is little new information to learn from (as evident in the learning that took place in the Unilever South Africa social group (**Table 5.7**)).

Learning evident in Unilever SA was restricted to building awareness of systemic water resource, and water service delivery issues, at a local municipal and national scale (**Table 5.7**).

Table 5.7: Social learning evident in the Unilever South Africa social group.

Sponsor community – Unilever South Africa		
Learning through engagement with WfD	**Learning mechanism**	**Behavioural change and/or active citizenship**
General water learning at a national scale e.g. water scarcity and systemic water challenges	Formal presentations	Encouraged the promotion of water sustainable product innovations. Reinforced household water conservation practices
General water learning at a municipal scale e.g. the state of WSD challenges	WfD-facilitated field trips, presentations and informal conversations with WfD	No evidence

Social learning in all three social groups (**Figure 5.3, Table 5.5, 5.6 and 5.7**) fostered behavioural changes (e.g. water conservation practices) and in some instances, active citizenship (citizens reporting water leaks to the MLM). This is an expectation of Reed et al. (2010) who claimed that good citizenship can be learnt through positive experiences of engaging with society – in this instance through experiences of participating in WfD-led initiatives. Clarke and Missingham (2009) argued that the promotion of active citizenship could play an important part in enhancing IWRM at a local scale. Citizens as rights holders can make claims on "duty bearers", the local service providers (Clarke & Missingham, 2009). Therefore, social learning occurring with respondents of the CRCs, where residents confirmed that they had learnt about their basic water rights, empowers residents to engage with government officials about local WSD.

Many South African townships are WSD-challenged in ways similar to Grahamstown East and are in need of development and transformation to more equitable and sustainable states (Jürgens et al., 2013). Ison (2010) suggested that transforming a situation to an improved state requires an ongoing cycle of interactions between stakeholder changes in understanding and changes in practice. The WfD

group catalysed social learning that enabled small pockets of transformation mostly at a household level, showing that CSOs can be one avenue among others to improve township WSD situations.

The aim of WfD to develop their individual capacity and in turn, develop a people's water science, was only partially realised. Yes, learning occurred, but we must question to what end? Despite three years of participation in the WfD CoP, there was little evidence of learning translating into capability, agency and improved livelihoods. Partners from the Institute for Water Research and Khulumani Support Group were perhaps naïve to assume that agency-enabling skills would be transferred simply through contact and demonstration during engagement spaces (e.g. meetings and workshops). I described the constraining factors to WfD CoP practice (poor internal leadership, socio-economic constraints and member turnover) in Chapter Four (Section 4.6.3), which directly impact on learning. Analysis of the constraining and enabling factors point at deeply embedded lack of agency.

It is important to be critical of the roles, responsibilities and ethical considerations of partners (research institutions, NGOs and municipalities included) to CSOs practicing in difficult social and economic contexts (Hart & Wolff, 2006). Just declaring limitations to bound expectations of CSO research partners (e.g. time, funding and training limits), does not mitigate disappointment in the lack of improved livelihood. There needs to be a greater focus on skills development and possibly formal qualification opportunities in a way that improved livelihoods are realised (as demonstrated by interventionist research conducted by Pesanayi and Weaver (2016) during a Training of Trainers course). This may require longer time frames and extended investment of support, training and finance.

South Africa's National Water Resource Strategy 2 and IWRM principles acknowledge that equitable, sustainable and efficient water management is key to sustainable social and economic development (DWA, 2013). Despite its ambitious and progressive water policy, South Africa needs to address fundamental issues of effective public service delivery and corruption before it can claim to be a true developmental state (Turok, 2010). Nevertheless, the magnitude of these issues should not paralyse action. Robust public participation in governance processes is required and is key to an effective developmental state (Leftwich, 2000; Muller, 2009). A prerequisite for robust engagement is a civil society that has the necessary skills, knowledge and social capital, characteristics that the vast majority of South African citizens lack (Burt & Berold, 2012). Muller (2009) stressed the importance of nurturing learning organizations if South Africa as an immature developmental state is to achieve sustainable development. Concurrent effort should be spent on building the social and knowledge capital and engagement capability of civil society to strengthen meaningful participation in governance processes. The case of WfD has shown that, civil society organisations can be rich learning environments for their members but also be valuable vehicles for social learning in their wider community of practice in which

they engage. Despite the discussed short comings of WfD's process, capacity building and empowerment leading to active citizenship of marginalised communities is an important progression to addressing water service delivery issues and improving IWRM processes at a local scale.

5.7 Conclusion

The majority of South African citizens lack the capacity to participate meaningfully in water governance processes essential for realising Integrated Water Resource Management. This study explored the degree to which a small CSO, practicing in its local community, learnt to become a social learning catalyst and mediator and contributed to the development of community water-related capacity required for meaningful engagement in water service delivery processes.

The situated learning process to becoming knowledge mediators occurred at the WfD team level through their social participation in the WfD community of practice. At this level WfD members underwent a process of learning that included learning as belonging, doing, experiencing and becoming.

Creating and supporting participation in both physical engagement spaces that were formally facilitated and informal, and virtual spaces, were important for developing the basic competence expected of WfD CoP members. Sustained engagement in practice and subsequent reflective processes encouraged situated learning that improved the ongoing effectiveness and sustainability of WfD practice. The experiences of participating in their CoP resulted in direct learning from the findings of their citizen research. Publication and presentation of WfD's practice findings and process in collaboration with academic partners, enhanced WfD's perception of the value of their findings. In addition learning as experiencing occurred as WfD observed the tangible impact that their practice had on their community. The WfD members' individual identity, ultimately perceiving themselves as citizen research partners, developed over time as they grew in confidence through sustained engagement in their water service delivery -related practice. WfD's consistent involvement in water service delivery processes in the municipality also resulted in development of their identity as perceived by other water actors, who saw WfD as credible and important water actors. These collective processes contributed to the development of WfD members as community knowledge mediators. Understanding these processes provides insight (e.g. the importance of diverse engagement spaces and persisting in reflexive practice) into ways of strengthening learning processes of CSOs practicing in other contexts.

The extent to which WfD practice resulted in social learning related to water service delivery issues was limited to the township community in which they practiced and to a lesser extent their sponsor community, Unilever South Africa. Social learning was fostered predominantly through structured

citizen engagements offered by the WfD initiatives as well as through informal conversations. Face-to-face engagements resulted in social learning related to general water knowledge, water conservation practices, best practice for safely storing water, personal water rights, and citizen responsibilities with regards to water. In some instances, these learnings resulted in behavioural change (e.g. adopting water conservation practices) and active citizenship (e.g. reporting water leaks to the municipality) which are the first steps towards a community transforming to an improved state. The key limitation of improved livelihoods for essentially volunteer citizens with limited economic capacity, was a significant constraining factor to CSO function and therefore learning.

Social learning was measured by applying Reed et al.'s (2010) definition. This method was useful in surfacing the socio-relational mechanisms that enabled social learning and to a certain extent resulted in behavioural change. Our approach could have been strengthened by conducting a rigorous measure of socio-cognitive aspects social learning as showcased by Van Der Wal et al. (2014). This method entails: identifying stakeholders' underlying perspectives on various aspects of natural resource management, then at a group level measuring the percentage of stakeholder agreement of and change in these perspectives over time.

These insights into effective pathways for learning between key individuals and the wider community can contribute to addressing the water-related knowledge gap evident in many South African communities. However, the scale of this knowledge of capacity building is small compared to what is required to enable meaningful community engagement in IWRM processes in the context of South Africa as a developmental state. It is possible that decades of an oppressive apartheid regime materially limited possibilities of agency and perhaps CSO development focus should be on the youth – generations born free of apartheid. Future research should address ways of changing or adapting existing IWRM processes to enable meaningful engagement given the social-economic realities of developing countries.

Promoting learning within CSOs and their potential as social learning catalysts in their communities with the ultimate goal of enabling meaningful participation in IWRM processes will be in vain if engagement platforms themselves inhibit participation. In Warner et al.'s (2007) review of Multi-stakeholder platforms (MSPs) they reveal that most MSPs face challenges relating to participation, power, autonomy and influence. It is important to build our understanding on these challenges and how they manifest in different contexts, particularly developing countries which have a history of water access injustice such as South Africa. Multi-stakeholder platforms need to be improved to be effective platforms where participation is meaningful, and yields results beneficial to participating stakeholders. In the following two chapters, Chapter Six and Seven, I delve into experiences of stakeholder participation in a catchment management forum, the Makana Water Forum. At this stage

in my research process my understanding and use of learning theory had evolved from trying to understand and describe the social learning related to Water for Dignity, to catalysing expansive learning with the MWF management committee.

Box 5.2: Reflection on my evolving application of learning theory in study in response to my adaptive engaged research process.

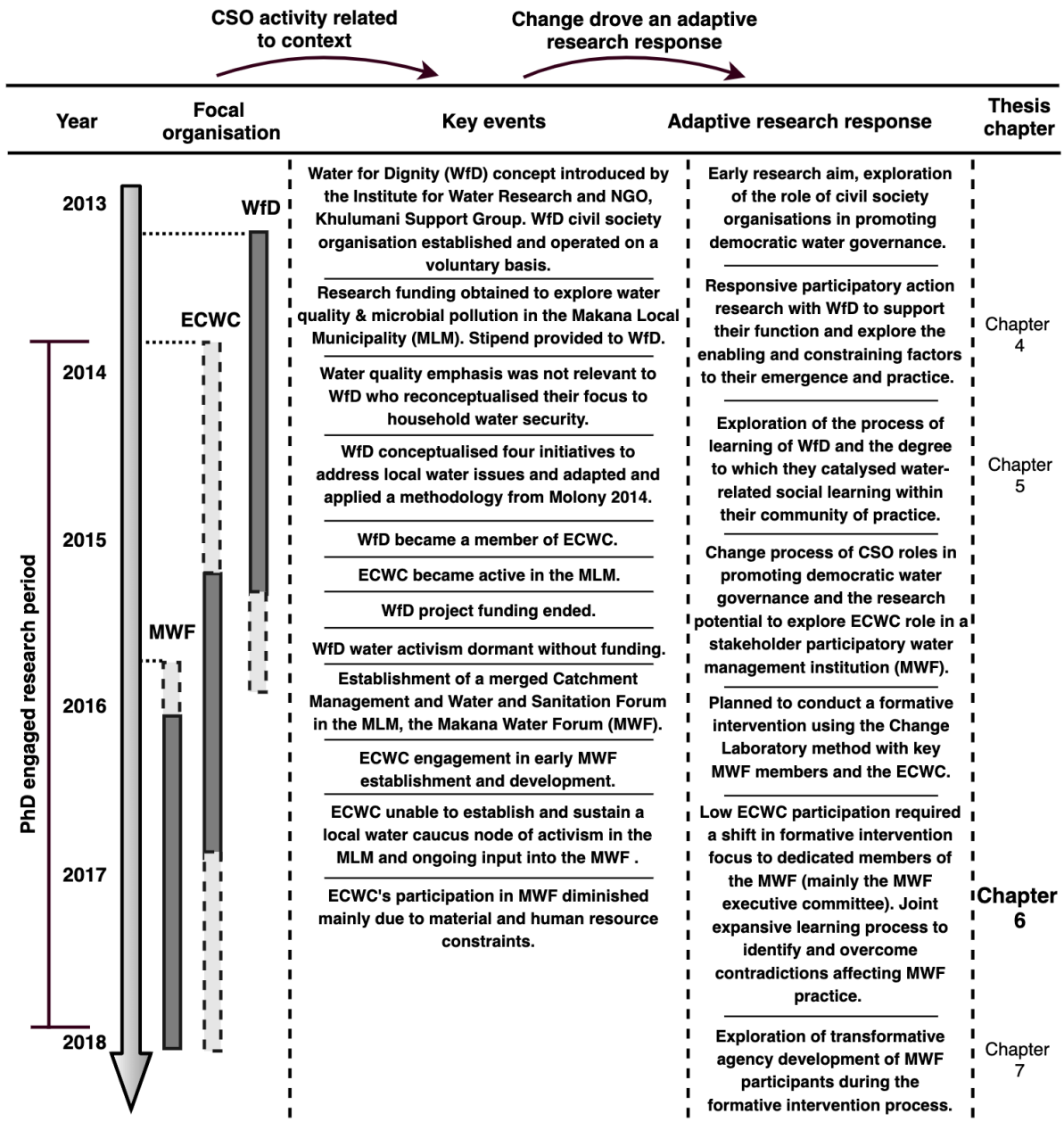
My evolving application of learning theory

The breadth of pedagogies and epistemologies applicable to learning situated in complex social-ecological system contexts are substantial. My understanding and application of learning theory evolved over the course of the five-year adaptive research process. My learning theory entry point was social learning, particularly Wenger's Communities of Practice theory. Communities of Practice (CoP) theory, specifically its focus on practice, was well suited to exploring the emergence and practice of WfD. Engaged research through Participatory Action Research was firmly grounded and directed at promoting effective and sustainable WfD practice. I found CoP learning theory suitable as an ethnographic theoretical framing for the retrospective analysis of WfD learning. However, I found that CoP was less applicable as a tool to stimulate learning, particularly learning geared at transforming problematic situations. Expansive learning was more applicable to engaged research that seeks to address and change problematic situations (Engeström, 1987). My research focus adaptation to civil society participation in a catchment management forum required that I advance my social learning focus to expansive learning informed by Cultural Historical Activity Theory (CHAT) (Engeström, 1987). Cultural Historical Activity Theory provided me with a methodology inclusive of and beyond the PAR approach, by intentionally stimulating expansive learning as a means to overcome problematic situations (caused by contradictions). In addition, CHAT provided me with a theoretical and conceptual framing suitable for analysing the interactions within and between social systems (activity systems) that engaged in shared practice related to water.

6 Chapter Six – Engaging with participatory water governance in the Makana Local Municipality

Some of the management committee of the Makana Water Forum which aimed to represent the various water stakeholders in the Makana Local Municipality

Box 6.1: Repeat of Figure 1.7 as a reminder of the research timeline in relation to Chapter Six. Timeline of the adaptive research process of the doctoral study.



Repeat of Figure 1.7: Timeline of the adaptive research process of the doctoral study. Active engaged research began at the end of 2014 and ended in December 2017. Of interest to this study was the sequential activity of two civil society organisations (CSOs), Water for Dignity (WfD) and the Eastern Cape Water Caucus (ECWC) and their overlap and engagement with the multi-stakeholder water governance platform, the Makana Water Forum (MWF). The degree of overlap and engagement of WfD and the ECWC with the establishment and function of the MWF is depicted (dark shading indicating high intensity of activity and light shading in dashed box depicting low intensity of activity). The MWF was initially a catchment management forum then transformed into a water forum which implied the inclusion of water and sanitation services and water resource management. Key events pertaining to the two CSOs that influenced the research process are described. The adaptive research response required as a result of the changing activity of the focal organisations is described and related to the relevant data chapter in the thesis. Note: This figure is repeated in Chapters Four to Seven for ease of reference.

6.1 Introduction

After 20 years of application, South Africa has struggled to implement integrated water resources management (IWRM) effectively (Schreiner & Hassan, 2011; Giordano & Shah, 2014; Mehta et al., 2014; Palmer & Munnik, 2018) Some of these IWRM pitfalls include a focus on the development of progressive water management policy that failed to adequately recognise the complexity of the implementation context of South Africa (Denby et al., 2016), particularly South Africa's complex historical context, and to take into account significant discrepancies of knowledge, access to resources and power (Dent, 2012). The power, responsibility and capacity of the state to oversee and manage water resources diminished and was increasingly assumed by the private and corporate sector (Schreiner, 2013). As a result, high-level and decontextualised IWRM objectives, such as catchment- or basin-level management, environmental flows, stronger water licencing and fees system, decentralisation through subsidiarity and participation, were difficult to realise in practice (Van Koppen & Schreiner, 2014). The complexity that arose from attempting to implement these IWRM objectives led to paralysis of action, largely at the expense of increased access to water access for the poor (Colvin et al., 2008; Denby et al., 2016). The second edition of the National Water Resource Strategy (NWRS2) sought to overcome these IWRM pitfalls by adapting to a developmental water resource management approach (DWA, 2013).

This adaptation involved three alterations to traditional notions of IWRM: 1) managing water resources was not the end point, but was guided to contribute to achieving South Africa's developmental state goals of redress, equity and social-economic development, 2) prioritising state interventions to get the basics of water infrastructure and service delivery right, and 3) foregrounding and operationalising the principle of equity (van Koppen & Schreiner 2014). Recent research efforts suggest that the complex nature of catchments, due to their diversity and dynamic nature, and the social systems that depend on them require an adaptive IWRM approach (Palmer et al., 2018; Palmer & Munnik, 2018).

Public participation is fundamental to developmental and adaptive water resource management and remains part of South Africa's democratic governance ideology (Masango, 2009; Van Koppen & Schreiner, 2014; Palmer & Munnik, 2018;). A key aspect of the participation argument is that multiple perspectives on a complex or wicked problem (sensu Rittel & Webber, 1973) can produce a multitude of overlooked management options that are inclusive and supported, and will result in more sustainable and equitable outcomes (Warner, 2005; Tsheola, Ramonyai & Segage, 2014). Other benefits of participation can include, mutual learning, improved decision making and increased government accountability and mandate delivery (Talley, Schneider & Lindquist, 2016; Wehn, Collins, Anema, Basco-Carrera & Lerebours, 2017). Multi-stakeholder platforms are widely viewed as vehicles

to enable participation in the sustainable management of common-pool resources such as water. Warner (2005 p.2), who contributed substantially to the early understandings of multi-stakeholder platforms, described them as "problem-solving institutional innovations, to democratise water management, to manage conflict, even to make water management more efficient".

In a South African context, catchment management forums (CMFs) are viewed as important multi-stakeholder platforms to effect decentralised IWRM (DWA, 2013; Munnik et al., 2015; Chapter One, Section 1.1.3). Decentralisation and public participation were regarded as critical in realising the guiding principles of South African water law, equity, efficiency and sustainability (DWA, 2013; Chapter One, Section 1.1.3). However, achieving the balance between these principles has proved challenging in practice. The national drive for short-term efficiency transgressed both equity and sustainability (Joy et al., 2014; Palmer & Munnik, 2018). Efficiency implies well-functioning governance and management organisations, and minimal waste of resources (water, material and human resources). However, achieving equity and sustainability requires compromise and trade-offs so that all people and the environment receive enough water for beneficial use now without compromising use in the future (Palmer, Berold, Muller & Scherman, 2002). An example of this tension was the drive for economic efficiency and equity (e.g. substantial capital investment to overcome the water access backlog to previously marginalised people) without investing time and resources in building the human capacity to maintain and manage water systems (Schreiner & Hassan, 2011). The outcome was a wicked problem that manifested as infrastructure breakdown and water service failure and an increasing number of service delivery protests (Morudu, 2017). Yet another outcome was the gradual collapse of waste water treatment works, leading to increasingly polluted rivers and compromised environmental sustainability (CSIR, 2010; Ntombela, Funke, Meissner, Steyn & Masangane, 2016).

The outcomes of these tensions between principles emerge as wicked problems that play out in the lived experience of people. However, deliberate engagement with these tensions bound possibilities of learning, and through practice, hold the possibility of transition towards sustainability, and environmental and social justice. Catchment level, multi-stakeholder platforms, such as CMFs, are platforms where stakeholders, including communities, government officials and academics, can table and jointly innovate ways to address these tensions through a process of mutual learning and agency development.

The above-mentioned tensions manifest within and between multiple scales, which Warner (2005, p.1) identified as: 1) between surface and groundwater, quantity and quality; 2) between water and land use (environment); 3) between water and stakeholder interests; and 4) between water-related institutions.

Tensions related to all of these scales were evident in the Makana water management CSES (Chapter Two, Section 2.5.3). In the MLM, problems as a result of these tensions catalysed the emergence of WfD (to address household water supply issues) (Chapter Four, Section 4.5), and the Makana Water Forum (to promote public participation to address any water-related issues). Of interest to this study were tensions related to the fourth scale, between water-related institutions, particularly tensions within the MWF (**Box 6.2**) that constrained its function and ability to effectively address water-related issues.

Box 6.2: Description of the emergence and development of the Makana Water Forum (MWF) which briefly outlines the teething problems the MWF experienced that stimulated a collective effort by the MWF management committee to improve its function.

Emergence, development, and teething problems of the Makana Water Forum

Two separate stakeholder engagement forum establishment processes initiated by the Minister of Water and Sanitation (then Nomvula Mokonyane) found traction in the Makana Local Municipality (MLM) in 2015. The first was the Catchment Management Forum Establishment and Revitalisation Program. The purpose of CMFs was to enable stakeholder engagement in water resource management in local catchment areas. In Makana the establishment of the Upper Kowie Catchment Management Forum was initiated. The second was a national drive to establish Community Water and Sanitation Forums. These forums were envisioned by government to improve communication and collaboration between municipalities and communities to support municipal service delivery and reduce the tension, unrest and protests prevalent in many municipalities. The overlap of similar stakeholders and government actors participating in the establishment of the two forums and the inextricable link between water resource management and water and sanitation delivery motivated the establishment of one merged Upper Kowie Water, Sanitation and Catchment Management Forum. In late 2017 the MLM, Department of Water and Sanitation and the Mzimvubu to Tsitsikamma proto-Catchment Management Agency collaborated to conceive a new name for the forum: the Makana Water Forum (MWF).

From participating in the establishment process and development of the MWF it was clear to me and others that the MWF was experiencing teething problems. Stakeholder attendance in MWF meetings was poor and inconsistent. Key stakeholders and government officials were not represented and seemed unaware of the MWF. Meetings started late and dragged on causing some stakeholders to lose interest and leave. Meetings were conducted in a top-down manner where municipal and DWS officials presented water-related information to stakeholders, after which a short period was allocated for stakeholders to ask questions. Power asymmetries seemed to exclude many stakeholders, particularly those from Grahamstown East, from speaking up in MWF meetings. These were some of the apparent problems that constrained the ability of the MWF to enable participatory water governance.

This chapter marks the transition to the second phase of my doctoral research. I make the transition from the first phase, where I focussed on the practice and learning of a civil society organisation engaging with predominantly household water issues (Chapters Four & Five), to an empirical analysis of civil society participation with water governance processes in a CMF in the second phase (Chapters Six & Seven). The emergence of a CMF, the Makana Water Forum (**Box 6.2**), provided me with the opportunity to expand my research focus to civil society participation with formal water governance processes. My initial engaged research trajectory was to advance my research from a CSO practice and learning focus, to a focus on the catalytic role of CSOs as enablers of participatory governance within a CMF (**Box 6.1**). However, limited ongoing involvement of CSOs in the CMF over the engaged

research period during the second phase of my research (October 2016 to December 2017), necessitated adapting my research focus to explore civil society participation in the CMF in a more general sense (**Box 6.1**). Transdisciplinary research in CSESs requires a flexible and adaptive approach to manage for emergence (van Breda & Swilling, 2018). My adaptation was in response to an unpredictable and emergent outcome of my CSES of interest (Chapter One, Section 1.4).

In this chapter I draw on the concept of nested systems from General Complexity Theory (Cilliers, 2000; 2001; Pollard et al., 2011) and systems thinking, to complement my use of Cultural Historical Activity Theory (CHAT) (Engeström, 1987; Foot, 2001) as a conceptual and methodological framing (Chapter Three, Section 3.2.2). CHAT is a practice-based and future orientated learning theory developed by Yrjö Engeström (1987) to understand and transform human practice. CHAT provided me with the necessary framing to understand and describe the MWF, specifically the historical factors that led to its emergence, the dynamics of its structure and behaviour, and the debilitating tensions (manifested as teething problems) that constrained its function. CHAT defines the activity system as the basic unit of analysis of any individual or collective human practice (Engeström, 2000). Through a CHAT lens, the social component(s) of a CSES can be framed as a collection of interacting activity systems. Often the wicked problems associated with CSESs are as a result of underlying tensions or contradictions within and between interacting activity systems operating within the CSES; activity theorists have posited contradictions as sources of potential learning and transformative change (Engeström & Sannino, 2011; Warmington et al., 2005; Mukute, 2009). CHAT provides a methodology, the Change Laboratory method (Engeström, Virkkunen, Helle, Pihlaja & Poikela, 1996; Virkkunen & Newnham, 2013), to facilitate practitioners through a process of expansive learning (Engeström & Sannino, 2016), using contradictions as a trigger to stimulate generative discussion as a means to innovate future actions that overcome contradictions and transform practice. The expansive nature of this learning refers to learning outcomes that are unknown to the practitioners and facilitating researchers at the start of the process (Sannino, Engeström & Lahikainen, 2016).

Change Laboratory is a type of formative intervention that has its theoretical roots in the field of Developmental Work Research and Design Experiments (Engeström, 2011; Mukute, Mudokwani, McAllister & Nyikahadzoi, 2018). "Formative" implies that the intervention was developmental in nature. The research is “interventionist” as it deliberately seeks to engender change in a human activity in crisis or experiencing problems (Engeström, 2011). Formative interventions differ from other types of interventions, such as design experiments (Engeström, 2011) where the end results are predetermined by the interventionist. A formative intervention is designed to catalyse participant learning and foster their agency to explore and develop new practice ideas and thereby transform or reconceptualise their shared human activity (Sannino & Engeström, 2017).

In response to the teething problems experienced by the MWF and the collective enthusiasm of the MWF committee to improve the function of the MWF, I suggested facilitating a formative intervention as a means to overcome these problems. The purpose of the formative intervention was to work with MWF committee members to: 1) identify key problematic aspects of the MWF function and 2) model remedial actions to overcome these problems. The overarching purpose of the formative intervention with the MWF was to improve its ability to enable participatory water governance. In accordance with my transdisciplinary research approach (Lang et al., 2012), the second phase of my research served both to further the scientific goal of better understanding participation in water governance processes, and to further societal goals by developing and implementing practical actions to improve participatory water governance.

Therefore, the aims of the chapter are:

5. To present the history of the Makana Water Forum activity system and the evolving water-related purpose.
6. To describe the key interacting activity systems composing the Makana Water Forum activity system.
7. To reveal contradictions affecting the functioning of the Makana Water Forum activity system, and its ability to enable participatory water governance.
8. To develop remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function through an interventionist approach.

The following sections first provide a deeper discussion of CHAT and its underlying principles that underpinned the formative intervention that I conducted with the MWF (Section 6.2). I describe the two principles that the Change Laboratory is based on, the process of double stimulation and ascending from the abstract to the concrete (Section 6.3). I then present an integrated research design section (Section 6.4) in which I provide an overview of the research process, data collection and data analysis of the two phases of the formative intervention: 1) the Exploratory phase (addressing Aims 5 and 6), and 2) the Expansive phase (addressing Aims 7 and 8). In the Exploratory phase sub-section (Section 6.4.1), I present the specific research process, data collection and results pertaining to Aim 5 and then again for Aim 6. The Expansive phase for Aims 7 and 8 (Section 6.4.2) follows this structure and the chapter ends with a discussion of the results and conclusions (Section 6.5).

6.2 Key principles of Cultural Historical Activity Theory (CHAT)

Engeström (2001) defines five important principles of activity theory: object-orientated activity systems as a primary unit of analysis; multi-voiced nature of activity systems; historical cycles of development influence historicity, activity systems, their objects and contradiction; contradictions are

a source of change and development; and activity systems can undergo long cycles of expansive transformations. In the following section I introduce each principle use a heuristic to depict the adoption and relevance of the principles to support engaged research into the MWF.

6.2.1 The object-oriented activity system and its three generations of development

The central and basic unit of analysis of CHAT is the activity system, which Yjro Engeström developed (Engeström, 1987; Foot, 2001) drawing on seminal work conducted by Vygotsky (1978) and his two colleagues, Luria (1976) and Leont'ev (1981). Engeström recognises that human activity does not occur in isolation but is influenced by the social relationships of the broader social system(s) in which human activity is embedded.

In recognition of power structures, hierarchical division of labour and formal and informal rules of the in an activity system, Engeström further developed the Vygotskian activity system triad of the subject addressing its object via mediating artefacts/tools (first generation activity theory, top triangle in **Figure 6.1**) by including an additional three elements: the rules associated with the activity, the community that has a stake in the object, and division of labour, thus creating a six-element activity system (second-generation activity theory) (**Figure 6.1**).

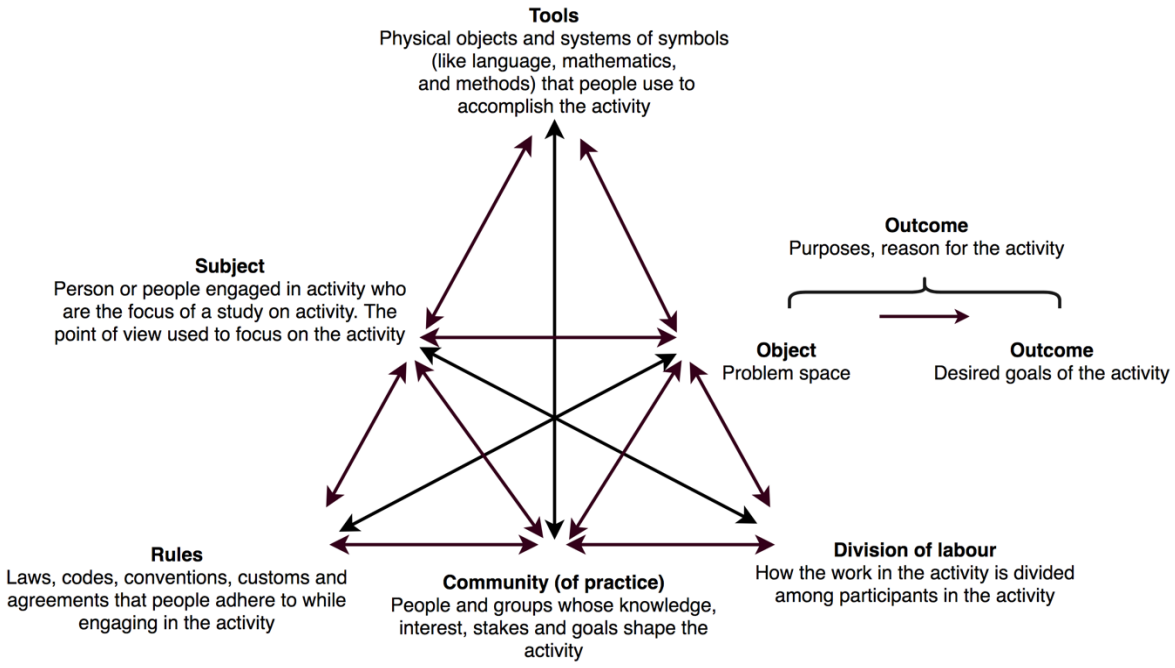


Figure 6.1: The triangular model second-generation activity theory and primary unit of analysis of Cultural Historical Activity Theory. Six components include: the subject of the activity system (e.g. a CMF or a CSO); the object, what motivates the activity; the subject's tools, what resources and materials help them do their job; rules, formal and informal that constrain and guide their actions; community, who influences their behaviour and actions; and division of labour, the hierarchy of participants and division of tasks to achieve their goals and objective (Adapted from Engeström, 1987).

Activity systems are generally open systems and therefore interact with other activity systems giving rise to Engeström's conception of third-generation activity theory (Engeström, 2001) **(Figure 6.2)**. Third-generation CHAT explores the interactions between different activity systems that have a common object **(Figure 6.2)**. Analysis of the interactions within and between different activity systems reveals tensions and contradictions (Section 6.2.4), which Sannino et al., (2011) suggest are opportunities or leverage points for learning, innovation and transformation towards improved activity system function.

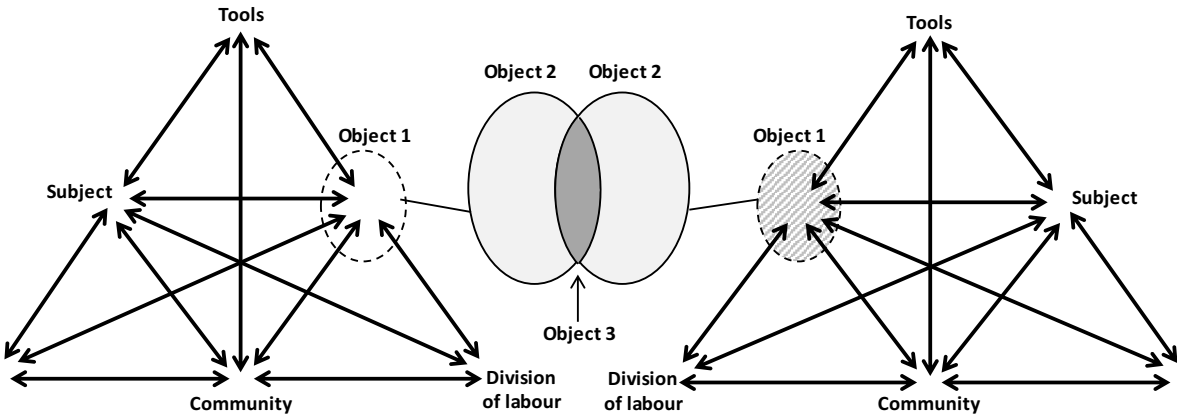


Figure 6.2: A heuristic depicting third-generation Cultural Historical Activity Theory, where two activity systems with a shared or partially shared object of activity interact (adapted from Engeström, 1999).

The object of activity is a slippery concept to grasp and has been interpreted differently by different activity theorists (**Box 6.3**). In this study I interpret the object to be, at its simplest form, the raw material that drives the activity system to conduct its practice. However, I also regard the object as including the raw material-related objectives of an activity system.

Box 6.3: Box expanding and demystifying the ambiguity of the object of activity, its conceptual origin and interpretations.

Demystifying the ambiguity of the object of activity

In Activity Theory the notion of the object is central, however challenging to grasp. An activity is defined by its object. The aggregate of actions carried out by the subjects of an activity system aim to achieve goals which ultimately strive towards some distant object. The object is what motivates the activity. Activity Theory is concerned with the object and therefore it is useful in understanding the motivations of people engaging in an activity.

Three prominent activity theorists, Lev Vygotsky, Aleksei Leont'ev and Yrjö Engeström had slightly different interpretations of what is meant by the object.

Although Vygotsky was an Activity Theory forefather, there is little evidence in his writings on the object of activity (Vygotsky, 1978). However, his articulation of concepts and the way in which word-meanings collectively construct a concept are similar to the way in which separate actions in an activity system relate to its object (Foot, 2009).

Leont'ev and Engeström built on the Activity Theory work of Vygotsky and were more direct in their understanding of the meaning of object (Engeström & Sannino, 2010). For Leont'ev, the object was what the activity was trying to bring about (Leont'ev, 1981) (e.g. in the instance of a plumber repairing a leaking tap, Leont'ev's object would be a repaired tap that

Demystifying the ambiguity of the object of activity

no longer leaks). For Engeström, the object is the raw material that the activity is directed at, which through the actions of the activity is transformed into an outcome (Engeström, 1987) (e.g. in the instance of a plumber repairing a leaking tap, Engeström's object would be the leaking tap; the outcome would be a repaired tap). In this regard, Leont'ev's object could be what Engeström terms the outcome.

Both Engeström and Leont'ev emphasised that, in order to understand an activity system, one needs to understand its object (Foot, 2009). They also compared an object to a horizon in that it can never be caught or reached. Facets of an object are obtained but it is constantly evolving through the collective influence of the participants of the activity system (Engeström, 1987).

Objects are multi-faceted and collectively constructed. Engeström maintains that an object is often not explicitly known by participants or obvious from observing activity system behaviour (Engeström, 2001). Understanding object identification requires careful phenomenological inquiry, as what people are doing and thinking is not clear simply through observation (Engeström, 2016). Participants engaged in an activity system are unlikely to have a clear picture of the collective object in their mind. Furthermore, the object looks different from different points of view. These different perspectives can lead to misunderstandings, tensions and contradictions, which Engeström (2001) argues, are potential sources of learning.

6.2.2 Multi-voicedness (Figure 6.5)

Individual and networked activity systems contain communities of different people, each with their own culturally-influenced history, perspectives and motives contributing to the multi-voiced nature of the system. In addition, different divisions of labour, as well as the historical layers embedded in tools, rules and traditions add to this multi-voicedness (Engeström, 2001). This multi-voiced milieu contributes both to the development of contradictions (Section 6.2.4) and provides the potential for innovation and collaborative development.

Dialogue among practitioners, catalysed by joint examination of conflicts, tensions and contradictions that manifest in a shared practice, serves to develop societally impactful and actionable knowledge that can be turned into transformative action (Sannino & Engeström, 2017). Multi-voiced dialogue, inclusive of non-academics, practitioners and academics forming a transdisciplinary team (Lang et al., 2012), brings diverse perspectives to bear on highlighted conflicts, tensions and contradictions that constrain joint activity (Engeström & Sannino, 2010). The act of multi-voiced analysis and remedial action modelling of contradictions promotes expansive learning (Engeström, 1987) (learning where the learning object and outcome are unknown) (Section 6.2.5), pivotal to development and transformation of an activity system.

6.2.3 Historicity (Figure 6.5)

All activity systems have a history. Over time, they undergo long cycles of change which influence their composition and nature (Engeström, 2001); problems that manifest in activity systems can only effectively be understood in the context of their historical development (Engeström & Kerosuo, 2007; Foot, 2009). Attention to history holds true, too, for informing the potential and future possibilities of an activity system. The historicity of an activity system includes the historical evolution of its object

and theoretical ideas, tools and rules (Engeström, 2001) (**Figure 6.1**). The development of these elements is influenced by the associated theoretical ideas, tools and rules in the wider local, regional and global systems in which they evolved and to which they are linked (Engeström & Sannino, 2010). For example, the object, tools, rule and theoretical ideas evident in a present-day local water governance activity system active at a municipal scale would be informed by the historical evolution of participatory water governance at a national scale, which in turn is influenced by global temporal trends of water governance. Many activity systems have existed for a long time and, understanding current problems and inform future development, requires tracing past cycles of activity that may reveal the roots of present-day behaviour, tensions and contradictions (Engeström, 2001; Price & Lotz-Sisitka, 2016).

6.2.4 Contradictions as catalysts for transformation (Figure 6.3 and Figure 6.5)

Conflict and dis-coordination are inevitable in any interaction within and between human activity systems. Engeström argues that historically emergent contradictions and tensions are important sources of potential learning and development in an activity system (Engeström & Sannino, 2011). Activity system practitioners can address contradictions through a design process which involves joint identification, analysis and modelling of innovative solutions to contradictions (Virkkunen & Newnham, 2013). This process often results in practitioners envisioning and modelling a new desired future of their activity and conceiving different ways of structuring and running their activity to achieve this future. Addressing often sub-conscious or implicit contradictions provides opportunities for the transformation or "expansive development" of an activity system towards a desired state (Engeström, 2016). On the other hand, showcasing and addressing a contradiction may lead to its aggravation or the emergence of new contradictions, thus hindering the function of the activity system (Warmington et al., 2005).

Detecting and making sense of contradictions can be challenging as they are rarely empirically observable in an activity, but rather are evident through their manifestations (Engeström & Sannino, 2011). For example Engeström and Sannino (2011) describe dilemmas, double binds, conflicts and critical conflicts as different dialectic manifestations of contradictions.

Contradictions can further be classified according to the level at which they occur, from primary to quaternary contradictions (Engeström, 1987) **(Figure 6.3)**. Primary contradictions occur between the use and exchange value of components within the six nodes of an activity system (e.g. between two conflicting rules) (Foot, 2014). Secondary contradictions occur between components at different corners of the activity system (e.g. between a rigid division of labour rebelling against the introduction of new tool such as a technology). Tertiary contradictions occur between a still old form of activity and

a new form of the same activity, typically when a culturally more advanced object or motive is introduced into an existing dominant form of the central activity (e.g. when subjects struggle to implement a new introduced procedure because they are used to the routine of an old procedure, how things have always been done). Lastly, quaternary contradictions occur between neighbour activity systems that interact with the dominant central activity system.

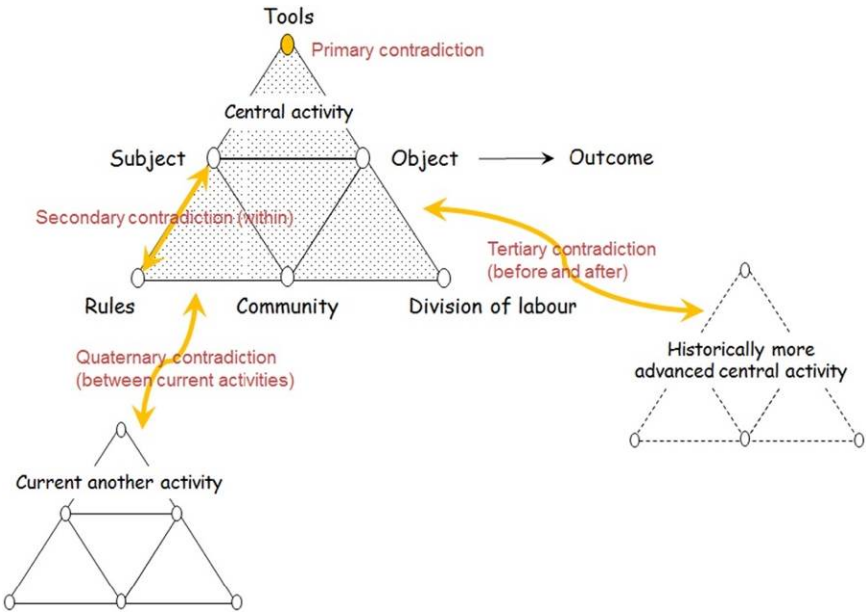


Figure 6.3: Different levels of contradictions classified in activity theory (Source: Yoon, Ham & Yoon, (2016)).

Activity systems naturally undergo long cycles of transformative change as practitioners shift or loosen problems affecting their function. Complex problems associated with CSESs are rarely solvable due to the dynamic nature of CSES, but rather can be shifted, loosened or changed to a more favourable state. So, although CHAT suggests a method for modelling "solutions" to contradictions (Engeström, 1999; Sannino, Engeström & Lemos, 2016), which suggests a finality rarely experienced in CSES, I prefer "remedial actions" to loosen contradictions. Contradictions that manifest over time can become increasingly debilitating to an activity system and can spark deliberate change actions to overcome them. Making conscious the possibility of overcoming contradictions is fundamental to the transformative power of CHAT. Engeström states that "an expansive transformation is accomplished when the object and motive of the activity are re-conceptualised to embrace a radically wider horizon of possibilities than in the previous mode of activity…" (2001, p.137). The space of future possibilities and expansive learning direction of an activity system was coined by Engeström as the zone of proximal development, which he describes as:

> "…the distance between present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind [form of contradiction] potentially embedded in the everyday actions." (Engeström, 2001, p.174)

Together these first four principles of CHAT underpin expansive learning processes and change efforts in collective human activities.

6.2.5 Expansive learning (Figure 6.4 and Figure 6.5)

Sannino et al., (2016, p.603) describe expansive learning as a "creative kind of learning in which learners join their forces to literally create something novel, essentially learning something that does not yet exist". Expansive learning differs from the traditional form of learning where the learning outcome is predetermined, and well-established knowledge uptake is mediated between expert and learner by the expert (Pahl-Wostl & Hare, 2004; Engeström & Sannino, 2010; Lotz-Sisitka et al., 2015). Often, it is difficult and unhelpful to predict the learning required to transform problematic work-based activities, as predetermined "solutions" may not exist or be appropriate for a particular context. An expansive learning approach has been found to be better suited to transforming problematic work activities (Engeström, 2000; 2011; Foot, 2001; Virkkunen & Newnham, 2013). Sannino et al. (2016, p.603) use the concept of "expansive" to depict the "…multidirectional movement of learners constructing and implementing a new, wider, and more complex object for their activity". In deliberate transformation efforts to remedy troublesome work activities, learning, assisted by mediating means, occurs socially as participants collaboratively identify and analyse work problems and invent, test and implement novel remedial actions to overcome these problems. Consequently, expansive learning in developmental work processes can result in the qualitative transformation both at the scale of individual action and at the larger scale of the collective activity (Engeström, Rantavuori & Kerosuo, 2013; Engeström & Sannino, 2016; Sannino, Engeström & Lemos, 2016).

Engeström describes the typical sequence of the expansive learning cycles as comprising seven epistemic actions (adapted from Engeström, Sannino & Virkkunen, 2014, p.123 (Figure 6.4):

1. Questioning, criticising or rejecting some aspects of the accepted practice and existing wisdom.
2. Analysing the situation: mental, discursive or practical transformation of the situation in order to find out causes or explanatory mechanisms.
    a. Historical-genetic analysis seeks to explain the situation by tracing its origins and evolution.
    b. Actual-empirical seeks to explain the situation by constructing a picture of its inner systemic relations.
3. Modelling the newly found explanatory relationship in some publicly observable and transmittable medium.
4. Examining the model, running, operating, and experimenting on it to fully grasp its dynamics, potentials, and limitations.
5. Implementing the model by means of practical applications, enrichments, and conceptual extensions.
6. Reflecting on and evaluating the process.

7. Consolidating the outcomes into a new stable form of practice.

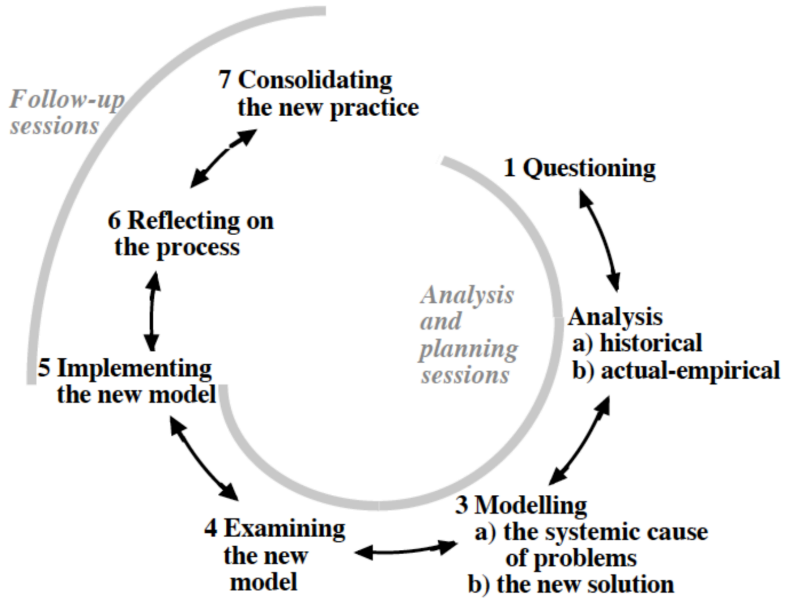


Figure 6.4: The expansive learning cycle (adapted from Engeström & Sannino (2010)).

I used these five CHAT principles as a conceptual framing to inform my formative intervention with the MWF. As a multi-stakeholder engagement platform, the MWF was essentially a learning hub, with the goal of shifting and loosening complex water service and resource problems. Expansive learning would have occurred naturally as stakeholders sought to address relevant water-related problems. Besides the numerous water-related problems in the Makana CSES of interest to the MWF, the MWF faced critical functional problems. These functional problems constrained the ability of the MWF to address wider water-related problems. I accelerated the expansive learning process by deliberately conducting a formative intervention, using the Change Laboratory method (Engeström et al., 1996), to assist the MWF committee to overcome those critical functional challenges.

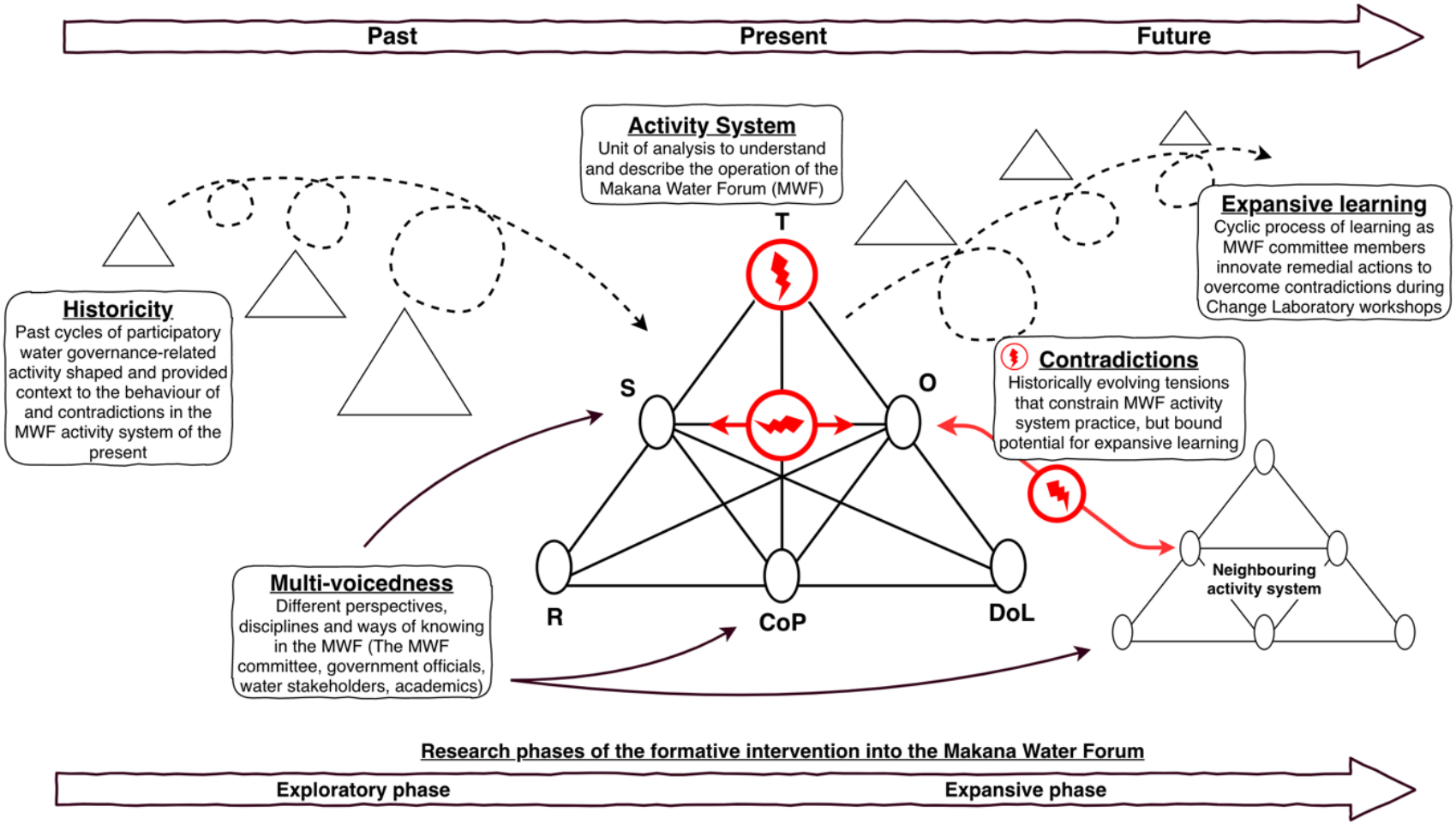


Figure 6.5: The key principles of Cultural Historical Activity Theory depicted in relation to my formative interventionist research with the Makana Water Forum (MWF). The formative intervention into the MWF comprised two research phases (Section 6.3): 1) the Exploratory phase focussed on understanding the historical development and influence of the MWF, the present structure and function of the MWF activity system and MWF problems (possible contradictions); and 2) the Expansive phase where I worked with MWF committee members to overcome MWF contradictions through an expansive learning process. The elements of the MWF activity system are represented by letters, subject (S), tools (T), object (O), division of labour (DoL), community of practice (CoP) and rules (R).

6.3 Change Laboratory

The Change Laboratory method is informed by Cultural Historical Activity Theory and falls within the field of Developmental Work Research (DWR) (Engeström, 2011). Developmental Work Research was conceived in Finland the late 1970s to overcome the limitations of individual-focussed personnel training by promoting a collaborative work process development approach, inclusive of workers, human resources practitioners and researchers (Virkkunen & Newnham, 2013). Activities based on DWR are informed by sociological theories of work and organisations and ideas from Cultural Historical Activity Theory influenced the development of DWR methodology in the 1980s and 90s. In the mid-1990s Change Laboratory (CL) was developed and fine-tuned as a method to carry out DWR that addressed the shortcomings of a decade of previous DWR projects (Virkkunen & Newnham, 2013, p.24). The CL method is an effective means of enabling transdisciplinary research (facilitating multi-voicedness (Section 6.2.2)) and generating societally beneficial scientific knowledge or "possibility knowledge" (Sannino & Engeström, 2017) to inform and conceive actionable local practice. The CL method is a process that enables and develops research and practice agendas through a collaborative learning endeavour among interventionist researchers, other disciplinary researchers and practitioners (Engeström, 2017). Using dialogue and collaboration, researchers and practitioners engage in a mutual learning process, guided by the expansive learning cycle, that includes data-based analysis of workplace problems and joint design of new concepts, tools and actions to transform the activity.

Change Laboratory is a type of formative intervention (Engeström & Kerosuo, 2007) that differs from traditional forms of design experiments, action research and change interventions (Collins, Joseph & Bielaczyc, 2004). Traditional forms of design experiments aim to solve immediately visible problems with little attention to their root causes (Engeström, 2011). The objectives of design experiments are often predefined by researchers or teachers and are achieved in a linear manner; an approach ill-suited to addressing complex problems (Rogers et al., 2013). Change Laboratory, on the other hand, adopts a cyclic approach, in which interventionist researchers and practitioners (the people experiencing the problem) jointly identify and analyse problems and their underlying causes and develop remedial actions through reconfiguring or reconceptualising the object of activity (Virkkunen & Newnham, 2013).

In CL, participant agency is purposefully enabled through the mechanism of double stimulation (Sannino, 2015a) (explained below) and ultimately seeks to have participants take charge of the development process. By contrast, in design experiments, participant agency is viewed as a disturbance to the process and something unintended that needs to be dampened, ignored or

eliminated (Engeström & Kerosuo, 2007). Consequently, the CL method seeks go further than developing generalisable solutions or remedial action for changing practice, to building the collaborative transformative agency of activity system practitioners who are motivated by jointly conceived future possibilities of their activity system (Engeström & Kerosuo, 2007; Virkkunen & Newnham, 2013).

The two principles of double stimulation and ascending from the abstract to the concrete are fundamental to promoting expansive learning through the Change Laboratory method.

Double stimulation

Vygotsky believed that human behaviour and psychological functioning was, at its core, mediated through external culturally formed artefacts such as tools and signs (Wertsch & Sohmer, 1995). The role that these cultural artefacts play in stimulating human agency became a key focal point of interventionist research. By applying the principle of double stimulation, Vygotsky showed that introducing successive stimulating artefacts could trigger a subject's agency to overcome a problematic situation they faced (Roth & Lee, 2007). The first stimulus is the challenging task or problem situation faced by the subject. The second stimulus is an introduced cultural artefact that the subject uses as a meaning-generating tool to assist in overcoming the problem. Subjects may adapt the introduced artefact to better assist them overcome the problem. The process of adapting the artefact may involve the subject reconceptualising new, possible forms of their activity in order to overcome the problem (Sannino, Engeström & Lemos, 2016). Sannino et al. (2016, p.604) describe Vygotsky's (1987) illustration of the concept of double stimulation through the "waiting experiment":

> In this procedure, a subject is left in a room to wait for an experiment to begin, but no one comes and nothing happens. Facing a conflict and oscillating between the urge to leave and the commitment to stay, the subject is at first paralyzed. The subject then identifies an external artefact, such as the clock on the wall, and turns it into a crucial sign: "When the hand moves to the vertical position, I will leave." After this, execution of the action of leaving happens as if automatically. In double stimulation, the first stimulus is the problematic situation, which triggers a paralyzing conflict of motives. In trying to cope with the problem, actors use artefacts that serve the function of meaningful signs. These signs are second stimuli, with the help of which the subjects can gain control of and transform the problematic situation.

In a Change Laboratory workshop, double stimulation is purposefully employed by the researcher-interventionist to stimulate expansive learning of participants to overcome problematic work situations. Typically, participants are shown pre-recorded examples of work problems as a first stimulus to stimulate cognitive action. These data are also referred to as mirror material or mirror data, and can be in the form of video, audio, pictures, interview transcripts, observation notes or documents showcasing problematic work situations. A second stimulus is introduced by the researcher to assist participants in analysing and innovating remedial actions to problematic situations showcased by the first stimulus. The second stimulus is typically the triangular activity system model

(**Figure 6.1**), which is useful to analyse causal mechanisms of problems as contradictions, but can also be additional mirror data or a more appropriate cognitive tool introduced or modified by the participants themselves (Sannino, Engeström & Lemos, 2016).

Ascending from the abstract to the concrete

First conceived by Il'enkov (1982), then developed by Davydov (1990), the principle of ascending from the abstract to the concrete is critical to activity theory, particularly in informing intervention research methods (Sannino, 2015b). Along with the principle of double stimulation, ascending from the abstract to the concrete is fundamental to the theory of expansive learning. Change laboratory is a method of navigating the expansive learning cycle. The process of navigating the epistemic actions of the expansive learning cycle is essentially a journey from the abstract to the concrete. Engeström et al. (2014, p.122) describe the principle of ascending from the abstract to the concrete as a dialectical movement between empirical and theoretical thinking:

> In empirical thinking based on comparisons and classifications, abstractions capture arbitrary, only formally interconnected properties. In dialectical-theoretical thinking, based on ascending from the abstract to the concrete, a "germ-cell" abstraction captures the smallest and simplest, genetically primary unit of the whole functionally interconnected system under scrutiny.

A germ-cell can be understood as an infant concept rich in expansive potential that grows as it matures to a present-day, fully fledged concept (Sannino & Engeström, 2017). A germ-cell is a vehicle for ascending from the abstract to the concrete. Formative interventions to transform activity systems through expansive learning seek to identify the initial germ-cell abstraction of an object of activity and, though a step-by-step process, theoretically trace the logic of its development, identify and resolve its historical and present-day emergent contradictions and form a re-conceptualised, expanded object and configuration of object-oriented activity (Engeström et al., 2014).

The formative intervention with the MWF employed the principle of ascending from abstract (distributed, individual, empirical and theoretical conceptualisations of a water-related object of activity) to the concrete (reconfigured collective MWF activity and expanded object) through an expansive learning process.

6.4 Research design and methods

Engaged research with Makana Water Forum was conducted as a single case study and followed a transdisciplinary approach (Chapter Three, Section 3.2.3). The scientific research aim was to gain a better understanding of participation in water governance processes. The societal aim was to catalyse and mediate transformation in the MWF towards improved participation and to promote more equitable and sustainable water service delivery and catchment management. To enable the

possibility of transformation in the MWF, I conducted a formative intervention using the CHAT-informed Change Laboratory method (Engeström et al., 1996; Virkkunen & Newnham, 2013).

The formative intervention with the MWF consisted of two phases: 1) the exploratory phase, and 2) the expansive phase. The exploratory phase served to build a rich contextual profile of the MWF which involved conducting an historical analysis and an activity system analysis of the MWF. The exploratory phase addressed Aims 5 and 6 (Aims 1 – 4 pertained to engaged research with Water for Dignity during Phase 1 of the doctoral study. This is not to be confused with phase 1 and 2 of the formative intervention described in this chapter as part of Phase 2 of the doctoral study):

5. To present the historicity of the Makana Water Forum activity system and the evolving water-related purpose.
6. To describe the key interacting activity systems comprising the Makana Water Forum activity system.

In the expansive phase, I conducted a two multi-session Change Laboratory workshops with the MWF management committee to surface and develop remedial actions in order to address underlying contradictions that constrained MWF practice. The expansive phase addresses aims 7 and 8:

7. To surface contradictions affecting the functioning of the Makana Water Forum activity system and its ability to enable participatory water governance.
8. To report on the development of remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function.

The data analysed in this chapter were collected through participant observation and informal interviews during 18 formal MWF engagements that took place between October 2015 to December 2017, and include: 13 MWF meetings (four committee meetings, four general MWF meetings open to the public, and five closed meetings focussing on specific issues); five workshops; two field trips (**Table 6.1**).

Table 6.1: Data collected from Makana Water Forum engagements occurring between October 2015 and December 2017. The formative intervention component column indicates engagements that included specific expansive learning steps (e.g. I facilitated the 3rd research and learning session during the MWF committee meeting on the 26th of July 2017 and the Water User Agreement meeting to implement a remedial action modelled during the 1st multi-session Change Laboratory workshop).

Makana Water Forum (MWF) engagement	Date	Meeting minutes /reports	Audio recording	Participant observation journal	Formative intervention component
MWF committee meetings	2016.11.10	-	✓	✓	-
	2017.03.13	✓	✓	✓	-
	2017.07.26	✓	✓	✓	✓
	2017.08.17	✓	✓	✓	✓
General MWF meetings	2016.05.05	✓	-	-	-
	2016.10.04	✓	✓	✓	-
	2017.05.15	✓	-	✓	✓
	2017.10.31	✓	✓	✓	✓
Closed specific issue-focussed meetings					
Makana Farmer Forum	2017.04.11	✓	✓	✓	-
Forum Communications Strategy Meeting	2017.04.31	✓	-	-	-
Makana Water Crisis Meeting	2017.06.02	✓	-	✓	-
Water User Agreement	2017.10.11	✓	-	✓	✓
Forum meeting with the Premier	2017.10.11	✓	✓	✓	✓
Workshops					
Stakeholder Capacity Building Workshop	2016.10.27	✓	✓	✓	✓
1st Adaptive Planning Workshop	2017.06.13-14	✓	✓	✓	-
2nd Adaptive Planning Workshop	2017.09.20	✓	✓	✓	-
1st multi-session Change Laboratory Workshop	2017.09.14	✓	✓	✓	✓
2nd multi-session Change Laboratory Workshop	2017.12.06	✓	✓	✓	✓
Field trips					
Bloukrans River Field Trip	2017.03.24	✓	✓	✓	-
Grahamstown Water Tour	2017.09.12	✓	-	✓	✓

Field notes were collected in a participant observation journal and used to populate an MWF record of engagements (Appendix L8). Fifty-two hours of participant observation during meetings and other participant activities were audio-recorded. All engagements that included formative intervention components (e.g. meetings that included research and learning sessions, Change Laboratory

workshops and implementation of model remedial actions) were transcribed. Other engagements were transcribed selectively for problem-related dialogue. Minutes were collected from MWF engagements (**Table 6.1**). Other data analysed included documents such as the MWF Terms of Reference, project reports, deliverables and strategies. All data were stored and managed in QSR NVivo 11 computer software.

I employed two modes of thematic inference to analyse the data, inductive and deductive thematic analysis (ref. Chapter Three).

Table 6.2: Timeline of the research process phases, data generation and analysis for the formative intervention into the Makana Water Forum and the research aim each step addressed: Aim 5: To understand the historicity of the Makana Water Forum activity system and its evolving water-related purpose. Aim 6: To describe the key interacting activity systems comprising the Makana Water Forum activity system. Aim 7: To surface contradictions affecting the functioning of the Makana Water Forum activity system, and its ability to enable participatory water governance. Aim 8: To report on the development of remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function.

Research phase	**Exploratory and early expansive phase**	**Expansive phase**			
Expansive learning step	**Step 1:** Questioning	**Step 2:** Analysis **Step 3:** Modelling remedial actions	**Step 4:** Examining and testing models	**Step 5:** Implementing new models	**Step 6:** Reflecting on the process and results **Step 7:** Consolidating and generalising **Step 2:** Analysis **Step 3:** Modelling remedial actions
Data generation	**Stakeholder Capacity Building Workshop** - questions and minutes (Appendix L9); Four **research and learning sessions** - minutes (Appendix L6), questions (Appendix L4) and transcriptions (Appendix L6); **Participant observation** during 16 Forum engagements - (Appendix E2)	Two **research and learning sessions** (Appendix L6); **1st and 2nd multi-session Change Laboratory workshop** (Appendix L7a & b)	**1st multi-session Change Laboratory workshop**; **2nd multi-session Change Laboratory workshop** (Individual assignments)	**Grahamstown Water Tour; 2nd Adaptive Planning workshop**; **One-on-one engagement** (water user agreement meeting); and **General Forum meeting**	**2nd multi-session Change Laboratory workshop** - questions (Appendix L4), transcription (Appendix L7b)
Date	27 Oct 2016 – 17 Aug 2017	15 May; 26 Jul; 14 Sep; and 6 Dec 2017	14 Sep; and 6 Dec 2017	20 Sep; 11 Oct; and 31 Nov 2017	6 Dec 2017
Data analysis	**Deduction:** Contextual profile of MWF **Induction:** Problems and challenges (tensions) **Deduction:** Primary contradictions **Induction:** Preliminary solutions	**Induction:** Reframed and prioritised contradictions, additional solutions and main issues discussed			**Induction:** Analytical memo of reflection and consolidation discussions **Induction:** Reframing and re-prioritisation of contradictions and additional solutions
Research aim	Aims 5 and 6	Aims 7 and 8	Aims 7 and 8	Aims 7 and 8	Aims 7 and 8

In the following sections I elaborate on the research process and present the results informing each of the four aims.

6.4.1 Exploratory phase

Preparation for the Change Laboratory (CL) workshops begins long before the first workshop. This preparation requires extensive ethnographic data collection to build a rich contextual profile of the activity systems of interest and intended CL workshop setting (Engeström et al., 1996).

The first part of the contextual profiling process included a historical analysis of participatory water governance at a national and local government scale. This history shaped the emergence and development of the MWF and influenced the emergent contradictions evident in the MWF.

The second part of the contextual profile was to develop an understanding and description of the multi-activity system network from which the MWF emerged and in which it was embedded. The network comprised all activity systems that shared a common interest in water, particularly those engaged in water governance processes in the Makana Local Municipality. This involved identifying and describing both the MWF as a central activity system of interest, and the activity systems that the MWF interacted with. The multi-activity system network interacted through continuous feedback loop cycles with the Makana water complex social ecological system (CSES) (a systemic description into the Makana Water CSES provided in Chapter Two).

This ethnographic data related to the history of the MWF, MWF activity system analysis, and problematic aspects of MWF practice contributed to the production of mirror data for subsequent Change Laboratory workshops. Mirror data (Chapter Three, Section 3.2.5) supported the process of double stimulation during the first two steps of the expansive learning cycle, questioning and analysis (**Figure 6.4**).

Research process, data collection and data analysis to address Aim 5: To understand the historicity of the Makana Water Forum activity system and its evolving water-related purpose.

Complex systems and activity systems have a history that shapes their present and future behaviour (McMurty, 2006). An historical analysis of the MWF was conducted in order to understand the cultural and historical influences that shaped its formation, function and manifestation of contradictions and tensions. This historical analysis first focussed on water policy, institutional development, and public participation in South African water governance processes at a national scale pre-1994 (the year South Africa became a democratic government) and post-1994 (Appendix L3). This was done through a literature review of a collection of texts including: (Turton, Meissner, Mampane & Seremo, 2004; Nel,

Van Damme & Braune, 2007; Van Koppen, 2008; King & Pienaar, 2011; Schreiner & Hassan, 2011; Schreiner, 2013; Tempelhoff, 2017;). Using a literature review and document analysis, I then narrowed the historical analysis to the local municipal scale, exploring past cycles of water-related activity in the Makana Local Municipality (MLM) before the emergence of the MWF. Lastly, the recent historicity of the MWF was detailed from its inception in October 2015 to the second CL workshop in December 2017 through document analysis and participant observation during MWF engagements (Appendix L3).

Results pertaining to Aim 5: To understand the historicity of the Makana Water Forum activity system and its evolving water-related purpose.

I developed five timelines to showcase key events that related to and influenced stakeholder participation (or lack thereof) in water governance processes in South Africa, and that ultimately contributed to the development of the water-related object of the MWF. The first two timelines are a synthesis of events pre- (**Timeline 6.1**) and post-1994 (**Timeline 6.2**) (before and after apartheid) at a national level. The third timeline is a synthesis of key events that influenced water governance at a local government level, in the Makana Local Municipality (**Timeline 6.3**). The fourth and fifth timelines are a synthesis of events related to the MWF, outlining its emergence and establishment (**Timeline 6.4**), development and function (**Timeline 6.5**).

Timeline 6.1: Historical development of public participation in water governance processes in South Africa pre-1994. I provide a brief summary of the events, highlight key events (bold) and outline the significance of each. Supplementary historical data provided in Appendix L3.

Events significant to public participation in water governance pre-1994 (apartheid)	
Date	**Event and significance**
Summary	State-centric water governance, no emphasis on public participation in water policy development. Social engineering excluded black South Africans from access to water resources, land, meaningful education and state governance processes. The effect of oppressive apartheid policies (including unequal water service and resource access) fuelled civil unrest, protest and ascendance of the liberation movement, the African National Congress Party.
1913	**Natives Land Act of 1913**. Distinguished white farming areas (87 percent of South African land (and African Reserves excluding black South Africans from purchasing land in white areas.
1948	**National Party election victory**. Calculated social engineering in governance (including water governance) to maintain white minority rule over a majority black population growing in power in urban areas. Several discriminatory laws were introduced from 1950 onwards.
1950	**Group Areas Act of 1950**. Separate racially classified residential areas.
1951	**Bantu Authorities Act of 1951**. National Party appointment of chiefs under their control to govern homelands.
1952	**Natives (Abolition of Passes and Coordination of Documents) Act of 1952** - all black South Africans were required to carry an identification document at all times.

Events significant to public participation in water governance pre-1994 (apartheid)	
Date	**Event and significance**
1954	**Natives Resettlement Act of 1954**. Relocation of people of colour to separate race-based townships. Townships had rudimentary water and sanitation services.
1955	**Adoption and showcasing of the Freedom Charter** by black solidarity movements and political parties (the African National Congress (ANC) and its allies, South African Communist Party and the South African Congress of Trade Unions). The Charter demanded that "people shall govern", and called for de-racialisation, democratic rule, and the right for all people to participate in governance processes. The Freedom Charter was denounced as treasonous by the National Party and the ANC banned.
1956	**Water Act No. 54 of 1956**. State control over abstraction, distribution, use, supply and pollution regulation and treatment and discharge of effluent. Riparian principle of access to water linked to land ownership privileged a small percentage of the South African population, most of whom were white residents.
1959	**Promotion of Self-government Act of 1959**. Relocation of black South Africans to demarcated homelands or Bantustans. Homelands were required to fund and provide their own services.
1960 - 1976	**African urbanisation**, **civil unrest** and **protest** were the only effective mechanism Africans had to influence governance processes. Oppressive apartheid laws and governance resulted in poor living conditions in African townships and slums due to a lack of adequate housing; non-existent or rudimentary water and sanitation services exacerbated black dissatisfaction, leading to unrest and protests. Protests culminating in the **Sharpville massacre** in 1960 and the **Soweto uprising** in 1976 resulted in partial improvement of water and sanitation provision in townships.
1980 - 1982	**Constitutional amendments, process to establish a Tri-cameral parliament started.** A three-tiered assembly provided a political voice for South Africans of coloured and Indian ethnicity. Black residents were still excluded.
1982	**Black Local Authorities Act of 1982.** Establishment of a local government representation structure to assist governance and administration in black urban areas.
1983	**Tri-cameral parliament inaugurated.** National Party attempt to inhibit coloured and Indian parties from aligning with African nationalists and anti-apartheid movements.
1984 - 1986	**State of emergency.** Escalating civil unrest, protests, violence and attacks fuelled by anti-apartheid movements. Detention and exile of anti-apartheid activists.
1989	**FW de Klerk replaces outgoing PW Botha as National Party president.** FW de Klerk advanced settlement negotiations between the ANC and National Party and implemented reforms.
1990	**Nelson Mandela released from prison, ANC and South African Communist Party unbanned and imprisoned political leaders were released.**
1991	**Convention for a Democratic South Africa (CODESA).** Negotiation of: the transition and government change-over process to a non-racial, non-sexist democratic government; the new constitution; establishment of an interim government; the future of homelands; a fully inclusive electoral system.
1993	**Interim Constitution the Bill of Rights.** Rights to dignity, access to water of a sufficient quantity and quality, and a healthy environment. Furthermore, provision needed to be made for public participation in the mediation of these rights.
1994	**First democratic elections.** The ANC won by 62.65%. Homelands/Bantustans incorporated into South Africa.

Timeline 6.2: Historical development of public participation in water governance processes in South Africa post-1994. I provide a brief summary of the events, highlight key events (bold) and outline the significance of each. Supplementary historical data provided in Appendix L3.

Public participation in water governance post-1994 and transition to a democracy	
Date	**Event and significance**
Summary	Extensive policy reform, emphasis on public participation, decentralisation and developmental local government, ambitious service delivery access targets prioritised but implemented through a top-down, technicist approach. Less emphasis on social capital development. Public participation structures established but poorly functioning. Poorly functioning local government, service delivery failure, disconnected civil society and increasing service delivery protests. Refocus on building capable and participatory local government. Water resource management decentralisation to Catchment Management Agencies. Catchment Forums established to enable public participation in effecting decentralised water resource management.
1994	**Reconstruction and Development Programme (RDP).** Large capital investment to address basic needs service delivery backlog inherited from apartheid. Emphasis on public participation to promote community empowerment and self-reliance.
	ANC encourages emerging democratic local authorities to collaborate with local stakeholders. Collaboration with community-based organisations and NGOs to promote accountable governance and implement developmental projects.
	Consultative water law reform process included:
1994	**1994 White Paper on Water Supply and Sanitation.** Basic water and sanitation provision defined (as 25L per capita per day or 6KL per household per month, within 200m of the household and with a minimum flow of 10L per minute). Proposed decentralised water service delivery; that democratic local government with interim support from Water Boards be responsible for water service delivery.
-	**Water Law Principles approved in 1996.** Informed by the Dublin Principles on water management; embodied the DWAF slogan "some, for all, forever", and included Principle 2: Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels.
	Water Services Act No. 109 of 1997. Legislated decentralised water service delivery.
1998	**National Water Act No. 36 of 1998.** Included the concept of the Reserve which enshrined the right of water for basic human needs and the needs of the environment. Legislated decentralised water resource management and the required institutional arrangements (Catchment Management Agencies (CMAs), Water User Associations and catchment forums), including provisions for public participation.
1995	**Mvula Trust (an NGO) appointed as the official RDP implementing agent.** Initiated community-led development and capacity building to empower marginalised communities as part of the RDP programme roll-out.
1996	**Constitution of South Africa.** Included the Bill of Rights which stipulated, among others, the right to sufficient clean water and a healthy environment. Made provision for public participation in matters of local government.
1998	**Municipal Structures Act No. 117 of 1998.** Outlined the establishment criteria for different categories of municipalities. Legislated local government structures to enable public participation through the Ward Committee system.
2000	**Municipal Systems Act No. 32 of 2000.** Outlined the legislation to uplift communities through access to essential services. Further promotion of community participation in local governance.
2001	**Free Basic Services legislated.** Obligated municipalities to conditionally provide free basic water (25 litres per person per day/6000L per household per month), sanitation (ventilated pit latrine) and electricity services to qualifying poor households.
2001	**Masibambane Programme initiated.** Foreign investment to support and strengthen local government water and sanitation services with a particular focus on consumer-driven interventions. This meant enabling inclusive sector-wide collaboration inclusive of role players both within and outside of government.

Public participation in water governance post-1994 and transition to a democracy	
Date	**Event and significance**
2003	**Municipal Infrastructure Grant established. Funded long-term (3 year) infrastructure projects.** Project cycles became increasingly technicist at the expense of building social capital and maintenance processes essential to the sustainability of service delivery systems.
2004	**Ward Committees established.** Primary avenue for public to raise issues of concern and engage with local governance. **Inkomati Catchment Management Agency Established.** Enabled stakeholder participation in local water resource management. **First edition of the National Water Resource Strategy released.**
2006	**Raising Citizens' Voice initiative implemented by the Department of Water Affairs.** Piloted in Cape Town and eThekweni with mixed success (Smith, 2011), it was an attempt to build local government-community engagement and public accountability by providing opportunities for civil society to engage with municipalities and their service providers to collaboratively address their service concerns.
2006	**Second municipal elections.**
2009	**State of Local Government Review** revealed that 37% of municipalities were functioning, with 32% almost dysfunctional and 31% dysfunctional. A **Water and Sanitation Audit** revealed a critical skills shortage in municipalities and near-collapse of most of the country's water treatment (90%) and sewerage works (85%). **Widespread service delivery protests.** Communities were becoming increasingly neglected and side-lined as passive participants in governance processes. Municipal dysfunctionality compromised the ability of local government to sustain reliable, quality-service delivery and eroded public confidence and trust in the municipal system. The number of protests recorded in 2009 equalled the total recorded in the previous 5 years. Protests indicated the need not only for improved quality and reliability of services, but also a more inclusive approach to developmental processes and service delivery governance. **Local Government Turnaround Strategy published by the Department of Cooperative Governance and Traditional Affairs (CoGTA).** The strategy included the "Back to Basics" campaign. All municipalities were directed to draft individual turnaround strategies to address the key challenges they faced. Mandatory strategy objectives included among others: to build clean, responsive, accountable local government and to strengthen partnerships between local government, communities and civil society. **Blue and Green Drop Reports published.** Subsequent Blue Drop reports published in 2012 and 2014 showed a general decline in tap water quality. A similar decline in Green Drop scores in 2012 and 2014 indicated a regressive trend in Waste Water Treatment Works performance.
2012	**Catchment Management Agencies reduced from 19 to 9.** Slow institutional development, partly due to limited DWS capacity to coordinate CMAs and partly to national government reluctance to relinquish powers and responsibilities.
2013	**Second edition of the National Water Resource Strategy published.**
2017	**Move to consolidate CMAs into a single, centralised CMA.** At the time of writing this process was on hold pending a review process and was being actively contested by the private and public sectors.
1994 - 2017	**Numerous NGOs and civil society organisations established to address water-related issues that included a focus on participation, for example:** the Wildlife and Environmental Society of South Africa (1926), an organisation that includes a focus on catchment- and water resource related issues; the Environmental Monitoring Group (1991), a not-for-profit organisation with a focus on sustainable development and social-ecological justice in natural resource management; the Association for Water and Rural Development (1998), a not-for-profit organisation addressing issues of poverty, inequality and sustainability in the natural resource management sector; and the South African Water Caucus (2002), a national CSO network advocating water and climate change justice.

Timeline 6.3: Historicity of public participation in water governance processes in the Makana Local Municipality. These refer to past cycles of activity related to public participation in water governance

processes that influenced the development of the Makana Water Forum. Sources (Mdlongwa, 2015; Yako, 2015; Grocott's Mail, 2016) Supplementary historical data provided in Appendix L3.

History of public participation in water governance at a local government scale – the Makana Local Municipality (MLM)

Date	Event and significance
Summary	For over a decade the MLM has gradually slipped into an increasing state of dysfunctionality due to factors including: uncontrolled debts, an unmotivated and oversized workforce, prolonged vacancies in critical positions (e.g. Municipal Manager, Financial Manager, registered engineers), gross mismanagement, cases of corruption (Kabuso, 2014) and repeated failed annual Auditor General reports (Chapter Two, Section 2.5 for a detailed analysis of the complex Makana water system and its associated problems). Three noteworthy outcomes of the MLM dysfunctionality of relevance to public participation are: 1) increasing infrastructure degradation and compromised service delivery; 2) deteriorating environmental health of Grahamstown's catchments and river systems catalysed numerous external and internal-driven remedial interventions and civil society responses; and 3) compromised functionality of legislated public participation structures, the Makana ward committee system and the emergence of alternative CSO public participation structures.
2003	**Makana Environmental Forum established (MEF).** Platform for stakeholders and municipal officials to engage on environmental issues affecting the MLM. Devoted MWF stakeholders developed a long-term vision and an accompanying series of Local Environmental Action Plans (LEAP) for the MLM (http://www.ru.ac.za/environment/resources/local/leap/). The LEAP documents assessed the status quo of the MLM natural environment and provided guidelines for its future management (Shackleton, Cundill & Knight, 2009). Lack of long-term funding and commitment from the key institutions, particularly the MLM, resulted in the collapse of the MEF and disregard of the LEAP (Shackleton et al., 2009).
	Kowie Catchment Campaign (KCC) established. The deteriorating health of the Bloukrans River and impact on the receiving Kowie River triggered the emergence of the KCC. Largely comprised of community members from Grahamstown West (white residents), it drove various initiatives to raise awareness and improve the condition of the Bloukrans River.
2004	**Ward Committee system established.** Functionality constrained by, among other issues, personnel capacity, partisan manipulation, lack of resources. Therefore, the ward committee system in Makana provides limited support for the promotion of participation in water governance processes. Stakeholders have been forced to seek other avenues to resolve their water-related concerns.
2009	**Unemployed People's Movement (UPM) established.** Primarily **r**epresent marginalised community interests in Grahamstown East. UPM advocates for bottom-up democracy and has adopted a confrontational approach to engagement; has organised several protest actions against the MLM. Protests have called for time-bound formal MLM responses to issues listed in memoranda relating to service delivery failure, lack of transparent governance, corruption, requests for provincial intervention and that the MLM be placed under administration (Kota, 2010). The UPM often collaborated with smaller social movements with a similar ideology: the Rural People's Movement, Anti-Privatisation Forum, Jubilee South Africa, and the Landless People's Movement.
2013	**Water for Dignity (WfD) established.** Addressed water-related issues in Grahamstown East (Chapter Four). The WfD CSO were members of the Eastern Cape Water Caucus; both organisations were active in Grahamstown and primarily represented marginalised communities in addressing water issues.
	The Grahamstown Business Forum. Aimed to improve the business environment in Grahamstown which includes employing measures to ensure that the MLM delivers on its services responsibility (http://gbforum.org.za).
2014	The **Makana Unity League established**. A collection of mainly Grahamstown West residents, addressing service delivery issues as its primary agenda (Corke, 2014).
	Makana placed under administration by the Eastern Cape Provincial Government. A Municipal Administrator was appointed to assist in assessing the status quo and developing plans and strategies to guide the municipal turnaround process guided by the national campaign to strengthen developmental local governance using the "Back to Basics" approach. Public participation spaces, "Workstreams", were created to enable stakeholder-government dialogue to better understand and co-produce remedial actions to critical issues facing Makana. Workstreams of relevance to civil society participation in water governance were: the "Driving service delivery" and "Reconnect with communities" workstreams (Yako, 2015). Despite several sittings of these workstreams, their efforts yielded little change in water service delivery experience and quality, or improved community-municipality communication (Yako, 2015). There is little evidence that the turnaround plans

History of public participation in water governance at a local government scale – the Makana Local Municipality (MLM)

Date	Event and significance
	and strategies were implemented by the MLM, an action greatly hindered by the lack of a permanent Municipal Manager or Chief Financial Officer (Penxa, 2017).
2015	**Adopt-a-River Campaign initiated in Grahamstown.** The campaign focussed on critical river health issues by employing and training historically disadvantaged community members to clean up polluted river sections. The impact of the campaign in Makana on unemployment, river health and capacity building was temporary and marginal given that the project only ran for one year and the MLM was unable to sustain it without departmental support (Grocott's Mail, 2015; Maclennan, 2018).
2016	**Grahamstown Residents Association (GRA) became increasingly active. Previously the Grahamstown Ratepayer's Association, the** GRA aimed to develop a mass membership representative of all of Grahamstown (although comprising mostly Grahamstown West residents) and build active citizenry to support and strengthen municipal service delivery function through regular constructive engagement. (http://grahamstownresidentsassociation.co.za). **Operation Masiphathisane (Let's work together) launched.** The programme included a two-tier reporting system to fast-track the resolution of service delivery issues: Communities, politicians and government officials engaged in ward-level "War Rooms" generated service delivery related information and remedial actions, which were then escalated to an overarching "Regional War Room" chaired by the Mayor.
2017	**Concerned Citizens Committee to Save Makana (CCCSM).** Initially supported the MLM but, as the cooperation of the MLM lessened, so the CCCSM's approach became more drastic (litigation through the courts).

Timeline 6.4: History of the process of emergence and establishment of the Makana Water Forum. Events are highlighted (bold) followed by a brief description of their significance. Some events involved research components designed to catalyse expansive learning. The research components are indicated (<u>underlined and italicised</u>) and the specific expansive learning steps are highlighted (bold and in brackets). (Sources Appendices L8 and E2). Supplementary historical data provided in Appendix L3.

History of the emergence of Makana Water Forum (MWF)

Date	Event and significance
May 2016	**DWS-led stakeholder consultations to establish a Community Water and Sanitation Forum in the MLM.** This was triggered by a Ministerial directive to establish similar forums nation-wide to strengthen communication between service providers and residents. The Minister believed that the establishment of these forums would provide alternative communication channels for addressing community concerns and thereby soothe the community tensions and reduce service delivery protests. The MLM was identified as a hotspot of service delivery related protests and targeted by the Eastern Cape DWS division as a priority establishment area. **DWS-led stakeholder consultations, via the Mzimvubu to Tsitsikamma proto-Catchment Management Agency (MT proto-CMA), to establish a catchment management forum (CMF) in the MLM.** As part of a nation-wide CMF revitalisation drive, the DWS identified the MLM as a strategic site for the establishment of a CMF. The MLM was strategic because Grahamstown is situated at the headwaters of the Kowie River and two towns downstream in the neighbouring Ndlambe Municipality, Bathurst and Port Alfred, partly rely on the Kowie River for their domestic water supply. These headwaters were severe polluted mainly due to untreated sewage leaking from over-capacitated sewerage infrastructure and non-compliant waste water discharge from both the town's over-capacitated waste water treatment works. Stakeholder consultations initiated by the MT proto-CMA. **Process initiated to merge the Community Water and Sanitation Forum and the Upper Kowie CMF.** The Institute for Water Research motivated for the merger due to overlapping agendas, a stakeholder base with similar interests, and the lack of human and financial capacity required to run two separate forums effectively. **Terms of Reference for an Upper Kowie Water Sanitation and Catchment Management Forum drafted by the DWS, MT proto-CMA, the Institute for Water Research and the MLM.** After several drafting iterations, the integrated Terms of Reference was released for wider stakeholder comment.

History of the emergence of Makana Water Forum (MWF)	
Date	**Event and significance**
	T**he forum was officially merged as the Upper Kowie Water, Sanitation and Catchment Management Forum.** The Forum was South Africa's first official forum to integrate water service and water resource related issues.
Sep. 2016	**Series of Upper Kowie Water, Sanitation and Catchment Management Forum public meetings.** Pressure from the DWS to host public Forum meetings to formalise the Forum. The DWS was mandated to support the establishment and function of legitimate, recognised CMFs through the provision of departmental resources (secretarial and coordination support, catering and transport). This recognition required the official acceptance of the Terms of Reference by stakeholders in a public engagement, and the election of an executive committee (DWAF, 2001). In the MLM, this process was frustrated by poor attendance and lack of sufficient stakeholder representation at meetings to deem the establishment process inclusive. Building inclusivity was further hampered by ongoing local government elections rendering key municipal officials and other active citizens unavailable. I introduced my intention and obtained consent to conduct engaged research with the Forum.
	Increasing involvement of the Eastern Cape Water Caucus (a water-activist network of civil society organisations). The Caucus sought to ensure that marginalised stakeholders were provided for in the Forum Terms of Reference.
Oct. 2016	**Upper Kowie Water, Sanitation and Catchment Management Forum stakeholder capacity development workshop facilitated by the DWS, MT proto-CMA, the MLM and the Institute for Water Research.** Draft Terms of Reference presented, and interim Forum management committee elected. I facilitated the first Research and Learning session in the form of an interactive session where stakeholders discussed their priority water, sanitation and catchment-related concerns. (**Expansive learning steps - Questioning, analysis and preliminary modelling of potential remedial actions).**
	Building Municipal support of the Forum. I presented the Forum concept and establishment process to the MLM Council during an official Council Introduction to Makana Stakeholders meeting.

Timeline 6.5: History of the process of the development and function of the Makana Water Forum. Events are highlighted (bold) followed by a brief description of their significance. Some events involved research components designed to catalyse expansive learning. The research components are indicated (underlined and italicised) and the specific expansive learning steps are highlighted (bold and in brackets). (Sources: Appendices L8 and E2). Supplementary historical data provided in Appendix L3.

History of the development and function of the MWF	
Date	**Event and significance**
Feb. 2017	**Drop a Block campaign in Grahamstown.** The Forum supported the implementation of the DWS-driven water conservation and demand management initiative, the Drop a Block campaign (DWS, 2016).
Mar. 2017	**Pollution incident on the Bloukrans River.** The Forum supported the Eastern Cape Water Caucus and Traditional Healers facilitating a DWS joint investigation into a pollution incident at the Sacred Pools. The Sacred Pools are an important site of cultural significance utilized by traditional healers for ritualistic practices. The pools had become inundated with duckweed (Lemnoideae subfamily), a rapidly growing, invasive aquatic plant, rendering the site unfit for conducting rituals.
	Makana Water Crisis Meeting. The Forum supported the MLM and DWS in facilitating a stakeholder engagement to strengthen drought resilience in the Municipality.
Apr. 2017	**Makana Farmer Forum Meeting.** The Forum facilitated an engagement between the MLM, the DWS and farmers who irrigate in the catchments supplying Grahamstown with water. This engagement served as a platform to discuss the implementation of water restrictions.
May 2017	**First general Forum meeting open to all stakeholders.** Dialogue facilitated regarding the status and strategies relating to water and sanitation service delivery, sanitation infrastructure and pollution of catchments in the MLM and urban and irrigation water use restrictions. I facilitated the second Research and Learning session to continue the questioning step of the expansive

History of the development and function of the MWF

Date	Event and significance
	learning cycle. The ECWC facilitated a discussion on issues related to building democratic participation of stakeholders in the Forum. (**Expansive learning steps - Questioning, analysis and preliminary modelling of potential remedial actions).**
Jun. 2017	**Makana Water Crisis Meeting. Grahamstown's water supply dams at critically low levels.** The Forum facilitated an engagement between the MLM, DWS and stakeholders to discuss the water supply status and strategy to address the looming water supply crisis in Grahamstown. **First Makana Water Plan workshop.** The Forum collaborated with the MT proto-CMA, IWR and the MLM to initiate the development of an Integrated Water Sanitation and Catchment Management Strategy for the Makana area. The strategy (water plan) was developed through two Adaptive Planning Workshops. The plan included a collective vision, shared value set to guide the implementation of the plan, the context of plan's target area, essential characteristics to be managed, and a hierarchy of objectives and consequential actions to achieve them. These objectives and actions were later taken up as potential actions for the Forum to champion.
Jul. 2017	**Forum management committee meeting, <u>third Research and Learning session</u> and commitment to a formative intervention process.** I offered, and obtained, buy-in from the committee members to facilitate a series of intensive multi-session Change Laboratory workshops to catalyse the improvement of the function and effectiveness of the Forum.
Aug. 2017	**Forum management committee meeting and <u>fourth Research and Learning session</u>.** I continued with the questioning step of the expansive learning cycle. Committee members discussed the purpose of the Forum (object) and reflected on critical challenges the Forum experienced. (**Expansive learning steps – Questioning and analysis).**
Sep. 2017	**The Forum collaborated with the Eastern Cape Water Caucus to coordinate the Grahamstown Water Tour.** The tour was an interactive learning journey to build Forum, municipal and community member understanding of the Grahamstown water system. The tour was a remedial action to a Forum problem that required urgent attention. Forum committee members were expected to effectively communicate water-related information to Grahamstown community members; however some felt that they lacked the required capacity to confidently carry out this role (Ndumiso Nkonki, pers. comm. 8 May 2017). **(Expansive learning steps - Questioning (problem raised at the first Makana Water Plan workshop), analysis, modelling, testing and evaluating (a series of Water Tour planning meetings) and implementing the modelled solution (coordinating the Water Tour).** **<u>First multi-session Change Laboratory Workshop</u>.** In the workshop I built on questioning processes conducted in previous Research and Learning sessions and advanced the Forum committee through the analysis, modelling, testing and evaluating steps of the expansive learning cycle. Three problems were prioritised for immediate analysis and remedial action modelling: lack of focus of the Forum; lack of representation, representivity and non-attendance; and Forum relationship with the Municipality. Several modelled remedial actions were selected for implementation in upcoming Forum engagements, including the 2nd Makana Water Plan Workshop, the next General Forum Meeting (public meeting) and one-on-one engagements with strategic water users (specific issue Forum engagements) (Section, 6.4.2). **(Expansive learning steps - Questioning, analysis, modelling, and testing and evaluating).** **Second Makana Water Plan workshop.** The Forum collaborated with the Institute for Water Research, the DWS, MT proto-CMA and the MLM to facilitate a second workshop to further develop the Makana Water Plan by including inputs from stakeholders missing from the first workshop.
Oct. 2017	**Water User Agreement meeting with strategic water users.** The Forum trialled a remedial action modelled in the first change laboratory workshop termed one-on-ones (small engagements aimed to address specific issues, needs to gain Forum credibility of strategic stakeholders such as commercial farmers, large water users, resource-poor farmers, and community development workers). A one-on-one session was facilitated between strategic water users to explore water conservation and drought mitigation practices in Makana and develop a catchment management agreement between farmers irrigating in the catchment area above Grahamstown's water supply dams and the Municipality. **(Expansive learning steps - Implementing modelled solutions).** **The Forum hosted its second General Forum Meeting.** Remedial actions modelled during the first change laboratory workshop were trialled (Section, 6.4.2). Feedback on the development of the Makana Water Plan was presented. A promising potential for collaboration between the Municipality and resourced stakeholders emerged where stakeholders offered the Municipality practical support to assist in maintenance and repair of infrastructure and procurement of materials. **(Expansive learning steps - Implementing modelled solutions).**

History of the development and function of the MWF	
Date	**Event and significance**
Dec. 2017	**Second multi-session Change Laboratory Workshop.** The workshop also served as a platform to evaluate and reflect on the Forum's activities and progress during the year. I revisited the Problem Themes, previous remedial actions that we modelled for the prioritised problems and facilitated a reflection on their implementation and effectiveness in formal Forum engagements. The session was enriched by the participation of the Makana Water and Sanitation manager and an influential ward councillor. The ward councillor was purposefully invited to contribute to the analysis and modelling of remedial actions to the Problem Theme: Forum relationship with the MLM. The workshop served as the formal conclusion of the interventionist process and official handover of my leadership role as chairman of the Forum. **(Expansive learning steps – Questioning; analysis; modelling; examining the new model; reflecting on the process; and consolidating the new practice).**

Research process, data collection and data analysis to address Aim 6: To describe the key interacting activity systems comprising the Makana Water Forum activity system.

An analyst needs to take multiple viewpoints to understand an activity system. A systemic view (as if observing the activity system from above) should be complemented with a view of the activity system from the perspective of its subjects (Engeström, 1999).

I drew on participant observation, focus groups in the form of Research and Learning sessions, and two multi-session Change Laboratory workshops as data generation methods to develop a combined systemic and subject perspective understanding and description of the MWF multi-activity system constellation.

Being embedded and directly involved in the establishment process and coordination of the MWF allowed me first-hand insight into the structure and dynamics of the MWF. I was therefore well placed to identify the composition of the multi-activity system constellation that consisted of the MWF. I drew deductively on the second- and third-generation activity theory (Engeström, 2000), specifically the triangular activity system model, to identify and map the different activity system components of the MWF (subject, object, tools, rules, community of practice, division of labour and outcome).

I selected actors most responsible for the coordination of the MWF as the subject perspective through which to view the MWF, namely the MWF management committee and certain motivated MWF members. Building my understanding of the possible shared object of activity of the MWF required that I collect additional ethnographic data from the subjects. Foot (2009, p.16) explains that an object that is "embedded-in-activity can be understood as a complex, multi-faceted, organizing principle of an activity that evolves over time. An object is conceptualised, engaged and enacted by participants in the activity in diverse ways, resulting in differing object-concepts within the same activity system. Thus, the identification of an activity's object requires careful observation from multiple viewpoints within the activity system, ideally over time". To build a picture of the shared object of the MWF

activity, I dedicated part of the 3rd Research and Learning session (designed as a focus group (Chapter Three, Section 3.2.5) to questioning participants about their perceived purpose of the MWF. I later used the two multi-session Change Laboratory workshops with the subjects as participants to mirror my understanding of the MWF activity system and the possible shared object. This provided participants with the opportunity to negotiate and reconfigure all components of the MWF activity system as well as to understand each other's partial object conceptualisations. The process helped the participants and me to build a clearer picture of the complex, multi-faceted, and evolving MWF object.

Results pertaining to Aim 6: To understand and describe the key activity systems comprising the Makana Water Forum activity system.

The following description outlines the Makana Water Forum (MWF) activity system, a non-statutory multi-stakeholder water governance institution in the Makana Local Municipality (MLM). The MWF aimed to enable and facilitate collaborative stakeholder engagement in water, sanitation and catchment management in the MLM (object or problem space). My understanding of "object" is the common purpose that motivates people to work collaboratively within an activity system or between activity systems.

The MWF activity system is described from the point of view of the MWF executive committee (subject) who actively coordinated the function of the MWF to address its object. The MWF executive committee comprised key water stakeholders and actors who represented different stakeholder groups, including the Department of Water and Sanitation (Water Sector Support, and Mzimvubu to Tsitsikamma proto-Catchment Management Agency), the Makana Local Municipality (Directorate of Engineering and Infrastructure Services: Water and Sanitation Management, Communications Office, and a Ward Councillor), Rhodes University (Institute for Water Research, MobiSAM and Rhodes Music Radio), a traditional healer, and a civil society organisation (Private Eye Community Watch). Both the traditional healer and the CSO representative were members of the CSO network, the Eastern Cape Water Caucus.

A range of mediating tools were developed and accumulated over time, and used by the executive committee to address its water-related object. These included the MWF Terms of Reference document (containing details on, inter alia, the vision, scope, aims, objectives, roles and responsibilities of the MWF), MWF meetings, workshops and field trips (bi-monthly meetings, general meetings and committee meetings, strategic adaptive management workshops, stakeholder capacity development workshops, a river field trip and a water tour), technical information (reports, presentations, meeting minutes), strategies and action plans (Mutual Gains Approach, Makana Water Plan), communication resources and technologies (email, phones, stakeholder database, MWF

WhatsApp messenger group, public address system, MLM communications strategy), meeting venues and equipment, catering and intermittent transport.

The MWF committee engaged with and were influenced by other stakeholders who, to a greater or lesser degree, shared a common interest in matters relating to water, sanitation and catchment management in the MLM. Because of the relatively broad nature of the water-related object of the MWF, there were many stakeholders that formed the MWF community of practice. The Department of Water and Sanitation (Water Sector Support, Mzimvubu to Tsitsikamma proto-Catchment Management Agency, Communications division), Makana Local Municipality (Communications office, Directorate of Engineering and Infrastructural Services, Portfolio Committee for Engineering and Infrastructural Services, Municipal Manager, Councillors, Ward Committees), agricultural extension officers, large-scale water users (industry, commercial farmers, businesses, schools, Rhodes University), resource-poor farmers, Civil Society Organisations (Private Eye Community Watch, Eastern Cape Water Caucus, Water for Dignity, Grahamstown Residents Association, Grahamstown Business Forum, Wildlife and Environmental Society of South Africa), Community Development Workers, research institutions (Institute for Water Research (IWR), Public Services Accountability Monitor (PSAM), and MobiSAM), and other interested water stakeholders.

The practice of the MWF was guided by rules, cultural norms and conventions developed over time (rules). The MWF Terms of Reference stipulated the guiding principles of the MWF, objectives, timeframes for reporting on MWF matters to members (e.g. meeting minutes), and roles and responsibilities of committee members and stakeholders. There were expectations expressed by MWF stakeholders (informal rules), stipulations in the Natural Water Resource Strategy 2 (formal rules) as well as directives from the Minister of Water and Sanitation (formal rules). Committee members had obligations according to drafted action plans. To access resources from the Department of Water and Sanitation, certain protocols and procedures needed to be adhered to. Other political and administrative protocols determined the MWF's engagement with the municipality.

The work of the MWF was largely shared between the committee members and, to a certain extent, among more committed MWF members. The Chairperson had the responsibility of leading the committee, coordinating the MWF, and facilitating Forum meetings. The secretary was responsible for the administration of the MWF in terms of convening meetings, taking minutes and disseminating information to stakeholders. Other committee members advised and supported the function of the MWF. The MLM Communications Office was responsible for all MWF communication and stakeholder database management. The Department of Water and Sanitation was mandated to support catchment management forums and therefore played an important advisory and resource-support role to the MWF.

I have depicted the MWF activity system with the MWF committee as the subject. Subsequent diagrams of the MWF activity system describe the network nature of the MWF (**Figure 6.7** and **Figure 6.8**). However, for analytical purposes and a "requisite simplicity" of the MWF, a summarised version was useful (Stirzaker, Biggs, Roux & Cilliers, 2010). The summarised version was also more accessible to participants and served as effective mirror data and second stimulus to encourage discussion and analysis during the first and second multi-session CL workshops (**Figure 6.6**).

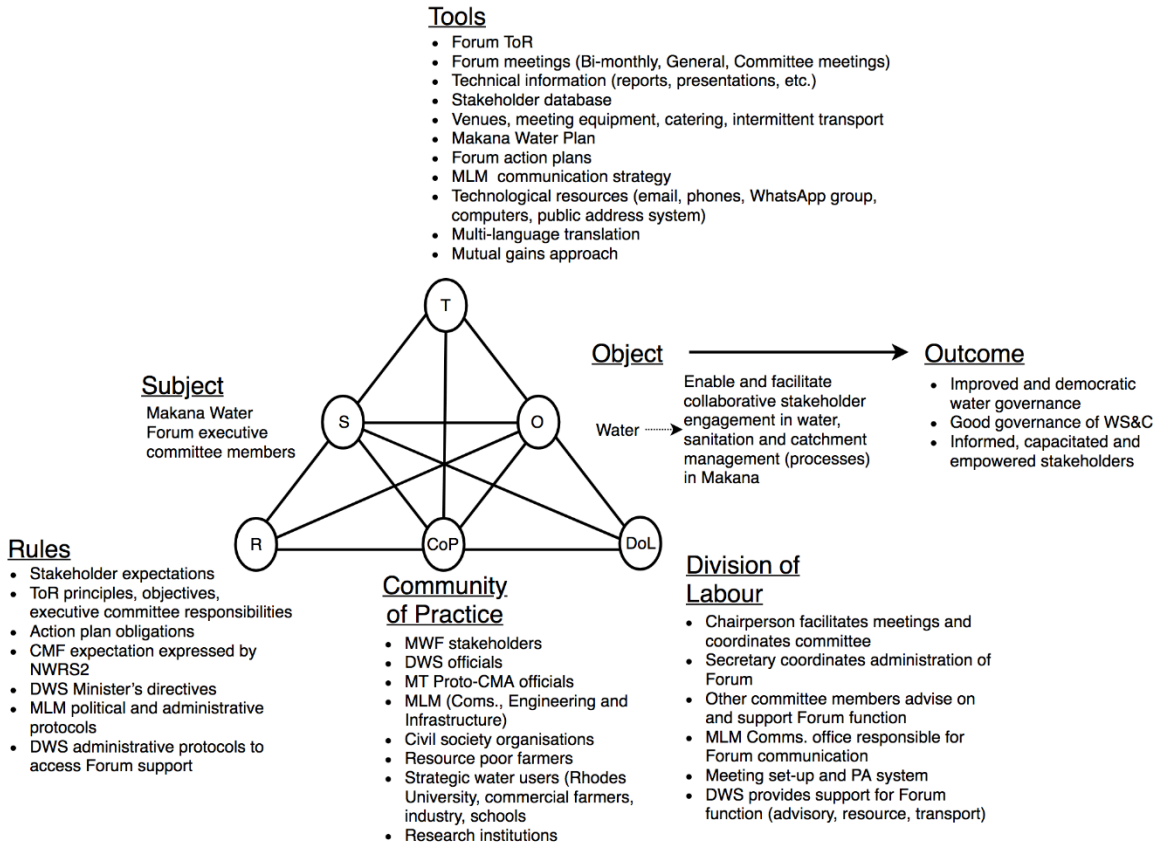


Figure 6.6: The Makana Water Forum (MWF) activity system and the elements of the six components of the activity system: tools (T), subject (S), rules (R), community of practice (CoP), division of labour (DoL) and object (O), as well as the intended outcome of the activity system practice. ToR = Terms of reference; MLM = Makana Local Municipality; CMF = catchment management forum; NWRS2 = second National Water Resource Strategy; DWS = Department of Water and Sanitation; MT proto-CMA = Mzimvubu-Tsitsikamma proto-Catchment Management Agency; WS&C = water, sanitation and catchment.

Identifying the shared object of the Makana Water Forum

The object of the Makana Water Forum activity system evolved and developed over time, influenced by the multiple water-related motives of different stakeholders' participation and their influence on the MWF agenda (**Table 6.3**). Consequently, the MWF object was in a constant state of flux. An analysis

of the historicity of the MWF showed the way in which its object evolved and developed (Section 6.4.1).

Table 6.3: The ancillary activity systems and what I perceived as their motives for participating in the Makana Water Forum (Meeting minutes, Participant observation journal – Appendices L8 & E2).

Activity system	Water-related motive
MLM Directorate of Infrastructure Development and Technical Services	Water supply of a sufficient quantity and quality for consumers
MLM Engineering and Infrastructural Services Portfolio committee	Oversight of administration responsible for quality water supply to consumers
MLM Ward councillors and committee members	Water and sanitation for citizens in their wards - Resolution of water service provision issues through government decision making processes
Environmental Monitoring Group	Social-ecological and climate change justice
Eastern Cape Water Caucus	Social-ecological and climate change justice
Industry and businesses	Sufficient quantity and quality water supply for industrial and business productivity and sustainability
Grahamstown Residents Association	Sufficient quantity and quality water supply for Grahamstown residents (members)
Eastern Cape Office of the Premier	Local government support of the MLM to deliver services
Community development workers	Support for resolving water-related issues experienced by ward citizens they are responsible for
Rhodes University Community Engagement	Community engagement in water issues
Public Services Accountability Monitor	Oversight of MLM governance processes evident in MWF engagements
Water for Dignity	Water service equity and justice
Commercial farmers	Water supply for irrigation
Resource-poor farmers	Water supply for agricultural productivity
Schools	Sufficient quantity and quality water supply for students

The stakeholders who participated in the MWF could be visualised as an activity system network that converged at varying temporal frequencies to address a partially shared object, or when their different objects aligned with the water-related object of the MWF. The broad network of activity systems that participated in the MWF is depicted in **Figure 6.7**. These include the subject and the community of practice of the MWF central activity system. The subject of the MWF and the orientation from which the MWF was analysed was the Forum Executive Committee. The Committee was elected to represent the wide range of stakeholders that the MWF aimed to service and can be viewed as comprising a

number of activity systems **(Figure 6.7)**. The absence of representation from certain stakeholder groups (e.g. agriculture and business) was, they claimed, largely due to time and commitment constraints.

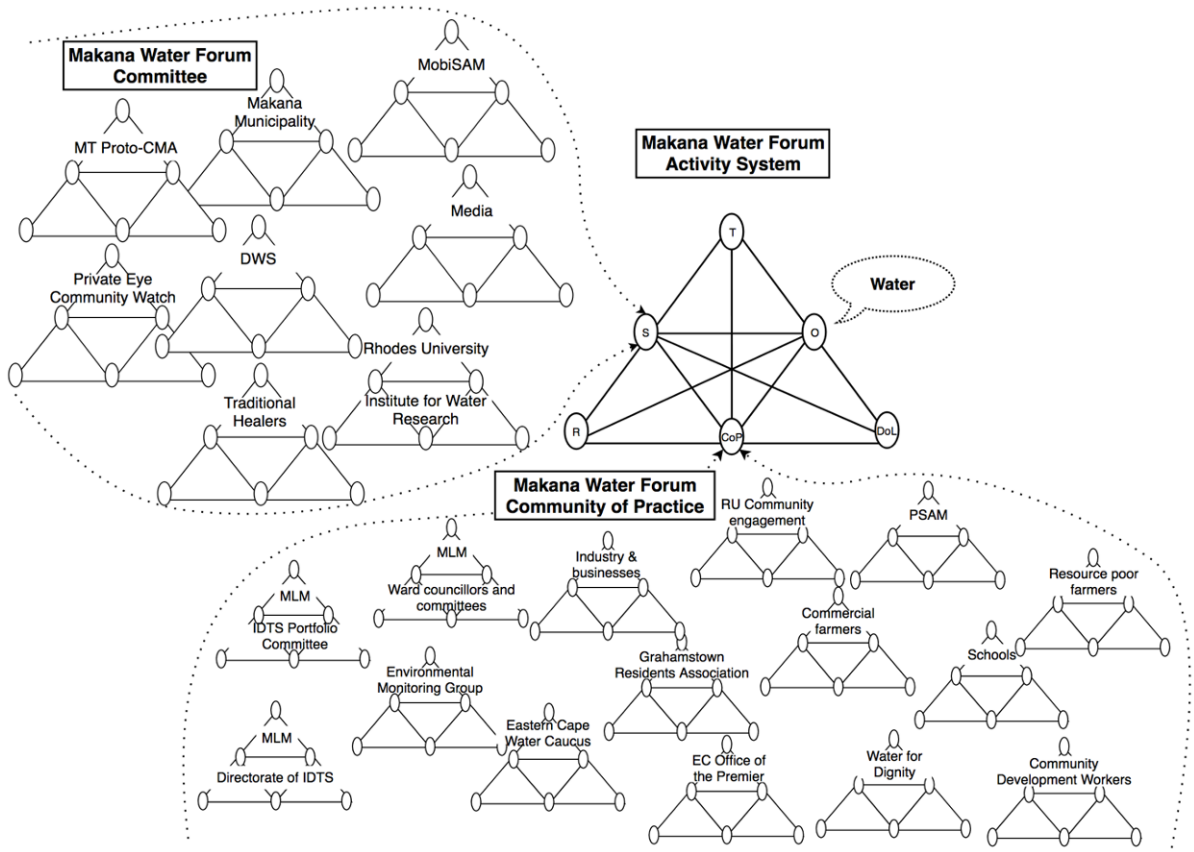


Figure 6.7: The network of participating activity systems in the Makana Water Forum (MWF) activity system. I selected the MWF committee, the most active MWF members, as the subject (S) of the MWF activity system analysis. The MWF committee were elected by the broader MWF stakeholder group (the MWF community of practice (CoP), to represent their interests. The shared object (O) of the MWF, at its simplest form, was water. Other components of the MWF activity system, tools (T), rules (R) and division of labour (DoL) are depicted in Figure 6.6. DWS = Department of Water and Sanitation; MT proto-CMA = Mzimvubu-Tsitsikamma proto-Catchment Management Agency; IDTS = Infrastructure Development and Technical Services; PSAM = Public Services Accountability Monitor.

Water and stakeholders' varying water-related interests was the raw material (sensu Engeström, 1987) that motivated stakeholders to participate in the MWF. The MWF committee represented the different water-related interests of participating stakeholders in the MWF and the MWF committee members articulated these interests and motives (objects) during the fourth formative intervention session. I combined these articulated interests and motives with the objectives and vision outlined in the MWF Terms of Reference (Appendix L2) to depict a first-draft expanded object of the MWF.

I presented this first-draft expanded object to the MWF committee members during the expansive phase of the formative intervention as mirror data in the first multi-session CL workshop for verification and validation (Appendix L5a: first-draft of the expanded object of the MWF that I compiled and presented in the first multi-session CL workshop). Taking these additions into account,

I revised the MWF expanded object and presented a second-draft for further validation in the second multi-session CL workshop. The MWF expanded object depicted in **Figure 6.8** is the final product these two iterations.

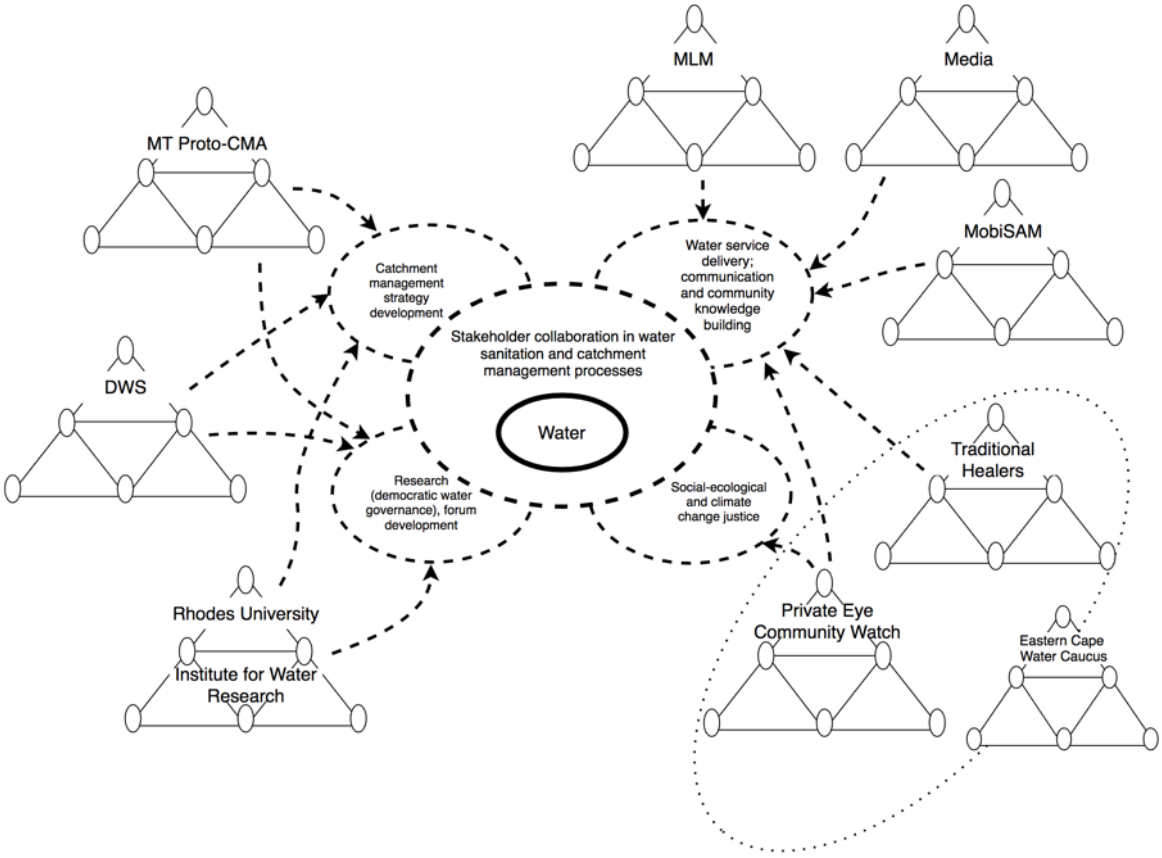


Figure 6.8: The expanded object of the Makana Water Forum (MWF). MWF committee members each represented an ancillary activity system that had slightly different water-related objects (the start locations of arrows from ancillary activity systems are not significant). These different water-related objects overlapped to form a common object: stakeholder collaboration in water, sanitation and catchment management processes (thick-dashed circle). At its simplest form, water is the object that brings different activity systems to participate in the MWF (solid inner circle). Committee members represented traditional healers and the non-profit organisation Private Eye Community Watch are both members (lightly dotted circle) and aligned with the object of the civil society organisation, the Eastern Cape Water Caucus (ECWC). MLM = Makana Local Municipality; DWS = Department of Water and Sanitation; MT proto-CMA = Mzimvubu-Tsitsikamma Catchment Management Agency.

6.4.2 Expansive phase

In the following section, I elaborate on the formative interventionist process conducted with the MWF. This serves as a combined description of the research process, data collection and analysis to address the seventh and eighth aims of the chapter. I then present the results pertaining to each aim in their own separate results sections. The seventh and eighth aims are:

- To understand and surface contradictions affecting the functioning of the Makana Water Forum activity system and its ability to enable participatory water governance.
- To report on the development of remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function.

The expansive phase of the research was characterised by my deliberate action to initiate a formative intervention process and facilitate intervention sessions with the MWF. The purpose of the intervention sessions was to guide MWF management committee members (**Box 6.4**) through the sequential epistemic learning steps of the expansive learning cycle so as to overcome critical problems constraining the MWF function. The learning steps served to guide participants gradually through a process of expanding from the abstract to the concrete (Sannino, 2015b; Sannino & Engeström, 2017) (Section, 6.3). This process was enabled and accelerated through a process of double stimuli (Sannino, 2015b), using mirror data of work-related problems as a first stimulus, and the second-generation triangular activity system model and additional mirror data as a second stimulus. Early expansive learning actions served to surface abstract ideas, partial conceptualisations of the issues that the MWF was facing, and preliminary, germ-cell remedial actions (Sannino & Engeström, 2017) to these problems. As participants advanced through the expansive learning steps, and through the analysis of problems, modelling, testing and evaluating and implementing of remedial actions, the germ-cell ideas grew into more concrete, actionable concepts and remedial actions (Section 6.3).

The formative intervention with the MWF needed to be adapted from the typical CL method developed by Engeström et al. (1996). Typically, the CL method involves conducting a series of five to eleven carefully facilitated workshops, each lasting approximately two hours (Virkkunen & Newnham, 2013). Engeström et al. (1996) designed the CL workshop process to facilitate participant navigation of the seven learning steps of the expansive learning cycle **(Figure 6.4)**. Workshops are facilitated by one or more interventionist researchers and include content specialists and practitioners and managers from the activity system(s) of interest.

With CLs increasingly being conducted in multi-activity system networks (Engeström et al., 2014), outside of well-structured, largely contained work environments that the CL method was developed in, researchers have had to adapt the CL method (Engeström, 2017). Formative interventions using the CL method are increasingly being conducted in contexts less conducive to the typical CL method (Mukute & Lotz-Sisitka, 2012; Pesanayi & Weaver, 2016; Engeström, 2017; Mukute et al., 2018). Engeström raised three key challenges experienced in conducting CLs that require methodological adjustment (2017, p.2):

> 1. Increasingly complex and contested social nature of problems and needs in [CL] interventions … objects and issues analysed … cannot anymore be treated as primarily technical; … are

increasingly political and moral challenges, often riddled with power struggles. … Issues and tensions of languages as well as ethnic, tribal, racial and political histories between stakeholders, as well as between participants and interventionists have surfaced.

2. Increasingly distributed and heterogeneous composition of parties that need to be involved in a [CL] intervention.
3. Increasingly longitudinal and multi-cyclic character of transformations. A single cycle of expansive learning only leads to first steps of the sustainability transformation, calling for additional cycles and efforts to secure continuity.

Many of these characteristics were echoed in the MWF intervention setting, including the complex, contested and multi-faceted nature of water as the broad object of activity, and the heterogeneous (varying psychological and material resource capacity) and distributed nature of participants (some participants living in cities 100-200 km away). Committee members of the MWF would convene on a monthly basis for two hours for committee meetings and two to four hours on a quarterly basis for General MWF meetings (public meeting). The majority of participants participated in the MWF on a voluntary basis (although some MLM and DWS officials were duty bound to participate) and therefore, had limited time to engage in the business of the MWF outside their core work commitments. As a result, MWF work was prioritised during engagements, requiring careful negotiation to allocate time to conduct the CL intervention.

Box 6.4: Box detailing the core participants of the Makana Water Forum (MWF) management committee who engaged in the formative intervention process with the MWF. The formative intervention process included four research and learning sessions and two multi-session Change Laboratory workshops.

Core participants of the formative intervention process

Participants were drawn from the management committee of the Makana Water Forum (MWF). Regular committee meetings made it easier to acquire buy-in from committee members to commit to a development process. Furthermore, the committee represented, to a certain extent, the diverse members of the MWF.

- The Department of Water and Sanitation (DWS) was well represented: four participating officials, including three based in Port Elizabeth, from the Mzimvubu to Tsitsikamma proto-Catchment Management Agency, two of whom specialised in the establishment and support of catchment management forums; the third, an engineer, specialised in the development of catchment management strategies; the fourth was an official responsible for Water Sector Support and was based in King William's Town. The combined DWS officials had vast experience in the water sector, including the management of water resources, past and current experience in the establishment and function of water management institutions, and technical water system knowledge. Although the DWS was well represented and a powerful stakeholder, they had an explicit intention to not dictate how the MWF should be run, but rather to encourage inputs and influence of local-based members.
- The second key committee representatives were four people from the Makana Local Municipality, three of whom were from the Municipal Communications Office and one, the Water and Sanitation Manager, from the Directorate of Infrastructure Development and Technical Services. The Water and Sanitation Manager was a critical member, firstly, for her current knowledge of the status and operation of the municipal water system, and secondly, she was a direct link for the MWF to influence municipal water management. A fifth municipal member, a ward councillor, joined towards the end of the interventionist process. His inclusion was partly for strategic reasons, to assist in addressing the issues related to the Forum's relationship with the MLM.
- Rhodes University was represented by three researchers, two from the Institute for Water Research and one representing MobiSAM, a mobile services accountability reporting and monitoring technology. Although the MLM was responsible for all communication and some secretariat services of the Forum, general and broader municipal dysfunction hindered their ability to carry out these functions effectively. As a result, researchers from the Institute for Water Research played an important role in shouldering the coordination and secretariat load. In addition, the Institute's persistent involvement and interest in the sustainability of the Forum resulted in me being nominated and

Core participants of the formative intervention process

elected as the interim chairperson to lead the MWF. An additional two post-graduate students joined the committee towards the end of the interventionist process to assist in coordinating the Forum.

- Three community members lived in Grahamstown East served to partly represent the interests of the Grahamstown East community as well as their individual professional interests. One led a civil society organisation, Private Eye Community Watch Project. The second was a Sangoma (a traditional healers' representative). Both the civil society organisation and traditional healer representatives were members of the Eastern Cape Water Caucus, a civil society organisation network addressing water and climate change justice. Lastly, the third was elected as a youth representative but also represented the media as he worked for a local radio station.

The schedule and design of a CL workshop can be adapted to suit the participant availability and context in which the CL intervention is to be conducted (Engeström, 2017; Mukute et al., 2018). Workshops can be run as a sequence of single session workshops every few weeks, or conducted as fewer, longer workshops consisting of multiple sessions (Lindley, 2014).

Time constraints of MWF committee members limited their ability to commit to an extensive CL process and required that I make two adaptations to the typical CL method (Virkkunen & Newnham, 2013). The first adaptation included conducting four short (30–60 minute) interventionist sessions within MWF meetings termed "research and learning sessions", two during public meetings, and two during management committee meetings. The second adaptation included conducting two intensive multi-session CL workshops; the first consisted of three two-hour sessions and the second of two two-hour sessions (Photographs in Appendix L1). The formative intervention with the MWF therefore consisted of four research and learning sessions and two multi-session Change Laboratory workshops.

For the multi-session CL workshops, I emulated the pedagogical guidelines and venue set-up described in the CL toolkit developed by Virkkunen and Newnham (2013) as closely as possible, given the context and resources available. I conducted the CL workshops in open meeting rooms, chairs were arranged in a horse-shoe shape facing a board and projector screen. I used the board and projector to present mirror data and record participant inputs relating to past, present and future of the MWF activity (photographs in Appendix L1).

Audio was recorded in all sessions and transcribed for analysis to inform subsequent sessions (Appendix L7). I analysed raw data inductively (Section 3.2.6) to identify evidence of problems and collate problem-related data into a "problem" analytical memo (a document containing all problem-related raw data). I then analysed the problem analytical memo deductively, according to Engeström & Sannino's (2011) contradiction manifestation classification: conflicts, critical conflicts, double binds and dilemmas. Although these classifications aided in identifying contradictions from raw data, they were less useful as categories when mirroring contradiction manifestations back to participants as a first stimulus (problems are manifestations of underlying contradictions **(Figure 6.3)** (Engeström & Sannino, 2011)). Participants related better to simple language such as "problems" and "problem

themes" as opposed to "contradictions" and "manifestations of contradictions". I therefore reanalysed the problem analytical memo inductively to generate Problem Themes which served as accessible material for mirroring to Change Laboratory participants.

Box 6.5: Description of initial intervention sessions, research and learning sessions, with the Makana Water Forum (MWF). Each session lasted from 30 to 60 minutes. I state the expansive learning steps that guided each session.

Research and learning sessions:

Research and learning sessions served as important intervention sessions to generate mirror data for subsequent multi-session Change Laboratory workshops as well as to take participants through the questioning step of the expansive learning cycle.

1st Research and learning session: (Questioning expansive learning step):

- Conducted during the Stakeholder Capacity Building Workshop (27 October 2016) open to the public. I facilitated workshop-style break-away discussion groups where I prompted stakeholders to raise their priority water-related concerns and suggest remedial actions to address them.

2nd Research and learning session: (Questioning expansive learning step):

- Conducted during a General MWF meeting (15 May 2017) open to all the public. I facilitated workshop-style break-away discussion groups where I prompted stakeholders to discuss three emergent problem areas that the MWF sought to address: 1) issues related to the drought water service delivery, 2) issues related to sanitation services and catchment health, and 3) issues related to representation, non-participation, and equitable participation in the MWF.

3rd Research and learning session:

- I conducted a focus group during an MWF Committee meeting (26 July 2017) in which I introduced and discussed the CL process and attained buy-in and commitment to conduct more intensive, multi-session CL workshops.

4th Research and learning session: (Questioning expansive learning step):

- I conducted a focus group during an MWF Committee meeting (17 August 2017) to explore the shared object and key challenges the MWF experienced. Committee members shared their perceptions of the purpose of the MWF (object) and in doing so, built their (and my) understanding of the possible shared purpose (shared object) of the MWF. Committee members then reflected on the existing practice of the MWF and shared their perceptions of the main challenges and problems that the MWF experienced.

Box 6.6: Description of the 1st multi-session Change Laboratory Workshop with the Makana Water Forum committee (14 September 2017). Each session lasted approximately two hours. I state the expansive learning steps that guided each of the three comprising intervention sessions (CL 1a, CL 1b and CL 1c).

1st multi-session Change Laboratory workshop (Figure 6.9)

In the 1st multi-session CL workshop, I facilitated participants through the first four steps of the expansive learning cycle: questioning, analysis (historical and actual-empirical), modelling (the systemic cause of problems and remedial actions) and examining the new model remedial actions.

Four sets of mirror data were presented during the workshop: 1) my articulation of the shared object of the MWF; 2) a problem constellation of issues of concern raised by stakeholders and participants, organised into seven problem themes, each with supplementary problem-related data; 3) a photograph-text based timeline of the development of the MWF leading up to the CL workshop; and 4) a populated version of my interpretation of the MWF activity system depicted on a second-generation triangular activity system model (mirror data included in Appendix L5). I encouraged the participants to validate, analyse, reconfigure and reframe mirror data that I presented.

CL 1a: Introduction and reconfiguring the object (Questioning expansive learning step)

1st multi-session Change Laboratory workshop (Figure 6.9)

- I reintroduced participants (Box 6.4) to the CL process and the expansive learning cycle (Figure 6.5). This served to situate and track the progress of the MWF committee along the expansive learning cycle and indicate upcoming expansive learning steps of the intervention process.
- We reflected on the purpose (object) of the MWF. This was aided by mirroring data I collected on what committee members felt was the primary role of the MWF (data collected during 4th research and learning session) as well as the role of the MWF as indicated in the MWF Terms of Reference (Appendix L2). I presented this mirror data as a PowerPoint slide of the object in a second-generation activity system model. Consequently, this initial reflection also served as an introduction to the notion of the activity system as a unit of analysis and tool for depicting the MWF activity system. Participants negotiated and reconfigured the object components (Appendix L5e).

CL 1b: Exploring, prioritising and understanding MWF problems (Questioning and Analysis expansive learning steps):

- I presented the problems related to the MWF practice to the participants of the CL as a problem constellation. These problems were a collection of issues of concern related to the MWF raised by MWF stakeholders and the MWF committee members during research and learning sessions. I compiled and organised these problem-related data into seven Problem Themes, which together, comprised the problem constellation. Problem Themes were essentially manifestations of underlying contradictions in the MWF. The problem constellation served as a first stimulus to encourage the empirical analysis of problematic aspects of the MWF practice.
- Participants collaboratively validated, expanded, reconfigured, and drew linkages between similar Problem Themes. Two similar Problem Themes (all relevant sectors not represented within the Forum and representivity of Forum participants) were merged (representation, representivity and non-participation), creating six Problem Themes.
- Participants prioritised two Problem Themes for immediate, deeper analysis and modelling of remedial actions: lack of focus of the MWF and representation, representivity and non-attendance (CL 1a). Lack of buy-in from the MLM was also highlighted as important and flagged by participants for priority attention during a subsequent Change Laboratory workshop.
- Participants then conducted an historical analysis to identify past causes of the first two prioritised Problem Themes. This analysis was catalysed by a photograph-text timeline depicting the historical development of the MWF (2nd stimulus). The timeline further served as a valuable tool to reacquaint and enlighten participants of the development process of the MWF, particularly those who were not involved during the early establishment of the MWF. The development process was recounted by participants who were involved during distinct MWF development stages and, in doing so, built a mutual understanding of the history of the MWF.
- Participants then conducted an actual-empirical analysis of prioritised Problem Themes. The second-generation activity system triangle was presented (**Figure 6.1**) as a second stimulus to aid participants to identify the root causes of the first two prioritised Problem Themes. I provided a populated activity system model of my interpretation of the MWF activity system as a starting point (**Figure 6.6**). Participants critically analysed, validated and reconfigured each of the six activity system nodes (subject, tools, object, rules, community of practice and division of labour). The modified MWF activity system triangle was then used to map contradictions and tensions between components that could have caused or contributed to each of the two prioritised Problem Themes.

CL 1c: Developing, examining and critiquing model remedial actions (Modelling and Examining the new model expansive learning steps):

- Lastly, participants collaboratively engaged in conceiving practical remedial actions to the first two prioritised Problem Themes. The distributed cognition of different participants, some with experience in running catchment management forums, proved valuable in this process. Participants also critiqued and discussed the pitfalls of the model remedial actions. Participants initially used the reconfigured MWF activity system triangle as a second stimulus to plot remedial actions, but subsequently opted to record modelled remedial actions in a simple problem-remedial action table (**Figure 6.9**). It was agreed that I would later plot the remedial actions onto an activity system triangle. The session ended with a discussion and agreement on model remedial actions and their required division of labour for implementation in upcoming MWF engagements.

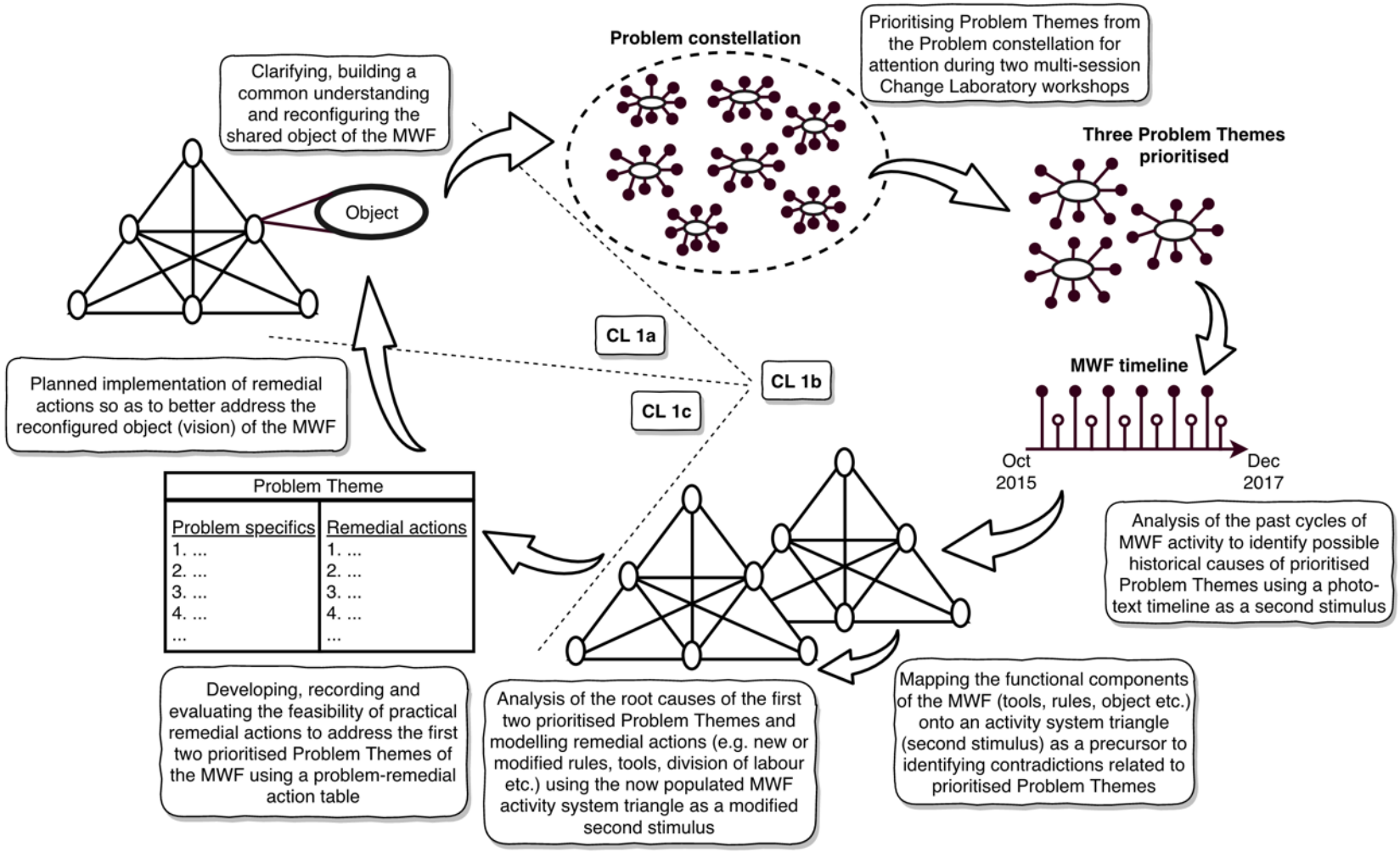


Figure 6.9: Process of the 1st multi-session Change Laboratory (CL) workshop with the Makana Water Forum (MWF) committee. The dots surrounding each Problem Theme represent supplementary problem-related data. The three intervention sessions of the CL (CL 1a, b & c) and the processes that occurred during each are delineated (dotted lines).

Box 6.7: Description of the 2nd multi-session Change Laboratory Workshop with the Makana Water Forum committee (6 December 2017). Each session lasted approximately two hours. I state the expansive learning steps that guided each of the three comprising intervention sessions (CL 1a, CL 1b and CL 1c).

2nd multi-session Change Laboratory workshop (Figure 6.10)

The second CL workshop comprised two sessions. The first session was designed to complete a cycle of expansive learning by engaging in the final two expansive learning steps, reflecting on the process, and consolidating and generalising the new practice (**Figure 6.5**). The second session returned to the analysis expansive learning step to address the remaining, third prioritised Problem Theme: lack of MLM buy-in into the MWF.

CL 2a: Revision and reflection on the intervention process (Reflecting on the process and Consolidating the new practice expansive learning steps):

- To assist in the reflection session, I drafted and sent a short report on the intervention process to participants in preparation for the 2nd multi-session CL workshop. The report included: the seven Problem Themes and their supporting problem data, the three prioritised Problem Themes, the remedial actions modelled to address the prioritised Problem Themes, and progress on the implementation of these actions during MWF engagements. As a pre-workshop task, participants were requested to review the effectiveness of implemented remedial actions modelled for the prioritised Problem Themes and suggest possible modifications or changes for future implementation.
- The reflection session began with a review of the formative intervention and the expansive learning process to date, which included: taking participants through the revised MWF activity system model, the MWFs position in the greater activity system network, and recapping the seven of the Problem Themes and their supporting problem data. This process served to acquaint new-comers with the progress of the intervention to date, and to remind and reinforce the process for regular attendees.
- Deviation from my interventionist script occurred (and was supported), when discussion of an unprioritised Problem Theme, communication capacity of the MWF, became a major talking point. This Problem Theme was escalated to a priority Theme for further attention. Participants subsequently launched into analysing and preliminary modelling of possible remedial actions to the Theme.
- After the reflection and discussion on the now fourth prioritized Problem Theme, participants highlighted and agreed upon successful remedial actions to be concretised and formalised into future MWF practice.

CL 2b: Analysis of the third prioritised Problem Theme (Analysis and Modelling expansive learning steps):

- The remainder of the workshop was dedicated to analysing and modelling remedial actions for the third prioritised Problem Theme. I presented updated mirror data of recent problem experiences related to the Problem Theme as a first stimulus. Analysis and modelling loosening actions steps were greatly assisted by the participation of two content specialists: the MLM Water and Sanitation Manager, and an influential Ward Councillor who had shown interest in the MWF and regularly attended its engagements. They provided insight into identifying causal explanations and suggested practical and realistic model remedial actions to the Problem Theme. Participants identified further possible remedial actions, including the required division of labour for their implementation in subsequent MWF processes.
- Participants agreed that remaining unprioritised Problem Themes would be set aside for future attention.
- This session marked the end to the formal interventionist process into the MWF and concluded with a final reflection activity where I asked that participants share their personal reflections of being part of the formative intervention process.

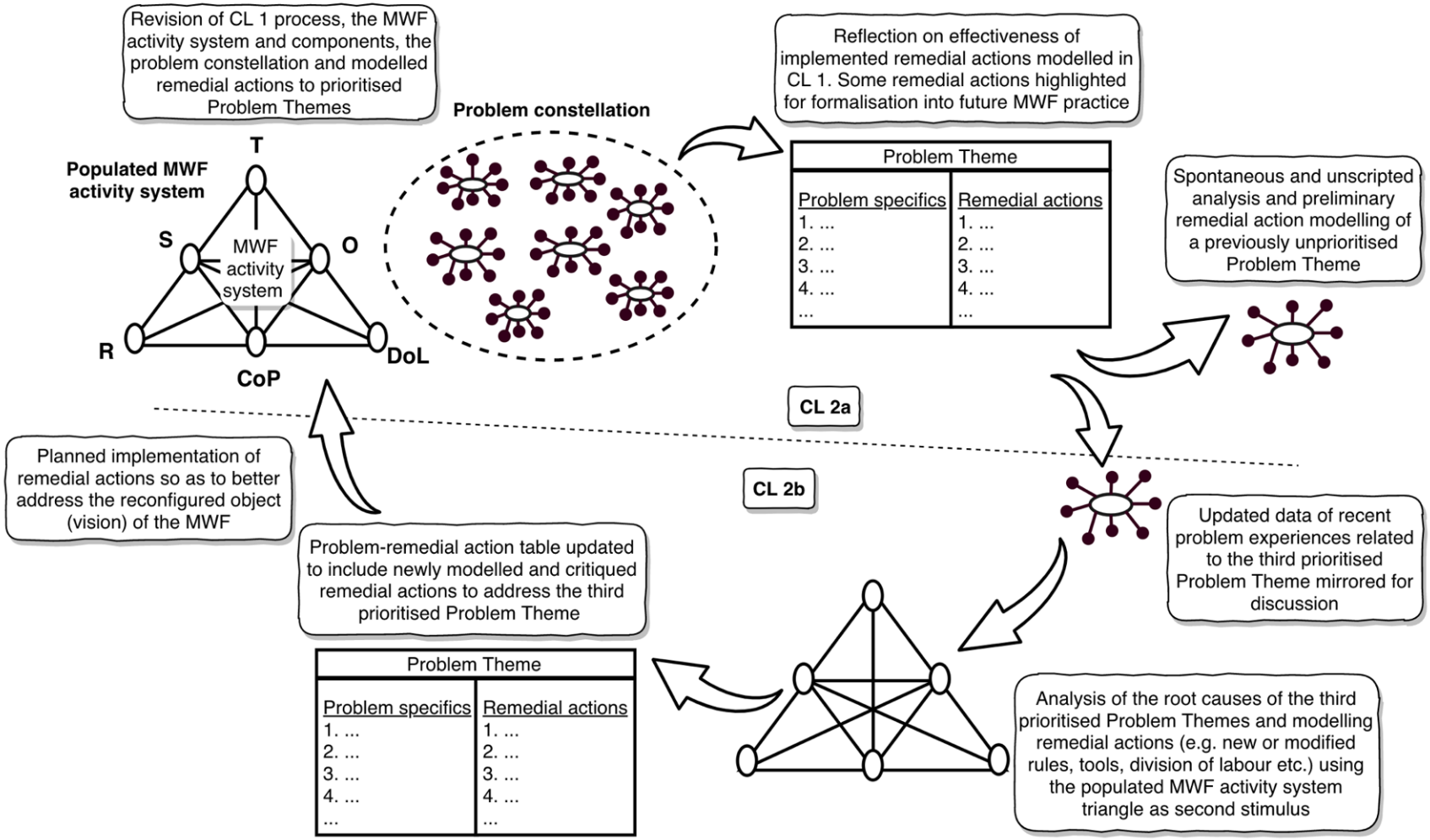


Figure 6.10: Process of the 2nd multi-session Change Laboratory (CL) workshop with the Makana Water Forum (MWF) committee. The dots surrounding each Problem Theme represent supplementary problem-related data. The three intervention sessions of the CL (CL 2a & b) and the processes that occurred during each are delineated (dotted lines).

Results pertaining to Aim 7: To understand and surface contradictions affecting the functioning of the Makana Water Forum activity system, and its ability to enable participatory water governance.

Engeström and Sannino (2010) highlight four types of contradictions: primary contradictions occur within elements of an activity system, secondary contradictions occur between elements of an activity system, tertiary contradictions occur between a newly envisioned activity system and past remnants of the same activity system, and quaternary contradictions occur between different interacting activity systems **(Figure 6.3)**.

In the following section I present data and interpretation of the main Problem Themes that the MWF experienced **(Table 6.4)**. I also present what I inferred as the underlying contradictions related to each Problem Theme. These data are presented in a series of tables (**Table 6.5**, **Table 6.6**, **Table 6.7**, **Table 6.8**, **Table 6.9** and **Table 6.10**). In addition, I have developed heuristics to indicate the level of contradictions (primary to quaternary, see **Figure 6.3**) and different activity systems involved, in each Problem Theme (**Figure 6.11**, **Figure 6.12**, **Figure 6.13**, **Figure 6.14** and **Figure 6.15**).

Table 6.4: Table outlining the Problem Themes that participants prioritised to focus on during the ongoing Change Laboratory sessions. The numbering reflects the original order in which the problem themes were discussed in the first multi-session Change Laboratory workshop.

Priority number	Word signifier	Problem Theme
1	**Focus**	Lack of focus of the MWF
2	**Participation**	Representation, representivity and non-participation (merger of two Themes)
3	**Municipality**	Forum relationship with the MLM (Councillors, Municipal Manager and Directorate of Infrastructure and Engineering)
4	**Communication**	Communication capacity and strategy of the MWF (emerged as a priority during second change laboratory workshop)
Unprioritised	**Function**	Functioning of the Makana Water Forum (MWF)
Unprioritised	**Impact**	"Law of the lid" (impact of the MWF and effectiveness of achieving its objectives)

Table 6.5: Problem Theme 1 related contradictions within and between activity systems engaging with the Makana Water Forum activity system that hindered collaborative stakeholder engagement in water, sanitation and catchment management processes. (A problem is a manifestation of a contradiction. I grouped problems into seven themes. I inferred underlying contradictions linked to identified problems within each problem theme. The first statement(s) is (are) empirical (underlined). I then nuanced and expanded empirical statement(s) drawing on a range of primary data sources (italicised text). The location of the inferred contradictions within and between activity systems are indicated by two statements (separated by "and") and depicted graphically in Figure 6.11).

Problem Theme 1: Focus (lack of focus of the MWF)	
Evidence and deepening of contradiction manifestations	**Inferred contradiction (Figure 6.11)**
a. <u>We struggle to paint a clear way forward, we do not have a clear vision, our focus is too broad for the capacity that we have</u> (AMj, 3rd R&L Session, 26 July 2017). <u>[…] [W]e have adopted water, sanitation and catchment as a broad focus. Giving these areas the required attention while facilitating insightful meetings is a challenge</u> (MW, 3rd R&L Session, 26 July 2017). Some committee members felt that the MWF lacked a clear direction and that its focus on water and sanitation services and catchment health was too broad for the current financial and human capacity of the committee. This broad focal area resulted from the merger of a community water and sanitation forum and catchment management forum and therefore the focus could not easily be narrowed without excluding one of these focal areas. It was found that some committee members who were not part of the early development and merger phase of the Forum during which the Forum Terms of Reference was drafted, were unfamiliar with the document which outlined the vision, aims and objectives of the Forum.	Primary contradiction between the use of the MWF Terms of Reference (ToR) as the official guiding document for committee members and participants (indicating the MWF aims, objectives and vision), **and** the physical and conceptual accessibility of the ToR. Secondary contradiction between MWF committee members unfamiliarity of their shared object and lack of understanding, **and** awareness of the vision, focus and objectives of the Forum as described in the Terms of Reference (ToR) (subject and tools). Quaternary contradiction between the broader stakeholder understanding of the purpose of the MWF (unclear shared object), **and** the physical and conceptual accessibility, effectiveness of the ToR as a tool to build this understanding.

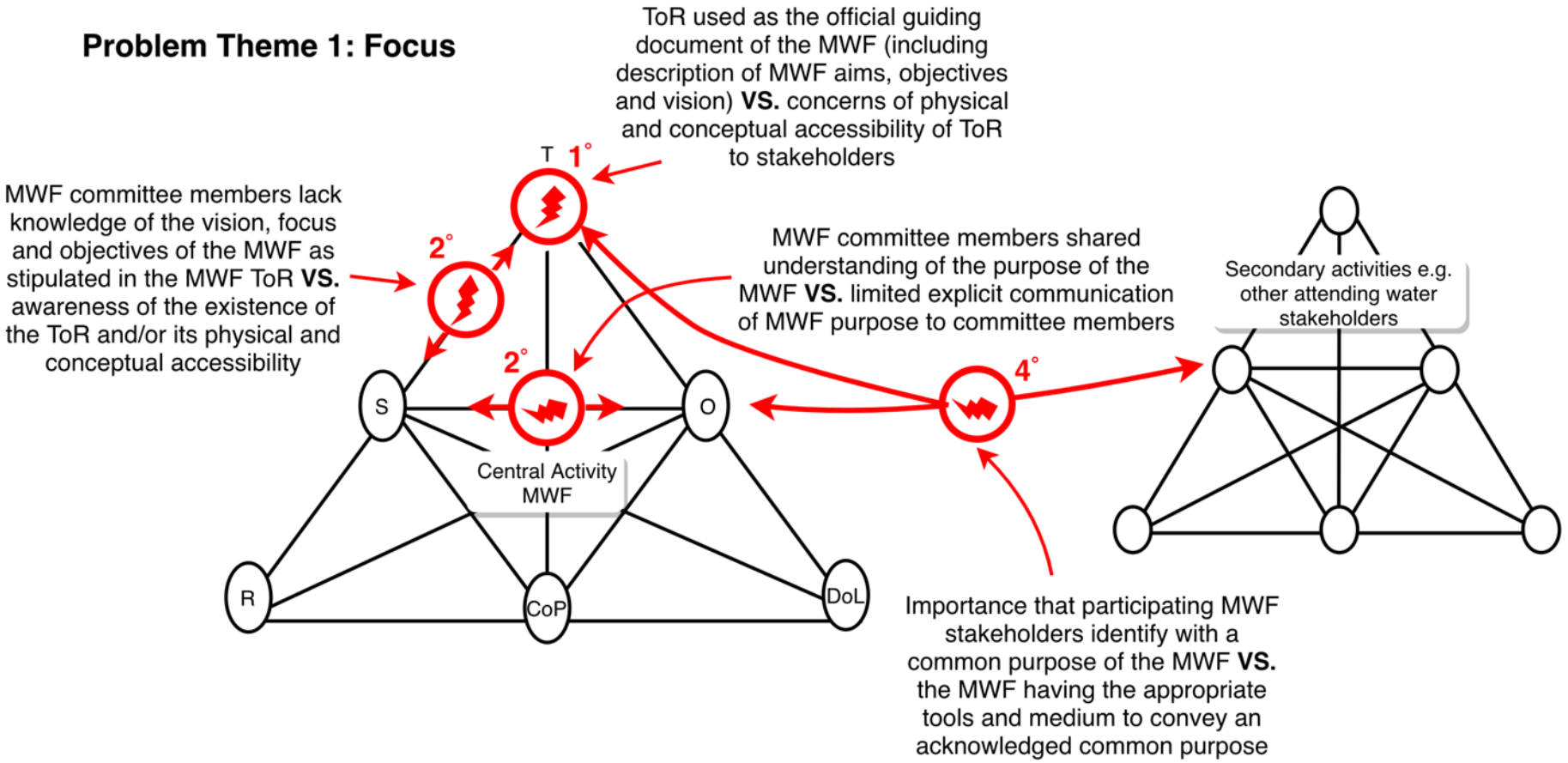


Figure 6.11: Activity systems and the contradictions relevant to the first prioritised Problem Theme: Focus (lack of focus of the MWF). Red lightning bolts and arrows depict contradictions. Contradiction levels are denoted as numbers from primary (1°) to quaternary (4°) levels. The elements of the central activity system are represented by letters: subject (S), tools (T), object (O), division of labour (DoL), community of practice (CoP) and rules (R). Unless indicated otherwise, arrows connecting to interacting neighbouring activity systems are to the activity system as a whole and not to a specific element of the neighbouring activity system. VS. = versus).

Table 6.6: Problem Theme 2 related contradictions within and between activity systems engaging with the Makana Water Forum activity system that hindered collaborative stakeholder engagement in water, sanitation and catchment management processes. (A problem is a manifestation of a contradiction. I grouped problems into seven themes. I inferred underlying contradictions linked to identified problems within each problem theme. The first statement(s) is (are) empirical (underlined). I then nuanced and expanded empirical statement(s) drawing on a range of primary data sources (italicised text). The location of the inferred contradictions within and between activity systems are indicated by two statements (separated by "and") and depicted graphically in Figure 6.12).

Problem Theme 2: Participation (representation, representivity and non-attendance)	
Evidence and deepening of contradiction manifestations	**Inferred contradictions (Figure 6.12)**
a. Non-attendance by stakeholders (e.g. resource-poor farmers (RPF)) and other sector departments and outside stakeholders who are relevant to the Forum (Participant Observation Journal; SM, 3rd R&L Session, 26 July 2017). Sense that the Forum is not attentive to RPF needs (MR, PC, 3rd R&L Session, 26 July 2017). No representation of RPFs on committee (YR, 3rd R&L Session, 26 July 2017). There was a noticeable absence of important sector departments such as Agriculture, Cooperative Governance and Traditional Affairs (CoGTA), Health, Education and Environmental Affairs, all of which have responsibilities related to water. These departments provide professional support to address the diverse water-related needs and issues voiced by Forum stakeholders.	Quaternary contradictions between the lack of recognition of stakeholder motives, **and** the motive presented by the MWF. Quaternary contradiction between the broad MWF purpose, as stipulated in the Terms of Reference, that aims to encompass all water stakeholder motives, **and** stakeholders' multiple, varied and often specific needs and objectives (there is a lack of an explicit common boundary object between the MWF and participating stakeholders).
b. The Forum is not feeding back to specific needs of participating stakeholders which has resulted in non-participation (e.g. resource-poor farmers' borehole status, commercial farmers' water restrictions, and future water availability and clearing of alien trees from catchments) (PC, 3rd R&L Session, 26 July 2017). Stakeholders expect to benefit from their investment of time and money (transport) to attend MWF engagements. Receiving relevant information is a benefit that, if the MWF cannot deliver on, would result in disbenefits to stakeholders and likely non-attendance in future events.	Secondary and quaternary contradictions between the MWF object to be inclusive of all water stakeholders, **and** its committee members' communication capacity and effective use of communication tools to effectively engage with stakeholders and respond to their different needs.
c. "Those that complain the most are not here" (PSAM member, Grahamstown Water Tour, 12 Sep 2017). Comment on non-attendance in MWF engagements. The MWF facilitated engagements that were seen as beneficial (community water capacity building) by those that participated and there was hope that increased understanding would result in meaningful and constructive engagement in water governance processes rather than adversarial engagement (e.g. protests). However, non-attendance of community members regarded as the dissidents, those that were vocal and critical of the MLM, decreased the potential positive impact of these engagements.	
d. Lack of involvement of stakeholders from Riebeek East, Seven Fountains and other areas in the Makana LM (stakeholder, 1st R&L Session, 27 October 2016; YR, 2nd R&L Session, Date). Grahamstown being the urban centre, the municipal base, home of Rhodes University and main economic centre of the MLM was where the MWF was based and where most of its attention lay. Consequently, stakeholders from smaller, outlying towns in the MLM	Secondary contradiction between the MWF object to be inclusive of all water stakeholders, **and** the MWF committee member communication capacity, effective communication tools and resources to encourage distant stakeholders to participate.

Problem Theme 2: Participation (representation, representivity and non-attendance)	
Evidence and deepening of contradiction manifestations	**Inferred contradictions (Figure 6.12)**
were poorly represented in the Forum. The Forum stakeholder database was not up to date with the contact details of most of these outlying stakeholders.	
e. We have not done enough in terms of empowering communities in terms of roles and responsibilities of the Forum (SM, AMj, 3rd R&L Session, 26 July 2017). Are stakeholders aware of the Forum, do they know what its purpose is? (NN, 3rd R&L Session, 26 July 2017). There was a feeling that stakeholder attendance waned due to a lack of clarity of their envisioned role, their importance and the potential benefit they would accrue through their participation. The MWF had not dedicated time to draft stakeholder roles and responsibilities in the MWF Terms of Reference or explicitly articulated what was anticipated of participants.	Quaternary contradictions between the expectations of MWF members to play a role in the MWF (rules), **and** the lack of articulated or stipulated stakeholder roles and responsibilities (division of labour) in the Terms of Reference (tools) or active division of tasks to stakeholders by the committee.
f. Many of the community are not aware of the Forum, or what benefits there are to participate in it (NN, 3rd Research and Learning Session, 26 July 2017). "We don't know about the Forum, we want to know more about it" (Community member, 2nd Adaptive Planning Workshop, 20 Sep 2017). It was felt that MWF committee members had not done enough to reach all stakeholders and build awareness about the Forum.	Secondary and quaternary contradiction between the community need to have a platform to engage in water-related issues, **and** the community lack of awareness of the existence and purpose of the MWF as well as the MWF committee members not actively promoting or recruiting members to the MWF, or not having the means to do so.
g. Those that attend meetings do not go back and share the information that they obtained with their constituencies (community member, 1st R&L Session, 15 May 2017; NN, 3rd R&L Session, 26 July 2017). There's lack of communication among the stakeholders who attended the meetings, they attend just for themselves… they are not sharing with their members (SM, 3rd R&L Session, 26 July 2017). For the MWF to play an effective communication role, participants were expected to be accepted and capable representatives of larger constituent bodies and to act as knowledge-sharing or social learning agents between the MWF and their constituencies. There was concern that the MWF was not attracting appropriate representatives to their engagements and not emphasising the importance of their role and responsibility as knowledge agents for their constituencies. In addition, participants raised the concern that MWF content was too technocratic to be accessible for stakeholders to easily absorb and share.	Primary, secondary and quaternary contradictions between the MWF objective of being water communication and learning hub (object), the accessibility of MWF content (tools), **and** the expectation that MWF stakeholders will act as learning and knowledge-sharing agents (rules); **and** the MWF not attracting capable and representative learning agents (community of practice) who are not necessarily committed to share MWF learning with their constituencies (rules and division of labour).
h. "Just because our name is on the register does not mean that we are represented in the meeting [...] we need to understand what is going on if we are to contribute and be able to report back to our constituents" (Resource-poor farmer, Makana Farmer Forum Meeting, 11 April 2017). This utterance was an indication that attendance did not assume representation and that there was a need and intention to build knowledge-agent capacity which was constrained by the inaccessibility of information presented during MWF engagements.	Secondary contradiction between expectations of stakeholders to be capable representatives and knowledge-sharing agents, **and** the accessibility of MWF information content as a tool to enable knowledge sharing.

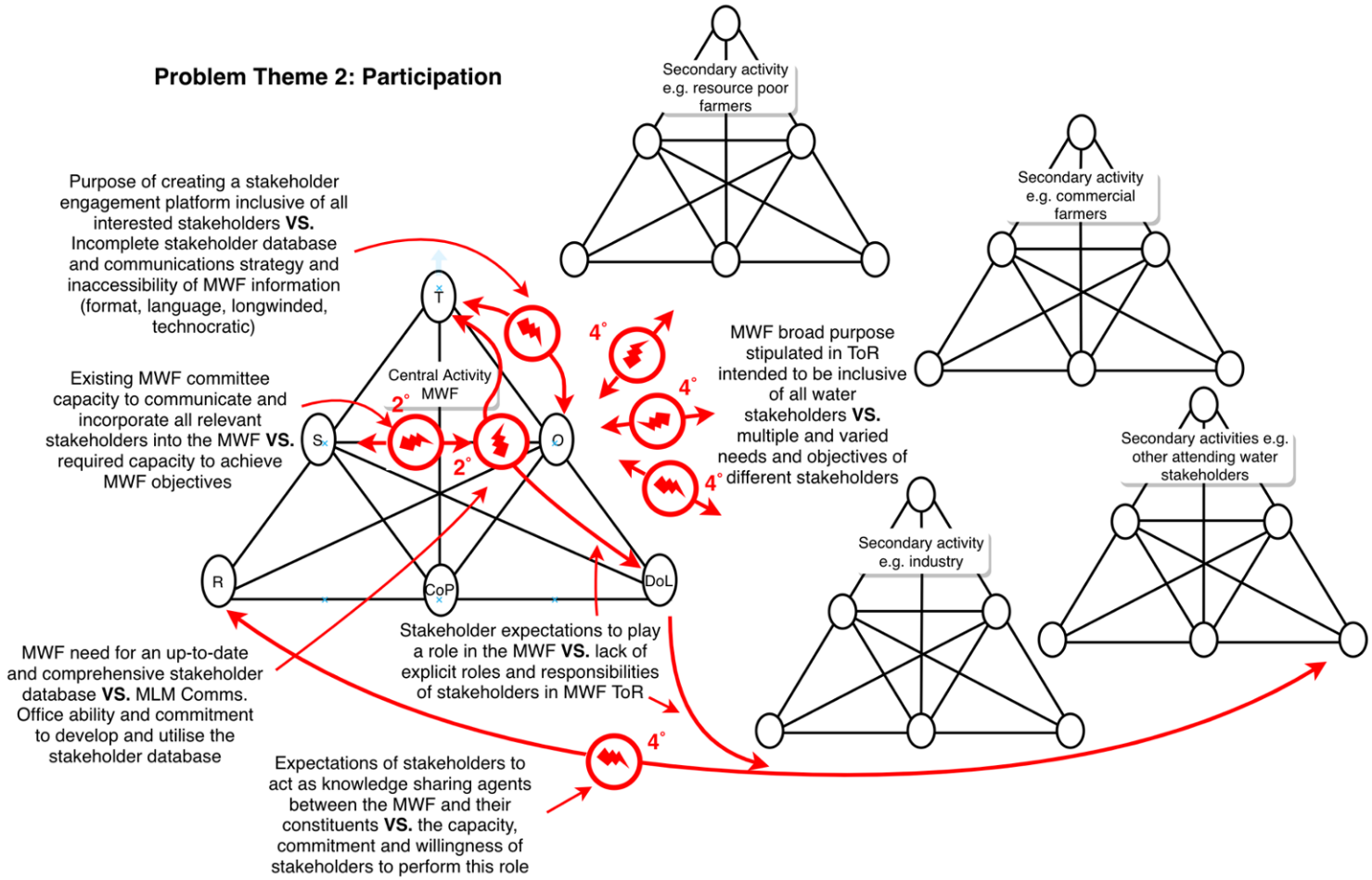


Figure 6.12: Activity systems and the contradictions relevant to the second prioritised Problem Theme: Participation (representation, representivity and non-participation). Red lightning bolts and arrows depict contradictions. Contradiction levels are denoted as numbers from primary (1°) to quaternary (4°) levels. The elements of the central activity system are represented by letters: subject (S), tools (T), object (O), division of labour (DoL), community of practice (CoP) and rules (R). Unless indicated otherwise, arrows connecting to interacting neighbouring activity systems are to the activity system as a whole and not to a specific element of the neighbouring activity system. VS. = versus).

Table 6.7: Problem Theme 3 related contradictions within and between activity systems engaging with the Makana Water Forum activity system that hindered collaborative stakeholder engagement in water, sanitation and catchment management processes. (A problem is a manifestation of a contradiction. I grouped problems into seven themes. I inferred underlying contradictions linked to identified problems within each problem theme. The first statement(s) is (are) empirical (underlined). I then nuanced and expanded empirical statement(s) drawing on a range of primary data sources (italicised text). The location of the inferred contradictions within and between activity systems are indicated by two statements (separated by "and") and depicted graphically in Figure 6.13).

Problem Theme 3: Municipality (forum relationship with the MLM (Councillors, Municipal Manager and Directorate of Infrastructure and Engineering))	
Evidence and deepening of contradiction manifestations	**Inferred contradictions (Figure 6.13)**
a. <u>Municipality tends to be defensive, perhaps seeing the Forum as a watchdog looking to bite</u> (PC, 3rd R&L Session, 26 July 2017). The MLM has undergone severe and sustained criticism from the public, private and government (provincial and national) sectors, partly due to its inability to deliver consistent and reliable services. Consequently, the majority of public engagements are characterised by heated discussion, accusations and criticism from the public, which results in Municipal officials retracting into their shells and becoming defensive. The Forum was possibly seen by the MLM as yet another abusive platform for the MLM to endure. b. <u>Apparent lack of buy-in and participation of municipal officials in the Forum (Personal Observation Journal</u> (MW, 3rd R&L Session, 26 July 2017). <u>Officials sit at the back of the Forum meeting giving an impression of non-commitment to Forum or of rather being somewhere else</u> (PC, 3rd R&L Session, 26 July 2017). <u>Officials arrive late to the meeting</u> (PC, 3rd R&L Session, 26 July 2017). The behaviour and body language of MLM officials during MWF engagements indicated their reluctance to participate and lack of ownership of MWF processes. Before MWF engagements there would be little communication between MWF committee members and MLM officials, some of which are MWF committee members, regarding their availability or commitment to attend engagements, resulting in perpetual uncertainty of whether MLM inputs could be counted on.	If the purpose of the MWF is not aligned with an important purpose of the municipality, Municipal officials will be reluctant to cooperate and take ownership of the MFW processes. Quaternary contradiction between the MWF purpose to create an open and safe stakeholder engagement platform inclusive of the MLM around water, sanitation and catchment management processes, **<u>and</u>** the MLM's low prioritisation of public participation responsibilities, viewing the MWF as an external critical platform outside of the MLM service delivery responsibilities (MWF object and MLM object).
c. <u>Councillors perceive members sharing Forum information with their constituents as impinging on their jobs and therefore interfere and constrain feedback processes. "We become unnecessary enemies of councillors"</u> (NN, 3rd R&L Session, 26 July 2017). A Forum committee member who attempted to organise community meetings in his ward to feedback on water-related information gained from participating in MWF engagements expressed the challenge he had in obtaining buy-in and support from his ward councillor. The ward councillor actively blocked feedback efforts by providing misleading information about ward committee meeting times and blocking venue access.	Quaternary contradiction between the overlap of community knowledge sharing and communication roles between Forum committee members (division of labour) **and** those of ward councillors and ward committee members (silo working and resistance to outside interventions by ward councillors and committee members).

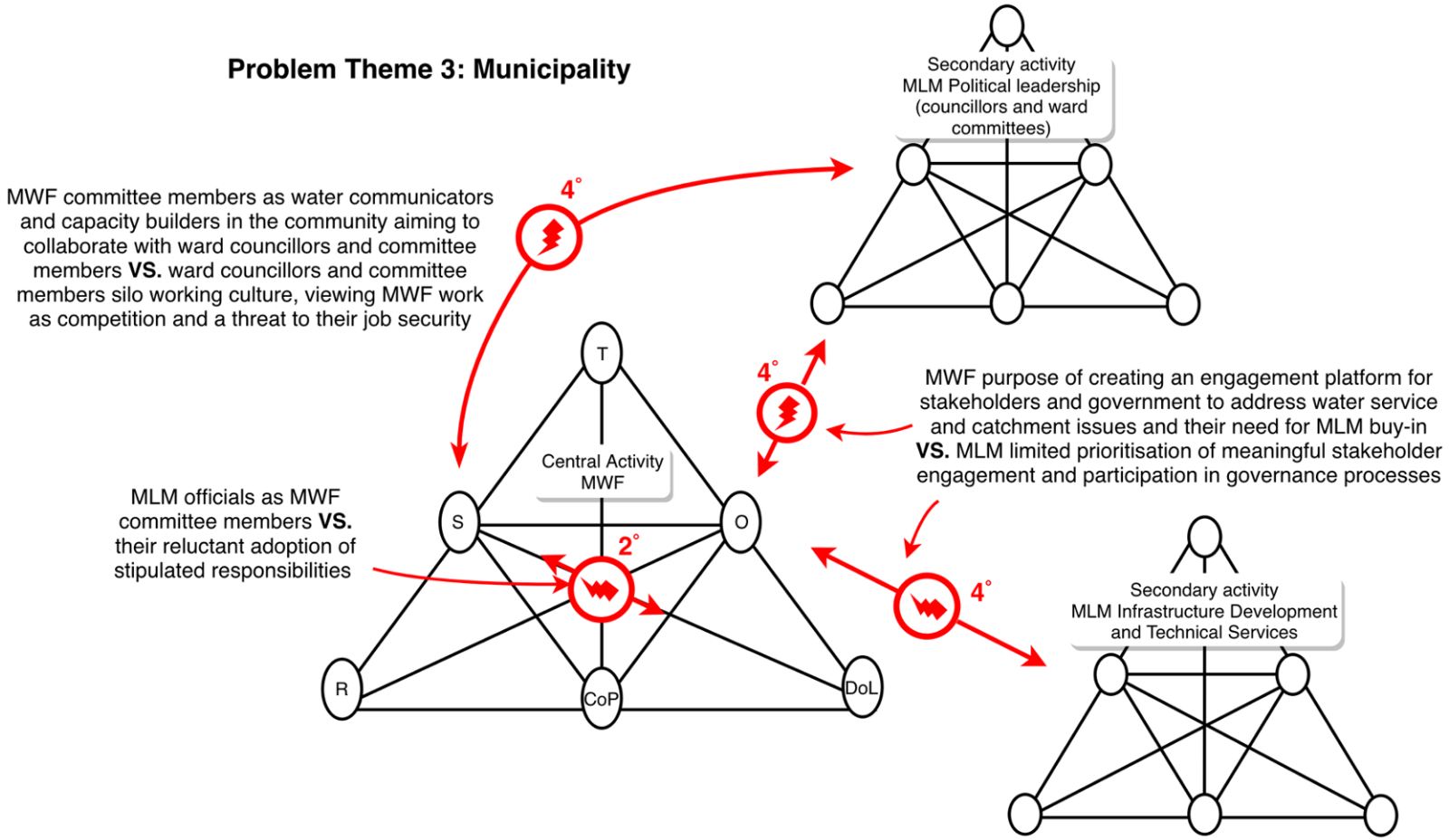


Figure 6.13: Activity systems and the contradictions relevant to the third prioritised Problem Theme: Municipality (MWF relationship with the MLM (Councillors, Municipal Manager and Directorate of Infrastructure and Engineering). Red lightning bolts and arrows depict contradictions. Contradiction levels are denoted as numbers from primary (1°) to quaternary (4°) levels. The elements of the central activity system are represented by letters: subject (S), tools (T), object (O), division of labour (DoL), community of practice (CoP) and rules (R). Unless indicated otherwise, arrows connecting to interacting neighbouring activity systems are to the activity system as a whole and not to a specific element of the neighbouring activity system. VS. = versus).

Table 6.8: Problem Theme 4 related contradictions within and between activity systems engaging with the Makana Water Forum activity system that hindered collaborative stakeholder engagement in water, sanitation and catchment management processes. (A problem is a manifestation of a contradiction. I grouped problems into seven themes. I inferred underlying contradictions linked to identified problems within each problem theme. The first statement(s) is (are) empirical (underlined). I then nuanced and expanded empirical statement(s) drawing on a range of primary data sources (italicised text). The location of the inferred contradictions within and between activity systems are indicated by two statements (separated by "and") and depicted graphically in Figure 6.14).

Problem Theme 4: Communication (communication capacity and strategy of Forum)	
Evidence and deepening of contradiction manifestations	**Inferred contradiction (Figure 6.14)**
a. <u>Communication tools and technology issues: Communication strategy undeveloped (Committee meeting, Date); MLM internet constantly not working</u> (MWF WhatsApp Messenger); <u>and confusion as to the state of completion and utilisation of MWF stakeholder database</u> (MW, 2nd R&L Session, 15th May 2017). The MLM communications office played the official communication role of the MWF and was responsible for stakeholder database development and management; the rationale being that, the greater the MLM role and responsibility in the MWF, the more likely the MLM would take equal ownership and buy-in to the MWF. In addition, the MLM Communication Office was already responsible for MLM water-related communication and therefore, to avoid duplication of efforts, it was agreed that the MLM should address MWF communications too. However, institutional and technical challenges faced by the MLM constrained their ability to deliver on their communication responsibilities which were ultimately largely carried by Rhodes University-based committee members. These challenges affected the ability of the MWF to share information to stakeholders, a role central to addressing its object.	The primary contradiction between the available **and** required communication tools to effectively run the MWF. The primary contradiction between the existing **and** required communication capacity of committee members (subject) to bring stakeholders together. Secondary contradiction between the MWF object of enabling broad stakeholder collaboration on the management of water, sanitation and the catchment, **and** the effectiveness of available communication resources (tools).
b. <u>Stakeholder frustration due to receiving invitations that they are not interested in, saying "please remove me from the mailing list" and "we have addressed these issues, resolutions were made in previous meetings"</u> (AMj, reporting on farmer communication in 3rd R&L Session, 26 July 2017). Commercial farmers attending a sequence of Forum engagements expressed their frustration at the slow pace at which MWF processes progressed to problem-solving and practical action. Examples of slow Forum processes were Adaptive Planning workshops that the Forum facilitated, to develop the Makana Water Plan. These aimed to be inclusive of a stakeholder group with diverse knowledge bases and different levels of understanding of water-related concepts. Much time was therefore spent on enabling meaningful engagement through participant capacity building by building a common understanding of concepts, shared values, a collective vision and catchment context.	Quaternary contradiction between MWF long-term purpose of building community capacity to meaningfully engage in water governance processes (object), and certain stakeholders (e.g. commercial farmers) motivation to prioritise immediate problem solving and practical action to address water-related issues (object).
c. <u>We don't know about the water system, we don't know enough to confidently talk about water and promote the Forum, we are committee members, but we know nothing about water</u> (NN, personal communication, ECWC meeting, 4 October 2017). Committee members were elected for their stakeholder sector representivity rather than expertise in water issues. Some committee members felt that they could not competently represent the Forum without adequate knowledge of the workings and dynamics of the Grahamstown water system. Committee members were expected to be MWF advocates and build community participation in the Forum but there were no formal training processes to develop the required competence to carry out this role.	Secondary contradictions between expectations (rules) and roles (division of labour) of MWF committee members to be knowledgeable water communicators (subject) to stakeholders and community members, **and** the knowledge capacity of committee members, and lack of available learning processes (tools) to develop this required knowledge.

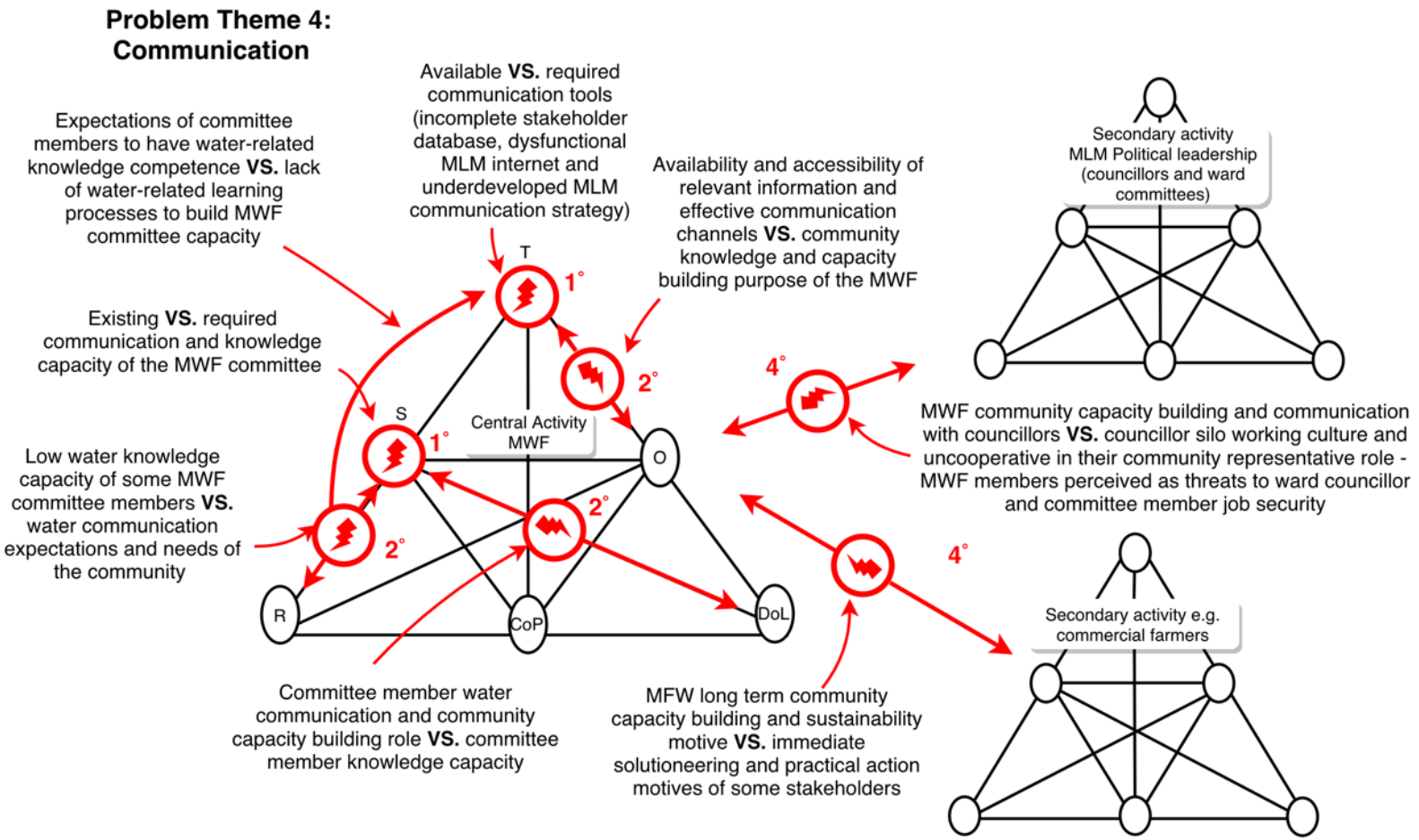


Figure 6.14: Activity systems and the contradictions relevant to the fourth prioritised Problem Theme: Communication (communication capacity and strategy of the Makana Water Forum (MWF). Red lightning bolts and arrows depict contradictions. Contradiction levels are denoted as numbers from primary (1°) to quaternary (4°) levels. The elements of the central activity system are represented by letters: subject (S), tools (T), object (O), division of labour (DoL), community of practice (CoP) and rules (R). Unless indicated otherwise, arrows connecting to interacting neighbouring activity systems are to the activity system as a whole and not to a specific element of the neighbouring activity system. VS. = versus).

Table 6.9: Problem Theme 5 related contradictions within and between activity systems engaging with the Makana Water Forum activity system that hindered collaborative stakeholder engagement in water, sanitation and catchment management processes. (A problem is a manifestation of a contradiction. I grouped problems into seven themes. I inferred underlying contradictions linked to identified problems within each problem theme. The first statement(s) is (are) empirical (underlined). I then nuanced and expanded empirical statement(s) drawing on a range of primary data sources (italicised text). The location of the inferred contradictions within and between activity systems are indicated by two statements (separated by "and") and depicted graphically in Figure 6.15).

Problem Theme 5: Function (function of the MWF – problems related to running MWF meetings/engagements)	
Evidence and deepening of contradiction manifestations	**Inferred contradiction (Figure 6.15)**
a. "We are not actually managing the stakeholders, we are managing the process of information sharing, overcoming constraints and reaching common goals"; and the Forum battles with its process management and operates in an ad-hoc manner. (PC, 3rd R&L Session, 26 July 2017).	Multiple primary and secondary contradictions between the use value of existing systems in place in the Forum (tools, rules and division of labour), **and** their exchange value (suitability) to effectively enable Forum function (object).
b. Forum is not utilising the full potential of key stakeholders to improve its effectiveness (e.g. MobiSAM to disseminate information and identify key problem areas that require solutions) (MW, 3rd R&L Session, 26 July 2017). The division of labour of the MWF was shouldered by a few committee members, particularly the interim chairperson and Rhodes University committee members, which posed sustainability concerns for the Forum. An MLM committee member was elected into the position of secretary to lighten the coordination role carried by the chairperson; however, the elected secretary failed to enact the stipulated roles and responsibilities that the position required.	Primary contradiction between the Forum's need for additional skilled committee members (e.g. coordinators, facilitators and organisers), **and** the skill and capacity of existing committee members (subject); the lack of a strategic division of labour and over-reliance on certain subjects and under-use of others. Tertiary contradiction between the election of a secretary to support coordination of the MWF in the future, **and** the current willingness and ability of the elected secretary to carry out the required role and responsibility.
c. Our meetings tend to drag on, possibly due to poor facilitation. We lose structure and people lose interest (MW, 3rd R&L Session, 26 July 2017). Venue set-up does not promote open engagement, venues are big and cold, translating presentations takes time and people disengage when they cannot understand (WhatsApp Chat; Participant Observation Journal, Date; Personal Communication Paul Chilton, 5 May 2016). In 2017 the MWF ran two general forum meetings that were open the all stakeholders. This infrequency meant long meetings (4-5 hours) to cover a wide range of topics and allow time for translation into isiXhosa. In early meetings the venue set-up, of a row of chairs behind tables in the front for presenters facing blocks of chairs for the public, did not encourage inclusivity and reflected entrenched power imbalances between officials and the public, typical of government engagements. This set-up allowed key municipal officials who often arrived late an easy option of sitting at the back giving the impression of non-commitment.	Primary contradiction between existing MWF committee member capacity **and** required committee member capacity. Primary contradiction between the functionality of existing meeting technology (public address system, laptop and projector) (tools) **and** the required tools to run professional meetings.
d. First main Forum meeting - disorganised start, projector not working, no screen to project on, laptop port not working, public address system not working, it was embarrassing, and it was felt that the Forum lost credibility	Secondary contradictions between the effective use of MWF tools by committee members to run MWF meetings as well as the unreliability of

Problem Theme 5: Function (function of the MWF – problems related to running MWF meetings/engagements)	
Evidence and deepening of contradiction manifestations	**Inferred contradiction (Figure 6.15)**
with stakeholders (WhatsApp Chat; Participant Observation Journal; MW and PC, 3rd R&L Session, 26 July 2017). The inability of the Forum to run a professional meeting reflected poorly on the Forum's capacity to be an effective institution.	MLM committee members to coordinate and provide required inputs into MWF engagements, **and** stakeholder expectations of experiencing insightful, professionally run meetings.

Table 6.10: Problem Theme 6 related contradictions within and between activity systems engaging with the Makana Water Forum activity system that hindered collaborative stakeholder engagement in water, sanitation and catchment management processes. (A problem is a manifestation of a contradiction. I grouped problems into seven themes. I inferred underlying contradictions linked to identified problems within each problem theme. The first statement(s) is (are) empirical (underlined). I then nuanced and expanded empirical statement(s) drawing on a range of primary data sources (italicised text). The location of the inferred contradictions within and between activity systems are indicated by two statements (separated by "and") and depicted graphically in Figure 6.15).

Problem theme 6: Impact ("Law of the Lid" - impact of MWF and effectiveness of achieving its objectives)	
Evidence and deepening of contradiction manifestations	**Inferred contradiction (Figure 6.15)**
a. The law of the lid applies to the Forum - the Forum's (in)ability to address its core focal points directly affects how the wider Grahamstown community will react to the Forum (LM, 3rd R&L Session, 26 July 2017). Participants felt that if the Forum could lead by example and have a visible or tangible impact, stakeholders would be more likely to buy into and support the Forum.	Multiple primary and secondary contradictions in the Forum resulting in it not being able to implement its objectives. Primary (low capacity of committee (subject), accessibility of the Terms of Reference); Secondary contradiction between the availability, **and** the required tools to effectively address the MWF purpose. Roles and responsibilities of all committee members not specified in ToR (tools) or enacted in a division of labour (DoL).
b. The Forum has lost momentum and therefore has a challenge with maintaining credibility with sceptical stakeholders (e.g. commercial farmers) (PC, 3rd R&L Session, 26 July 2017). Farmers arrive early, and Forum meeting starts late - the impression given is that the Forum does not take its business or the time of stakeholders seriously (PC, 3rd R&L Session, 26 July 2017). Disorganisation of the MWF conduct of initial public meetings due to internal functional challenges made a poor impression on attending stakeholders. This was compounded by the pace at which the Forum addressed issues raised by sceptical stakeholders, such as water security in the context of the drought, water restrictions and alien vegetation removal]	Secondary contradiction between the MWF subjects' (committee members and key Forum actors) commitment, diligence and organisation to carry out Forum practice, **and** existing (or still-to-be drafted) operating principles of Forum (rules).

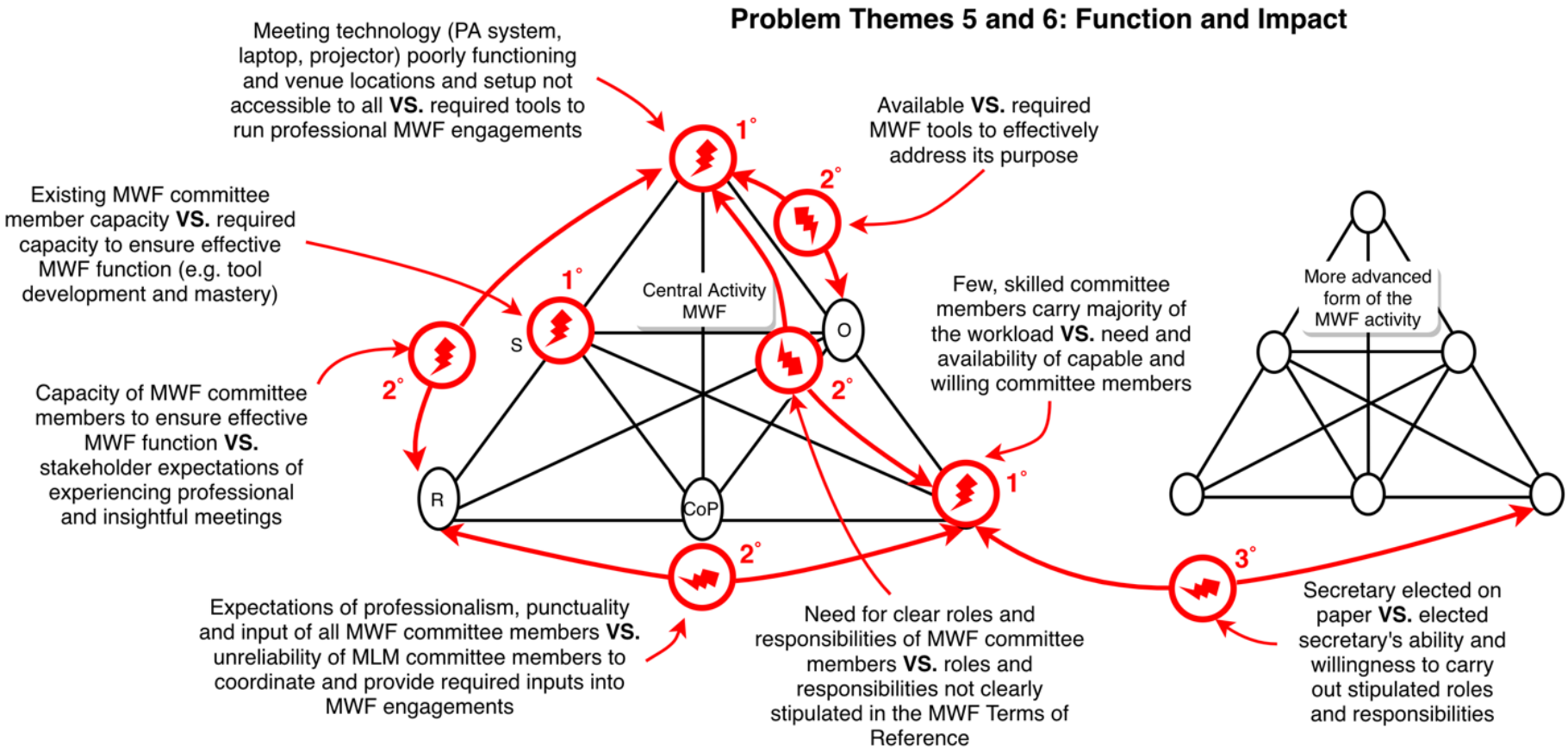


Figure 6.15: Activity systems and the contradictions relevant to Problem Themes 5: Function (functioning of the Makana Water Forum (MWF) (Problems relating to running Forum meetings/engagements)), and 6: Impact ("law of the lid" (impact of the MWF and effectiveness of achieving its objectives)). Red lightning bolts and arrows depict contradictions. Contradictions levels are denoted as numbers from primary (1°) to quaternary (4°) levels. The elements of the central activity system are represented by letters, subject (S), tools (T), object (O), division of labour (DoL), community of practice (CoP) and rules (R). Unless indicated otherwise, arrows connecting to interacting neighbouring activity systems are to the activity system as a whole and not to a specific element of the neighbouring activity system. (VS. = versus).

Results pertaining to Aim 8: To report on the development of remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function.

Model remedial actions to loosen and address contradictions related to prioritised Problem Themes developed during the two multi-session CL workshops were compiled into tables which were used to inform their implementation during subsequent MWF engagements (**Table 6.11**, **Table 6.12** and **Table 6.13**). During the second multi-session CL workshop, model remedial actions and their implementation progress were mirrored back to participants for reflection, refinement and to concretise effective model remedial actions into future practice (**Figure 6.10**). As agreed upon in the first multi-session CL workshop, I framed remedial actions using the second-generation activity system model (**Figure 6.16**, **Figure 6.17** and **Figure 6.18**).

Table 6.11: Preliminary remedial actions modelled and implemented by Change Laboratory participants towards loosening and addressing the 1st prioritised Problem Theme: Lack of clear focus of the MWF.

Preliminary modelled remedial actions	Implemented new models
• Existing Terms of Reference clarifies focus objectives and roles and responsibilities of stakeholders (existing Tool under-utilised) • Repetition of a simplified ToR (New Tool) - Ice-breakers, constant reminders of MWF focus, and roles and responsibilities of stakeholders during introduction of every MWF engagement (build understanding, get comments on constraining factors for stakeholder implementation of ToR, present in isiXhosa) • Committee to take comments into account and review ToR – objectives, roles and responsibilities of stakeholders • MWF committee to sharpen and refocus the MWF objectives (Modify Tool) • MWF committee to strategise to achieve objectives (refer to Makana Water Plan objectives hierarchy (Tool under development)) • Custom email signatures of MWF committee members – displaying the condensed MWF objective or vision (New Tool) • Overview of different participating organisations and their roles and responsibilities	• Acting as the MWF chairperson, I presented a simplified ToR at the following General MWF meeting (31 October 2017) • Roles and responsibilities of stakeholders presented by a Department of Water and Sanitation official at the following General MWF meeting (31 October 2017) • I drafted an outline of the roles and responsibilities of key stakeholders and emailed them to relevant stakeholders for comment

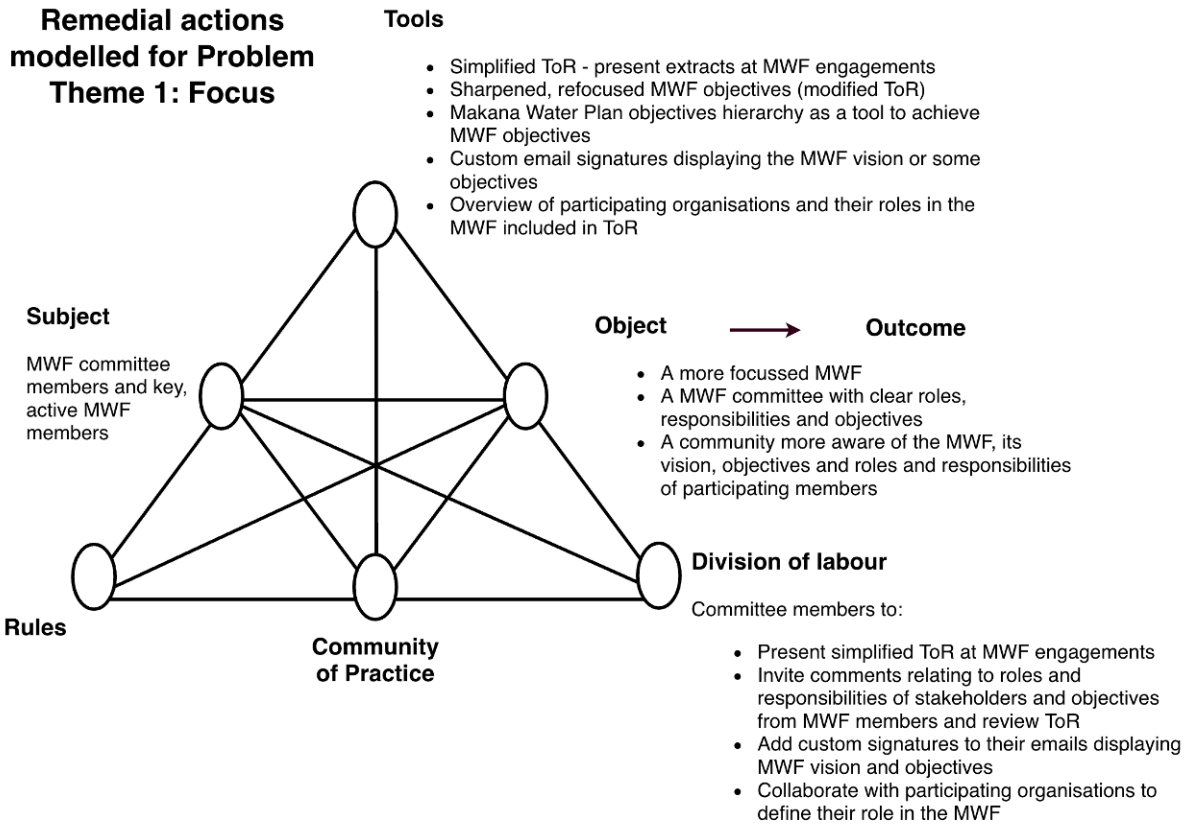


Figure 6.16: Preliminary remedial actions modelled to loosen and address contradictions manifested as the 1st prioritised Problem Theme: unclear focus of the Makana Water Forum (MWF). Terms of Reference = ToR.

Table 6.12: Preliminary remedial actions modelled and implemented by change laboratory participants towards loosening and addressing the 2nd prioritised Problem Theme: representation, representivity and non-attendance. DWS = Department of Water and Sanitation.

Preliminary modelled remedial actions	Implemented new models
• Review, maintain and utilize an up-to-date stakeholder database, highlight key stakeholder representatives including: Community Development Worker list, War Rooms (ward-based service delivery reporting spaces), ward committees, farmer representatives, Grahamstown landlords and Rhodes University community. Establish a database development working group from MWF committee members • Forum name change from Upper Kowie Water, Sanitation and Catchment Management Forum to the Makana Water Forum • One-on-one engagements with key representatives of stakeholder groups. (Mutual Gains Approach (MGA) (New Tool) to be used where applicable. (The MGA is a collaborative negotiation method to set mutually beneficial management objectives while maintaining healthy relationships and reputations (Susskind & Landry, 1991). The MGA was introduced to the MWF committee by a Department of Water and Sanitation official. Suggested one-on-one stakeholder engagements:	• MLM Communications team to collaborate with researcher interventionists to develop database. Include stakeholder area of interest as a database category • Acting as the MWF chairperson, I presented the new name and name change rationale at a General MWF Meeting (31 October 2017) • MWF meeting with the Eastern Cape Office of the Premier • MWF committee meeting with strategic water users (Rhodes University and Farmers) proposing the Mutual Gains Approach as a mechanism to negotiate and

Preliminary modelled remedial actions	Implemented new models
○ Strategic water users (Rhodes University, commercial farmers, industry (e.g. Carara Agro Processing), schools and hospitals); ○ Portfolio heads, ward councillors and ward committees (dispel perception that the "MWF actors are there to criticise or spy on them" (SM, CL1c 14th September 2017)); ○ Community Development Workers (CDW) (evaluation and testing the model: CDWs and ward councillors sceptical of government official processes, fearing exposure or critique); ○ Farmer association leaders • Influential stakeholders to influence non-participating stakeholders e.g. Mayor, Speaker, Office of the Premier to encourage councillor participation • Make explicit the MWF guiding principles that guide stakeholder attendance and engagement (in ToR) • Address internal function-related problems of the MWF (clarify focus) and non-attendance issues concurrently • Stakeholder-specific actions, results-orientated actions of MWF (flagship activities) and dissemination of results of actions (record activities and report their successes) build impact and reputation of the Forum e.g. quick wins, such as specific cases: sewage spill in resident's yard, borehole information to RPFs, Water Tours • Quick wins to build impact and reputation of Forum and encourage attendance • Develop a refined, focussed MWF meeting agenda • Stakeholders expected only to attend meetings with agenda items relevant to them (Rule development) • Timely circulation of pre-meeting/workshop materials and agendas • Establish ad-hoc sub-committees/task teams to address specific MWF-related issues e.g. sewerage and pollution (Evaluation and testing – require interested, capable and available stakeholders to drive sub-committees) • Follow up with people who confirmed that they would attend MWF engagements but were absent to understand their barriers and explain consequences	co-develop mutually beneficial water management objectives • MWF facilitated a DWS official to respond to water supply challenges that resource-poor farmers faced, e.g. borehole issues • Grahamstown Water Tour (build Forum awareness, stakeholder knowledge building, relationship, trust building btw MLM, DWS officials and stakeholders) • The MWF facilitated a one-on-one engagement to negotiate water resource management procedures between strategic water users within Grahamstown's water supply catchments. Participating strategic water users included: farmers (Mosslands Dairy), large-scale urban users (Rhodes University), the DWS and the MLM. In the engagement, the MLM and DWS accepted the existing self-regulation water management process of farmers in the catchment area above Settlers Dam (the largest dam that supplied water to Grahamstown)

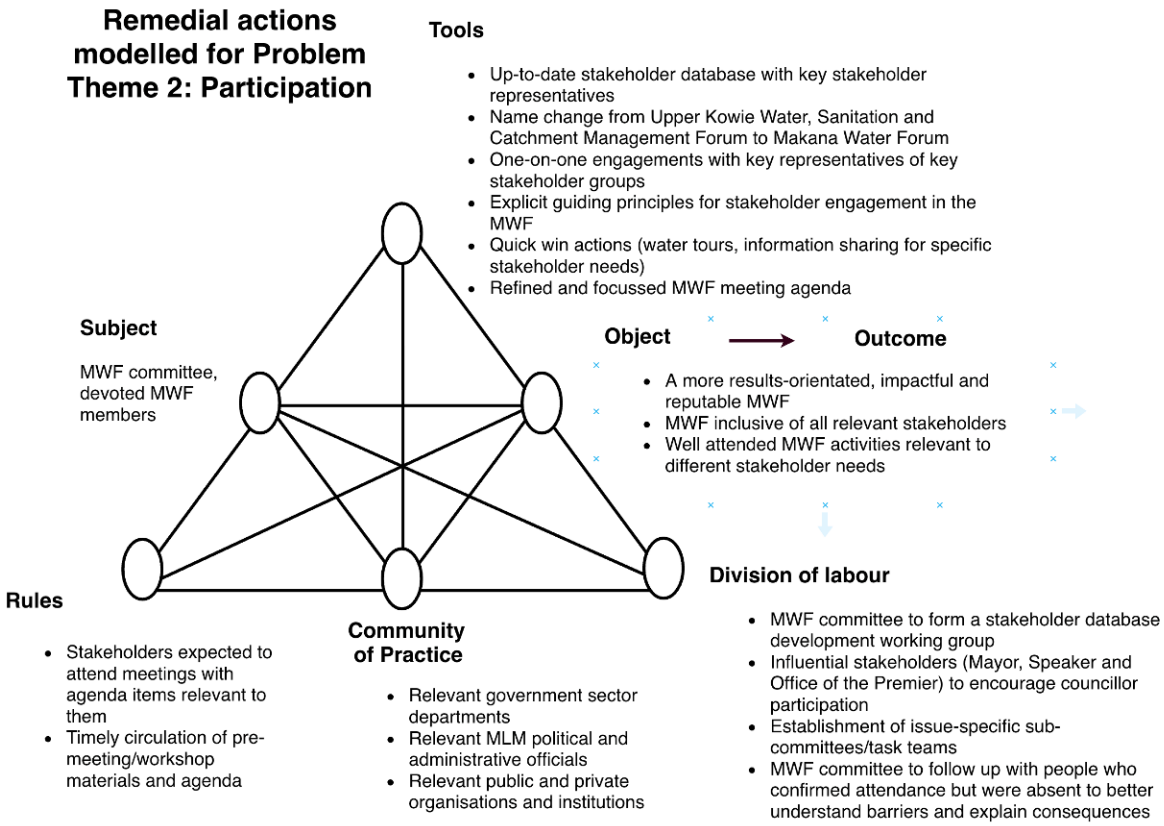


Figure 6.17: Preliminary remedial actions modelled to loosen and address contradictions manifested as the 2nd prioritised Problem Theme, representation, representivity and non-attendance.

Table 6.13: Preliminary remedial actions modelled and implemented by change laboratory participants towards loosening and addressing the 3rd prioritised Problem Theme, forum relationship with the MLM.

Modelled remedial actions	Implemented new models
• Build MWF awareness/understanding of Municipal and Government protocols (Tool and Rule development) • Target MWF support and endorsement from the Mayor, Speaker and Portfolio chairperson of the Infrastructure Development and Technical Services and Municipal Manager • Take steps to ensure MWF is provided for in the municipal Integrated Development Plan (IDP) to gain official municipal legitimacy and budget • Create a standing agenda item on the quarterly Infrastructure Development and Technical Services Portfolio Committee meeting (top level municipal decision-making meeting for service delivery matters)	• MWF meeting with the Eastern Cape Office of the Premier to build legitimacy of the MWF and its processes (11 October 2017) • Acting as the chairperson, I requested that the MWF be provided for in the municipal IDP (Mayoral IDP Roadshow, 30 November 2017)

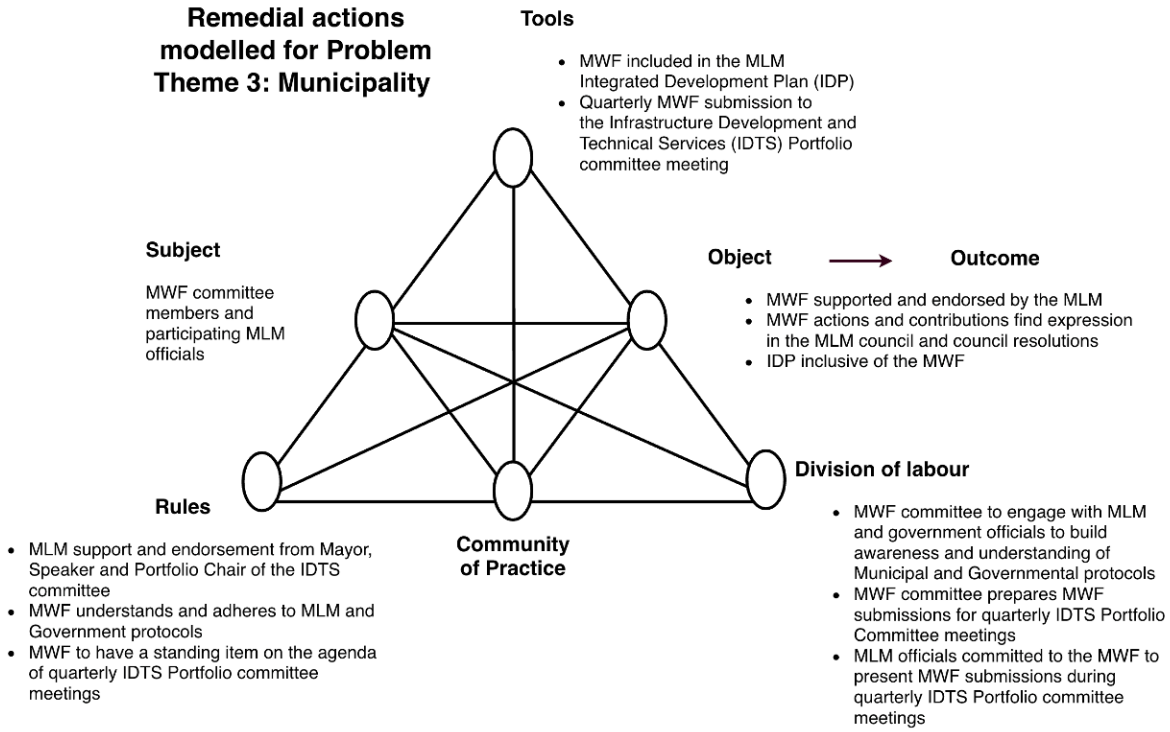


Figure 6.18: Preliminary solutions modelled to address tensions and contradictions manifested as the 3rd prioritised Problem Theme: forum relationship with the MLM (councillors, Municipal Manager and Directorate of Infrastructure Development and Technical Services). IDTS = Infrastructure Development and Technical Services.

6.5 Discussion

Participation remains central to achieving the ideals of developmental (van Koppen & Shreiner, 2014) and adaptive Integrated Water Resource Management in South Africa (Palmer & Munnik, 2018). Multi-stakeholder platforms (MSPs) have been adopted as the institutional framework to effect micro-level participation in water resource management at a catchment scale. Tensions as a result of the state's drive to achieve a balance between its initial IWRM goals of equity, efficiency and sustainability in a complex bio-physical, socio-economic and political landscape have manifested as intractable, wicked problems. These problems manifest in the everyday lived experiences of people. Participation in MSPs holds the possibility of real engagement with these tensions and provides a platform for expansive learning and agency development to overcome them.

Learning theory argues that learning mediates activity and practice, therefore I applied Cultural Historical Activity Theory as a conceptual and methodological framing to explore "real" participation in an MSP, and conducted an intervention to collaboratively transform the MSP to better enable "real" participation.

To date, most MSPs, and therefore the studies into them, have mainly focussed on participation in water resource management issues (such as the Inkomati CMA , Kat River Forum, Mthatha CMF, Blyde River WUA) without explicit inclusion of water service delivery related issues. The Makana Water Forum was probably the first national instance where water services and water resource management issues were explicitly included in the purpose of the forum. The MWF, therefore, provided a unique case to explore participation in an MSP where these two facets of water governance were integrated. In this chapter, I used the case study of the MWF to understand the historical development of the MWF and its underlying tensions and contradictions that constrained its ability to enable democratic water governance. I delved into the source of participatory water governance and investigated the historical and present challenges that came with both facets of water governance in the context of South Africa's political ideological commitment to participation.

In the following section, I discuss the results related to each of the four aims of the chapter. I have integrated the discussion for Aim 7 (to understand and surface contradictions affecting the functioning of the MWF activity system and its ability to enable participatory water governance) and Aim 8 (to develop remedial actions to loosen and address prioritised problems affecting the MWF activity system function through an interventionist approach). In the multi-session Change Laboratory workshops, the analysis of prioritised Problem Themes progressed into the modelling remedial actions stage. I did not undertake a detailed analysis of the remedial actions but rather reported on them (Section 6.4.2). In the following discussion I have included a brief remedial actions sub-section within each of the Problem Theme discussion sub-sections.

6.5.1 Discussion of Aim 5: To understand the historicity of the Makana Water Forum activity system and its evolving water-related purpose

The evolution of the object of activity (purpose) of the Makana Water Forum and the underlying contradictions constraining its practice were influenced by a history of past cycles of participatory water governance-related activity at a national and local scale.

The object of activity of the MWF was related to the convergence of two main, interconnected water governance components, namely, participation to address issues of domestic water supply and sanitation, and participation to address issues of water resource management. Problems that manifested in the MLM water CSES including primary water scarcity (e.g. drought), secondary water scarcity (due to infrastructure management and operation challenges), inequitable access and poor water quality drove the formation of the MWF. The causes of and participation to engage with these issues have historical roots dating well before 1994. I traced the history of participation with the two

components of water governance and their associated problems from a national scale pre- and post-1994 to a local government scale within the Makana Local Municipality.

At a national scale, participation with water governance was influenced by the high-level shift from an authoritarian, state-centric governance ideology pre-1994, to an inclusive, democratic developmental state governance ideology post-1994. Pre-1994, under apartheid, there was little scope for public participation, and water law favoured water supply for the white-owned agricultural sector and urban centres that excluded the majority of the population. With the transition to the new democratic state, the majority of the population joined the minority white population as official voting, rights-bearing citizens. Backed by a newly developed progressive Constitution and robust legal framework, all citizens now had the right, among other things, to basic services (water, sanitation, electricity, housing, health care and education), information, a healthy environment, and participation in governance processes to realise their rights.

The state faced two big challenges in the first decade of democracy: to establish a functional democratic state, and redress the inequalities of the past, which included providing access to water and sanitation to over 40 million people. The immediate task of large-scale water infrastructure development was prioritised, while developing participatory structures to enable inclusive water governance proceeded in the background. Although domestic water supply and sanitation services were viewed as a component of the newly adopted integrated water resource management approach, separate legislation, authorities and participatory institutions were developed for the domestic, and water resource components of water governance. Water resource management was under the jurisdiction of DWAF (now DWS), legislated by the National Water Act of 1998 with direct civil society participation through catchment management agencies, catchment management forums, and water user associations. Domestic water supply and sanitation services were under the jurisdiction of local government, legislated by the Water Services Act of 1997 and participation through layers of political structures with ward committees as the base civil society participatory interface. The integration and interrelation of processes and institutions to govern, manage and enable participation in these two aspects of water governance was and remains unclear.

In both sectors, the decentralisation of water governance to a local level proved challenging. Local government was responsible for both service delivery and for effecting developmental local governance, which required municipalities to collaborate with citizens to meet their social, economic and material requirements and so improve their well-being (McEwan, 2003). The state prioritised the development of technical infrastructure to provide basic services to citizens but invested limited effort in developing sufficient human capital within local government to operate and maintain the infrastructure effectively. The ward committee system was envisaged as the primary avenue to enable

citizen participation in developmental local governance, but municipalities were poorly capacitated to facilitate meaningful participation effectively, resulting in increased alienation of the public from the government. These responsibilities proved too great a challenge for most municipalities, which had yet to develop the capacity to sustainably operate and maintain complicated water systems and deliver water reliably to residents. In addition, the majority of the population had been excluded from decision-making processes for so long that they often lacked the required know-how to make meaningful contributions to governance processes without undergoing extensive capacity building. Increasing service delivery failure and poorly functioning ward committees resulted in limited options for public engagement. Perpetuated water-related injustices ultimately resulted in widespread service delivery protests in the second decade of democracy.

The National Water Act was designed to shift water resource management from a state-centric command-and-control approach to a decentralised participatory, multi-stakeholder-led approach. This approach required establishing Catchment Management Agencies as self-regulating institutions to manage water resources within a macro-hydrologically-bound area known as a Water Management Area. Micro-level and integrated management of water resources required that CMAs work with catchment management forums. As non-statutory bodies, CMFs were regarded as key platforms to enable consensual participatory catchment management. Water User Associations were also developed as statutory bodies, some as transformed white-run irrigation boards, to support the productive water use activities of stakeholders such as agriculture.

Issues affecting participation with water governance at a national scale manifested at a local government scale within the Makana water management CSES. Recurring emergent problems linked to the MLM water management CSES served as the object of activity for past cycles of participatory water governance activities in the MLM. The three main problems driving these activities were: 1) water service delivery failure due to, among other causes, ageing and poorly maintained infrastructure; 2) deteriorating catchment health and human health risks as a result of leaking sewage and over-capacitated, poorly functioning wastewater treatment works, and 3) limited and poorly functioning participatory channels, primarily the ward committee system.

The historicity of the MWF and the historical analysis of the Grahamstown water system (Appendix A) revealed that water challenges have been a constant occurrence in the city since the inception of the town (Mullins, 2011). Participation in water governance processes excluded black South Africans pre-1994 but remained ad-hoc and limited post-1994. The historical analysis (Section 6.4.1) revealed limited past cycles of collective action relating to water governance processes in the MLM. Civil society engagement in water governance processes occurred through sporadic public meetings and, typically, took the form of top-down domestic water supply information transfer from the Municipality to the

community, with little opportunity for meaningful, collaborative-type engagement. The top-down style of engagement is typical of local government participation strategies (Head, 2007; Smith, 2011). A primary and informal avenue for civil society to influence water governance decision making was through protest action and the delivery of timeframe-bound demands to Municipal decision makers.

The ward committee system existed in the MLM as an avenue to escalate citizen concerns from street to council level. However, dysfunctionalities within this system hampered its effectiveness as a participatory channel (Smith & de Visser, 2009). Dysfunctionalities in the MLM ward committee system echoed those found in other municipal contexts, including being influenced by partisan politics, lack of skills and financial and material resources, inaccessibility to residents, and the inability of ward councillors to influence higher tier council decision making (Piper & Deacon, 2008; 2009; Smith & de Visser, 2009). Furthermore, ward committees served to enable vertical information exchange rather than multi-stakeholder dialogue that could promote horizontal learning about water issues.

Increasing municipal dysfunctionality post-1994 triggered the emergence of a number of civil society organisation activity systems that mobilised civil society to address water issues, among other matters. These included environmental lobby groups as referred to before. Although water issues served as a common boundary object for these organisations, they tended to operate in isolation of one another. Municipal workstreams established during the period that the Municipality was under administration to enable stakeholder collaboration in priority municipal issues provided a partial, but temporary, avenue for these activity systems to collaborate on water-related issues and therefore yielded marginal advancement in participatory water governance in the MLM.

Only the establishment process of the Mzimvubu to Tsitsikamma Catchment Management Agency and the accompanying establishment of CMFs in the water management area enabled long-term formalised participatory water governance in the MLM. The collective efforts of organised social protests across South Africa triggered a response from the DWS Minister to similarly formalise participatory engagement platforms through community water and sanitation forums so citizens could engage constructively with municipalities on water service delivery issues. The establishment of these multi-stakeholder institutions in Grahamstown was envisioned to formalise participatory governance in water resource management and water service delivery.

The manner in which a multi-stakeholder platform is established influences the development of its object (the manner of participation is also affected). A CMF can either be externally induced by the government, or internally induced by local stakeholders. The MWF was an externally induced CMF catalysed by two forum development initiatives mandated by the Department of Water and Sanitation (**Box 6.2**). Externally induced formation implies that early object development can be significantly

influenced by the mandates of the external establishment agents. In the case of the MWF, DWS officials were mandated to coordinate the establishment of a CMF in order to open a grassroots participatory channel to support the establishment of the Mzimvubu to Tsitsikamma Catchment Management Agency. In particular, the CMA required stakeholder participation to develop a catchment management strategy for Mzimvubu to Tsitsikamma Water Management Area (**Figure 1.5**). Officials from the DWS were also mandated to establish a Community Water and Sanitation Forum as a channel for public participation to promote open dialogue on domestic water supply and sanitation service processes to reduce the need for service delivery protests.

Experiences documented by Simpungwe (2006; 2007) of the establishment and challenges facing the Mthatha and Kat River CMFs in the Eastern Cape contrast government- and societally-driven CMF formation. Where the DWS drove CMF development, platforms were dominated by government and private sector organisations (e.g. the Mthatha CMF), effectively side-lining community stakeholders. The opposite was the case with the Kat River CMF, where, supported by Rhodes University, empowering community stakeholders and encouraging environmental activism was emphasised. However, in the Kat River, government officials and private sector stakeholders showed little interest. Government and private stakeholder legitimacy are important sources of financial and material support to enable CMFs to influence water governance practice.

Engeström et al. (2016) describe three phases of object formation during the expansive learning process: 1) emergence of an initial diffuse object; 2) formation of a consciously articulated, abstract germ-cell object, and 3) construction of a concrete expanded object. The object development of the MWF followed a similar trajectory. In the MLM, a diffuse object existed related to participation in water governance processes, with numerous activity systems engaging with water governance in an isolated and ad-hoc manner. The establishment of the MWF began a coalescing process that brought different activity systems together to negotiate a broadly shared object of activity. This negotiation process occurred through dialogue during MWF engagements and became increasingly conspicuous as MWF participants articulated the purpose of the MWF in its Terms of Reference and developed its vision through Adaptive Planning Workshops. The formative intervention process, particularly the first multi-session Change Laboratory workshop, served to develop and articulate the expanded object. Finally, implementing remedial actions to address contradictions that the MWF faced was evidence of elements of the object becoming more concrete. The diversity of stakeholders and their varied water-related interests means the MWF object will be in a constant state of flux and will expand as partially shared components of the object are engaged with and remedial actions to their related contradictions are expansively addressed. As a result, multi-stakeholder platforms such as CMFs are

likely to have dynamic and compound objects that will transition through iterative cycles of the abstract to the concrete.

6.5.2 Discussion of Aim 6: To understand and describe the key activity systems comprising the Makana Water Forum activity system

The Makana Water Forum is an activity system network made up of multiple sub-activity systems with a common boundary object related in some way to water. Water was the common denominator, the "raw material" (Engeström, 1999), that coalesced different actors and activity systems to engage in the MWF activity system. The MWF's water-related shared object can be articulated as an expanded shared object: stakeholder collaboration in water sanitation and catchment management processes. The vision of the MWF, as expressed in the MWF Terms of Reference, was closely aligned to this expanded object (Makana Water Forum, 2017 in Appendix L9). In fact, the collaborative process of identifying, understanding and articulating the shared MWF object coincided with and influenced the MWF vision development process and its formal articulation in the Terms of Reference.

The primary subjects of the MWF each had a slightly different object that overlapped with the purpose and motive of the MWF and were associated with four overlapping expanded objects:

- Catchment management strategy development (Mzimvubu to Tsitsikamma proto-Catchment Management Agency, Department of Water and Sanitation and the Institute for Water Research at Rhodes University);
- Research into democratic water governance and CMF development (Mzimvubu to Tsitsikamma proto-Catchment Management Agency, Department of Water and Sanitation and Rhodes University);
- Water service delivery, communication and knowledge building (Makana Municipality, Media, MobiSAM, Traditional Healers and the NGO, Private Eye Community Watch); and
- Social-ecological and climate change justice (the Eastern Cape Water Caucus through participating members, traditional healers and Private Eye Community Watch).

These eight activity systems constitute the committee and backbone of the MWF activity system. They were also the subject and perspective through which the activity system analysis of the MWF was conducted. The composition of the committee adequately represented stakeholders who participated in the early establishment forum engagements. Several key sectors and stakeholder groups that were not well represented on the MWF committee included the agricultural sector (commercial farmers, emerging farmers or resource-poor farmers, the Departments of Agriculture Forestry and Fisheries, and Rural Development and Agricultural Reform), business and industry, the Department of Cooperative Governance and Traditional Affairs, and resident representation from Grahamstown West. The absence of many of these sectors was highlighted a weak point that required attention.

Stakeholder activity systems that made up the multi-activity system constellation of the MWF can be defined as either organisational (such as government departments, private companies, academic

institutions and NGOs) or community stakeholders (Simpungwe, 2006). Organisational stakeholders tend to participate as a proxy of the organisation they belong to, whereas community stakeholders are typically embedded in the catchment and represent their individual interests.

The committee was strongly weighted by two organisational stakeholder groups, the Department of Water and Sanitation (including DWS officials representing the Mzimvubu-Tsitsikamma proto-Catchment Management Agency) and the Institute for Water Research at Rhodes University. Both these stakeholder groups have extensive experience in water resource management matters, are well resourced and therefore were well suited to coordinate and maintain the function of the MWF. Representation from the other committee members was weaker. The MLM was represented on paper by the MLM Water and Sanitation manager and the MLM Communications Office; however, the Water and Sanitation manager rarely attended MWF committee meetings. Although the MLM Communications Office had high attendance, they had a limited grasp and ability to influence water service delivery management processes. Similarly, the MobiSAM representative provided valuable input in addressing problems to MWF communication-related issues, but rarely participated to the extent that this expertise could be utilised effectively. The traditional healer representative, a community stakeholder, could effectively represent traditional healer inputs from her own experience, but due to the isolated, secretive and disconnected nature of the traditional healer community, was unable to serve as a concrete conduit between the traditional healer community and the MWF (personal communication Kondile, 24 March 2017). The Private Eye Community Watch representative elected as a CSO/NPO representative was a dedicated committee member, but lacked the social capital to effectively represent the CSO sector (the CSO sector is diverse and therefore cannot realistically or justly assume to be represented by a single CSO representative or a particular CSO). The youth and media representatives participated sporadically in MWF committee meetings. As outlined above, the motives for participation were wide and varied.

The MWF aimed to achieve the key outcomes of improved governance of water service delivery in the MLM and informed, capacitated and empowered stakeholders participating meaningfully in water governance processes in the MLM. The MWF aimed to achieve these, in part, by facilitating water service delivery and resource management presentations and promoting dialogue between stakeholders and government during public meetings. The premise was that participating stakeholders would act as knowledge-sharing and capacity-building agents, representing the views of their constituencies to government and feeding back responses and updates to their constituencies. Buy-in and ownership of municipal and governmental officials and actors involved in community reporting structures was fundamental to realising these outcomes. Ward councillors and ward committee members are the structure through which water-related information passes between the

municipality and the public. Similarly, community development workers are seen as playing an important community capacity-building role in each ward. Both ward councillor-committee and community development worker activity systems participated sporadically and often unwillingly in MWF engagements. This effectively broke the communication chain between the Municipality and the community and undermined the knowledge and capacity-building impact of the MWF.

The MWF management committee did not represent all relevant stakeholders. In the absence of sub-committees or working groups on specific issues, it was left to the executive committee to oversee that all issues that fell within the object of the MWF were addressed. This resulted in some issues, such as catchment health and water for agricultural use, being neglected. Sub-committees are an important division of labour structure enabling a wide range of different work areas to be effectively addressed without compromising the required attention each area requires (Department of Water Affairs and Forestry (DWAF), 2001).

Engeström's (1987) activity system triangle model proved useful to conceptualise the different participating stakeholder activity systems in the MWF. The nature of the MWF activity system was best understood by exploring the relationships between activity systems working on the shared object. Problematic relationships within the MWF activity system and between its interaction with neighbouring activity systems are manifestations of contradictions. The following section discusses contradictions evident in the MWF.

6.5.3 Discussion of Aims 7 and 8: Aim 7: To understand and surface contradictions affecting the functioning of the Makana Water Forum activity system, and its ability to enable participatory water governance; and Aim 8: To report on the development of remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function

The MWF's teething problems influenced the forum's ability to participate in water governance. Problems that surfaced during the exploratory phase of the formative intervention process with the MWF management committee were manifestations of underlying contradictions. Further analysis of the teething problems identified a possible 25 contradictions, from primary to quaternary levels. I presented related contradictions as a Problem Constellation comprising seven Problem Themes which the participants then reorganised into six Problem Themes, of which three were prioritised for immediate attention. The three prioritised Problem Themes were: lack of clear focus of the MWF; representation, representivity and non-attendance, and the MWF relationship with the Municipality. In the following section I discuss the significance of the 13 contradictions related to these prioritised

Problem Themes. Contradictions related to the remaining unprioritised three Problem Themes are not included in the discussion.

Contradictions related to the Problem Theme: lack of clear focus of the Makana Water Forum

The MWF was typical of a multi-stakeholder platform, characterised by multiple stakeholders, each with slightly different water-related interests that motivated their participation in the MWF. Contradictions related to the perceived unclear focus of the MWF appeared to have two root causes, the first related to the broad nature of IWRM, and the second to the development, reliability and accessibility of the MWF Terms of Reference as a tool to convey the MWF purpose.

The MWF was established to enable inclusive participation in all aspects of IWRM, water supply, sanitation services, water resource management and catchment health. Each of these aspects comes with an array of management components. The MWF was a constellation of multiple stakeholder activity systems, each with different interests in certain management components of the various aspects of IWRM. Few, if any, MWF stakeholders had a comprehensive understanding of all of these IWRM elements and most had, at most, a rudimentary understanding. The focus of the MWF can be likened to its object of activity (Engeström, 2000; Foot, 2009). Each participant had a different perspective and understanding of the shared object of activity, and a slightly different personal object of activity linked to their motive for participating in the central activity. Foot (2009, p.8) articulates it thus: "at any point in time, participants in an activity may be at different stages in the contingent processes of need-consciousness and object formation, thus shaping their ability to perceive and articulate the object of the activity in which they are engaged." Defining and building a common understanding of the shared object – the MWF focus among all stakeholders and committee members – was thus challenging and perpetuated the impression that the MWF lacked focus.

The Terms of Reference (ToR) was the primary tool developed to articulate the shared focus of the MWF to committee members and stakeholders, a process that caused several contradictions. The ToR served as a tool for committee members to convey the function, vision, objectives, roles and responsibilities of the MWF to stakeholders. The actual drafting of the ToR was limited to resourced stakeholders with computers and internet; this excluded most of the community stakeholders. Community inputs came from several stakeholder engagement meetings held to build awareness and garner support for the establishment of the MWF. Limited involvement and contributions of community stakeholders in the ToR development process reflected the broader inequalities of the MWF catchment area. Socio-economic and, in turn, education disparity, is a constraint to facilitating fully inclusive institutional development (Cleaver, 2005; Cleaver & Whaley, 2018). Participants who were involved in the ToR drafting process had a clear sense of the MWF focus, whereas new-comers

and those elected as committee members later in the MWFs development, after the ToR was drafted, had different levels of understanding of the MWF's evolving purpose and shared object. For many stakeholders, including most of the committee, the first time they saw the MWF ToR was when it was presented for comment and adoption during a stakeholder capacity-building workshop. The committee was elected at this same workshop.

Other contradictions that constrained stakeholder and committee member understanding of the ToR related to the physical (means of obtaining a digital or hard copy) and cognitive (literacy and comprehension levels) accessibility of the ToR. The ToR was written in English, circulated electronically and presented digitally. These accessibility constraints call into question the value of the ToR as a tool for committee members, firstly, to coordinate stakeholder participation in the MWF and, secondly, to focus stakeholders' collaboration efforts in addressing complex IWRM problems.

Attention should be paid to inducting new committee members into the intended purpose of an MSP. This would entail developing mediating tools that enable this capacity building, and a division of labour to facilitate capacity building by knowledgeable MSP members. Here management committees could learn from Wenger's Community of Practice theory which suggests how core participants can act as boundary-crossing knowledge agents, capacitating participants on the periphery of the activity or community of practice (Wenger et al., 2002). Learning through boundary-crossing plays an important role in the development the object and explication of the different needs of activity system participants.

Remedial actions to Problem Theme: lack of clear focus of the Makana Water Forum

Tools to articulate the focus of a CMF, such as a ToR, are useful but need to be conveyed in creative ways to cater for the diversity of education, language and ways of knowing. Revisiting, learning and renegotiating the shared focus of a CMF should be an iterative process to respond to, firstly, the discontinuous nature of stakeholder participation and forum coordinator turnover, and secondly, the changing state of the complex social-ecological system in which the CMF is embedded.

Multi-stakeholder platforms that seek to enable equal and meaningful participation to address all water issues relating to IWRM will inevitably face the challenge of breadth versus depth of focus. It is unrealistic to expect stakeholders to be interested in all issues that fall under the ambit of IWRM.

IWRM, by definition, implies a holistic approach to manage all aspects of water. Catchment management forums, as grassroots IWRM institutions, are therefore required to enable participation in virtually any water-related issue. As a result, MSPs, particularly forums like the MWF that explicitly include water supply and sanitation services, are predisposed to a broad focus. Communicating and

building a common understanding of the depth of this broad focus among stakeholders is a key building block in meaningful stakeholder participation.

Contradictions related to the Problem Theme: representation, representivity and non-attendance

The broad and multi-faceted object of activity of the MWF required that include a broad range of stakeholders. Limited capacity, resources and appropriate tools available to the MWF significantly hindered its ability to identify, attract, enable and sustain participation of all relevant stakeholders.

Many of the contradictions point to the capability of the MWF management committee to attract a broad range of stakeholders to participate in the MWF.

Representation

A wide, diverse mix of stakeholders have a vested interest in, or are affected by IWRM (Schreiner & Van Koppen, 2002; Colvin et al., 2008; du Toit & Pollard, 2008). This is a mix of ethnicity, gender, age, cultural historical backgrounds, geographic locations, socio-economic positions, employment, levels of education, capabilities and power relations. The discrepancies between stakeholders is particularly striking in developing countries where much of the population is poor and live in rural, peri-urban and densely populated areas. Here MSPs essentially resemble "coalitions of the unlike" (Weber, 2003, p.107). Swatuk and Motsholapheko (2008) remark that in these contexts, questions such as "[h]ow to get there; what to say; and how to say it are not self-evident processes". There is no “one-size-fits-all” approach to building an inclusive MSP in the context of such diversity; different stakeholders have different limitations that need to be overcome. It is the task of the coordinating committee of the MSP to innovate ways of achieving this inclusivity as well as mediating their engagement around their partially shared objects.

Tremendous skill and investment of time and effort is required to effectively coordinate and recruit stakeholders to an MSP. A coordinating team requires a basic understanding of IWRM concepts and water governance institutional arrangements, and needs communication, facilitation, conflict management and negotiation skills, as well as firm leadership (Pegasys, 2017). Skilled facilitation is key, particularly in the early vision-setting stage of the MSP. If this is badly done, Warner (2005, p.8) cautions it "can result in a totally expedient 'vision' with a high deal of equifinality (a condition in which different initial conditions lead to similar effects), without addressing the actual dilemmas". If poorly coordinated, an MSP runs the risk of losing credibility in the eyes of stakeholders and results in its rejection as an avenue for participatory water governance.

The election of the MWF management committee members was on the grounds of inclusivity, to ensure a broad representation of stakeholders. The capability and coordination experience of

nominees had no bearing on the election. The combined MWF management committee lacked sufficient capacity and time (most were volunteers, with MWF work falling outside their primary work domain) to ensure that the diverse and specific needs of all stakeholders were attended to during MWF activities. This resulted in a drop-off in attendance of stakeholders whose needs were "neglected" in MWF engagements.

Lastly, coordinators of MSPs require access to adequate tools to assist in identifying and encouraging participation of appropriate stakeholders. Tools may include a communication strategy, stakeholder database and communication technology (email and telephones). In the case of the MWF, contradictions revealed these tools to be under-utilised and insufficiently developed. Access to financial resources may also be required to assist stakeholders in overcoming barriers that limit their participation. For example, limited resources available to the MWF constrained its ability to offset the transaction costs of disenfranchised stakeholders, such as resource-poor farmers, to attend MWF engagements (e.g. provide or pay for transport).

In addition to being well capacitated and having access to adequate tools and resources, MSP coordinators' ability to articulate the potential benefits of participation to stakeholders will largely determine their involvement.

Non-attendance

Stakeholder participation in an MSP exhibits a primary contradiction between the exchange of resources (transport and time away from responsibilities and income-generating activities) and the value of benefits that participation will yield. If resource costs of participating in MSP activities outweigh the potential benefit, stakeholders are unlikely to sustain their participation (Simpungwe, 2006; Warner & Verhallen, 2007; Pegasys, 2017).

Contradictions related to the perceived mismatch between the projected broad object of the MWF and the specific object of different stakeholders discouraged participation. Stakeholders struggled to relate, on a practical level, to the broad IWRM concepts presented as the purpose of the MWF. This is confirmed by Simpungwe (2006) who found that self-realisation and the potential for tangible benefits incentivised participation.

Disenfranchised stakeholders, particularly, may find their time be better spent seeking employment or performing other necessary tasks. Often disenfranchised community stakeholders attend MSPs with the hope of immediate benefits that somehow alleviate their situation and improve their well-being (Butterworth, Warner, Moriarty, Smits & Batchelor, 2010). As Simpungwe (2006) found, local communities often view government officials, researchers and NGOs as avenues to access financial resources. If participation does not yield benefits to stakeholders, participation can be expected to

wane. Furthermore, the benefits of participation may only materialise after several months, or even years, of sustained, concerted action. For example, participation in the development of a catchment management strategy is likely to yield benefits such as improved water access water resource quality years after the implementation of the strategy. An MSP should include an action component (Warner, 2005) and strive for balance between facilitating activities that yield short- and long-term benefits. Identifying and capitalising on "quick wins" or "low-hanging fruit" are important to satisfy and sustain stakeholder interest and enhance the required continuity of participation in processes that take a long time to bear fruit (Warner, 2005; O'Donnell, Lamond & Thorne, 2018).

The MWF coordinators had not put sufficient effort into negotiating and defining the potential roles and responsibilities of different participating stakeholder groups. Stakeholders had no explicit division of labour within the MWF. As a result, many stakeholders were unaware of not only the role of the MWF in the broader water governance institutional system, but what their role would be within the MWF. Typically, stakeholders do not want to take the resource or service management responsibility away from the government, but want to be informed and included in management processes (Warner, 2005). The negotiation of roles and responsibilities provides a sense of purpose to participation and builds stakeholder ownership of the platform (Warner, 2005).

Many community members experience real social and environmental injustice on an everyday basis and their participation is driven by the expectation that direct benefits will accrue. If the purpose of the platform and potential benefits of participating are not clear, stakeholders are likely to prioritise other income-generating actions over participation.

Representivity

Many of the stakeholders that the MWF did attract were not true representatives of their constituencies and seemingly participated for their own benefit. Once again, this contradiction related to the ability of the MWF to identify and attract the right stakeholders to its engagements.

Representivity is related to the ability and willingness of stakeholders who attended the MWF to represent the interests of their constituencies and to act as knowledge brokers back to their community. To enable inclusive and democratic water governance, an MSP needs to attract the appropriate people to the room. Ideally MSPs require people that are true representatives of wider stakeholder groups and have the capacity and accountability to act as knowledge- and social learning agents both within the MSP and within their constituency. Essentially these representatives act as boundary-crossing agents (Wenger et al., 2002; Engeström & Sannino, 2010; Akkerman & Bakker, 2011) between the MWF and their personal activity systems.

Multi-stakeholder collaboration in resource management processes has been shown to promote social learning (Huitema et al., 2009; Ashley et al., 2012; O'Donnell et al., 2018). An MSP can therefore provide a fertile social learning environment to build the representative capacity of stakeholders. Members that maintain continuity of participation are likely to build their knowledge capacity and become more capable and confident social learning agents within the MSP and their constituencies. However contradictions revealed that, in a quest for inclusivity, the MWF prioritised increasing the numbers of participants across all stakeholder groups, rather than targeting key stakeholder representatives. van Mierlo et al. (2013) cautions against this mass participation approach, which in collaborative engagement spaces can constrain social learning. Prell, Hubacek and Reed (2009, p.501) argue that careful stakeholder analysis informed by actor network analysis "can be used to avoid inflaming conflicts, ensure that the marginalisation of certain groups is not reinforced, and fairly represent diverse interests". These analyses could support the development of effective communication tools to support the identification of applicable stakeholders.

The participants' ability to build their capacity as social learning agents through participation within the MWF hinges, to some extent, on the accessibility of the content and the manner in which it is presented and discussed within an MSP. In this sense, accessibility is influenced by the predominant language used, the level of complexity and technical detail of content, and the method of mediating content (facilitation technique).

The state, supported by academic institutions and NGOs, has a critical role in developing the collaborative capacity and empowering stakeholders to become legitimate owners of MSP processes (Simpungwe, Waalewijn & Raven, 2007).

To maintain participation in MSPs, the process must yield benefits to stakeholders that can be realised in real terms. The degree to which MSP resolutions and discussions can be implemented in practice hinges on the support, buy-in and commitment of government officials. Local government, through Water Services Authorities and Water Service Providers, are ultimately responsible for domestic water supply and sanitation services as the DWS is responsible for water resource management. Contradictions related to municipal buy-in were the third prioritised for urgent attention.

Remedial actions to the Problem Theme: representation, representivity and non-participation

The MWF management committee stood by their commitment to enable inclusive participation in the broad scope of IWRM. As a result, remedial actions revolved around tool, rule, and division of labour development to broaden representation, improve representivity and increase participation. New and improved tools, such as a comprehensive stakeholder database and a refined, focussed MWF meeting

agenda, sought firstly to identify key stakeholder representatives, and secondly, to better understand and cater for the specific water-related needs of the stakeholders they represented.

The reconfiguration of the MWF activity system as a result of changes to the tools, rules, and division of labour indicated a shift in the MWF coordination approach to address its object. This focus shifted from facilitating engagements which aimed to cover the broad range of IWRM components in each quarterly meeting, to multiple, diverse engagements targeting specific IWRM components in more depth. Different forms of engagement included interactive learning tours, stakeholder-specific "one-on-one" engagements, as well as the typical general MWF meetings. Tours and one-on-one engagements served as a means to achieve the quick wins required to maintain short-term interest of stakeholders and to encourage their participation in long-term IWRM processes (such as catchment management strategy development).

The existing MWF coordinating committee lacked the capacity to implement the variety of proposed engagements and provide the required attention to the different stakeholder needs. To combat this limitation, issue-specific sub-committees comprising interested and motivated MWF stakeholders were envisaged as a new division of labour. Sub-committees can be likened to Engeström's concept of knot-working, where different actors coalesce on an issue and innovate ways of loosening or changing it for the better. If well facilitated, sub-committees could provide a fertile social learning and agency development spaces that build the collaborative capacity of stakeholders to enable transformative change.

Contradictions to the Problem Theme: Lack of buy-in from the Makana Local Municipality

Poor attendance, buy-in and commitment to the MWF by political and administrative Municipal officials greatly reduced the potential of stakeholder dialogue to influence water governance decision making.

Key municipal decision makers who are directly responsible for: 1) administering water and sanitation services, namely the Municipal Manager and officials from the Technical Development and Infrastructural Services officials, and 2) political oversight of water governance, such as portfolio and ward councillors, participated intermittently and seemingly reluctantly in MWF engagements. The inferred contradiction related to this issue was that there was a lack of shared object between the MLM and the MWF. However, discussion in the second multi-session Change Laboratory workshop revealed that the Municipality was so preoccupied with firefighting to maintain a dysfunctional system that was financially constrained, short staffed, fighting litigation and under a barrage of criticism from the public (and other sectors), that it had little time to prioritise to public participation processes. Key municipal actors, such as the Water and Sanitation Manager, viewed the MWF as space to report to

the public and endure criticism, as opposed to a collaborative and generative space that the MWF intended to be.

Buy-in from government officials not only increases the legitimacy of an MSP, but also provides direct access to decision makers and implementing agents that can translate the products of multi-stakeholder dialogue into practical actions to shift complex water problems.

Ideally, participation of government officials, other organisational stakeholders and community stakeholders needs to be delicately balanced. If participation is weighted towards government officials, there is a risk of alienating community stakeholders and reducing the sense of stakeholder ownership of the platform. As seen in the Mthatha CMF development (Simpungwe et al., 2007), community stakeholders may shift their general distrust in government to the platform and view it as another self-serving, government-run initiative rather than a space to serve the interests of the people. Platforms overly weighted by well-resourced and traditionally powerful stakeholders such as organisational stakeholders and the social elite, can similarly deter disenfranchised community stakeholders. This challenge was evident in forums in the Inkomathi CMA development process (Anderson, 2005; Simpungwe et al., 2007). On the other hand, as exemplified in the Kat River Forum in the Eastern Cape (Simpungwe et al., 2007; Burt, Mcmaster, Rowntree & Berold, 2008), if a platform is overly weighted with community stakeholders, government officials may be disinclined to participate. Government officials may be reluctant to put themselves in positions which may undermine their traditional hegemony, make them vulnerable to public scrutiny that could expose shortfalls in their knowledge and competence, or which take time away from their core mandates.

All MWF members are expected to share information obtained at MWF engagements with their social networks, and in doing so, build the broad-scale community knowledge capacity (DWAF, 2001). Ward councillors and committee members play a similar knowledge-sharing role, which ideally, MWF actions should complement. However, as evidenced in the MWF, some Ward Councillors and committee members perceived MWF knowledge-sharing activities as competition and a threat to their job security, and actively undermined MWF social learning efforts. Furthermore, involvement of government sector departments, such as the DWS, through forums, are viewed by some officials from the municipality (e.g. ward councillors) and government officials (e.g. Community Development Workers) as interference, as outside agents quality-checking municipal work, rather than as potential collaborators and supporting agents.

Relationships and trust between and among community stakeholders and government officials is required for successful IWRM. Such relationships can be built through sustained and productive engagement within a MSP (O'Donnell et al., 2018).

Remedial actions to the Problem Theme: Lack of by-in from the Makana Local Municipality

During the stage of analysis and modelling remedial actions, it became clear no major reconfiguration of the MWF object was required to better align with the object of the Municipality. Rather, remedial action modelling focussed on the development of new tools, rules, and divisions of labour to build relationships between and support from key municipal officials, and influence policy and high-level municipal decision making. To increase the legitimacy of the MWF in the eyes of the political leadership of the MLM, participants committed to drafting (new division of labour) quarterly submissions of MWF resolutions and recommendations (new tool) for the consideration at the Infrastructure Development and Technical Services portfolio committee meetings. From the portfolio committee resolutions progress to the municipal council for final decision making. In addition, the role and mandate of the MWF in aspects of the water services and resource management value chain was to be strengthened by securing its inclusion in the Integrated Development Plan (IDP) of the MLM. Inclusion in the IDP opens an avenue to access municipal finances and therefore the means to practical action. Although these tools could greatly increase the legitimacy of the MWF, their enactment is likely to be constrained by the existing limitations of the coordinating committee.

6.6 Conclusion

This chapter marked the transition into the second phase of my research, where I presented an account of the emergence, function and transformation process of a multi-stakeholder water governance platform, the Makana Water Forum (MWF). I applied Cultural Historical Activity Theory to 1) describe and understand the emergence and function of the MWF, and 2) conduct a formative intervention using the change laboratory methodology to catalyse a process of expansive learning and transformative change to overcome debilitating contradictions affecting MWF function. In this conclusion, I synthesise some of the key learnings from this chapter and suggest the possible value of their application.

The evolution of the purpose of the MWF and contradictions affecting its function were influenced by past cycles of participatory water governance activity at a local, provincial and national scales. A deep historical analysis was required to understand the root causes of contradictions and to inform the process of overcoming them. The key learning: Conducting part of this historical analysis as a participatory process, in a change laboratory setting, enhanced participant learning towards the identification and joint remediation of contradictions.

The multi-faceted nature of water management in complex social-ecological systems comprising diverse stakeholders and interests gives rise to wicked problems, which in turn can be understood as

being driven by underlying contradictions. Contradictions are rich in potential for enabling learning. It stands to reason that, with careful facilitation, multi-stakeholder platforms (MSPs) engaging with wicked problems can serve as valuable platforms to enable learning towards positive change. However, as evident with the MWF, the ability of an MSP to manage for complexity and overcome contradictions are greatly influenced by the human capacity, resources and agency it can muster. The key learning: The effectiveness and sustainability of the MWF as an MSP could be improved by having a well-capacitated management committee, with strong municipal support and local stakeholder buy-in that has a common, basic understanding of the nature of Integrated Water Resource Management.

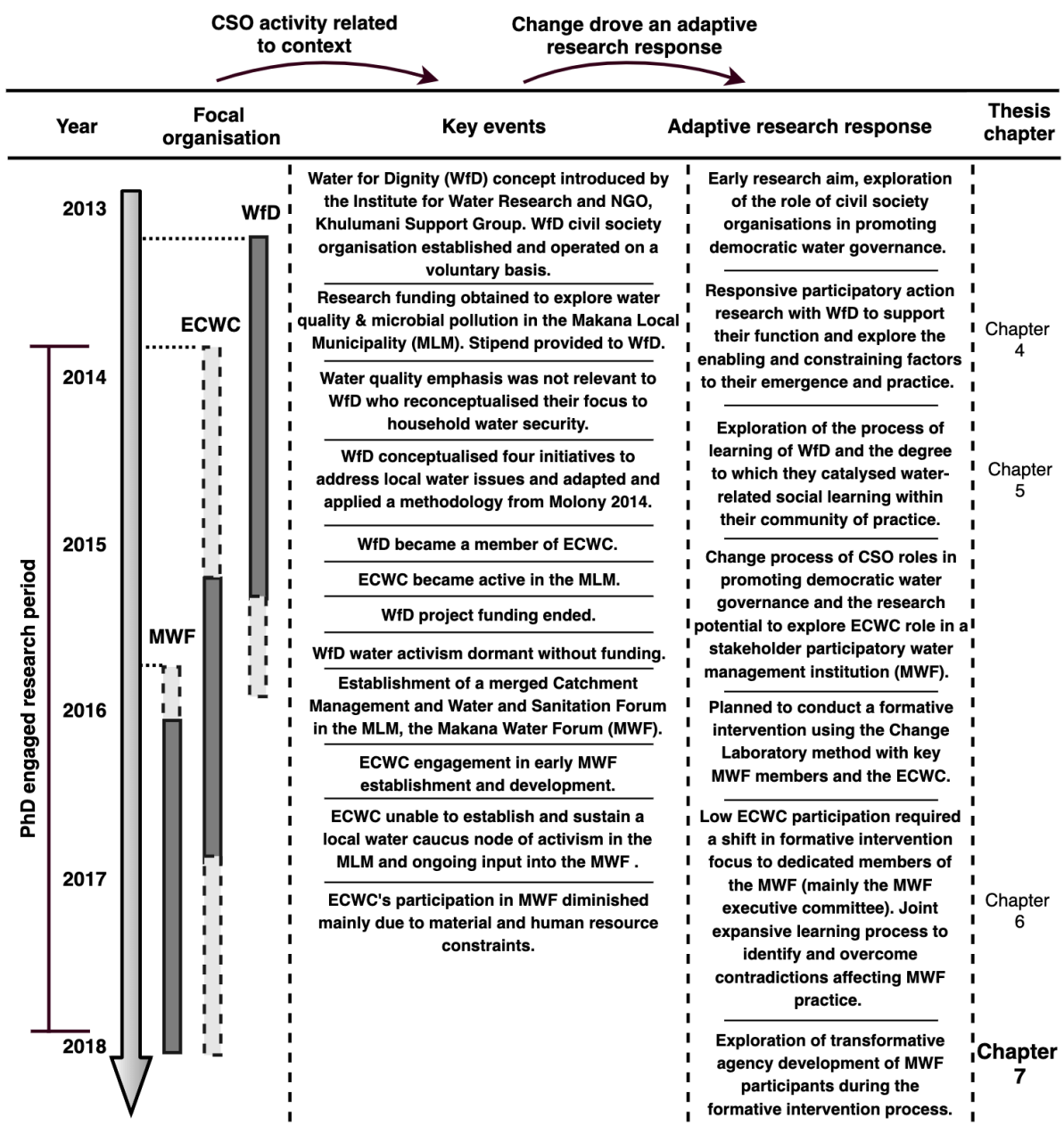
During the Change Laboratory process twenty-five contradictions were identified and grouped into seven Problem Themes. Three of these Problem Themes related to MWF focus, participation and municipal buy-in were prioritised for immediate attention during workshop sessions. Remedial actions to overcome prioritised Problem Themes were jointly developed and to a certain extent, implemented by the Change Laboratory participants. The formative intervention process served as an effective method to accelerate participant learning towards identifying and overcoming critical contradictions affecting the function of the MWF. The contradictions identified and remedial actions developed have application value as future management objectives to the MWF. The key learnings: The findings from this formative intervention process can inform the function of other MSPs emerging in similarly complex water management contexts. In addition, this study provides an example of the first application of the Change Laboratory methodology in a water governance MSP context. Lessons from this application (such as frequency and of intervention sessions, participant composition and the inclusion of content specialists among others) should inform the application of future interventions in other contexts.

An important outcome of an expansive learning process is the development of transformative agency. In the following chapter, I explore the development of transformative agency of participants of the multi-session CL workshops. I provide a summary of the rationale for IWRM in CSESs and therefore, the importance of developing the adaptive capacity of responsible stakeholders and how catchment management forums are rich spaces for this development. I present and discuss the findings and implications of a micro-analysis of agentive talk evident during the CL process.

7 Chapter Seven – The development the Makana Water Forum through an interventionist approach: transformative agency formation during the expansive learning process.

The Makana Water Forum facilitated the Grahamstown Water Tour to build the water knowledge capacity of its coordinating committee and relational agency between stakeholders.

Box 7.1: Repeat of Figure 1.7 as a reminder of the research timeline in relation to Chapter Seven. Timeline of the adaptive research process of the doctoral study.



Repeat of Figure 1.7: Timeline of the adaptive research process of the doctoral study. Active engaged research began at the end of 2014 and ended in December 2017. Of interest to this study was the sequential activity of two civil society organisations (CSOs), Water for Dignity (WfD) and the Eastern Cape Water Caucus (ECWC) and their overlap and engagement with the multi-stakeholder water governance platform, the Makana Water Forum (MWF). The degree of overlap and engagement of WfD and the ECWC with the establishment and function of the MWF is depicted (dark shading indicating high intensity of activity and light shading in dashed box depicting low intensity of activity). The MWF was initially a catchment management forum then transformed into a water forum which implied the inclusion of water and sanitation services and water resource management. Key events pertaining to the two CSOs that influenced the research process are described. The adaptive research response required as a result of the changing activity of the focal organisations is described and related to the relevant data chapter in the thesis. Note: This figure is repeated in Chapters Four to Seven for ease of reference.

7.1 Introduction

South Africa's decentralisation of natural and domestic water governance is effected through an integrated water resource management (IWRM) approach (du Toit & Pollard, 2008) and Developmental Local Government (Clifford-Holmes et al., 2016). Decentralisation means that IWRM and water service delivery is the responsibility of local managers and policy makers who have been mandated to enable stakeholder participation in water governance processes (Funke et al., 2007). Indeed, the rationale behind enabling stakeholder participation in natural resource management (NRM) processes is compelling and the benefits widely documented (Armitage, 2005; Maak, 2007; Knapp et al., 2014; Talley et al., 2016) and increasingly mandated in NRM policy (Masango, 2009; Turner et al., 2016). Some of these benefits include: increased likelihood of good decision making; promotion of social learning; promotion of project outcomes that are supported, relevant and applicable to their implementation context (Talley et al., 2016). Furthermore, the participatory role of citizens to take ownership of their democracy and proactively involve themselves in governance processes has repeatedly been emphasised and encouraged in policy (DWAF, 2004; DWA, 2013) and political rhetoric (The Presidency, 2016; 2017; 2018).

South Africa's natural water resources are fully allocated and are becoming increasingly degraded (Adler, Claassen, Godfrey & Turton, 2007; Colvin et al., 2008; Hedden & Cilliers, 2014). Throughout the country local water supply systems are failing (Giordano & Shah, 2014; Clifford-Holmes et al., 2016; Tandwa, 2018) due to a complex range of interconnected factors from lack of qualified personnel and ongoing maintenance, financial mismanagement and revenue non-collection, poor political oversight, to drought (Smith & Green, 2006; Quinn, 2012; Schreiner, 2013). Catchments and the water supply systems embedded within them can be viewed as complex social-ecological systems (CSESs) (Pollard & du Toit, 2008; 2011; Jaeger et al., 2013; Weaver et al., 2017; Chapter Two, Section 2.3). Problems associated with CSESs, often referred to as wicked problems (sensu Rittel & Webber, 1973), are typical of water supply systems, and local government actors have been hard pressed to manage the complexity of these systems (Weaver et al., 2017). The "business as usual", top-down approaches that rely on pre-existing knowledge and predetermined ideas and strategies are ineffective in dealing with the often-unpredictable nature of CSESs. Adaptive management (Pollard & du Toit, 2011) and transdisciplinary (Max-Neef, 2005; Lang et al., 2012) approaches are better suited to water resource management in CSESs (Meissner et al., 2013; Palmer et al., 2015).

It is therefore important to build the adaptive capacity of policy makers, managers and participating stakeholders to manage this complexity and improve the sustainability of water management CSESs (Cilliers et al., 2013). As grassroots, multi-stakeholder engagement platforms, catchment management forums (CMFs), have the potential to support the development of the adaptive capacity

of water management actors and in doing so, play a valuable role in improving the sustainability of catchments and embedded water management systems. Catchment management forums, linked to overarching Catchment Management Agencies (CMAs), were envisioned as important vehicles to effect IWRM (Meissner, 2016) and to showcase the interconnected nature of water resource management and urban water supply (DWAF, 2001). The multi-stakeholder nature of CMFs bring together policy makers, managers, academics, non-academics and water stakeholders with their different disciplines and ways of knowing. The CMF then serves as a rich and generative learning environment to innovate novel approaches to support water management. Cilliers et al. (2013) caution that diversity brings different and sometimes conflicting perspectives, values, motives and time horizons which require skilful management. To a certain extent, the individual and collective agency of the CMF members, as well as the receptiveness of the SES landscape to change determine the potential impact of CMFs on CSES transformation and sustainability. Using the case of the Makana Water Forum (MWF) in the Makana Local Municipality (MLM), in this chapter I argue that CMFs can provide an enabling environment for stakeholders to build and effect individual and collective agency for CSES transformation and sustainability.

Initiatives to establish two forums were set in motion in the MLM towards the end of 2015. One, a CMF to enable stakeholder participation in water resources management, and the second a Community Water and Sanitation Forum to enable public participation in water service matters. The integrated nature of water resources management and water service delivery led to the integration of the two Forums to form the MWF. As described in Chapter Two (Section 2.5.3), the MLM water CSES is a wicked problem (Rittel & Webber, 1973); the MWF aimed to address the problems associated with this wicked problem. However, the MWF had its own operational challenges and the management committee of the MWF decided to participate in a formative intervention using the Change Laboratory (CL) method (Virkkunen & Newnham, 2013) to reconceptualise its activity so as to better fulfil its function of improving the sustainability of the MLM water CSES (Chapter Six, Section 6.4.2). Formative interventionist research and the CL method are designed to facilitate transformation of collective human activity systems in crisis (Sannino, Engeström & Lemos, 2016). Chapter Six focuses on the formative intervention process itself, the historicity of the MWF and its objectives (Section 6.4.1), a description of the multi-activity system network related to the MWF, and the process of surfacing and overcoming contradictions through an expansive learning process (Section 6.4.2). Transformative agency (detailed below) is the most important outcome of a CL formative intervention (Sannino, Engeström & Lemos, 2016). The aims of this chapter are to determine the extent and forms of transformative agency that emerged through the interventionist process in the MWF.

7.2 Transformative agency development in an expansive learning process

Cultural Historical Activity Theory-informed formative interventionist research has been widely used as a learning process to engender transformation in organisations, communities and collective human activities that are at risk, or in crisis (Engeström, 2011). Engeström and Sannino (2010) state that, particularly in activities undergoing complex change, the most important outcome of expansive learning is transformative agency. Human agency is the capability of a person to purposefully change their behaviour to effect change in the world (Thorne, 2015). Transformative agency is a form of agency that is the result of actors' engagement with conflicts, disturbances, and contradictions in their activity (Sannino, Engeström & Lemos, 2016). In this study, transformative agency is used within a Cultural Historical Activity Theoretical (CHAT) context (Engeström, 2000), therefore I have used Virkkunen's (2006, p.49) description of transformative agency as "breaking away from the given frame of action and taking the initiative to transform it". Haapasaari et al. (2016, p.259) report that:

> Actions and expressions of transformative agency emerge when people are placed in demanding situations and are given an opportunity to analyse, envision and redesign their activity collaboratively, with the help of mediating conceptual instruments.

In a formative intervention, dialogue among practitioners catalyses by joint examination of conflicts, tensions and contradictions, manifesting in a shared practice which develops societally impactful and actionable knowledge that can be turned into transformative action (Sannino & Engeström, 2017). Multi-voiced dialogue, inclusive of non-academics, practitioners and academics, brings diverse perspectives to bear on conflicts, tensions and contradictions that constrain joint activity (Engeström & Sannino, 2010). Multi-voiced problem-solving of contradictions promotes expansive learning (Sannino & Engeström, 2017), which is pivotal to developing and transforming a collective activity (Engeström, 2001). Multiple voices not only enhance the process of overcoming problems, but can also increase the potential of implementing the solutions (Engeström, 2001; McMurty, 2006). Including key actors, such as municipal officials, councillors, departmental officials (e.g. Department of Water and Sanitation (DWS) officials), community members, academics and other relevant practitioners in addressing water-related issues and modelling remedial actions can fast-track the implementation of model remedial actions. In addition, involving both policy and management actors and community members in the process promotes the authenticity and legitimacy of remedial actions from a municipal perspective, and ownership from a community perspective. It stands to reason that multi-stakeholder water governance platforms, such as CMFs, contain the necessary ingredients to engender expansive learning and generate societally impactful and actionable knowledge required for effective and sustainable water services and resource management.

In the context of a collective activity such as the MWF, transformative agency develops the activity as participants articulate and envision future possibilities (Haapasaari et al., 2016). Transformative agency is therefore greater than individual actions and seeks to transform collective activity towards systemic change. Given that the intention of the intervention into the MWF was to facilitate developmental change towards improved forum function (to overcome the problems identified in the problem constellation, Chapter Six, **Figure 6.9**), the concept of transformative agency was key in understanding, analysing and describing the developmental process and its outcomes.

The formative aspect of the intervention was to improve the democratic nature of water governance in the Makana Local Municipality. This research took the form of an active intervention – using learning theory to design workshops for MWF members to learn, expand and focus their practice. However, during negotiations about the implementation of the intervention, participants motivated for a general MWF development intervention rather than a specific focus on democratic governance development. They envisaged development of democratic governance occurring as a natural outcome of the intervention that did not require foregrounding or prioritising.

Speech theory suggests that spoken language can be regarded as a form of consequential action (Austin, 1962 in Haapasaari et al., 2016) and the interplay between talk and consequential action is an important feature in any formative intervention. Sannino (2008, p.255) emphasises this dialectic by suggesting that "…discursive agency fulfils its agentive nature by progressively transcending the situated confines of discourse and taking the form of concrete developmental actions". Here Sannino defines how transformative agency manifests, particularly in innovation activities such as formative interventions. She found that people's voiced commitments to act, or their reflection of examples of past successful practice as potential future remedial actions, were expressions of agency. Building on findings from Sannino's (2008) initial study, Engeström (2011) defines five types of expressions of transformative agency that manifest in formative interventions. These include: resisting the intervention or management; explicating new possibilities in the activity; envisioning new patterns or models of the activity; committing to concrete actions aimed at changing the activity; and taking action to change the activity (Engeström, 2011, p.622). Haapasaari et al. (2016) expanded these five by adding criticising as a form of transformative agency, which refers to discourse that includes criticism related to the current activity, the organisation, management, or the intervention process itself. Finally, and most recently, Heikkila and Seppanen (2014) offered reframing as a seventh form of transformative agency, referring to agency that is motivated by the need to protect one's well-being and which is characterised by a reframing of the object or their actual agency. All these forms of transformative agency are expressions of participants' agency to effect change in their collective activity.

Catchment management forums are primarily spaces to enable dialogue (Lotz-Sisitka & Burt, 2006). Utterances and talk are the main source of exploring agency development and dialectic forms of action. In this study the seven forms of transformative agency were used to analyse the extent to which transformative agency occurred, in a series of formative intervention sessions, to transform the MWF.

7.3 Research design and methods

7.3.1 Expansive learning and Change Laboratory

In 2017 members of the MWF management committee participated in a formative intervention process (Engeström, 2011) (Chapter Six, Sections 6.1 and 6.3) to resolve critical contradictions constraining the function of the MWF.

Committee members engaged in two multi-session Change Laboratory (CL) workshops, the first on the 14 September 2017 and the second on the 6 December 2017 (Chapter Six, Section 6.4.2). Workshops were largely based on the CL toolkit developed by Virkkunen and Newnham (2013). The two multi-session workshops comprised five, two-hour CL sessions, each session with specific learning tasks and actions designed to guide participants through the expansive learning cycle (Chapter Six, Section 6.2.4).

7.3.2 Data analysis

The five CL workshop sessions were audio-recorded and transcribed verbatim. The ten hours of audio recording translated into 97 pages of transcription. Each session transcription was divided into participant speaking turns (a total of 1034 speaking turns), which were classified as uninterrupted talk by a single participant. Each speaking turn was analysed deductively (Chapter Three, Section 3.2.6) drawing on the seven classifications of expressions of transformative agency developed by CHAT theorists (Heikkilä & Seppänen, 2014; Haapasaari & Kerosuo, 2015; Haapasaari et al., 2016) (**Table 7.1**). Analytical memos of speaking turns coded according to the seven expressions of transformative agency were collated for each of the five CL sessions (Appendix M1). Additional inductive analysis was conducted on each agentive analytical memo to determine the main subjects. All data were organised, managed and analysed using the QSR NVIVO 11 data management software.

7.4 Results

In the following section I explain each of the seven expressions of transformative agency and provide a quote from raw data from the Change Laboratory sessions. I present the analysis and interpretation

of the different expressions of transformative agency throughout the two multi-session Change Laboratory workshops.

7.4.1 Expressions of transformative agency

Table 7.1: Discursive data from Change Laboratory workshops were broken down into individual speaking turns, each of which were coded using the seven discursive expressions of transformative agency as a conceptual framework. (Sources: Adapted from Engeström & Sannino, 2011; Heikkila & Seppanen, 2014, pp.13–14; Haapasaari & Kerosuo, 2015).

Expression of transformative agency	Data examples from Change Laboratory sessions
Resisting the change, new suggestions or initiatives Directed at management, co-workers or the facilitator of the intervention	AM: "OK can we read them first and you tell us after. You (interventionist) don't tell us now, you tell us after we have read them to see if you, you might somehow pre-arrange our minds to what you would have raised."
Criticising the current activity and organisation, highlighting the need for change Change oriented and aimed at identifying problems in the current way of working	YR: The other problem is the committee is not representing all the stakeholders that are water related. We only have a few, like Private Eye, traditional healers, those are the only stakeholders we have (emphasising the need to increase stakeholder representation on the Forum committee)."
Explicating new possibilities or potential in the activity Relating to past positive experiences or former well-tested practices	NN: "Two days back we had what we called the water tour, there was a full representation of different stakeholders there. So, I think that will come as a solution to this (non-representation). Because if we keep those contacts that were represented there, remember, we have good numbers, good turnout there […] plus minus 40 […] that could be a solution to sector representation."
Envisioning new patterns or models of the activity Future-oriented suggestions or presentations of a new way of working	LM: "Not even the whole Terms of Reference, maybe we look at the slot, maybe the key responsibilities of the member, maybe the next meeting the functions of, not the whole document."
Committing to actions Committing to take concrete, new actions to change the activity. Commissive speech acts are tied to time and place	PC: "[…] there is a proposal there as an activity to kick off, certainly the next workshop, with an understanding of the Terms of Reference."
Taking action Reporting having taken consequential actions to change the activity in between or after the laboratory sessions	SM: "We have committed to that (inviting the Department of Environmental Affairs) in our previous meeting and I said that we have a name for that. I have already liaised with that person."
Reframing A subject's reflexive attempt to reframe their practice often in order to preserve or protect their work-related well-being	NN: "[…] this is something that I would like as Private Eye, one of the stakeholders of the Forum, is to see the Forum go straight and do something so that we can be known by other people."

7.4.2 Evidence of transformative agency during the Makana Water Forum interventionist process

Transformative agency is the most important outcome of an expansive learning process (Sannino, Engeström & Lemos, 2016), so data from the Change Laboratory (CL) workshops were analysed for evidence of transformative agency. Of the 1034 speaking turns analysed, 406 showed some form of transformative agency, ranging through all seven types: resisting, reframing, criticising, explicating, envisioning, committing and taking consequential actions (Table 7.1).

A similar number of MWF committee members participated in the five CL sessions (8-12). Representation from the Department of Water and Sanitation, researcher-facilitators from Rhodes University (from the Institute for Water Research and the MobiSAM project based at the Department of Information Systems) and communication and water and sanitation administrators from the Makana Local Municipality (MLM) outweighed representation from community NPOs, community media and MLM politicians (**Table 7.2**).

Table 7.2: Different sectors that participants represented during the during the five Change Laboratory (CL) sessions. Department of Water and Sanitation = DWS, Makana Local Municipality (MLM), Non-profit organisation (NPO).

Participant representation	CL 1a	CL 1b	CL 1c	CL 2a	CL 2b
Researcher-facilitator	3	2	2	3	3
DWS	5	5	5	3	3
MLM political	0	0	0	1	1
MLM administrative	3	3	0	2	3
Community NPO	1	1	1	1	1
Community media	0	0	0	1	1
Total	12	11	8	11	12

All seven expressions of transformative agency were identified during the CL sessions (Table 7.3). Apart from CL 2a, which recorded the highest proportion of agentive expressions (percentage of speaking turns that were agentive), the proportion of agentive talk increased progressively over the five intervention sessions. Envisioning, criticising and commissive were the most prevalent forms of agentive expression respectively, followed by taking action, resisting and reframing. The second Change Laboratory workshop (CL 2) was split into two as it comprised two distinct sessions, each focussing on a different expansive learning step. Speaking turns were longer in CL 2a and CL 2b, which partly accounts for the low number of total speaking turns (Table 7.3, Appendix L7).

Table 7.3: Distribution of speaking turns and different agentive expressions occurring across the five Change Laboratory (CL) sessions.

Change Laboratory (CL) session	CL 1a	CL 1b	CL 1c	CL 2a	CL 2b	Total	% agentive turns	% all turns
Resisting	9	1	0	4	1	15	3,7	0,9
Criticising	27	27	31	17	9	111	27,3	6,7
Explicating	4	10	16	8	5	43	10,6	2,6
Envisioning	13	46	34	26	22	141	34,7	8,6
Committing	8	25	13	9	8	63	15,5	3,8
Taking action	1	3	9	15	1	29	7,1	1,8
Reframing	0	0	0	2	2	4	1,0	0,2
% agentive turns	25,0	37,0	42,0	61,8	44,9	39,3		
Total agentive turns	62	112	103	81	48	406	100	24,6
Total non-agentive turns	186	191	142	50	59	628		
Total speaking turns	248	303	245	131	107	1034		

The percentage occurrence of each form of transformative agency was explored in each of the five sessions of the two multi-session CL workshops: three sessions during the first, and two in the second workshop. The percentage was calculated from the total number of speaking turns during each CL session (**Figure 7.1**).

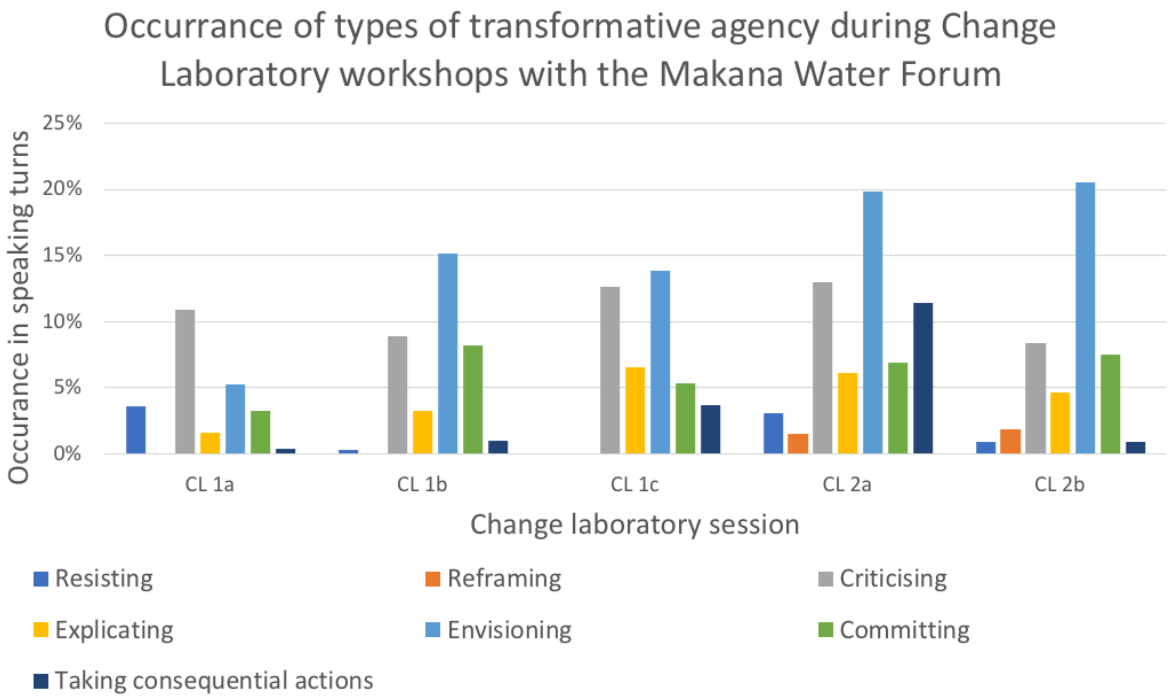


Figure 7.1: Percentage occurrence of different expressions of transformative agency during each Change Laboratory session (CL 1a - c and CL 2a and b). The proportion of transformative agency percentages was calculated as a percentage of the total speaking turns in each CL session. (CL 1a had 248 speaking turns, CL 1b had 303, CL 1c had 245, CL 2a had 131, and CL 2b had 107).

In the following section I present an overview of the different expressions of transformative agency that were evident across the five CL sessions (labelled as CL 1a, CL 1b, CL 1c, CL 2a and CL 2b). Participant quotes were selected to best represent the different expressions of transformative agency, as well as to cover the problem themes. In some cases, text deemed irrelevant to the analysis was omitted from quotes (represented as an ellipsis in square brackets, "[…]") so as to focus the analysis, increase readability and reduce text volume. To reduce the text volume further, I have reduced the number of direct quotes in the findings below; a comprehensive set of findings is presented in Appendix M2.

Resisting the change, new suggestions or initiatives – Directed at management, co-workers or the interventionist

Resisting expressions of transformative agency were most evident in the first session of CL 1 and the first and second sessions of CL 2 (**Figure 7.1**). Resistance during CL 1 was mostly directed at the interventionist and related to the legitimacy of the process; questioning the session plan and influence of the interventionist on prioritising focal areas, and to the actions of co-workers.

Questioning the legitimacy of the first CL session, a participant asked:

> "[...] do we feel that it is broad enough [committee representation]? There is tremendous participation from the DWS [...] and the Municipality [...] we are getting a slightly uneven weighting. So we need to be careful of that, to be aware of that. Some people will say do we have a quorum for the Forum, can we continue? Are we happy for us to continue with this as we are?" (PC, CL 1a).

A participant questioned the session play, saying, "I want to understand, now we have a full page [of objectives outlined as the expanded MWF object], what are we saying about that, how do we move forward? Was that not one of the objectives [of the CL workshop], to try and come up with something, clear?" (AM, CL 1a); and the same participant cautioned against the over-influence of the interventionist, "So we want to know how the house feels. Don't be intimidated by him and his professor, this is our project, this is our Forum. If his number one priority is the last one for us, we tell him now. He spoke of the engagement principles that we must be open and not be shy." (AM, CL 1a). During CL 1a, the same participant expressed resistance to the way in which colleagues were fast-tracking the session plan by jumping to solution or remedial action modelling before the analysis.

New members to the CL process who were not fully aware of the history of the developmental process to date criticised its legitimacy, thereby resisting the interventionist and management:

> "[...] how will we know if the Municipality is not interested if they are not here… I want to know in this activity system of the Makana Water Forum, are you the one that developed it, or were the communities involved? Are these the outcomes that are coming from the committee or was the community also involved in coming with this activity system [...] Hmmm it was assumed actually, so you didn't involve them at all [...] So you just assumed that these are the problems?" (NL, CL 2a).

When asked to reflect on the interventionist process to date, the MLM Water and Sanitation manager expressed resistance to the interventionist and the session plan, "Yoh, you want me to [answer] that question. What do you want from me? How long are we still going to be because I have another meeting at half past one?" (NT, CL 2 b).

Criticising the current activity and organisation, highlighting the need for change - Change oriented and aimed at identifying problems in the current way of working

Criticising expressions of transformative agency occurred throughout the five CL sessions and comprised 27% of all agentive speaking turns. Participants discussed the MWF challenges aligned with the seven identified problem themes (Chapter Six, Section 6.4.2). Each problem theme was characterised by a range of contradiction manifestations. The first session of CL 1 focussed on mirror data displayed in the problem constellation (first stimulus – collection of problem themes and supporting data, Appendix L1). Initial reporting and expounding on the problem constellation all constituted criticising the current practice and highlighting key points for potential forum development. In CL 1b, during the analysis phase, criticising expressions were less frequent and were directed mainly at prioritised Problem Themes: lack of MWF focus; and representation, representivity and non-attendance of stakeholders in the MWF. Deeper analysis of each of these themes revealed a

criticism of the effectiveness MWF tools such as the accessibility of the Terms of Reference. The first name of the forum, which at the time of the CL workshop was Upper Kowie Water, Sanitation and Catchment Management Forum, was criticised by some participants as being misleading as "…some people understand the name Upper Kowie as the other side of Port Alfred [neighbouring town in Ndlambe Municipality]" (YR, CL 1b).

The second prioritised theme of representation, representivity and non-attendance was the focus of much criticism both during the problem analysis and remedial action modelling steps of the first CL workshop (Chapter Six, **Figure 6.9**). Participants expressed criticism:

- that the MWF did not clearly communicate intended stakeholder roles and responsibilities and potential membership benefits (NN, CL 1b; PC, CL 1a), "[…] why they are there, what they should be doing [...]" (PC, CL 1a);
- that "[…] people don't have the terms of reference or they don't understand it, or they haven't read it" (MW, CL 1a);
- about the capacity of committee members to run professional meetings and operate their technical equipment "[…] it looked like we didn't know what we were doing." (PC, CL 1b);
- about the impact of the MWF and its inability to solve issues stakeholders raised resulted in a decline in attendance, particularly from resource-poor farmers (Mr, CL2 a) and commercial farmers, "[...]they wanted to see results […] they felt that we were standing in one place and nothing was happening" (AMJ, CL 1b);
- the ability of the MWF to effect change, which was attributed to its non-statutory nature and lack of formal decision-making power, "Somehow it is powerless [...]" (PC, CL1 c) and, "It is viewed as toothless […] it has no authority to act" (SM, CL 1c).

Criticising also focussed on the ability of the MWF to solve intractable problems such as the double bind of sewage leaks requiring urgent attention, but the waste water treatment works operating beyond capacity; and on sustainable solutions hinging on a large-scale works upgrade which would only occur in the distant future, "[…] the Eastern side, the problem which I don't know if it is going to be solved" (AM CL 1c).

Non-attendance and representation from the municipality and Community Development Workers (CDWs) was seen as a critical problem and several aspects of this were criticised during the analysis and modelling remedial actions phases in CL1 b and c. The challenge of getting ward councillor and ward committee member to attend Forum engagements, and power relations between these municipal officials and Community Development Workers was raised, "[…] the relationship between […] CDWs, community development workers and the councillors are not good. Hence you won't find

them in one group resolving matters. That is one of the biggest challenges that we encounter as CMFs" (SM, CL 1c). Experience of intervention by the DWS in an attempt to encourage attendance from these community representatives highlighted political tension between government departments (DWS), municipalities and CDWs, "[…] there is a negative perception [...] about our functions. It is [as] if we are trying to expose them or something, we are spying on their work […]" (SM, CL 1c).

In CL 2a, a revision of the problem constellation (Appendix L1) accounted for the high frequency of criticising expressions. In a deviation from the planned session script, a previously unprioritised theme from the problem constellation, Communication capacity of the MWF, emerged as a key issue for the participants and was the source of many criticising agentive expressions related to:

- the communication ability of MWF members, "[…] how we communicate [and disseminate] information, I think there is a lot of work that the Forum needs to do, but I don't know if we have the capacity to do it" (LMs, CL2a);
- limited reach of current communication strategies, "they (MWF communication team) will only reach the people that they have been reaching for the last 10 years; how do we capture the rest?" (LM, CL2a);
- the need to develop innovative communication tools to address the challenge of encouraging active citizenry when citizen interventions yield little impact (LMs, CL2a).

In CL 2b, the third prioritised problem theme, MLM buy-in into the MWF, was revisited. The few criticising expressions were attributed to recounting the mirror data for this problem theme, responses from the MLM, and testing and evaluating modelled remedial actions to the problem. The MLM Water and Sanitation Manager criticised the ability of her own directorate to provide services and attributed their preoccupation with addressing this service delivery inefficiency to the perceived lack of MLM buy-in:

> "[...] I think the Forum is aligned, but […] at this stage because of the status and how we are servicing the people, it [the Forum] comes with more complaints that giving us a platform to talk about water business than under normal circumstances […] and I think it is going to get better." (NT, CL 2b).

Responding to a proposed remedial action of having a respected councillor act as the MWF chairperson, the councillor cautioned the viability of the solution, criticising political influences that may hinder the MWF and its relationship with the MLM:

> "With the council, the chair of the Infrastructure is […] the member of the Mayoral committee […] I am his junior as per protocol. You don't want a situation whereby you get the negative attitude that would jeopardise the authenticity of the Forum […] I am for the [MWF] committee to be sustainable, [but] I don't want it to be hit by the negative attitude that will be coming from within my institution." (RN, CL 2b).

Criticising transformative agency expressions were an important precursor to explicating and envisioning forms of transformative agency which are more advanced in conceiving possible solutions to problems raised in the developmental process.

Explicating new possibilities or potential in the activity - Relating to past positive experiences or former well-tested practices

Occurrence of explicating expressions of transformative agency were relatively low throughout the two CL workshops, although occurrence did increase in CL 1c, CL 2a and CL 2b. Explicating expressions of transformative agency are characterised by participants recollecting past cycles of activity system practice and positive experiences that could inform current problematic practice situations. Low occurrence of explicating expressions could be attributed to the MWF being relatively new (two years) and therefore yet having developed an extensive institutional memory of past positive or negative practice cycles. In fact, many of the occurrences were from participants recounting experiences from other catchment management forums in which they were involved, recounting lessons learnt for possible application in the MWF. In this regard, explicating served as a key precursor to envisioning agentive expressions, seeding possibilities for modelling new remedial actions.

I also interpreted explicating as expressions aimed at expanding on problems, making them more comprehensive, as indicated by a participant from the DWS regarding participants' ignorance of the formal rules associated with municipal interaction:

> "I can add another one onto this one here [MLM buy-in into the MWF]. It is this guys with their researchers that are busy here and they don't know how protocol goes. It is another challenge." (AM, CL 1a).

To address the issues of representation and non-participation, the participant from the NPO drew on an example from another CMF meeting he had attended and suggested that the MWF should learn from their approach of specifying stakeholder roles and responsibilities:

> "The role of each and every stakeholder, what's the use of becoming a stakeholder or becoming part of this forum [...] [MW] if you still remember when we went to that place (Amathole Catchment Management Forum meeting), I raised that, I was checking our position in this Forum as a developmental agency or an NGO, what are we going to do?"(NN, CL 1b).

When modelling the change of name from Upper Kowie Water, Sanitation and Catchment Management Forum to the MWF, some participants were concerned that moving from a catchment boundary to a municipal boundary would mean a far greater and less manageable area. The NPO participant explicated an example from another CMF:

> "There is that Amathole (Management Forum) on that side and they also cover all those communities there, so I don't think there will be a problem there if we can change this one to be Makana." (NN, CL 1b).

I further explicated a caution:

> "What they did was that they had a phased development, so they had their first five years or three years focussing on the upper part, the Tyume River, then they had their 5 to 10-year plan where they expanded into the other catchments. Because if you from the word go you try and do everything, you will struggle. I mean we are struggling to meet the expectations of just those around here. So we must also be careful." (MW, CL 1b)

Participants from the DWS who had engaged in CMFs in other provinces drew on their past experiences to caution the MWF against bringing in as many stakeholders as possible, and advised bringing in a broader scope of stakeholders only for specific problems, projects, or in a crisis (SM, CL 1c). These responses resulted in fine-tuning the agenda and moving from envisioning a generic MWF agenda to implementing it (commissive speech acts) in the following MWF meeting.

An IWR participant recounted successful experience of strategies to elicit buy-in from key stakeholders through one-on-one engagements:

> "Is it not worth you and I asking whether we could join one of their meetings if possible and explain, just try and get rid of that perception that we are against them [Community Development Workers]. The same thing that we did with the municipality. Because remember we were able to get [the MLM Water and Sanitation Manager] to come after our meeting [one-on-one meeting]. (MR, CL 1c)

One-on-one meetings became the MWFs primary strategy to service key and sceptical stakeholder needs and elicit their buy-in.

Participants shared their positive experiences of interventions in similar issues in other contexts as explicating agentive actions, as in this experience of the communication capacity of the MWF: "… one of the things [mass education and communication strategy] that worked well for us was, in our circle, tasking everyone to write 500 words, like a blog post." (LM, CL 2a).

A DWS participant also shared examples of successful strategies from his experience in the Nelson Mandela Bay Metropolitan on water use efficiency reporting and communication strategies. He emphasised the benefits of awareness campaigns:

> "[…] [I]f I was in the Municipality and also having seen the Metro's situation, their biggest wins have been in their awareness campaigns. So, to get behavioural change through awareness campaigns has been the big win in the metro, and the potential is also here. So, if the Municipality can see this Forum as contributing to an awareness campaign to get behavioural change it will get a lot of value […] getting behavioural change both from the urban sector and your agricultural sector, across all sectors and that applies to water use and also pollution control. To me these are the big wins or potential big wins." (PC, CL 2a).

Envisioning new patterns or models of the activity - Future-oriented suggestions or presentations of a new way of working

Just over a third (34.2%) of agentive expressions in the Change Laboratory sessions were envisioning expressions. The percentage increased markedly in CL 1b in the analysis and solution modelling phase of the workshop. These expressions typically suggest remedial actions to address elements of problem themes related to the prioritised Problem Themes: lack of Forum focus (13,3% of envisioning agentive

expressions); representation, representivity and non-participation (48,9%); and lack of MLM buy-in into the Forum (11,1%). However, unprioritized and previously un-categorised themes such as communication capacity of the Forum, incurred 16.7% of envisioning expressions: Forum function (2.2%), forum leadership (5.6%), the change laboratory process (2.2%) and forum autonomy.

The following provides examples of envisioning expressions related to the problem themes that they targeted.

The top priority problem theme, lack of Forum focus, was addressed first (CL sessions 1a and b). Participants felt it an easy fix and rapidly envisioned solutions with little time spent, accounting for only 13,3% of envisioning expressions which related to: reflecting on and suggesting modifications to the mirrored expanded shared object of the MWF (NN, CL 1a); increasing the accessibility and stakeholder awareness and understanding of the Terms of Reference (ToR) (MW, CL 1b; PC CL1 b; AM, CL 1b); and presenting snapshots of the ToR as ice-breakers during MWF meetings (LM, CL 1b; AM, CL 1b).

The problem theme Representation, representivity and non-participation received nearly half of all envisioning expressions (48,9%). Participants regarded this as a major problem for various reasons, as shown in the criticising and explicating agentive expressions presented earlier. Envisioning agentive expressions covered a range of suggestions including:

- providing stakeholders with clear roles and responsibilities (tool modification) (LM, CL 1b; PC, CL 1b);
- outlining potential benefits to stakeholder participation (PC, CL 1b);
- developing strategies to gain representation and identifying key stakeholders (PC, CL 1b);
- improving the stakeholder database as a communication tool (MW, CL 1b);
- implementing flagship activities targeting specific problems to gain Forum credibility and buy-in (NN, CL 1b);
- renaming the Forum (YR, CL 1b; SM, CL 1b; NN, CL 1b; LM, CL 1b);
- using targeted strategies such as one-on-one engagements to draw sceptical stakeholders into the Forum, such as commercial and resource-poor farmers (PC, CL 1c; MW, CL 1c), MLM officials and Community Development Workers (PC, CL 1c; AM, CL 1c);
- formulating MWF task teams or sub-committees (PC, CL 1c; SM, CL 1c; MW, CL 1c);
- showcasing progress in addressing the specific needs of stakeholders would encourage greater buy-in and participation in Forum processes (PC, CL 1c).

In CL 2, a relatively high percentage of speaking turns related to envisioning solutions to challenges referred to the communication capacity of the Forum (16,7%) and MLM buy-in into the Forum (11,1%).

The unscripted discussion of the communication capacity of the Forum may have surfaced because water communication is a key role of the Forum, particularly given the drought-induced water crisis at the time. However, this discussion could possibly have been encouraged by a representative from MobiSAM (a community-municipal communication initiative) and his closely aligned interest in communication matters. Envisioning expressions related to communication ranged from using and strengthening communication through existing channels, such as the ward committee system and CDWs (SM, CL 2a), and MWF slots on community radio (NM, CL 2a)); methods and strategies (e.g. developing a water usage reporting tool (PC, CL 2a; MW, CL 2a)), and content. Participants felt that improving communication would directly affect Forum buy-in and participation from the community (MW, CL 2a). Lastly, a communication content specialist offered additional suggestions: "innovative plugs" (LM, CL 2a) including a "…a massive report of victories" (LM, CL 2a); simple sustained communication, and being more proactive.

> "[…] [I]f people are not coming to us then we need to go to them […] be a representative at the ward, […] sit at ward council meetings, […] have the ability to then represent what the Forum stands for in that community-based meeting […] [try] to assimilate with community." (LM, CL 2a).

Buy-in from the MLM was the third prioritised problem theme and the second Change Laboratory workshop was planned around analysis and solution modelling of the problem. Participation by two municipal officials, a ward councillor and the MLM Water and Sanitation Manager greatly enhanced the richness and validity of the analysis and solution modelling steps. Envisioning agentive expressions on this problem theme included suggestions to garner support at a high political level by endorsement from the heads of the Infrastructure Development and Technical Services Portfolio and Development and Technical Services Portfolio. Developing MWF reports on priority issues and suggested actions for portfolio committee meetings were also suggested. Such reports could then be presented in a standing MWF agenda slot (RM, CL 2b) at quarterly portfolio committee meetings (RM, CL 2b).

The MWF battled to obtain buy-in from the MLM Water and Sanitation Manager. She suggested that the Forum continue its work and remain patient, as work pressure limited her participation (NT, CL 2b). Another MLM participant emphasised that the high workload of this manager required that the Forum be clear as to its expectations of her (AMj, CL2b).

Other examples of envisioning expressions related to forum function (systemising the MWF approach to addressing issues (SM, CL2a) and succession plans to maintain leadership continuity (PC, CL 1c; SM, CL 1c; AM CL 1c)), forum autonomy (the risk of having a municipal official as a MWF chairperson or the forum being dominated by one interest group (PC, 2b)) and the Change Laboratory method (MW, CL 2b).

Committing to concrete actions - Committing to take concrete, new actions to change the activity.

Transformative agency, in the form of commissive speech acts, occurred throughout the five CL sessions. The highest percentage (8,3% of session speaking turns) was evident during CL 1b and slightly less in the remaining sessions (5,3%, 6,9% and 7,5% respectively). The lowest percentage occurrence of commissive speech acts (3,23%) was evident in CL 1a, possibly due to the early stage in the expansive learning process, where conversations focussed mainly on clarifying and understanding the problems associated with the problem constellation. As participants delved deeper into the contradictions behind the mirrored problem manifestations and began to model solutions to overcome them, commissive expressions of transformative agency increased. Commissive speech expressions mainly related to the three prioritised Problem Themes (80,3% of commissive agentive expressions): lack of Forum Focus (29,2%); representation, representivity and non-attendance (29,2%); and lack of MLM buy-in (22,9%). To a lesser extent, commissive speech expressions related to Forum function (6,3%) and the Change Laboratory process itself (2,1%). The following selection of participant extracts provides an overview of commissive speech acts associated with each of these problem themes.

The participants committed to three actions in respect of lack of Forum focus: i) to develop and implement a long-term, standard Forum meeting agenda; ii) to form sub-committees to address agenda items; and iii) to implement ice-breakers to build a common understanding of the MWF Terms of Reference. The following three commissive speech extracts made by DWS participants and the interventionist (MW) make these actions clear:

> I said that let's put those issues on the agenda (farmer issues). We've also got a responsibility to establish a sub-committee so the committees that will deal with these specific issues then report to these management committees, that is part of actions (SM, CL 1b)

> So, we will test that (draft Forum agenda) out in the next general meeting (MW, CL 1c). Exactly! we call the municipality in that case, because they are the ones responsible for the sewage infrastructure. They will have to account (SM, CL 1c). Even with the expertise around the table, we could give some advice, or we can facilitate communication between the parties. I mean that is essentially what our function is. (PC, CL 1c).

> We can have that ice-breaker every time we meet, maybe one or two (LM, CL1b). There is a proposal, there as an activity to kick off, certainly the next workshop, with an understanding of the Terms of Reference (PC, CL1b). If we have a bigger Forum meeting, we can also add that ice-breaker … present it in Xhosa . . . simplifying it so that the stakeholders understand the Terms of Reference (AM, CL 1b).

Actions intended to address the issue of representation, representivity and non-participation included commitments to target invitations at key stakeholders, as expressed by a DWS participant:

> I think we can extend representation to him (MLM agricultural extension officer) for the next upcoming workshop . . . Makana Municipality, I would ask them to extend invitations to Makana internally. Then we (DWS) will look to the ones in the Agricultural Department (SM, CL 1b).

Exposing the Forum to other service delivery engagement platforms such as the Masiphathisane Ward War Rooms (Department of Cooperative Governance and Traditional Affairs (CoGTA)) initiative to establish public engagement platforms to report and fast-track the resolution of service delivery issues) provided another opportunity to build stakeholder representation in the Forum. Showcasing this, the ward councillor said: “What I will do look is from my Ward I will invite you to the Masiphathisane meeting . . . because we have everybody, social development, participating at that forum.” (RN, CL 2b).

A participant from the IWR expressed her intention to set up one-on-one engagements to gain buy-in from Community Development Workers who were key knowledge-sharing agents in the Grahamstown East community: “Then I said that next year we will start calling them. So next year we will work with CDWs mainly.” (MR, CL 2a).

In addition, participants committed to actively developing technical tools of the MWF, such as the online stakeholder database to build stakeholder representation. This is evident in expressions made by a DWS participant and me:

> [Review] the stakeholder database to ensure representivity. Definitely the comms. team would be involved in this as the holders of the database (AM, CL 1b). Myself and [MR] would be keen on helping … we have the Google Drive. I will send it to you and you can see what we have and … assist in contacting and populating it with the right people (MW, CL 1b).

Four examples of commissive speech acts representing different strategies to address the issue of lack of MLM buy-in have been extracted. Two examples relate to acquiring MLM support at the top political level. The first, expressed by an IWR participant, was aimed at the mayor:

> At half past three this afternoon the executive mayor, Councillor Gaga, is coming to Rhodes to present the municipal strategic plan and to talk about the relationship between Rhodes and the Municipality. I want, if possible, by then to have a one-pager about what we have already done just to give her … I'll take a picture of this problem constellation and add it to the one-pager to give to the Mayor later (TP, CL 1a).

The second, was expressed by an MLM councillor and targeted the Infrastructure Development and Technical Services Portfolio Committee:

> I raised this (activities of the MWF) strongly in the portfolio committee Infrastructure, because that is where we all sit. And we had the resolution that the report from the Water Forum must be part of the agenda of the Portfolio Infrastructure Committee. This ensures that now these workshops, these meetings, they find expression within the Municipality (RN, CL 2b).

Another strategy was to get formal MWF legitimacy through its incorporation in local government planning documents, particularly the Integrated Development Plan (IDP), as expressed by the councillor: “So as per legislation in 2018, it is still going to be reviewed, so definitely we are going to be able to have this (the MWF) within the IDP.” (RN, CL 2b).

A commitment from the MLM Water and Sanitation Manager participating in the workshop was key to the lack of MLM buy-in issue, as her non-participation undermined the impact of the Forum. She confessed the following:

> So, for me, for now, I see the Forum helping in a longer term, but for now I think it is for me to come and sit, participate, but more of taking the problems and noting the problems that our communities are being affected [with] (NT, CL 2b).

Commissive speech acts to address the Problem Theme – lack of communication capacity of the Forum – focussed on the MWF i) being given a voice in the official MLM Communications Strategy, and ii) procuring regular water usage data for reporting purposes. Examples of these expressions are evident in comments by the councillor and Water and Sanitation Manager, respectively:

> So if you didn't manage to get a draft of the document [MW], then [AMj] can email that through to you so that if you want to make any input on that you can willingly do that . . . we have got that strategy that is going to be adopted by the council in January, around the issue of communication. So definitely these two young men will ensure that that is a thing of the past (RN, CL 2a).

> No, we can, we are able to estimate based on the volumes being used from the East and West. So, we know how much is being used per day, then from there calculate how much each household uses. We can get it on a monthly basis (NT, CL 2b).

Lastly the issue of forum function was addressed by the councillor agreeing to provide leadership assistance to the MWF by agreeing to act as an interim chairperson; he said: “I can help in the meantime.” (RN, CL 2b).

Taking consequential actions - Reporting having taken consequential actions to change the activity in between or after the laboratory sessions.

Taking consequential actions is the most advanced form of transformative agency (Engeström, 2011). In discourse data, this form of agency is mainly evidenced by participants reporting back on implemented activities that they have envisioned or committed to in previous change laboratory sessions. Consequently, evidence of taking consequential actions was relatively low across the five change laboratory sessions, consisting of only 2,8% of all speaking turns and 7,1% of all agentive expressions (**Figure 7.1**, **Table 7.3**). The MWF CL sessions followed the trend of other studies, where transformative agency associated with taking consequential actions increased as participants advanced through the expansive learning cycle (Haapasaari et al., 2016; Heikkilä & Seppänen, 2014; Vänninen, Pereira-Querol & Engeström, 2015). The bulk of the remedial action modelling occurred in CL 1a and CL 1b, and therefore evidence of the implementation of these modelled remedial actions was mainly seen in the progress report-back session that I facilitated in CL 2a. The drop in taking consequential actions expressions in the CL 2b can be attributed to participants reverting to the beginning of the expansive learning cycle and starting afresh with the questioning, analysing and modelling solutions to the third prioritised Problem Theme, lack of MLM buy-in in the MWF.

Participants reported actions that were implemented to remediate identified Problem Themes and effect change in the MWF activity: lack of Forum focus; representation, representivity and non-attendance; lack of MLM buy-in; communication capacity of the Forum, and lack of Forum function. In addition, some reported actions cut across several Problem Themes. The following quotes represent participant expressions of taking consequential actions related to these Problem Themes.

Taking consequential action related to lack of Forum focus, focussed mainly on building a common understanding of the MWF Terms of Reference, and presenting and clarifying stakeholder roles and responsibilities. This is evident in a statement that I made:

> So, at the start of every engagement we said ok, we must present brief snapshots of what the Forum is about and what are our main objectives. I did that in the last general meeting; I did a presentation about that at the beginning and at the end. Ananias presented about the roles and responsibilities of stakeholders (MW, CL 2a).

Consequential action expressions related to representation, representivity and non-attendance were the most prevalent (57,1%) and included a number of different interventions. A DWS participant reported on his actions to increase government sector representation in the Forum: “We have committed to that (inviting the Department of Environmental Affairs) in our previous meeting and I said that we have a name for that. I have already liaised with that person.” (SM, CL 1b). A participant from the IWR reported on her actions to improve attendance during MWF catchment management strategy development workshops, by highlighting where different stakeholder expertise would be valuable in the workshop:

> [This] time we tried to unpack the agenda items, and at the bottom (of the agenda) we tried to show which part entailed what. So, if someone was to look at that part and see and be able to recognize how they would fit (into the workshop process) (MR, CL 1c).

In an attempt to build stakeholder representation and attendance, the MWF committee designed a long-term general MWF meeting agenda, with different water-related items, so that stakeholders could identify items aligned to their areas of interest. This was evident when a DWS participant reported that: “Ja, we already have an agenda that we drafted.” (SM, CL 1c).

Participants also reported on the success of one-on-one engagements as a strategy to gain buy-in and address specific needs of strategic stakeholders, as evident from a DWS participant’s comment:

> There have been other successes … For example, that discussion between the farmers and the commercial users in town … you had Rhodes and your interest groups … And out of that discussion, to me it was very important to hear the rationale as to why they felt that they should not be releasing water to the dam and also to see that the rest of the participants accepted that … that the Municipality accepted that reason by the irrigators upstream … So to me that is a very significant win of this Forum (PC, CL 2a).

The same DWS participant reported how having Rhodes University at the one-on-one engagement strengthened the Rhodes-Municipal relationship and partnership to help the Municipality write funding proposals to maintain and upgrade the water service infrastructure: “So there to me that

could be a huge positive. So, I think the Forum could score that, you put the Municipality in touch with people that are willing to help them raise funds." (PC, CL 2a).

A participant from the IWR reported on another successful one-on-one engagement with Community Development Workers: "Ja, I spoke to them, and they said they would like to come, because they had a lot of ideas." (MR, CL 2a).

A promising step towards improving MLM buy-in into the MWF, evident in a comment made by the ward councillor, was the minuted intent to create a standing MWF agenda item on the Infrastructure Development and Technical Services Portfolio Committee meetings:

> I sit in the portfolio committee of infrastructure where these issues are dealt with. Hence, I am able to say in our committee that we took the resolution that there must be an item regarding Water Forum that forms part of the agenda (RN, CL 1b).

A prime example of reporting on consequential actions that cut across multiple problem themes was my report on the Grahamstown Water Tour: "So, this is an example of how we, step by step, [identified] the problems, modelled solutions, then implemented a particular new element (the Water Tour as an MWF tool)." (MW, CL 2a).

Although the water tour was implemented two days prior to the first CL workshop, it was purposefully designed to address Problem Themes that made up the MWF problem constellation, particularly to improve the knowledge of MWF committee members and the impact of the MWF. Emergent positive outcomes of the water tour were that it built MWF representation, representivity and attendance as the positive experience that participants had on the tour resulted in them being more interested in attending future MWF events. Furthermore, the tour served to build relationships and trust between the MLM and MWF members, which improved MLM buy-in.

Reframing - A subject's reflexive attempt to reframe their practice, often in order to preserve or protect their work-related well-being

Reframing expressions were the least prevalent form of transformative agency to occur during the Change Laboratory sessions (1% of agentive turns). This could be evidence that the shared object of the MWF (stakeholder collaboration in water, sanitation and catchment management processes) remained closely aligned with the motives of the MWF committee members (**Figure 6.8**). There was little evidence to suggest that either the MWF needed to actively reframe its broad object to align with those of its members, or that members needed to reframe their individual objects to align with the object of the MWF.

In CL 2b, I provided an opportunity for participants to express their reframing agency by inviting reflection on the articulated shared object (its shared purpose which included its objectives) of the MWF.

> This is what we have said is the current objective of the Forum, encompassing our personal interests of our own little activity systems which we are busy with, like Private Eye, Communications, Youth, DWS? If it is not fitting in there, then people will always be reluctant, so we need to reassess and see if this is actually still agreed upon (MW, CL2a).

A DWS participant expressed reframing agency regarding catchment management and being more flexible and adaptable to local situations, relationships and effective informal agreements between water users and municipal officials. He said:

> So, as a catchment manager I actually got some comfort out of that (informal agreement related to farmers self-regulation of their water use between the MLM and farmers) in that I felt that we didn't need to intervene further because there seemed to be some understanding among the urban and agricultural users as to what mechanism they had adopted (PC, CL 2a).

The NPO committee member expressed a desire to reframe his agency, not only from a desire to have an MWF role in addressing water issues, but also to implement MWF activities that would build his reputation in the community:

> We as Private Eye, we knew that we had a problem with water but we didn't know how can we fit in in this whole scenario and how can we get heard and also to the Forum, how can the Forum take our views, as we are representing the beneficiaries from our communities, seriously … Ja to finalise it (defined MWF stakeholder roles and responsibilities), this is something that I would like as Private Eye … to see the Forum go straight and do something so that we can be known by other people (NN, CL 2b).

The progression of agentive expressions during the CL sessions are significant evidence of how, through expanding knowledge and learning, participants began to address a series of problems constraining the development and effective function of the MWF.

7.5 Discussion

The aim of this chapter was to determine the forms and extent of transformative agency that emerged through the interventionist process in the MWF. The following section discusses the forms and distribution of agentive expressions evident across the five CL sessions and the implications for engendering wider CSES transformation towards sustainability. It further highlights the practical implications of the study as well as its limitations and opportunities.

Forms of transformative agency

Although all seven discursive forms of transformative agency were evident within the CL sessions, criticising, and envisioning were most prevalent, with resisting, explicating, committing to act and taking actions were least prevalent in transforming the MWF activity.

Criticising is key to any formative intervention and is regarded as constructive and generative (Vänninen et al., 2015; Haapasaari et al., 2016). As seen in this study, criticising engenders dialogue and learning about problematic elements of practice that can then be analysed and addressed.

Envisioning agentive actions were the most prevalent and important in stimulating learning within the analysis and modelling steps of the expansive learning cycle. A goal of any formative intervention is to overcome constraining challenges (Engeström, 2017; Sannino & Engeström, 2017). Given that much time in a formative intervention is dedicated to generating remedial actions to problems (Virkkunen & Newnham, 2013), it is not surprising that there was a high prevalence of envisioning agentive actions across the CL sessions.

Explicating agentive expressions are expected to be more prevalent in well-established activity systems that can draw on past experiences accumulated over a history of activity cycles (Price & Lotz-Sisitka, 2016). Interventions into relatively young activity systems, such as the MWF (less than two years), lack sufficient institutional memory to induce significant explicating agentive expressions. Participants drew largely from applicable past experiences in similar activity systems, emphasising the value of the involvement of content specialists with broad experience in the area of the activity system problem and in building transformative agency in a formative intervention (Chapter Six, Section 6.1).

Resisting discursive actions were few, indicating that the intervention process was well supported and encouraged by the MWF committee.

Commissive speech and taking consequential actions were relatively low and mostly dominated by the researchers and DWS committee members, suggesting that those with the most resources and investment in the sustainability of the MWF were best placed to commit to and implement modelled solutions. This has sustainability implications for the MWF and its vision to be owned by the stakeholders. Like many water governance institutions, the establishment, development and function of the MWF was largely driven by government and in this case, researchers; both are groups with access to material resources.

Reframing was the least evident agentive expression. It is possible that, at this early stage in the life cycle of the MWF, participants' personal motives more or less aligned with aspects of the expanded MWF object and therefore, there were few individual-level conflicts of motive that required individual object reframing.

As evidenced by Haapasaari et al. (2016), this study showed a similar developmental trend of transformative agency, starting with agentive expressions of resistance, criticising, explicating, envisioning, committing and taking consequential actions. Different agentive actions also largely coincided with the certain phases of the expansive learning cycle (Engeström & Kerosuo, 2007). Agentive actions associated with resisting, criticising and explicating coincided with questioning the existing practice and historical and actual-empirical analysis phases; envisioning and committing to concrete actions with the modelling and evaluating and testing model solutions phases; and taking

consequential actions with implementing the new model and reflecting on implementation phases. The proportion of agentive expressions also grew with each subsequent CL session, supporting the need for continuity and commitment to a long-term sequence of CL sessions. Given the extent and multi-faceted nature of the MWF object of activity (Stakeholder collaboration in water, sanitation and catchment management processes, Chapter Six, Section 6.4.1), and the numerous problem themes identified, if the formative intervention is to induce lasting, meaningful transformation, then many more CL sessions were required than those the limited study period allowed. Despite this limitation, significant agentive action evidence of committing to actions and taking consequential actions towards the end of the two multi-session CL workshops indicate the progress of individual and collective transformative agency built during the intervention.

Translating activity system-scale transformative agency to wider systemic change

The formative intervention into the MWF sought to build transformative agency and implementable actions in order to improve the practice of the MWF to shift the MLM water management CSES towards sustainability. Complex SESs are in a constant state of flux, displaying the changing landscape of organisations and institutionalisation (Dorado, 2005) that determine its fitness (Westley et al., 2013), or receptiveness to intervention efforts. The particular state a CSES is in will, to some extent, determine the degree of impact that formative intervention outcomes will have on the system's transformation.

Holling's (1986) lemniscate adaptive cycle, with its slow-moving front-loop of growth or exploitation, and conservation transitioning to the more rapid hind-loop of release and reorganisation, provides a valuable means to understand the transitional phases of a CSES. Transitions through the adaptive cycle are governed by two drivers: connectedness (homogeneity-heterogeneity) and potential (stored-released capital). Transformation actions within a CSES require awareness of the phase in which the system is, in order to inform the strategies required to effect change towards sustainability.

To explore the opportunity context of social innovation driving institutional change, Dorado (2005) drew on social movement literature regarding political change. She identified three defining factors of institutional change: agency, resource mobilisation, and opportunity context (Dorado, 2005). Similar to Holling's (1986) two adaptive cycle drivers (connectedness and potential), Dorado (2005) named "multiplicity" and "institutionalisation" as the drivers determining the opportunity context for effecting change in an organisational field. Multiplicity is the diversity and overlap of organisations in a problem domain that determine the flow and accessibility of resources that change agents can draw on to implement innovations. The second driver, institutionalisation, is the degree to which

institutions direct social behaviour. Dorado (2005) identified three forms of opportunity context: “opaque”, “hazy” or “transparent”.

- “Opaque” opportunity conditions are characterised by low multiplicity of organisations which are dominant and institutionalised and therefore, there is limited opportunity to mobilise resources and entrenched institutions resist change and innovation.
- “Transparent” opportunity conditions are characterised by moderate multiplicity and institutionalisation and therefore, resources are available and new, supportive institutional arrangements are possible, creating abundant opportunities for change innovations.
- Lastly, “hazy” opportunity conditions are characterised by low institutionalisation and a high multiplicity and fragmentation of organisations and different initiatives that result in the problem domain being uncertain, unpredictable and volatile. Organisational fragmentation constrains resource mobilisation and there is little institutional structure to ground change projects.

Westley et al. (2013) linked Holling's (1986) four-phase adaptive cycle and Dorado's (2005) notion of opportunity contexts to explore the specific agency requirements in distinct phases of a complex adaptive system in catalysing transformation towards ecosystem stewardship and resilience. Transformation efforts within a CSES require awareness of the phase in which the system is. Westley et al. (2013) posit “institutional engineers” (also referred to as champions, catalytic individuals and big movers) as key change agents that influence CSES transformation and synthesise specific skills and strategies required to drive transformation through different CSES phases (Westley et al., 2013, p.11). They further suggest that:

> by connecting certain types of entrepreneurial activities to phases of change we can improve our understanding of specific strategic aims of these activities and their impact on the overall process, including their impact on the process of transformation in SES (p.6).

In this study, the characteristics of the MLM water CSES included: infrastructure failure, low water availability due to drought, insufficient technical staff, poor political oversight and financial management, low revenue collection, poor ecological condition of the rivers, and multiple small organisations with many different schemes attempting to influence the CSES, all competing for limited resources. The ruling party of the dominant organisation, the Makana Local Municipality, maintained a political hold on the system and was more preoccupied with “firefighting” (dealing with problems as they arise, rather than planning strategically to avoid them) to keep the municipality functioning and to maintain political control, than collaborating with other organisations to support innovation and systemic change. This “firefighting” strategy is evident in other similarly embattled municipalities and is illustrated in Clifford-Holmes et al. (2016) study of the institutional dysfunctionality of the Lower

Sundays River Valley Municipality. These characteristics indicate that the MLM water CSES presented an opportunity context between the “opaque” and “hazy” and was likely to transition from a conservation to a release adaptive cycle phase. In these conditions, Westley et al. (2013) suggest a strategy of setting up shadow systems in preparation for implementation when the adaptive cycle transitions from release to reorganisation phase.

The opportunity opaque and hazy conditions that the MLM water management CSES was in, could explain the limited committing and taking action agentive forms in the MWF CL sessions. However, criticising, explicating and envisioning agentive actions are important early forms of transformative agency which can be translated into more impactful committing and taking action forms when the CSES moves through the release and reorganisation adaptive cycle phases. In these phases, the CSES presents a transparent opportunity context more receptive to the implementation of model remedial actions.

Holling & Gunderson's (2002) concept of "panarchy" is further useful to place systemic change in the context of larger, slower moving adaptive cycles operating at a greater scale. The notion of panarchy alerts us to the interactions between adaptive cycles across scales. For example, efforts to induce transformation within the MLM water management CSES are influenced by larger scale systems dynamics. For example, regional climate patterns and their effect on local rainfall in the catchment that supplies the MLM or the national DWS drive to establish participatory forums in local contexts was partly in response to escalating service delivery protests at a local municipality scale.

The adapted Westley et al. (2013) model would be a useful tool to support formative intervention processes, particularly as a second stimulus to enable the expansive processes of the modelling, testing and implementation of remedial actions. Understanding the opportunity context of the CSES, in which focal activity systems are imbedded, could provide insight into the degree to which transformative agency will develop taking action agentive forms, and the potential impact these actions could have on CSES transformation.

The value of unscripted deviations from the intervention session plan and the importance of content specialists

The unscripted deviation by participants to envision remedial actions to the Problem Theme, communication capacity of the MWF, indicated the underlying importance of the problem. The participation of a communication content specialist (MobiSAM participant) possibly fuelled this burst of agentive expressions and indicates the importance of relational agency (Edwards, 2007) in overcoming activity system problems (particularly in formative intervention sessions). This indicates the importance of having content specialists participate in CL processes. The MWF CL sessions could

have benefitted from additional content specialists (e.g. knowledgeable stakeholders from unrepresented sectors such as commercial and resource poor farmers).

Most of the expressions of transformative agency in the MWF CLs came from a few content specialists. However, their expressions triggered agentive expressions from others. Indeed Haapasaari et al. (2016, p.258) acknowledge that "[even] though the first expression of transformative agency is initiated by an individual, it requires collaboration and collective agency in order to survive and expand". This emphasises the importance of content specialists in promoting transformative agency development.

Practical implications

If water resource management and developmental local government are to be truly integrated and effected at a local level, contradictions between interacting water stakeholders (including government) need to be addressed. The rolling learning cycles that result from attending to contradictions will sequentially drive adaptive responses required to manage for complexity in SESs. Formative interventions between these water stakeholders, based on expansive learning and transformative agency, could promote sustainable management and service provision of water in CSES. Catchment management forums currently serve as rich sites to expand learning and generate transformative agency. However, learning progress is likely to be slower in collective platforms such as CMFs, which aim to represent the heterogeneity of the water stakeholder landscape (DWAF, 2001). In an engaged study to induce system learning in the poultry industry, Van Mierlo et al. (2013) found that concurrent participant representation of the whole value chain in workshops hindered learning and stifled innovation (largely by dominant players). They suggested conducting multiple, smaller learning engagements, bringing relevant innovators, value chain stakeholders and actors together. The MWF concepts of one-on-one engagements and sub-committees to encourage learning and innovation on specific water-related issues may reduce the barriers suggested by Van Mierlo et al. (2013). If properly translated into action, these concepts could serve as durable and generative spaces for double stimulation (Section 6.3) which, as suggested by Haapasaari and Kerosuo (2015), are key for sustaining the participants' development of transformative agency beyond a formative intervention process.

The majority of the forms of transformative agency fell within the first four forms (criticising, resisting, explicating and envisioning). Fewer forms were related to committing to actions and even fewer to taking consequential actions. Given the current model of CMFs in South Africa where participation is voluntary, focus is broad, and resources are limited, CMFs are likely to remain learning and problem-solving spaces. In order for CMFs to build transformative agency to the point of committing to

concrete actions and taking actions, CMF actors require resources (financial and material) and support from resourced participating implementing agents.

Limitations and opportunities

The five Change Laboratory (CL) sessions conducted with the MWF were on the lower limit of what is recommended in the ideal-type CL method, typically five to eleven (Virkkunen & Newnham, 2013). Less time was available to dedicate to each of the expansive learning stages, which probably limited the opportunity to build the transformative agency. Also, the two multi-session CL workshops were held three months apart rather than the recommended two weeks apart. This undoubtedly disrupted the continuity and momentum gained in the first workshop and required spending time in the second workshop reacquainting participants to the CL process to date.

The MLM Water and Sanitation officials viewed the MWF as yet another avenue for complaints and receive additional work, rather than a potential collaborative, problem-solving space. For real problem-solving to be possible, MWF resolutions need to be reflected on the agenda of quarterly Infrastructure Development and Technical Services Portfolio Committee meetings – from where they could be submitted to council for final resolution. Political divisions/rifts in the council leadership between councillors and senior administration officials further hindered progress and change. These bureaucratic challenges restricted the impact of the MWF to a learning and reporting platform, solving issues in an ad-hoc manner, firefighting, and only addressing surface level manifestations of deeper systemic problems.

7.6 Conclusion

This analysis contributes to the literature on the development of transformative agency through formative interventions and Change Laboratory. The study further contributes to literature on transformative agency development in the context of a heterogenous activity system network. Much of the transformative agency work to date has focussed on activity system networks in more structured activity system settings. Catchment management forums have the potential to be rich, generative spaces of transformative agency development, particularly as sources for generating sustainability innovations. If the intervention process involves champions or big movers – people with financial, relational, political and technical resources and power – transformative agency is more likely to progress through the sequential agentive forms and result in consequential actions that induce change in a system of interest. Furthermore, these big movers are also likely to build buy-in and participation from other stakeholders as there is a better chance that their participation and contributions in CMF platforms will have an impact on the system. Understanding the adaptive cycle phase, and consequent opportunity context of the CSES in which focal activity systems are imbedded,

could provide advance insight into the degree to which transformative agency will develop to the extent of taking action agentive forms and the potential impact these actions will have on CSES transformation.

Transformation towards sustainability typically takes a long time. The formative intervention with the MWF was too short a process to clearly observe the effects of transformative actions on the sustainability of the MLM water CSES. However, long chain transformative agency through the development of durable double stimuli (e.g. one-on-one engagements, learning journeys and reflexive component to CMF engagements) could support transformative pathways to sustainability in the MLM water CSES.

In the following chapter, I draw the thesis to conclusion. I provide an integrative summary of the key findings of the research. I then provide a critical assessment of the its significance, strengths, and weaknesses research. Finally, I suggest recommendations for policy and practice for participation processes in integrated water resource management and the conduction of formative interventions in multi-activity constellations.

8 Chapter Eight – Overview, reflections and recommendations for further research

8.1 Introduction

The South African state's ideological commitment to a participatory approach to managing water resources and delivering services in a way that includes all stakeholders warrants critical analysis. Realising this ideological commitment has proved challenging, largely because of the complex historical, political, social, and environmental context of integrated water resource management (IWRM) in South Africa. The overarching aim of this study was to explore the nature of civil society participation in water governance at a local government scale.

To address this aim I conducted a single, in-depth, four-year case study into civil society participation in the Makana Local Municipality. Both phases of the research were located at the research-practice interface and sought to transform and advance both scientific research and societal goals. The case study comprised two research phases. In the first phase, I investigated the emergence, practice and learning of a civil society organisation in response to water service delivery issues at a local government scale. This built my understanding of the impact of factors that enable and constrain the practice of a community-based civil society organisation in addressing local water service issues, and of their role in building water-related knowledge in their community. As participation with the first civil society organisation fragmented, the opportunity arose for local government, the National Department of Water and Sanitation and civil society to co-engage. This opened up the second phase of the research during which I investigated the role of a multi-stakeholder platform, the Makana Water Forum, in enabling democratic water governance. These two phases served to advance my exploration of civil society participation from informal participation to address water issues, to formal participation in water governance processes.

This chapter provides an overview of the core research findings of the two phases of the study, as well as a consideration of the implications of the findings in the IWRM sector. In particular, I discuss the implications of community-based communities of practice (CoP) that engage in practices related to water service delivery. Recommendations are made, based on lessons learnt during the study, for nurturing and supporting effective and sustainable community-based CoPs. I present an integrated picture of the linkages between findings within and between Phases 1 and 2 of the research, and discuss these findings in relation to the literature and their implications for inclusive, democratic IWRM practice. This integrated picture serves to address the research questions and the aims that guided the research in each phase. I provide an assessment of the research in which I critically review

the research process and discuss the strengths and weaknesses of the study. Finally, I make recommendations for further research and suggest a way forward for research and practice in participatory water governance spaces.

8.2 Core findings and recommendations of the research

In this section I outline the core findings and key discussions related to the nine aims of the research. Findings and discussion highlights also serve to answer the research questions that guided the study. Where relevant I have linked and integrated findings with related recommendations.

8.2.1 Phase 1: Engaged research with the civil society organisation (CSO), Water for Dignity

The first phase of the study was guided by one overarching question: What factors enabled and constrained the emergence, practice and learning of a civil society organisation in response to domestic water service challenges in the Makana Local Municipality? Four aims were addressed to answer this question. In the following section I highlight the core findings related to each of those four aims.

Research aim one: To describe the process of emergence and practice of a township-based, water-centred civil society organisation, Water for Dignity.

- A partial window of opportunity catalysed the emergence of WfD. This opportunity included the urgent problem of water service challenges in Grahamstown East and a means and available resources to address the problem through the establishment and practice of a community-based civil society organisation (CSO): Water for Dignity (WfD). Facilitation by researchers from the Institute for Water Research (IWR) and a leading member of the Khulumani Support Group (KSG), combined with the passion and enthusiasm of catalytic individuals within the WfD group to build and drive the WfD CSO, enabled its emergence (Chapter Four, Section 4.6.1). The window of opportunity was partial due to the absence of a conducive political environment (Chapter Seven, Section 7.5), which limited the potential for WfD practice to extend into participatory water governance spaces.

Research aim two: To describe the factors that enabled and constrained the practice of the civil society organisation, Water for Dignity.

- Reflexive opportunities played an important role in developing the social capital of the WfD community of practice (CoP), including building relational agency and trust between CoP members. For the WfD CoP, Appreciative Inquiry workshops served as reflexive spaces that enabled negotiation and critical reflection on the joint enterprise and offered a clear structure

and direction for WfD members. The habit of reflexivity helped WfD CoP members to adapt their practice to changing circumstances (emergence) in the complex social-ecological system (CSES) in which they engaged (Chapter Four, Section 4.6.2).

- The shared motive of WfD members to make a meaningful contribution to local water service delivery (WSD) played a significant role in sustaining their practice. A shared motive can be likened to the shared-object of Cultural Historical Activity Theory (CHAT) in that both serve as a common purpose guiding joint practice and mutual learning.
- The combination of the urgency of critical water-related issues and passionate core members motivated to address these issues played an important role in sustaining the activities of the WfD CoP. Sustainability and effectiveness were also greatly enhanced by contributions of experience, expertise and intermittent leadership from the distributed expertise of other CoP members (Chapter Four, Section 4.6.3). In the WfD CoP, concerted collaborative action from academic and NGO members was essential. That these partners played a pivotal role in sustaining community-based CSO practice was evidenced by the subsequent cessation of WfD practice once IWR and KSG involvement ceased. This points to the need to deepen the notion of extractive research in terms of the constraints of funding periods, an issue also raised by Hamer et al., (2018).
- Financial incentives play an important role in sustaining community-based CSOs. However, stipend provision comes with inherent power dynamics where a sense of dependency may develop that can stifle the autonomy and innovation of community-based partners (Chapter Four, Section 4.6.3).
- This study revealed the importance and constraints of the role of champions (also known as catalytic individuals, or institutional engineers). Although a champion can sustain the energy and practice of a CoP, over-reliance can result in burnout and the neglect of their responsibilities. Furthermore, in small CSOs or CoPs, dominance of one member can stifle the innovation, learning and agency development of less dominant members (Chapter Four, 4.6.3).
- This study paints a troubling picture for the potential of community-based CSOs to support the realisation of IWRM objectives on the ground. Without the support and leadership intervention from experienced and resourced partners, community-based CSOs are unlikely to sustain their practice. This hints at the deeply embedded lack of agency of the WfD members, and likely community members living in similar contexts. For instance, the Eastern Cape Water Caucus was supported by an anchor NGO, the Environmental Monitoring Group,

and experienced similar sustainability and functional challenges (Wilson et al., 2016). Agency development in these contexts requires more careful and purposeful actions to build.

Research aim three: To explore the learning process of the civil society organisation, Water for Dignity, as they developed personal and collective identities, and shared meaning and practice.

Learning dynamics evident in the WfD group followed a pattern similar to that described by Wenger (1998a) – through learning as belonging, learning as doing, learning as experiencing and learning as becoming.

- The variety of engagement spaces, both physical (meeting spaces) and virtual (email and WhatsApp messenger group) that enabled the negotiation of the joint enterprise and the development of the shared repertoire of the WfD CoP resulted in learning as belonging. In addition, Appreciative Inquiry workshops proved to be key social learning spaces that contributed to relationship and trust building as well as defining roles and responsibilities of WfD CoP members (Chapter Five, Section 5.6.1).
- The WfD team adapted their practice in response to the different scenarios they faced in the field – the emergent behaviour of the CSES. This required reflexivity where members learnt by doing as they adapted their practice in response to feedback from the CSES.
- The production of meaning is an outcome of learning (Wenger, 1998). The meaningful contributions that the WfD group made to improving local IWRM in Grahamstown East was a product of learning as experiencing. Meaning was derived from experiences gained through engaging in the WfD practice and included: context-specific WSD-related information; identification of areas that require further research, such as the culture of non-payment of water bills; establishment of emergency water supply infrastructure to parts of the community; advisory and participatory contributions to various environmental forums and activities (Chapter Five, Section 5.6.1).
- Learning as becoming was evident in the individual and collective identity development of WfD members. Their identity shift from volunteers, active citizens, citizen scientists to citizen-based research partners coincided with the development of their knowledge, skills base, self-confidence and agency (Chapter Five, Section 5.6.1). Persistent water-related practice led to the development of WfD's outward identity (identity perceived by others) as credible and important local water actors.

Research aim four: To explore the degree to which learning was transferred from the WfD to the wider social context in which WfD practiced.

- There was evidence of social learning occurring between WfD members and their wider community of practice, namely Citizen Report Card (CRC) respondents; relatives, neighbours and friends of the WfD group; and to a lesser extent, Unilever SA (Chapter Five, Section 5.6.2). Findings revealed that, through structured practice engagements and informal conversation with WfD, CRC respondents and relatives, neighbours and friends of WfD built their understanding of water conservation and best practice water storage, the water reticulation system, their basic water-access rights, and their water services responsibilities as citizens. The results show that a community-based CSO can catalyse water-related social learning which, in some instances, resulted in positive transformation at a household level.
- The aim of WfD to develop their individual capacity, and in turn, develop a people's water science, was only partially realised. Yes, learning occurred, but to what end? Despite three years of participation in the WfD CoP, there was little evidence of learning translating into capability, agency and improved livelihoods or meaningful engagement in water governance. This reveals that there is some potential for CSOs to act as social learning catalysts in disenfranchised communities. However, the scale of impact is small compared to the required investment of effort, time and resources. A more sustained period of support is required.
- Partners from the Institute for Water Research and Khulumani Support Group were perhaps naïve to assume that agency-enabling skills would be transferred simply through contact and demonstration during engagement spaces (e.g. meetings and workshops) – over a three-year period. Other forms of deliberate support may be more effective in building capability of community-based CSOs. For example, the capability and agency building potential of people-centred, certified training courses demonstrated by Pesanayi & Weaver (2016) in the Training of Trainers course, Burt & Wilson (2015) in the Changing Practice course, and the newly developing Transgressive Learning (T-learning) (http://transgressivelearning.org/) courses hold promise.
- The key limitation of improved livelihoods for essentially volunteer citizens with limited economic capacity, was a significant constraining factor to CSO function and therefore, to learning.

I have provided additional practical recommendations related to nurturing community-based Communities of Practice drawn from experiences with the WfD CoP in Appendix O. In summary, recommendations included in Appendix O, include: enabling newcomer learning through "legitimate

peripheral participation" (sensu Lave & Wenger, 1991); investing time in the negotiation of a joint enterprise and principles of engagement; building autonomy and ownership from the outset; avoiding stagnation of the core group; building benches (sensu Cundill et al., 2015) to promote boundary-crossing learning; enabling focussed practice – do less, well rather than more, poorly; encouraging a habit of record keeping and focussed facilitation during meetings; actively nurturing strong leadership within the core group; enabling organisational support if necessary; and providing material and financial support to overcome communication limitations. It is critical to note that these recommendations are insights drawn from the shortcomings of what and how processes were implemented to promote the sustainability and function of the WfD CoP. Experience from engaged research with WfD revealed that individual limitations of CSO members, tensions between supporting CSO partners and not investing enough time into enabling processes greatly constrains the sustainability and function of community-based CSOs.

Chapter One (Section 1.4) indicated three distinct engaged research adaptations which ultimately ended in a research focus on civil society water governance in a multi-stakeholder platform, the Makana Water Forum (MWF). These engaged research adaptations were 1) WfD aiming to, but unable to co-engage with the Makana Local Municipality, 2) the Eastern Cape Water Caucus (ECWC), with WfD as a member CSO, engaging an emerging MWF, and 3) waning involvement of the ECWC in the MWF and a research focus adaptation to a formative intervention with the MWF management committee. This final adaptation formed the second phase of the research.

Phase 2: Transformative intervention with the Makana Water Forum (MWF) – towards improving civil society participation in local water governance processes

The second phase of the research was guided by five research questions, each linked to a research aim. In this section I present the aim followed by the research question it served to address. The formative intervention process with the MWF management committee was designed to co-develop remedial actions to overcome debilitating contradictions that constrained the MWF function. Those remedial actions served the purpose of: 1) contributing directly to the development and practice of the MWF, 2) as recommendations concerning the function of other multi-stakeholder platforms, and 3) contributions to research into local participatory water governance.

Research aim five: To understand the historicity of the Makana Water Forum activity system and its evolving water-related purpose.

This aim served to address the research question: What cultural historical phenomena led to the formation of the Makana Water Forum activity system and the development of its object (purpose) of activity?

- The evolving object of activity of the Makana Water Forum and the evident contradictions were strongly influenced by past cycles of participatory water governance-related activity and practice at national and local scales (Chapter Six, Section 6.4.1).
- At a national scale, the political ideology of water management evolved from an authoritarian, exclusionary, state-centric style of governance pre-1994, to an inclusive, democratic, developmental state style of governance post-1994. Despite high-level political aspirations for inclusivity through decentralisation and broad-based participation in water governance, realising these aspirations in practice has proved challenging. Separate legislation, authority and participatory institutions to manage water resources and water services complicates participation processes towards the high-level vision of holistic and integrated water management. These parallel national-scale water management developments ultimately influenced the local-scale emergence of the MWF, which formed as a result of the merger of the idea of two separate forums through the development of a single Terms of Reference inclusive of both water services and water resource management.
- Post-1994, the State prioritised the development of large-scale infrastructure to overcome the water and sanitation service backlog inherited from Apartheid over the development of capable, participatory institutions and actors to facilitate meaningful bottom-up engagement of stakeholders in water governance processes. As a result, many past and current participatory platforms are ill-equipped to enable truly democratic water governance. The disparity in the collaborative capacity between different stakeholder groups seen in the MWF is also a reflection of marginalisation actions of the past. This was clearly articulated by Simpungwe (2006, p. 212), who suggested that:

> [c]ontemporary socio-economic conditions in South Africa have created conditions under which material inequality between black and white created by the apartheid government is now being extended to an objective intellectual and economic inequality between expert systems and local poor community members. In turn, these inequalities are redefining dimensions for collaboration in resource management.

- At a local government scale, the MWF activity system, its perceived object and evident contradictions were influenced by three main factors: a legacy of dysfunctional water service in the MLM; deteriorating catchment health as a result of a failing waste water reticulation and treatment system; and, inadequate avenues to enable participation in water governance processes, particularly the ward committee system (Chapter Six, Section 6.4.1).
- The establishment and development of the MWF, and the complex nature of the MLM water management CSES drove further object evolution and contradiction formation. Multiple problematic aspects that emerged from the CSES, both from within (e.g. water supply failure

and environmental pollution) and without (e.g. regional drought and ministerial intervention), and the resultant diversity of stakeholder interests in engaging in the CSES, resulted in the MWF object being multi-faceted and ever changing (Chapter Six, Section 6.4.1). This multi-faceted character of the object was similar to what Engeström (2016) terms a "runaway object". In such a contested situation, it was found that stakeholders with power and resources were well positioned to drive the agenda of the platform and influence the direction of its object development.

Research aim six: To understand and describe the key activity systems comprising the Makana Water Forum activity system.

This aim served to address the research question: What is the nature of the activity system network that comprises the Makana Water Forum activity system?

- The Makana Water Forum resembles a multi-activity system network, or constellation, comprising multiple sub-activity systems, with a partially-shared boundary object related in some way to water (Chapter Six, Section 6.4.1).
- The activity system analysis of the MWF was conducted from the perspective of the MWF executive committee – the subject of the MWF activity system (Chapter Six, Section 6.4.1). The primary subjects of the MWF were associated with four overlapping expanded objects of activity: 1) catchment management strategy development; 2) research (democratic water governance) and CMF development; 3) water service delivery, communication, and knowledge building; and 4) social-ecological and climate change justice.

Research aim seven: To understand and surface contradictions affecting the functioning of the Makana Water Forum activity system, and its ability to enable participatory water governance.

This aim served to address the research question: What are the key contradictions evident in the Makana Water Forum activity system?

- A total of 25 possible contradictions were identified through the questioning step of the expansive learning process of the formative intervention with the MWF (Chapter Six, Section 6.4.2). Cumulatively, these contradictions appeared to constrain the function of the MWF and its ability to enable inclusive and meaningful participatory water governance. As discussed earlier (Chapter Six, Section 6.2.4) there are four levels of contradiction: primary, secondary, tertiary and quaternary. An analysis of the seven Problem Themes revealed all four levels. From a research perspective, the contradiction levels proved useful in classifying and understanding the nature of contradictions, but less useful in the Change Laboratory setting

as a concept to support collaborative analysis and model remedial actions to overcome them. Participants favoured working with the concept of "Problem Theme" and the activity system triangle to explore its "root causes". Through the Change Laboratory, participants reorganised themes into six Problem Themes, of which three were prioritised for attention during the Change Laboratory sessions: lack of clear focus of the MWF; representation, representivity and non-attendance; and the MWF relationship with the Makana Local Municipality. I briefly highlight core findings and discussions related to each of the three prioritised Problem Themes as well as the remedial actions developed to overcome them.

- Multi-stakeholder platforms (MSPs), particularly those in developing countries, operate in CSESs characterised by high levels of heterogeneity. This context is typified by diversity of water-related problems, and multiple stakeholders with different interests, and different levels of education and agency. Under these diverse circumstances, projecting a clear, understandable focus of an MSP that all stakeholders can relate to is likely to be a challenge to any MSP. Contradictions related to the lack of focus of the MWF stemmed, firstly, from its commitment to enable participation in all aspects of IWRM, and secondly, from the capacity of its coordinating committee and their available tools to communicate and build a common understanding of this broad IWRM-related focus among stakeholders (Chapter Six, Section 6.5.3).

Recommendation: For MSPs that adhere to IWRM as their broad focus, it is important to invest time in building a common understanding of the nature of IWRM among its coordinating committee and stakeholders. This could start with building an initial high-level, common understanding of IWRM. Subsequent efforts to build a comprehensive understanding of different IWRM aspects can follow with time. For the MWF this meant revisiting the Terms of Reference and improving its accessibility as a tool for building a common understanding of the MWF's focus.

- A common challenge in multi-stakeholder platforms (MSP) are participation-related contradictions such as attracting the right people from the relevant sectors and keeping them interested so as to promote productive collaboration in MSPs (Chapter Six, Section 6.5.3). In the MWF, many of these participation-related contradictions appeared to stem from the capability and capacity of the coordinating committee and the available resources required to identify, attract, enable and sustain participation of all relevant stakeholders. Stakeholders need to understand what their envisioned role and responsibility would be, and how their participation, particularly for marginalised community stakeholders, could yield benefits that can be felt in real terms.
- South Africa is a deeply divided and unequal country. This makes inclusive, fair and meaningful participation in water management processes challenging. Typically, those with the most

power and influence in MSPs are seeking long-term systemic change in water management systems. However, community stakeholders mostly require their participation to yield tangible benefit that may alleviate the difficult socio-economic challenges they face on a day-to-day basis. Attending to both these needs is important if inclusive multi-stakeholder platforms are to endure.

Recommendation: From the remedial actions developed during the CL workshops it was clear that an MSP should, firstly, invest effort in developing tools to identify and understand the needs of appropriate stakeholders; secondly, the MSP should employ a diverse range of engagements that include action components, tailored to address specific stakeholder needs in greater depth. In this way, an MSP can sustain stakeholder participation by balancing activities that yield tangible, short-term benefits with activities that contribute to processes that have the potential to yield long-term benefits.

- Success in addressing the shared object of the MWF depended, to a certain extent, on buy-in from key municipal leaders and administrative officials. Buy-in and involvement from these officials increases the legitimacy of the platform and the outputs that stem from the multi-stakeholder dialogue processes it enables. Low participation of these actors was not due to them perceiving the MWF as unimportant, but to the MLM being in a perpetual state of crisis management and unable to prioritise public participation processes (Chapter Six, Section 6.4.2 and 6.5.3). This points to the lack of adaptive capacity of the municipality to manage the inherent complexity in the MLM water management CSES. This is likely to be a widespread challenge in South Africa, where many municipalities are in, or near to, a state of dysfunctionality (Tandwa, 2018).

Recommendation: An avenue to achieve political legitimacy is for the MSP to find formal expression in municipal processes and policy. In the case of the MWF, a process was initiated at the end of the research period, where MWF reports were included in high-level political decision-making meetings on a quarterly basis (limitations of the then coordinating committee would constrain the ongoing development of these reports). In addition, MSP inclusion in municipal development plans, such as the annual Integrated Development Plan (IDP) would not only bolster legitimacy, but also provide access to financial resources required for concerted practical action on MSP innovations.

- Mistrust between stakeholders (between municipal officials and other organisational and community stakeholders) is a barrier to multi-stakeholder collaboration processes. For example, some ward councillors perceived the actions of the MWF as competition or an attempt to undermine their community-related work (Chapter Six, Section 6.4.2 and 6.5.3).

Recommendation: Persistent engagement between key MSP actors and sceptical municipal actors is required to build a common understanding of how to transform seemingly conflicting relationships into collaborative relationships. In the MWF, the concept of one-on-one engagements was developed as a means of building relationships with reluctant government stakeholders (e.g. Community Development Workers).

- Multi-stakeholder platforms can serve as a space to enable the social-relational processes required to build trust between stakeholders and develop their collaborative and adaptive capacity. These capabilities are vital for learning to manage for complexity associated with resource management in CSESs.

Research aim eight: To report on the development of remedial actions to loosen and address prioritised problems affecting the Makana Water Forum activity system function.

This aim served to address the research question: How can a Change Laboratory intervention process into the Makana Water Forum affect democratic water governance at a local government scale?

- Over two multi-session Change Laboratory workshops, participants worked collaboratively to better understand the three prioritised Problem Themes related to Focus, Participation, and Municipal buy-in. Participants analysed the historical and current root causes of the Problem Themes and developed remedial actions to overcome them.
- Remedial actions were implemented between and after the two multi-session Change Laboratory workshops during the end of the research period (Chapter Six, Section 6.4.2). The division of labour required to implement most of the remedial actions modelled demanded an investment of time and effort from the MWF coordinating committee. Consequently, the implementation of many of these remedial actions was, and would likely be, constrained by the limitations of available time, funding and capability of the MWF coordinating committee. As a result, implementation largely fell on the shoulders of organisational stakeholders, those with resources and partial mandates to support the function of the MWF. These findings point to the importance of building a strong, well-capacitated and motivated coordinating committee to ensure the effective function and ongoing sustainability of MSPs. Support could come in the form of well-resourced entities acting as “anchor organisations”, such as the role of the Environmental Monitoring Group, an NGO that supports the South African Water Caucus.
- It was too early in the implementation phase to understand the true impact of the CL process, but there were promising signs of progress towards addressing some of the contradictions, particularly those associated with the Problem Themes related to focus and municipal buy-in.
- In answer to the question of how a Change Laboratory intervention process in the MWF could affect democratic water governance at a local government scale: the intervention had a marginal obvious and immediate effect. Remedial actions modelled and those enacted have however, improved aspects of the function of the MWF (e.g. diversified modes of engagement and a more focussed agenda), but have only resulted in incremental shifts towards enabling

improved participatory practice (e.g. stakeholder-municipal trust building through an the interactive learning field trip, the Water Tour), most markedly in building a collaborative relationship between the MWF, municipal and government officials. Achieving ongoing an effective implementation of transformative actions towards improved democratic water governance may require a dedicated, even paid, coordinator or liaison officer. For the MWF this position could be supported by Rhodes University.

Research aim nine: To determine the extent and forms of transformative agency that emerged through the interventionist process in the Makana Water Forum.

This aim served to address the research question: To what extent and what forms of transformative agency were developed through the Change Laboratory workshops with the Makana Water Forum?

- Agency is the human capacity to act in order to reach a desired end. I explored the development of transformative agency of the MWF management committee during two multi-session Change Laboratory (CL) workshops (Chapter Six, Section 6.4.2). Transformative agency is the most important outcome of a CL process (Sannino, 2016) and is defined by Virkkunen (2006, p 49) as "breaking away from the given frame of action and taking the initiative to transform it". Through a micro-analysis of agentive talk in the CL process I was able to identify and understand the progression of individual and collective transformative agency development of participants from grappling with a contradiction, through to their envisioning and committing to implement remedial actions to overcome it (Chapter Seven, Section 7.3.2). In corroboration with Haapasaari et al. (2016), the progressive development of forms and amount of transformative agency across the two multi-session CL workshops (Chapter Seven, Section 7.4.2) aligned closely to the sequential steps in the expansive learning cycle (Chapter Six, Section 6.2.5).
- Agentive talk enabled me to see how participants connected past experiences to both inform proposed new remedial actions and to assess their likelihood of success; for example, officials from DWS shared past challenges to getting buy-in from other municipal and government officials, thus linking the historical, material and cultural antecedents of past practice to inform elements of future practice. This highlighted the importance, particularly in young activity systems such as the MWF, of including participants with experience and expertise in the contradiction subject matter. I found that participants enacted relational agency (Edwards, 2007) to further stimulate transformative agency. This occurred as participants fed off and built on one another's suggestions (envisioning agentive talk) to collectively develop partial suggestions into fully fledged, implementable remedial actions.

- Although all seven forms of transformative agency were detected, this study found the criticising, explicating and envisioning forms were prevalent (Chapter Seven, Section 7.4.2). The limited capacity and resources available to the MWF to implement remedial actions modelled during CL workshops explained the low prevalence of committing, and taking consequential actions forms of agentive talk. Multi-stakeholder platforms, such as the MWF, are primarily spaces to promote dialogue around water issues (Razzaque & Kleingeld, 2013). However, with the inclusion of key "big movers" in MSPs, people with financial, relational, political and technical resources and power, transformative agency is more likely to progress through the sequential agentive forms and result in consequential actions that induce change (Chapter Seven, Section 7.6). The influence of catalytic individuals in accelerating the uptake of remedial actions was evidenced in the second multi-session CL workshop. Participation of two key MLM officials in the workshop, a councillor and the water and sanitation manager, resulted in rapid agency development and uptake of modelling of remedial actions to address contradictions related to the Municipality (Chapter Six, Section 6.4.2, Chapter Seven, Section 7.4.2).
- In multi-activity system constellations in which collaborative efforts seek to induce systemic change, careful attention should be paid to understanding the opportunity context that the CSES presents (Westley et al., 2013) – either an opaque, transparent or hazy opportunity context (Chapter Seven, Section 7.5). The transformative phase that a CSES is in and its position along the lemniscate adaptive cycle of Resilience Theory (Gunderson & Holling, 2002; Olsson et al., 2006) determines the opportunity context and the receptiveness of the CSES to intervention efforts. Awareness of the opportunity context of a CSES provides insight into the degree of impact that taking action forms of agency will have on CSES transformation. The opportunity context of the MLM CSES revealed that it was approaching an environment, but was not yet, a fertile environment, to provide traction for implementing remedial actions. In these circumstances, MSP could focus on building the individual and collective collaborative capacity of its members, and the relational capital that is required for action. Led by catalytic individuals and supported by "big movers", efforts in implementing innovative remedial actions to CSES problems can be escalated when the CSES transitions into an opaque opportunity context. Preparedness and timing, therefore, seem to play an important role in the potential impact that change actions will have on the transformation of a CSES.
- Despite their limitations (Chapter Six, Section 6.4.2; Faysse, 2006; Simpungwe et al., 2007), MSPs such as catchment management forums, are well suited to address wicked problems associated with natural resource management. I suggest that MSPs hold a significant source

of untapped expansive learning and transformative agency potential. Expansive learning and transformative agency could occur organically in an MSP through typical dialogical "problem solving" processes. However, expansive learning and transformative agency could be greatly accelerated through strategic facilitation and active use of wicked problems and their contingent contradictions as sources of double stimulation. Through this learning and agency development process stakeholders could drive transformative change towards social and ecological justice in the CSES.

8.3 Reflective review of the research process

This research was a response to the social component of a CSES. Learning mediates the interaction of the social components with all other components of the CSES. In essence, learning is the catalyst for interacting with and inducing transformation in a CSES. Learning, particularly social learning, builds the collaborative and adaptive capacity of actors and networks that lead to creative, concerted action towards addressing complex problems associated with water management and towards positive transformation in a CSESs (Suskevics, Hahn, Rodela, Macura & Pahl-Wostl, 2018). The application of a transdisciplinary (TD) and complexity-based research approach to addressing wicked problems in CSESs implies a greater focus on the relationality between elements, actors and networks than on the components of the CSES themselves (Palmer et al., 2015). A transdisciplinary research approach explicitly calls for co-producing knowledge that is socially contextualised and, in doing so, furthers both scientific and societal goals (Jahn et al., 2012; Lang et al., 2012). As a result, TD has a strong practical, learning-by doing thread. My TD research approach, deeply embedded in practice, had a strong tacit and experiential learning component.

Throughout the TD research process, my research focus, effort and time oscillated along the research-practice continuum. In both the first and second phases, my research efforts with the Water for Dignity (WfD) Community of Practice (CoP) and the Makana Water Forum (MWF) was weighted towards the practice side of the research-practice continuum. My TD research approach called for a dedicated reflexive research practice (Chapter Three, Section 3.2.4) which served to develop my learning from the engagement with the WfD CoP and the MWF. Reflexivity in the TD research process enabled our TD team to produce several outcomes that furthered scientific goals. These contributions included theoretical contributions through the production of accredited publications (Chapter Two published as Weaver et al., 2017; Chapter Four submitted as Weaver et al. (under revision with Geoforum); Chapter Five submitted as Weaver et al. (under revision with Geoforum), Hamer et al. (2018), Palmer and Munnik (2018), and Wolff et al. (under review with Ecology and Society)) and presentations at five local and two international conferences. In addition, the research process

produced six post-graduate students (two of each Doctoral, Masters and Honours). However, despite two years of intensive engaged research with the WfD CoP, the degree of learning measured from WfD was limited (Chapter Five), as was the tangible impact of their practice (Chapter Five). Even with our adoption of a TD research approach, one of the leading transformative forms of engaged research (Jahn et al., 2012; Lang et al., 2012; Wickson et al., 2006), progress in furthering societal goals was tenuous. This indicates that, despite having a transformative intention, the results of TD research can tend towards extractive research, weighted more towards furthering the scientific goals than those of society.

Critical analysis is required of what we as a TD team hoped for and what we achieved. We were, and still are, in an aspirational space, grounded in practice (Chapters Two, Four and Six), guided by theory (Chapter Three), but yet to be significantly transformative; for example, aspirations that WfD would develop into a sustainable CSO capable of catalysing learning and agency in a poor community required for meaningful participation in water issues and decision making; aspirations of the MWF becoming an MSP to enable inclusive and fair participatory water governance and actually be a transformative catalyst in the MLM water CSES.

A significant gap existed between this aspirational space and what transpired. Neither of the two-year TD research processes with the WfD, nor with the MWF, reached a complete or sustainable learning cycle where new forms of practice became embedded. Furthermore, neither WfD nor the MWF became self-sustainable without significant support from IWR members of the TD team. Throughout the two-year period of engagement with the MWF we never reached the stage where the MWF acted as a catalyst to transform water-related wicked problems in the MLM. This degree of dependency highlights the sobering reality of the fragility of disenfranchised groups and their ability to sustain productive participation in multi-stakeholder water management processes. This fragility is also present in TD research projects where funding will always be limited and time bound.

Given these tenuous outcomes, the question must be asked what TD research means in a context where most people are disenfranchised, have limited education, where the Gini-coefficient of agency is greater than that of income, and where the command-and-control legacy of apartheid still lingers in development processes? Our aspiration is that, through participation and social learning, we can shift the CSES towards and into an improved state, and towards greater social and ecological justice.

We invested significant amounts of time, effort and resources into both TD research processes; they yielded some scientific outputs, but the transformative impact of the research remains marginal. Our insights into learning, practice and agency development (Section 8.2) suggest that we are on the right path. The TD research process with WfD essentially “prepared the ground” for the establishment of

the MWF. Through their initiatives, WfD built relational agency among key actors and stakeholder awareness of water challenges in Grahamstown East. The transformative intervention with the MWF continued social-relational development among water stakeholders, revealed critical contradictions for further attention, and began to develop stakeholder transformative agency. So the investment of the TD research effort was not in vain, but this research shows that we are still at the early stages of this transformative process.

8.3.1 Theoretical and methodological limitations, opportunities and implications

Reflections on my Transdisciplinary research process

I experienced several limitations during my TD research process that appeared to constrain our ability to catalyse real transformative change within our non-academic partners, and broader positive systemic change within the MLM water CSES. Some of these limitations related to timeframe, the capacity and multi-disciplinary requirements of the TD team, and maintaining and sustaining a TD team.

As an engaged TD researcher, I was constantly seeking to balance my time between meeting the intellectual requirements of my degree in terms of scientific output, and the expectations of and obligations to my research participants. This was a difficult balance to achieve, particularly as the practice component of research does not form part of the evaluation criteria of the doctoral degree (Mullins & Kiley, 2002). The increasing move towards ethics and values-based TD research (Cockburn, 2018; Jahn et al., 2012; Popa et al., 2015) places additional emphasis on investing time in the social-relational and practice components of the research. This commitment exacerbates the existing tension between the commitment to the academic and practice research components.

A characteristic of complex systems is the largely unpredictable scale of outcome from inputs of energy, where large inputs can result in disproportionately small changes in the system, and small inputs may result in disproportionately large changes in the system (Cilliers, 2000). A substantial amount of financial and material resources and time commitments are required to carry out a transformative TD research process. These resources are necessary to maintain the TD team and the requirements of its practice. I invested extensive amounts of time in building relationships with practitioners. Postgraduate research has limited time and budget to influence real change. Even five-year TD research projects such as the Towards Practicing a New Paradigm project, which had a medium-sized budget, resulted in little obvious change to the MLM CSES. There is promise with the ongoing Ntabelanga-Laleni Ecological Infrastructure project which is a 10-year, multi-million dollar project and a big scale difference, but even there, the results for the CSES and dependent communities have been tenuous.

Maintaining the relationships that sustain a TD team requires an investment of energy and ongoing support (including financial support). All participants in a TD team should feel comfortable about engaging in the collaborative research process on an equal footing; this requires paying attention to hierarchies of power. Power dynamics were evident in both the WfD (Chapter Four) and the MWF TD teams. One example was how the tensions between partner organisations in the WfD CoP had a negative feedback on WfD's ability to implement their practice. Water for Dignity received different advice from the Institute for Water Research and Khulumani Support Group on what WfD practice should focus on. It emerged that WfD viewed themselves as subordinate to both organisations. This resulted in a paralysis of action and a significant delay in WfD progress on their initiatives.

Researchers and students typically select theories to support their engaged research, primarily to enable them to achieve the academic obligations and requirements (such as publications, or a thesis) of their institution. The time available to employ these theories is "short" compared to the time it takes to induce transformative change. I suggest that, for TD research to be truly transformative, it requires continuity of persistent TD practice in the CSES of interest. Maintaining and sustaining a TD team in which the academic component comprises a mix of well-coordinated students and researchers who are able to drive the research-practice endeavour beyond the short cycle of post-graduate turnover is important. In this way, transformative-driven research approaches, such as strategic adaptive management and formative interventions, can be sustained and enhanced, thereby increasing their generative potential to yield positive transformative outcomes.

Lastly, as a TD researcher I was required to build a broad level of theoretical and methodological competence across different disciplines. This probably resulted in my missing some important features of the theoretical and methodological approaches that I applied. I briefly outline the shortcomings, implications and contributions to my application of Communities of Practice and Cultural Historical Activity Theory.

Reflections on my application of Cultural Historical Activity Theory

As I developed my understanding and capacity to apply CHAT to my research, I became increasingly aware of the shortcomings of my application, for one, my loose use of the concept of contradictions. As Sannino et al. (2018, p. 49) emphasise:

> "[c]ontradiction is a foundational philosophical concept that should not be equated with paradox, tension, inconsistency, conflict or dilemma. Many of the terms misused as equivalents of contradiction may better be understood as manifestations of contradictions. Contradictions are historical and must be traced in their real historical development".

Although I delved into the true nature of contradictions in my analysis of the MWF Change Laboratory workshops (Chapter Six, Section 6.4.2), analysis of contradictions with participants occurred mainly at

the Problem Theme level. Consequently, it is likely that we were dealing with manifestations of contradictions without tackling actual underlying contradictions.

Cultural Historical Activity Theory (CHAT) emphasises two epistemological-methodological principles as fundamental to any activity-theoretical research: the principle of double stimulation (Chapter Six, Section 6.3), and ascending from the abstract to the concrete (Engeström & Sannino, 2016). In my application of CHAT, particularly in the design and conduct of the formative intervention process, I effectively employed the first principle, but failed to make use of the full potential of the second. Expanding from the abstract to the concrete did occur as participants gradually navigated through the expansive learning steps – from partial (abstract) conceptualisations of contradictions to fully fledged, implementable remedial actions. However, we did not reconceptualise the object to the extent that the MWF practice was radically changed. This future envisioning of a reconceptualised object entails charting and navigating the "zone of proximal development" (Chapter Six, Section 6.2.4). The generative potential of employing this concept was missed and could have strengthened the formative intervention process.

This research contributes to the limited existing literature on the application of formative interventions in multi-activity system constellations (Sannino & Engeström, 2018). To the best of my knowledge this is the first application of a CL process in multi-stakeholder platform such CMFs, which engage infrequently and for short periods of time. Application of a CL in this context with the MWF required methodological adaptation and flexibility (Chapter Six, Section 6.3) – a mix of four short, preliminary CL sessions and two multi-session CL workshops. Ideally, additional CL sessions should be conducted with greater frequency to maintain continuity and momentum through the expansive learning cycle and to allow participants to delve deeper into each expansive learning step.

Limitations to conducting a single case study in a Category B2 municipality

I adopted a single case study design, as justified in Chapter Three, Section 3.2.4, which enabled me to conduct in-depth, engaged research into participatory water governance processes in a Category B2 municipality. This limited the comparability of my findings to these processes in other classes of municipalities. Secondly, my in-depth focus into a single civil society organisation and a single multi-stakeholder platform, limits the generalisability of my findings to inform research into other CSOs and MSPs.

8.4 Recommendations for further research

The scope of this research was limited to the participation and observation of a single civil society organisation, WfD. The findings of this study could be deepened by comparison with other CSOs

engaging in similar water-related practices. Additionally, an exploration of civil society values in relation to water service delivery would be an ideal avenue for deepening the study.

The learning aspect of this study focused on learning within the WfD group and that of the people they engaged with, but not the learning that occurred in the WfD/University partnership. Exploring the learning that occurred within participating researchers could provide valuable insights into fostering CSO/University partnerships that encourage social learning.

This research was unable to effectively address the question of the extent to which CSOs can enable civil society, particularly marginalised civil society, to engage meaningfully in participatory water governance. Developmental pathways of the Eastern Cape Water Caucus and the Makana Water Forum did not overlap to the extent that allowed a formative intervention to be conducted between them. The challenge of marginalised or previously disadvantaged communities not having the capacity, agency and material resources to meaningfully engage in water governance decision making processes remains critical in many stakeholder-led water management institutions. Research into strengthening CSOs as civil society capacity and agency building entities is required. The Change Laboratory method is well suited to conduct such a development process.

Deep analysis of the level and process of expansive learning was not an aim of my interventionist research with the Makana Water Forum. Additional analysis should be conducted on data gathered through the interventionist research process with the MWF to explore the mechanisms of expansive learning development in a multi-activity system constellation. To date, the majority of interventionist research has been conducted between organisations that have clearly defined boundaries (Engeström, 2016; Nummijoki, Engeström, & Sannino, 2018; Sannino et al., 2016; Vänninen et al., 2015). There is a global push towards research into complex and highly contested, multi-scaled social-ecological problems (Benson & Quinney, 2014; Ison, 2017; Pahl-Wostl, 2018). Further research is necessary to develop theoretical and methodological insights into conducting formative interventions within such multi-activity system constellations (Sannino & Engeström, 2018). This will further existing interventionist research that mainly focusses on two or more, distinctly bounded, interacting organisations with a clearly definable shared object, as opposed to loose networks which often have multi-faceted objects characterised by multi-activity system constellations.

This research further advocates for the power of Change Laboratory as a research method to enable expansive learning and develop transformative agency. Of particular significance is the potential of combining concepts and analytical tools from resilience theory to enhance the transformative potential of the CL method (Chapter Seven, Section 7.5). Contextualising a CL process within the adaptive cycle of a CSES and the particular opportunity context the system presents could inform the

enactment of agency and its potential impact on CSES transformation. Further research into the conceptual integration between resilience theory and the CL method and its application holds great potential for improving the impact of interventionist processes in CSESs.

8.5 Conclusion and way forward

The commitment of the second National Water Resource Strategy to developmental water resource management and the DWS drive to support existing CMFs and establish new ones, indicate a firm commitment to maintain and build participatory water governance in South Africa. Therefore, CMFs are likely to remain integral to representing the stakes of people, particularly poor communities, in South Africa's developmental water resource management agenda. However, in a country where the Gini-coefficient of agency is just as disparate, if not more so, than its Gini-coefficient of income, significant strides are still required at foundational capacity level to enable meaningful and inclusive participation in water governance.

From this study it seems as if learning increases the likelihood of transformation and plays the important role of a catalyst in transformative processes. The catalyst metaphor implies that learning provides additional energy to shift a situation or state to a different level. Learning improves the collaborative and adaptive capacity of people, and therefore, water management institutions, to manage explicitly for the complexity inherent in "C"SESs. To some extent, the challenge of bridging the gap between research and practice remains. We have made progress in moving beyond conducting research that is useful to research that is used, but we need to go further. For one, more can be made of the role of learning as a catalyst in adaptive IWRM. Perhaps greater effort should be channelled towards developing values and ethics-based TD research and enabling persistent TD practice (Wolff et al., under review) that transforms CSESs towards sustainability and social-ecological justice.

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