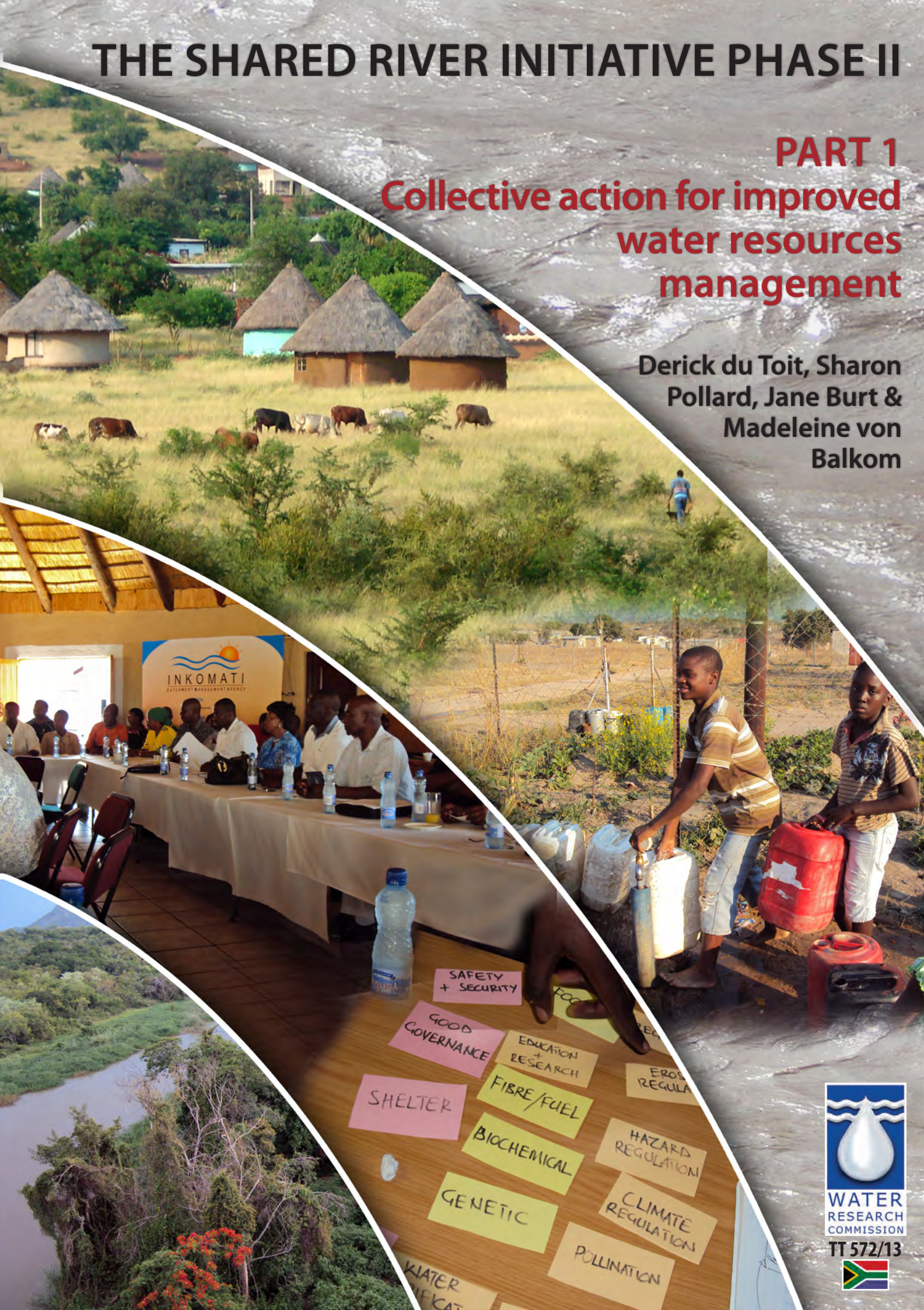
THE SHARED RIVER INITIATIVE PHASE II

PART 1
Collective action for improved water resources management

Derick du Toit, Sharon Pollard, Jane Burt & Madeleine von Balkom



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Water Research Commission

by

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PREFACE

Over the past decades, integrated water resource management (IWRM) has gained prominence as a powerful water management concept. It is an idea that promotes the equitable and sustainable management of a catchment by all who live and share its waters. The complexities of realising IWRM are emerging within the context of South Africa.

Emerging concerns regarding the sustainability of South Africa's water resources contend that despite world-acclaimed legislation, such as the National Water Act (NWA), the ecological condition of the country's river systems – a number of which are transboundary – continue to deteriorate.

On the one hand many recognise that at the very least, developments are taking longer than expected to take effect, and an 'implementation lag' is to be expected. On the other hand, with varying degrees of empathy or frustration, stakeholders express the view that government is unable, or even unwilling, to enforce legislation and water users, acting with impunity, take as much or pollute as they want.

There is much that can be shared and learnt between South Africa and its neighbours. The Lowveld river basins, for example, are all shared between neighbouring states. Each river-sharing neighbour faces a similar set of needs and challenges in its attempts to balance social development imperatives with management for resource sustainability. There is a clear need to harmonise management and decision-making within relevant institutions and between neighbours to ensure fair and effective policy implementation.

From these concerns has emerged an initiative known as the Shared Rivers Initiative (SRI), a transboundary project that aims to understand and effect change in the implementation of policies and legislations relevant to the wise use of the Lowveld river systems. The programme has been led by the Association for Water & Rural Development (AWARD) and is funded by the Water Research Commission (WRC).

Establishing the sustainability of Lowveld water resources

As part of Phase I of the Shared Rivers Initiative, AWARD undertook a preliminary assessment of the status of sustainability of the water resources of the Lowveld and the factors that constrain or contribute to this, in order to provide a grounding from which the project was able to design and implement real change. Investigations were carried out in six major river catchments (Levuvhu, Letaba, Olifants, Sabie-Sand, Crocodile and Komati), residing within the three Water Management Areas (WMAs), namely the Levuvhu/Letaba WMA, Olifants WMA and Inkomati WMA. The results of this study are captured in the report, *The Shared Rivers Initiative Phase I: Towards the sustainability of freshwater systems in South Africa* (WRC Report No. TT 477/10).

Phase 1 of the SRI raised some serious concerns. Of the Lowveld Rivers investigated, none met the Reserve requirements in terms of river flow. In fact, with the exception of the Sabie River, the situation was found to be generally worse than when the NWA was promulgated in 1998. In many cases, water quality also seemed to have deteriorated. However, some signs of a welcome turn-around were evident, certainly in the Crocodile Catchment which falls in the Inkomati Water Management Area, where new Integrated Water Resource Management (IWRM) approaches driven by the Inkomati Catchment Management Agency and stakeholder partnerships were due to come online.

In the Phase 1 report the authors point out firstly that one does not 'implement the Reserve' but rather it is the collective plans for Integrated Water Resources Management (IWRM) that are together designed to achieve the desired outcomes, including equity and sustainability (through the Catchment Management Strategies, Pollard & du Toit 2008). Thus securing river systems is predicated on a 'bundle of strategies' that are collectively required to achieve sustainability. Furthermore, ensuring water in the river means bringing different stakeholders (e.g. agriculture, municipalities) along the river on board – each with their own planning frameworks driven by different factors (e.g. crop production and water supply). This also illustrates that time is needed to re-orientate users to a new unified goals of sustainability and equity and thus lags are to be expected. Moreover it highlights the importance of having a flexible and adaptive approach that embraces learning-by-doing. This moves water resources management into the world of complexity where multiple factors working at different scales render outcomes that are not always predictable.

That said, the Phase 1 report pointed to seven key areas where action is required to transform the degrading river systems. The key findings against which recommendations were made are:

1. A generally poor understanding of the Ecological Reserve and hence failure to change practices
2. The almost total lack of integration of water resources management and supply
3. Some degree of unlawfulness but more importantly, the weak regulation of unlawful use and poor legal literacy.
4. Some seemingly excessive lags in the implementation of the Reserve and emergence of sustainability discourse
5. Various examples of the emergence of, or lack of, self-organisation, leadership and feedback loops in adaptive action and management
6. Attendant dearth of skills, capacity, monitoring and legal literacy with some exceptions.
7. The importance of participatory and representative platforms for collective action: their functioning and contribution to IWRM

In May 2009 a working group convened to charter a way forward for a Phase 2 of the SRI. It was clear from the report that the vast geographic expanse of the study area, the scope and depth of issues at hand, and the need to include a basin-wise (international) perspective, that there was a need to focus the work in the second phase. The working group decided to limit the focus mainly to the Inkomati Water Management Area with the guiding focus of how to best support compliance with environmental water requirements within the evolving institutional environment.

Furthermore, the overarching theme of Phase 2 was that of sustainability and how it can be planned for and achieved over the coming decade. Based on this, Phase 2 was conceptualised as key themes suggested by Phase 1 that would support compliance with the EWRs. The operating assumption is that fundamental to addressing degrading systems is the recognition that the priorities for managing water have shifted where the concerns for sustainability and equity become paramount. Phase 1 pointed towards a situation where, if appropriately addressed, catchments can become units for sustainable water resource management that are both robust and responsive. Achieving this requires – at the outset – a 'shift in the discourse' such that sustainability and equity guide planning and implementation rather than being seen as simply a 'requirement of the Act'. The motivation for this is that, firstly, without adequate understanding of the concepts and language of sustainability (and the EWRs), there is unlikely to be meaningful progress in realizing its goals. This means that water managers and users need access to new concepts and reasoning associated with these new management priorities. Secondly, there is a strong need for learning associated with the use of new 'tools' that focus on the practicalities of achieving sustainability. In this case learning about the ecological Reserve and its provisions, is fundamental to building

sustainability into water management practices. Thirdly, there is the requirement for a 'new shared discourse' for water management across all sectors. The challenge is to support institutions and multiple stakeholder platforms that can potentially develop and hold a collective discourse on sustainability and that realize adaptive management processes as crucial for managing in complex environments.

Given these challenges, Phase 2 set about by structuring the research process around three case studies each exploring different aspects of IWRM raised in Phase 1. The three cases form the basis for this report and are briefly introduced here, and dealt with in detail as Parts 1, 2 and 3 of this document.

Case 1: Collective action for improved water resources management

The research process of this case is to explore new ways of working by bringing stakeholders together to decide on collective actions that will halt the degradation of the lowveld rivers. The expectation in employing such an approach is that water users, with different stakes and views of how the resource should be managed, arrive at a strategic plan for protecting the resources of a specific catchment. Essentially this entails decentralisation and democratization of water management functions where various stakeholder groups are engaged in platforms for participation and decision making. These are commonly called multiple stakeholder platforms (MSPs). MSPs therefore give meaning to the decentralization process by providing spaces where stakeholders can be involved in processes of improving specific situations/conditions that adversely affect them.

The aim of this project action was to explore ways of moving beyond awareness raising to collective action which is defined as: ''the collective process of involving diverse stakeholders for resolving conflicts and advancing shared visions''. However as Phase 1 pointed out, planning forums and multiple stakeholder platforms in the lowveld are bedevilled by a sense of inaction and criticisms are levelled that "nothing ever happens". Almost always they lack a focus on sustainability (and specifically the Reserve).

This case completed a literature and policy review of collective action and drew on the key findings of the other cases in the project. The findings were used to develop a set of guideline principles for collective action. These included the fundamental importance of activities for collective action such as setting a vision, integration of policy and legislation to support collective action, and the importance of meaning making and learning in collective action processes.

Case 2: Building regulatory competence for addressing unlawful water use

Phase I identified that there is inadequate compliance monitoring and enforcement around environmental and water laws with the consequent poor compliance with legal requirements such as the Reserve. Critical deficiencies in the water-use license applications were also highlighted. These shortcomings have contributed to the perception that the "regulator cannot regulate" and that the "regulator lacks teeth". AWARD has observed factors that contribute to this include a lack of legal competence both in the private and public sector as follows: building legal cases around sustainability, poor and underdeveloped enforcement protocols for ensuring legal compliance with instruments such as the Reserve and a failure to attract and expose legal students (future lawyers and judges) to the water sector.

It can be argued that the twin mechanisms of compliance monitoring and enforcement, are the most important mechanisms to ensure legal compliance. Legal provisions, such as those under the NWA, generally give a government entity the authority to conduct inspections and carry out investigations. They provide the authority to impose sanctions, in either the administrative, judicial, or criminal forum, and require the violator to come into compliance

with the law. These regulatory powers play a significant role in deterring unlawful activities. Better understanding challenges and shortcomings faced by the regulator when undertaking compliance monitoring of and enforcing the NWA and other environmental laws and providing constructive recommendations to address those challenges is essential to ensuring sustainable water resources.

Through a collaborative and co-learning process with regulators, multiple stakeholder platforms and law students, this component of the project sought to identify factors that constrain compliance with environmental water requirements and to collectively seek solutions to enable a better regulatory environment.

Case 3: Benefit sharing: understanding the intention of the Reserve and the benefits that an ecosystems goods and services approach provides

Findings of Phase I clearly demonstrated a weak grasp of the Reserve such that almost all stakeholders perceive that the benefits of measures associated with sustainability (such as implementation of the Reserve) accrue to *other* stakeholders whilst *they* (i.e. their sector) carry all the risks. This poses a serious obstacle to fulfilling the intentions of sustainability and equity of water resources through stakeholder participation. People indicated that if they comply, it is because of a legal obligation rather than because it is regarded as beneficial to them or future generations.

Given the aforementioned tendency to perceive the Reserve as risks ("to me") and benefits ("to others"), the research process in this component set out to examine with stakeholders the benefits and risks associated with compliance (or non-compliance). This meant exploring benefit-sharing through a sound framework to help stakeholders understand the implications of meeting (or not) the environmental water requirements. The guiding questions were: What are the implications of not meeting the Reserve? Or phrased another way: What are the benefits for society of being compliant? As researchers, the question also arose as to how best these can be communicated to affect the kind of changes needed? Under Case 3 the issue of boundaries became important because such questions can be asked at the scale of users in a catchment (upstream-downstream 'boundaries' or boundaries between sectors) and between sovereign nations (commonly referred to as transboundary or international issues).

This case sought to focus specifically on the development of a framework and method for exploring the risks and benefits of meeting the EWRs with a focus on the Sand and Crocodile rivers of the Lowveld. This meant developing a solid conceptual and methodological basis through bringing together appropriate skills and expertise drawn from a trans-disciplinary group of scholars and practitioners involved in different aspects of water-related work.

Although the proposed framework was developed in relation to the Ecological Reserve it is not limited to this aspect of resource management alone. The project suggests that the benefits and risks of a Reserve scenario are a component of the broader Classification process which will have a number of Reserve scenarios – at least one for each class. This work therefore has application at this level as well as at basin-scale planning, across international boundaries.

Experience from other transboundary basins suggests that it is important to scope out and understand the full range of issues specifically related to international agreements and co-operation that need to be considered. Such issues are of high priority in the Incomati Basin where, amongst other things, EWRs are being considered in the formalisation of comprehensive water-sharing agreement between three sovereign states of Mozambique, Swaziland and South Africa.

Conclusion

The work presented in this three-part report has the potential to contribute to our knowledge of the policy-science-management-practice interfaces by adopting an integrated approach that seeks to track a policy intent such as environmental water requirements through to outcomes. It seeks to deepen the discourse on environmental water requirements, compliance and what these mean for society – both at a national and international scale. It is built on the recognition that ensuring water for future generations is the basis for a healthy and thriving society. Ensuring both provisioning and regulating services through Reserve compliance provides for benefits that impact on health and at the same time the economy. Demonstrating where the distribution of benefits lie is an important component of understanding the links between environmental water requirements (designed for the benefit of society) and economic well-being.

Although the project concentrated on the rivers under the jurisdiction of the Inkomati Catchment Agency, its findings have a wider application at the national and international scale especially in the light of needing to address sustainability of freshwater systems. Such efforts however cannot be tackled without the involvement of stakeholders. An important aspect of working within complex systems such as catchments is to identify the requisite simplicity and present this in a way that can be communicated to all concerned in a practical and tenable way. The impact is to be experienced as a shift in the language and discourse of water management towards more sustainable ways. By engaging all sectors through multiple stakeholder forums the intention is to gain recognition for integrated approaches and to emphasize the importance of sustainability in adaptive planning. To this end concept and competence development at all levels is central to implementing the recommendations set out in this report. The overarching aim of this report is therefore to provide the basis for shifting the discourse in water resources management towards more sustainable configurations.

Note on report format

This report is presented in three parts, each documenting the work done within the three cases summarised above. The decision to keep the work separate is based on the distinct nature of each of the case studies. It also recognises that legal research and referencing is different to the format used in scientific research. Presenting the report in three parts allows for the conservation of disparate methods and formats.

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EXECUTIVE SUMMARY: PART 1

Part 1 of this report builds on the findings of the Shared Rivers Initiative Phase 1 which identified the need to strengthen sustainability and integration of water resource management practice. The research focus is on an exploration and analysis of the role of collective action for achieving this. The nature of WRM in South Africa calls for a decentralised and democratic approach to managing the resource. A new institutional framework leading to the development of management structures at a catchment level provides the platform for decentralised management but the process by which this will occur is still unclear.

Much research in Natural resource management has explored the concept of collective action as "the collective process of involving diverse stakeholders for resolving conflicts and advancing shared visions" (Gray, 1985). The research (as explained in the preface) focused on three areas that are important for sustainable management. These were exploring a systemic approach to reaching environmental water requirements through understanding the distribution of ecosystems services; an evaluation of the legal practices of enforcement, and an overarching theme of collective action. This meant that within each of the themes collective action was tracked and assessed to gain an understanding of how collective action could strengthen the integrated practice of WRM tasks and activities.

A literature review was done using a laminated frame of reality guided by the work of Bhaskar and Danermark (2006) which sees reality as stratified into seven laminations that cannot be reducible to each other. Using this frame helped separate out how different theorists addressed different contexts and concerns of collective action at different levels, for example Game Theory explores collective action in response to individual action (level 2 according to the laminated framework) whereas Ostrom's work tends to focus on interactions *between* individuals (level 3) and the influences of social structures such as institutions (level 4). By reviewing literature using this frame helped the researchers understand collective action and the role of collective action with more depth. It also avoided the problem of choosing one theoretical position over another, rather different theoretical positions helped researchers understand how collective action is influenced by a variety of factors at multiple levels. It was only when these theoretical positions contradicted each other that a choice needed to be made.

A review was also done of the South African legislative environment and its reference to co-operative governance. It was argued that the legislation calls for the collective decision making with regards water resources management activities and that co-operative governance is the mechanism through which this can be achieved. The following legislative instruments were analysed for collective action, collaboration and co-operative governance: The South African Constitution; The Intergovernmental Framework Relations Act; The National Water Act and The National Environmental Management Act.

The three cases studies mentioned earlier provided the basis from which key findings were drawn. The findings were used to develop a set of guideline principles for collective action. These included the fundamental importance of activities for collective action such as setting a vision, integration of policy and legislation to support collective action, and the importance of meaning making and learning in collective action processes. Recognising the collective action occurs in complex settings and that collective learning is central to designing appropriate management action in such settings. This means that learning cannot be about 'transferring' knowledge but rather about how people construct their understanding of their world and how this influences the outcome and practice of water resource management. An example of this is the different understandings people have of environmental water requirements and how this translated into planning and management practices in the catchments of the lowveld.

From these cases, the research highlights a way forward for more democratic, decentralised water resources management activities. Key to ensuring that these activities reach an expected outcome is understanding how they play out in practice and where there are contradictions that inhibit practice. To do this, researchers suggest working with activity theory as an analytical tool for understanding how management practices evolve as systems of activities. A basic framework for conducting such an analysis is presented as a way forward for improving collective action towards more sustainable water resource management.

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1. SECTION A: INTRODUCTION

"Throughout human history the critical threats to survival came as dramatic external events: floods, earthquakes, attacks by wild animals or rival tribes, fire. Today, the most critical threats are slow, gradual processes to which we have contributed ourselves; environmental destruction, the global arms race, the decay of educational, family and community structures. These types of problems cannot be understood, given our conventional ways of thinking. There is no beast to slay, no villain to vanquish, no one to blame – just a need to think differently and to understand the underlying patterns of dependency. Individual change is vital, but not sufficient. If we are going to address these conditions in any significant way, it will have to be at the level of collective thinking and understanding – at the level of organizations, communities and society." (Senge et al. 1996*)*

1.1. Collective action within the context of IWRM in South Africa

Today water and water management are serious concerns particularly for an arid to semi-arid continent like Africa. A great percentage of the African population deals with some sort of water related issue, and access to water still seems to be defined by demographic inequalities (Swatuk 2002).

Falkenmark (1990) writes that focusing on existing water related problems and failing to predict problems is a fundamental challenge for most African countries. Even though the focus of water management has been to adopt a proactive rather than reactive approach, it is still difficult to predict, and consequently prepare, for unexpected changes in water availability.

In an attempt to develop a more proactive form of management, South Africa has been divided into water management areas (WMA), so as to enhance productivity, management practices and decentralise management functions to those most affected by shifts in the availability of the resource. (DWAF 2004) Within this new institutional framework, the success of water management practices is often a reflection of the cooperation between users and the multiple sectors in these water management areas. One of the most common problems concerning any kind of development field is a lack of long term commitment (or understanding) in collaborative management processes (Pollard and Du Toit 2011) leading to fragmented action.

The Constitution of South Africa requires that co-operative governance occur with the Intergovernmental Relations Framework Act (IGRFA 2005) providing a framework for this integration. More specific to water resources management is the explicit adoption of INTEGRATED water resources management by the Department of Water Affairs as a national policy. However a 'vehicle' and mechanisms for this integration is not explicitly articulated anywhere. We explore the concept of Collective Action in relation to this context as a possible means of shedding light on improving and formalising integration as an operation construct in water resources management in South Africa. We investigate the extent to which integrated water resource management practices are applied collectively by understanding the roles and responsibilities of multiple sectors and therefore the role of collective action in achieving sustainable water resources management. We consider the consequences of a lack of collective planning for actors who voluntarily work together to achieve the ideals of sustainability as expressed by the NWA.

1.2. IWRM – the joint responsibility of stakeholders?

Integrated Water Resources Management (IWRM) with its proposed institutional arrangements as set out in the National Water Act (NWA) (RSA 1998), provides the broad context for the engagement of the general public in water resources management. The NWA makes provision for a number of stakeholder platforms (Catchment Management Forums – CMFs and Catchment management Committees – CMCs) where IWRM can be negotiated at

the level of a Water Management Area. The platforms are intended to be more than places where stakeholders defend vested interests in water resources. They are platforms where decisions are taken and collaborative actions are designed in order to strategically manage water resources for and by the inhabitants of a WMA.

South Africa has yet to implement a comprehensive and functional approach to stakeholder engagement at the level of WMAs. One of the most important challenges relates to focusing the interactions on specific IWRM tasks (or activities) (Du Toit et al. 2005). As multiple stakeholder environments are potentially conflictual it is essential that water management tasks are clearly articulated and well-presented so as to appropriately direct engagement. We cannot assume that stakeholders will automatically collaborate with each other despite there being a legal imperative to do so (RSA 1998). Overcoming the realities of different interests and perceptions relies on developing an atmosphere of trust (Rogers 2005). The best way of achieving this is to focus on future needs rather than on present and past problems.

The challenge of stakeholder engagement is heightened when one is dealing with a stressed catchment where there is an oversubscription of a resource such as water. This needs to be considered because the nature of the dynamics between stakeholders will be different during times of stress to a time of abundance. In South Africa this is particularly relevant as many of our catchments are being closed as requirement exceeds availability. In this situation, there is a need for clearly defined WRM activities and the role of the mediator/facilitator and regulator becomes more significant.

In this particular context, we recommend that there needs to be a clear understanding of the kinds of activities (tasks) that are needed to implement IWRM and that these are integrated. To do this we advocate for the use of activity theory to unpack IWRM activities in order to understand the strengths and weaknesses of current practice. We also advocate for the adoption of well-formulated social learning processes as integral to all IWRM activities.

1.3. Background and project overview

The Shared Rivers Initiative Phase 2 (SRI 2) builds on the findings of Phase 1 of the SRI (Pollard and Du Toit 2011). Like SRI 1, phase 2 is conceptually rooted in the principle of **sustainability**, one of the main principles underlying IWRM. In particular, SRI 2 focuses on how sustainability can be planned for and achieved over the coming decade. In South Africa, the principle of sustainability is primarily rooted in Section 24 and 27 of the Constitution. Section 24 establishes a fundamental right to an environment that is not harmful to a person's health or well-being, and requires the environment to be protected for the benefit of present and future generations. The protection should be afforded through reasonable legislative and other measures that secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development.

SRI 1 research undertook to identify points of entry aimed at improving the sustainability of the rivers of the lowveld (Pollard & du Toit 2011). More formally the aim was *to provide an assessment of the status of sustainability of the water resources of the six lowveld river systems, and the factors that constrain or contribute to this, in order to provide a grounding from which the project is able to design and implement real change*. Analysis of results indicated that securing the Reserve (as a benchmark for sustainability) is predicated on a 'bundle of strategies' that require collective action to achieve sustainability.

The Phase I research illustrated difficulties and successes with respect to this transformation to an integrated approach (IWRM). In summarising the major factors we pointed to the following (see final report of Phase 1 for a full discussion).:

1. A generally poor understanding of the Reserve and hence failure to change practices

2. The almost total lack of integration of water resources management and supply

3. Some degree of unlawfulness but more importantly, the weak regulation of unlawful use and poor legal literacy.

4. Some seemingly excessive lags in the implementation of the Reserve and emergence of sustainability discourse (see WRC/ DWA consultancy)

5. Various examples of the emergence of, or lack of, self-organisation, leadership and feedback loops in adaptive action and management (see Pollard & du Toit in press)

6. Attendant dearth of skills, capacity, monitoring and legal literacy with some exceptions.

7. The importance of participatory and representative platforms for collective action: their functioning and contribution to IWRM

In the Shared Rivers Initiative Phase 2 one theme has been to understand the role of collective action for strengthening sustainable practice in water resource management. The other two themes are water use regulation/enforcement and ecosystems goods and services. The latter themes form case studies in different spheres of water resource management through which the application of methods can be understood.

The theme of collective action ran across all themes and aimed to explore and test new ways of bringing stakeholders together to decide on collective actions. The findings from this investigation have been synthesised into a guiding framework for collective action in IWRM (this report).

1.3.1. The specific objective for this project

BOX 1. Sub-objectives for SRI phase 2

1. To implement and test a series of collective actions through engaging multiple stakeholder platforms in action research methods for tackling key sustainability challenges identified in Phase 1, namely: assessing the functioning of multiple stakeholder platforms for collective action
2. To develop a generic framework for an integrated systems approach to examine and assess the benefits and risks of meeting environmental water requirements through understanding the distribution of ecosystems goods and services (EGS).
3. To research and evaluate the application of legal practices and procedures for the enforcement of the National Water Act and other legislation related to ensuring sustainability of water resources through a collaborative process with regulators, multiple stakeholder platforms, and law students.

1.3.2. Collective action for improved water resources management

As Phase 1 pointed out, planning forums and multiple stakeholder platforms in the lowveld are bedevilled by a sense of **inaction** and criticisms are levelled that “nothing ever happens”. Almost always they lack a focus on sustainability (and the Reserve).

The aim of this theme is to move beyond awareness raising to collective action which is defined as: ‘‘the collective process of involving diverse stakeholders for resolving conflicts and advancing shared visions’’ (Gray 1985). Engagements for collective action are characterized by face-to-face dialogue, mutual learning, and voluntary participation in working towards

shared goals. The expectation in employing such an approach is that water users, with different stakes and views of how the resource should be managed, arrive at a strategic plan for protecting the resources of a specific catchment. Essentially this entails decentralisation and democratization of water management functions where various stakeholder groups are engaged in platforms for participation and decision making. These are commonly called multiple stakeholder platforms[1] (MSPs) (Steins and Edwards 1988, Warner and Verhallen 2005, Warner 2006). MSPs therefore give meaning to the decentralization process by providing spaces where stakeholders can be involved in processes of improving specific situations/conditions that adversely affect them.

1.3.3. Research framework for investigating collective action in IWRM

In order to arrive at a guiding framework for collective action the project engaged with three cases derived from each of the three objectives listed in Box 1 (and documented in full in various project deliverables).

In each of the three cases multi stakeholder groups where engaged in various tasks. During this process the ability of the collective to function was tracked and assessed. This assessment process was conducted in conjunction with the participants. The overall aim was to research how collectives for local action can be built by testing responses to sustainability challenges.

The project followed the following procedure:

1. A literature review of the concepts associated with collective action
2. A review of the legislative environment in support of collective action, collaboration and co-operative governance.
3. The selection of 3 cases where collective action is relevant
4. The involvement of stakeholders in collective action processes or the evaluation of existing collective actions
5. Reporting on the cases and the extraction of key findings
6. The drafting of a set of guidelines for supporting collective action

2. SECTION B: A literature review of collective action

Collective action theory and practice have been applied in a wide variety of settings and with respect to a number of natural resources but usually the application has been at a local level with regard to a single local resource that is accessed by users with similar stakes or interests in the resource.

Although the studies explored for this review have differences they also have points of commonality. However none of them have looked at the application of collective action in the management of catchments in South Africa.

2.1. Collective action in natural resource management

In recent decades, ecological preservation and management of natural resources have gained a significant amount of attention prompted by a critical degradation of natural resources. The overuse of natural resources by several communities and/or industries has been a major cause of this degradation. This has led to an increased attention being given to what it means to manage natural resources. O'Riordan, as quoted by Bahuguna et al. (1994, p.269)., defines resource management as "a process through which society exercises equitable and sustainable control, distribution and exploitation of the resources" and "the process of decision making whereby resources are allocated over space and time according to

[1] A **Multiple Stakeholder Platform** has been formally defined as a "*decision-making body (voluntary or statutory) comprising different stakeholders who perceive the same resource management problem, realise their interdependence for solving it, and come together to agree on action strategies for solving the problem*" (Steins and Edwards, 1998:1).

needs, aspirations and desires of man within the framework of his technological inventiveness, his political and social institutions and his legal and administrative framework".

The management of natural resources was originally seen as an activity separate from the activities of people using them. This approach has now been replaced by the realisation that the activities of people have a direct impact on the health of the resource both in a negative and positive way. Furthermore the increased stress on resource use means that management decisions need to be made collectively in order to ensure sustainable solutions. There needs to be agreement between different groups on what needs to be done and by whom. Understanding collective action and the different definitions and approaches to it, and understanding what is needed to sustain, improve or restore natural resources is crucial to restoring the integrity of our natural world.

2.2. What is collective action?

There is an abundance of literature on collective action and thus many definitions of what it means to engage in collective action. This diversity is due to collective action being formulated within different work contexts, different approaches to research and in relation to different resource systems. Some of these definitions are more relevant to the field of IWRM than others. As Johnson et al. (2001, p.5) argues "Collective action for watershed management is unique to other resource management because of size of geographic area, diversity of stakeholders involved and the combination of both private and common property."

The diverse definitions of collective action are focused around explaining two things: what the 'action' of collective action is, and, what components are needed for an action to be collective. Meinzen-Dick and Di Gregorio (2004) define collective action as "a voluntary action taken by a group to achieve a common interest; members can act directly on their own or through an organization" (p.2). The essential components of collective action are "decision-making, setting rules of conduct of a group and designing management rules, implementing decisions, and monitoring adherence to rules" (Meinzen-Dick, Di Gregorio and McCarthy 2004, p.4)

Panda (2007) defines the components of successful collective action at a grassroots level as including "institutional arrangements, clear incentives (short and long term), social capital (cohesiveness and social structure of the community), property rights, leadership, assumed gender roles and responsibilities, a sense of ownership and transparent mechanisms for the sharing of benefits" (p. 2).

The late Elinor Ostrom did some of the most fundamental work on the collective management of natural resources. She and her team prepared guidelines for the collective management of natural resources (see Box 1 by McCulloch, Meinzen-Dick & Hazell (1998, p.14)). Ostrom (2004) describes collective action as "when more than one individual is required to contribute to an effort in order to achieve an [collective] outcome" (p.4) and that a certain level of self-organization is necessary in order for an action to be executed. Whilst Ostrom's work is valuable for collective action it does not focus on how practice emerges historically nor does it look at how practices can be transformed in the way that Ray Ison suggests is necessary (Ison 2004). Also the nature of water resources management with its cross-boundary implications and the fact there are multiple users of a resource that is mobile is a further complicating factor that requires more than the guidelines suggested by Ostrom and her team.

Verghuse and Ostrom (2001) describe the elements of a self-organised system as existing when "actors, who are major appropriators [users] of a resource, are involved over time in making and adapting rules within collective choice arenas regarding the inclusion or exclusion of participants, appropriation strategies, obligations of participants, monitoring and sanctioning, and conflict resolution" (p. 748). Underlying Ostrom's work is that this kind of self-organisation is possible and indeed has or used to exist within community structures that managed local resources for the benefit of a group. There is an acceptance that human

actors have a tendency to work together for the benefit of the collective in certain circumstances.

BOX 2. Guidelines for collective action in natural resource management

- set a *clear definition* of the members and the boundaries of the resource to be managed or improved;
- set *clear rules and obligations* that are adapted to local conditions;
- be able to *modify rules to changing circumstances as a collective;*
- have *an adequate monitoring systems* to evaluate the collective activities
- have *clear enforceable sanctions* appropriate to the seriousness and context of the offense;
- have *effective mechanisms* for conflict resolution; and
- the collective should *not be challenged or undermined*, if not empowered or recognized by government authorities

(Ostrom 1994, summarised by McCulloch, Meinzen-Dick & Hazell 1998, p.14)

Garrett Hardin's (1965) work, however has been very critical of collective action and people's ability to manage natural resources collectively. He claimed that community-based resource management would fail because of people's self-interest in managing natural resources (Wessels 2008, Bahunga et al. 1994, Waring 2011). Mancur Olson (1968) also had his reservations about the ability of people to act collectively, and stated that they will not form a collective [voluntarily] unless they are forced to do so (Bahunga et al. 1994). This position highlights the influence that game theory has had on collective action. The above position assumes that human actors are mostly driven by individual self-interest and that this self-interest is not always linked to the collective. This position draws on a particular approach to game theory, which Schelling (2010) defines as hard game theory, which is defined as "*as the study of models of conflict and cooperation between intelligent rational decision-makers'.* Being intelligent and rational in this context means finding the best way to look after one's self-interests. This approach to game theory also influenced the famous psychologist R.D Laing who viewed humans as existing in an isolated world of the individual where even the context of the nuclear family was made up of a series of competitive games based on satisfying self-interest (Curtis 2007).

The soft definition of game theory is described as the study of "two or more entities (people, governments or organisations) that make interdependent choices between different actions in situations where the outcomes depend on the choices of both or all of them and where each has his or her own preferences among the possible outcomes." (Schelling 2010, p. 28) Various research programmes, that have been done since the 1960s, and have shown that it is possible for people to cooperate and sustain common resources (Bruns et al. 2004, Ostrom 2004). This has been verified and argued by Ostrom's work in the field of collective action (Ostrom 2004).

For this report we shift the focus of collective action from the individual or the structure/institution to the activity of integrated water resource management. We argue that the role of agents is just one aspect of collective action. We focus on people's practices and how these influence the activities of water resource management. Within this framing

individuals perform different and diverse roles in order to make an activity happen. Individuals come and go, as we have seen in the South African water sector, what needs to remain intact is the activity. The challenge is to clarify the activities of WRM, which include clarifying an agreed outcome, rules, and division of roles of an activity so that different and maybe multiple role-players can take on different aspects of the activity and progress towards a collective outcome. For example, the practice of regulation will be both the responsibility of the CMA and the National Department of water Affairs and it will also be the responsibility of individual members.

Collective action is affiliated to democratic processes but has also developed a discourse of its own. In box 2 we provide a list of some concepts that relate particularly to collective action. These concepts are fundamental for democracy. In the current context of IWRM they may be poorly expressed or inhibited by practices inherited from the previous regime, for example, ideas like inclusion and self-organisation. Under the apartheid government self-organisation in the form of meetings, organisation and publications could be legally banned through the 1929 Riotous Assemblies Act (RSA 1929), and the 1950 Suppression of Communism act (RSA 1950). There was no avenue to appeal against a banning.

BOX 3. The language of collective action – a collection of terms and concepts drawn from the literature on collective action in natural resource management

- Trust
- Knowledge sharing
- Cooperation
- Voluntary participation
- Equity/Heterogeneity
- Long-term sustainability
- Inclusion
- Problem solving/prevention
- Preservation
- Mutual understanding of meanings/definitions
- Self-organization
- Common interest/beliefs/goals
- Inequality
- Community effort

2.2.1. Why collective action?

People involved in the management of resources have come to realise that the success or failure of ensuring the health of a resource lies in working with the people that use the resource. There are two reasons for this: the ecological system can no longer be viewed as separate from the humans that rely on it for their livelihood and, excluding people from managing a resource that they use may lead to managers missing or ignoring sustainable practices that are already in place, not understanding current management practices and how they may need to change to be more sustainable.

The Constitution stipulates three spheres of government and the responsibilities of each sphere. The intergovernmental system creates strong provincial and municipal levels of government, which have some control, over what the decentralised offices of national line

departments do within their areas, while sharing this control with the national ministries. Thus in a number of areas (but not all) there are "concurrent competencies". The negotiations that occur between the national, the regional and the local levels are held to lead to a system of "cooperative governance".

The emphasis on cooperative governance and integrated approaches identifies the need and intention for collective action, but the processes and practices for this are still emerging. Co-operative governance is sought in some cases through structures for joint meeting, but mainly through a range of planning and strategic instruments – such as the Integrated Development Plans with the Spatial Development Frameworks, Land Use Management Systems, Environmental Management Plans, Water Services Plans, and Catchment Management Strategies.

The Constitution states that "government is constituted as national, provincial and local spheres of government which are distinctive, interdependent and interrelated".[2] The promotion of local government to a position of equal importance to that of national and provincial government was a novel concept of the 1996 Constitution. This new position is entrenched in the 'principles of co-operative government and intergovernmental relations' under chapter three of the Constitution, which provides that all spheres of government have a duty to:

- Preserve the peace, national unity and the indivisibility of the Republic;
- Provide effective, transparent, accountable and coherent government for the Republic as a whole;
- Respect the constitutional status, institutions, powers and functions of government in the other spheres;
- Not assume any power or function except those conferred on them in terms of the Constitution;
- Exercise their powers and perform their functions in a manner that does not encroach on the geographical, functional or institutional integrity of government in another sphere; and
- Co-operate with one another in mutual trust and good faith by fostering friendly relations; assisting and supporting one another; informing one another of, and consulting one another on, matters of common interest; co-ordinating their actions and legislation with one another; adhering to agreed procedures; and avoiding legal proceedings against one another.[3]

Whilst each sphere remains autonomous, and separate from the other two, they are also connected and rely on each other to fulfil their Constitutional mandates, and not to encroach on the duties of the other spheres.[4] Thus the system requires an appropriate balance between autonomy and supervision.[5] In this way the Constitution moves away from a competitive form of federalism where executive and legislative powers are assigned exclusively to either the national or regional government, and towards a co-operative form of federalism where each sphere of government is allocated both legislative and executive powers concurrently and operates under a system of shared responsibilities.[6] It is generally provincial and local government who take responsibility for implementing national and provincial laws where executive responsibilities are concerned.[7] This has the advantage of allowing the uniform rules of the country to be adapted by local authorities to best fit local

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[2] S 40(1)

[3] S 41(1)

[4] Nico Steytler and Jaap de Visser *Local Government Law in South Africa* (2007) 16-16.

[5] Anel Du Plessis 'Local Environmental Governance" and the Role of Local Government in Realising Section 24 of the South African Constitution' (2010) 21 *Stell LR* 265 at 274.

[6] Iain Currie and Johan De Waal Johan *The New Constitutional and Administrative Law Volume 1. Constitutional Law* (2001) 119.

[7] Du Plessis, op cit note 62 at 266.

implementation of these rules. In other words laws and policies that were made centrally can be moulded to best be executed at regional level.[8]

Section 152 of Constitution sets out that the objectives of local government are, among other things, to ensure the provision of services to communities in a sustainable manner,[9] and to promote a safe and healthy environment.[10] It is the responsibility of both national and provincial governments to "support and strengthen" municipalities to enable them to manage their own affairs and fulfil their obligations.[11]

Should a municipality be unable to fulfil its functions, the Constitution allows for intervention from the provincial government. This intervention can extend to the relevant province to assume the municipality's obligations to maintain essential national standards or meet established minimum standards, should the municipality fail in its obligation to do so.[12]

According to section 139(5) of the Constitution, if a municipality, owing to a crisis of financial affairs, breaches its obligation to provide basic services (such as sewage disposal), a recovery plan must be imposed by the relevant provincial authority. This recovery plan must aim to rehabilitate the municipality to the extent that is it able to meet its obligations to provide basic services. The provision also requires the provincial executive to assume responsibility for the recovery plan should the municipality be unable, or fail to implement the plan.[13] Should the provincial executive fail to correctly exercise its powers in relation to the provisions above, it is the duty of the national executive to intervene.[14] This is supported by section 155 which provides both national and provincial governments with the legislative and executive authority to see to it that municipalities perform their functions effectively.[15]

In addition to the Constitutional requirements set forth above, the Municipal System's Act,[16] requires municipalities to exercise their legislative and executive authority within the parameters of co-operative government as set out by section 41 of the Constitution.[17] Furthermore, the act sets out objectives that municipalities and local government must seek to fulfil in order to obtain effective co-operative governance:

- The development of common approaches for local government as a distinct sphere of government;
- Enhancing co-operation, mutual assistance and sharing of resources among municipalities;
- Finding solutions for problems relating to local government generally; and
- Facilitating compliance with the principles of co-operative government and intergovernmental relations.

2.3. A framework for understanding the social phenomenon of collective action

As mentioned above, there are many studies on what enhances or inhibits collective action in a variety of contexts and in terms of the management of different resources. Studies range from case study research to far more quantitative studies such as models that draw on game theory and analyse human propensity to engage in collective action. In order to understand a social phenomenon like collective action it is useful to view it in terms of a laminated reality

[8] Ibid at 120.
[9] S152(1)(b)
[10] Ibid s 152 (d)
[11] S154(1)
[12] S 139(1)(b)(i), See also Section 105(1) of the Municipal Systems Act.
[13] S 139(1)(b)
[14] S 100(1)
[15] S 155(7)
[16] Act 32 of 2002
[17] Ibid s 3(1)

where, at different layers, collective action is being influenced in different ways. There is obviously interplay between the layers as reality is not actually split up into little bits. What is useful about using a layered approach is that it helps us understand what we know about collective action at what scale. This helps diffuse the debate about whether individual choice and agency has more of an effect than policy changes and institutional structure. When we view social phenomena as a laminated system, we also avoid using one explanation of collective action to be reduced away by another (Price 2013). An example from research into the nature of disability explains this: in the 1950s and 60s the neurophysiological explanation dominated (disability was seen as a problem of the physical body). This was seen in opposition to socio-economic explanations (which highlight problems of the person who is disabled as societal). Finally, cultural, constructivist explanations saw the use of language and discourse as directly impacting on the experience of being disabled and how this is dealt with in society. Bhaskar and Danermark (2002) argue that for the disabled person the experience of being disabled is interplay of all these factors. One explanation cannot be reduced away by another nor does one explanation fully capture what it means to be disabled and the challenges a disabled person may face.

To do this analysis, this report will draw very loosely on Bhaskar's laminated system for analysing social phenomena. We are not sticking exactly to Bhaskar's system but will work with the scales that make the most sense in terms of collective action. The scales of Bhaskar's model are as follows. In brackets is the writer's interpretation of this scale in terms of collective action:

1. Psychology of individuals (Action in response to a reading of an individual identity, this can be conscious but equally unconscious)
2. Individual material circumstances (Action in response to an individual context)
3. Human face-to-face interaction (Interactions between individuals. This can be one-on-one interactions, interactions between neighbours, between groups)
4. Structure-culture of society (the influences of social structures such as institutions e.g. local government or cultural beliefs)
5. Society as a whole (influence of ideas that are held by a particular society. An example of a society would be southern Africa for example. The influence of this society on collective action will be that it adheres it is an emerging democracy, adopts a human-rights approach and, in terms of water embraces the principles of IWRM)
6. Geo-historic trajectories (This relates to broad geological/geographical and historical influences such as a degrading environment, a closed catchment, rainfall patterns, apartheid and colonialism, land use practices)
7. Global trends (This refers to global movements both socially and ecologically that effect all of us such as climate change, democracy, patriarchy, the rise of the internet, social media, economic rationalism)

At each level there will be different explanations for what inhibits and enhances collective action as described below.

This laminated framework is consistent with systems thinking which forms the foundational theoretical frame for the project. System thinking takes cognisance of drivers at all scales and how these impact on each other and on socio-ecological systems. The laminated framework helps us understand what these drivers (or mechanisms) are and how they influence integration and collective action.

How people perceive themselves will influence collective action (psychology of individuals)

There are not many studies on how an individual's psychology will enhance or inhibit collective action. This is mostly because an individual's view of themselves is tied up to other levels of understanding reality such as social and cultural beliefs and interactions, which are in turn influenced by global movements such as patriarchy, democracy and economic rationalism. Collective action studies tend to focus on these levels. What is worth noting though is that a lot of current research in neuroscience, neuropsychology and evolutionary

psychology are pointing to two factors within human psychology that would influence collective action:

How we act is often based on how we want other people to see us (Gilbert 2010). For example, in the context of big business we do not want to be seen as weak, we want to be viewed as competitive. Working together is encouraged within the in-group of fellow employees but even this is not assured. Employees can easily be fired and/or replaced depending on the dictates of the balance sheet. Being generous, working collaboratively is not valued as much as being seen as being ambitious and achieving set goals. However, in the context of people we know in our domestic lives, we want to be seen as a mixture of things: kind, generous, strong, maybe funny. This desire to be seen in a particular light with a particular identity will impact on how we act collectively. A study done by Padmanabhan (2006) in India on the sharing of rice seeds within a collective showed that the fact that the villagers identify themselves as generous impacted on the rules they developed around sharing seeds. This trait, based on a group practice, is being threatened by the need to grow cash crops to survive in a changing economic environment (Padmanabhan 2006). Eran Binenbaum et al. (2005), in a study on collective action and plant breeding, uses a quantitative model from game theory to understand the likelihood of individuals to engage in collective action. One of the variables of the model is how our propensity to participate within a particular collective increases as we are influenced by those close to us. Berijikian (1992) also explores this from the viewpoint of revolutionary collective action.

Ostrom (2005) adds that collective action is influenced by how people view each other and the future. This in turn is influenced by their sense of place within the environment and their connection to a vision of themselves as part of a larger system. Ostrom explains that high discount rates usually mean people are only interested in short-term goals. Things like secure property rights, which would influence people's sense of place within the environment, can influence a long-term vision. Most people can imagine a future for themselves but don't often reflect on this future in relation to the collective. It takes an effort of expanding one's view of oneself to see how one's individual self is interconnected and how the future of a catchment is deeply connected to one's own future. Values and attitudes can also be affected by one's view of oneself in relation to others and the environment, for example, a catchment under stress can affect people at a psychological level. They can see themselves as under threat of losing something or, because the catchment is no longer cared for and in a state of degradation, as something to be further abused and used at will.

Another important factor is that a human brain has three main emotional systems that are influenced by different hormones. These emotional systems are:

1. Threat system: focused on averting threat or danger. In the water sector this is apparent in the focus on risk management approaches.
2. Drive system: focused on gaining resources this is realised through the drive to compete. This drive is apparent in the water sector where stakeholders try to maximise yield and continually compete for higher water allocations.
3. Affiliation/contentment system: focused on feeling safe, content and connected (Gilbert, 2010)

Collective Action research tends to focus on how the first two emotional systems influence collective action (See below Swallow's three motivations for collective action in the next section). Studies tend to ignore the third, which is alluded to in Padmanabhan's study where a group of people adopt an identity of 'generosity'. This gives them a sense of belonging and connectedness to each other and those outside their defined group. Cultural spirituality also feeds the affiliation system through connecting people to the environment. This is often expressed in terms of sacred spaces, for example, the Kerala villagers view the rice paddies as not only as a source of food but as sacred (Padmanabhan 2006). As mentioned above, strong game theory, which has had a significant influence on understanding collective action, tends to focus on the human tendency to want to avert danger and compete for personal or collective advantage. It does not acknowledge the equally strong evolutionary human need to feel connected and safe.

What is interesting to contemplate is how a catchment that has become toxic or polluted would affect these drive systems. If the way in which people behave in the catchment are predominantly within the second drive system then a catchment that becomes toxic or polluted will change their relationship towards it. Would they want a high stake in a polluted catchment? Would they still want to compete for a resource, which is no longer as valuable? Equally so, if people's belonging and sense of safety are linked to the health of the catchment, how would this influence their behavior and ability to function as a collective?

What is important to note is that all these drives are working in the individual at once and in different contexts, different drives will come to the fore. The point that is being made here is that collective action tends to focus on harnessing the first two drives without considering how the third could play a role in collective action both in terms of enhancing people's willingness to work together as well as inhibiting it if people no longer feel that they know their catchment or belong to it.

How and why human interaction effects collective action

The world of human action is not only influenced by an internal world but also by the material world into which, we are born. People find themselves in a material world with a particular context, which includes a particular status in society. People have very little say over this context and their roles are in response to and limited by this material reality.

Game theory has had an impact on the study of collective action and our attempts to understand what makes an individual want to act within a collective. It does this by suggesting individuals take on different metaphorical roles for example in certain situations they may respond as a prisoner**.** Benvenisti (1996) uses Game theory (which claims that when certain conditions are met cooperation between certain actors will happen) in his paper on riparian states and shared freshwater, to explain the kinds of problems that usually trigger a need for collective action. He uses three games as examples to identify the problems that need collective action

First, he looks at the Prisoner's Dilemma (PD) that says in order to ensure sustainability of the riparian states (the actors/stakeholders) should cooperate through communication and be loyal to their commitment. Second, the Chicken game proposes that the actors/stakeholders involved want the other to solve a problem or sustain a resource, but since neither party wants to do that, to cooperate would be the best solution in managing the resource. Third, the Stag Hunt game suggests that several actors/stakeholders would have to sacrifice some of their control to meet the needs of the collective.

Swallow et al. (2001) also uses game theory to argue that self-motivation to engage in collective action is stronger when participants can see how they will directly benefit from participating. He identifies three key motivations a) reduced risk b) increase in cash crop production c) avoiding punishment. This is important for water resource management where the direct benefit of participating in sustainable action or a task of water resource management is not always clear. For example, deciding the classification of the reserve will directly impact on the availability of ecosystem services to residents of a catchment at different time and space scales. If residents do not understand these implications they will be less likely to participate in collective decision making.

Ostrom (2001) argues a similar point but from a different standpoint. Instead of it being important for individuals to understand benefit, she says that there should be an agreement that there is a problem and that it is important. Bahuguna et al. (2012) mentions that it is a crisis or collective problem that clearly leads to collective action. Understanding that a river system is stressed and the effects this would have on livelihoods may enhance collective action.

The added complexity of IWRM in relation to people's interactions with each other is that a crisis in a water resource, although originating in one point in the catchment, transports itself to another point in the catchment and changes the material context in which people live. This unique quality in water resource management means that people from many different

contexts need to be able to act together in order to address the arising concerns of the catchment as a whole.

These are all considerations that are bought to the fore in water resources management where there is an assumption that the collective will be able to make collaborative decisions, develop a common vision and take collective action without some form of co-ordination.

Structure and culture of society effect collective action

There is the misguided assumption that all of society functions according to the same rules and obligations. Governments and global institutions often accept western rules and ideologies as the dominant perspective. Cousins challenges this dominant perspective (Cousins, T. In press) and argues that many assumptions within this dominant ideology can inhibit collective action.

The way a group of people structure themselves and their understanding of themselves in relation to their environment will impact on the way in which collective action practices emerge. This feeds directly into issues of governance.

An example is work by Pollard and Cousins (2010) on wetland management and governance. This study highlights two arguments that would affect collective action.

- The way property and the ownership of property are understood impacts the governance of a resource. In western economic terms property is viewed as the fixed asset of an individual, company or government. Meinzen-Dick and Nkoya (2005) argue that property rights are actually a bundle of entitlements that define the owner's rights and responsibilities for using the resource. When ownership consists of a group of people sharing a common resource then the need to establish rights and responsibilities becomes a collective activity. Clarifying how a resource is understood and the language used to describe the resource will impact on the kind of structures that are put in place for the collective governance of a resource.
- Pollard and Cousins argue that there is a flawed perception of how 'commonly' held natural resources are perceived as belonging to no one and are subsequently not managed (according to western notions of ownership/tenure), and thus open to abuse. They argue that in many cases these resources are held under traditional systems of tenure that are as securely governed as property under title deed.

Different cultures also have different ways of viewing or understanding their relationship to a resource whether shared or otherwise.

Berijikian (1992) argues that at the heart of understanding collective action is the role of structure and agency. He argues against individual and structural reductionism, rather he proposes, "individuals evoke alternative decision rules in different structural contexts which leads to exploration of the role of ideology in explanations of collective action. These rules are related to individuals understanding of current and past structural relationships." This is relates to Pollard and Cousins (2010) research on property ownership and the management of a common resource. They argue that if you develop governance structures that function according to rules that are based on a misunderstanding of property and property ownership this will have direct implications for the kind of collective activities that develop. They recommend that it is important to understand the kind of structures that are already in place and from this basis define rules for collective action together with residents.

Ostrom also argues that contrary to classical game theoretical situations, "people in the natural world do not make decisions independently but rather engage in a discourse where they share or withhold information. Likewise they are confronted with different enforcement mechanisms by local institutions and larger government structures, which are in place to improve the likeliness of people behaving in a predicted way" (Ostrom 2005b).

Effects of 'society as a whole' on collective action

The literature reveals various challenges that confront collective action and community co-operation. Amongst these are ethnic and cultural diversion, class differences, corruption and gender inequalities.

Waring (2011) demonstrated his theory on ethnic diversity and the lack of cooperation in Tamil Nadu, India, by showing that there was little voluntary contribution of labour in irrigation systems by a great number of castes in the area. Trust issues among ethnic groups for example and a lack of mutual understanding among people with different sociocultural backgrounds make the management of a natural resource difficult (Verghuse and Ostrom 2001).

A case study on womens' collective action in sustainable water management in Gujarat, India, suggests that gender also plays an important role in collective action and that in most cases the impact of some of the gender related issues that would eventually enhance the management of natural resources are ignored. For example, Panda (2007) found that the claim of success is insignificant when gender inequality exists; that the lack of promotion of womens' efforts might be significantly different (and more successful) than that of men; and that there is a lack of understanding about the different ways men and women organize for natural resource management.

Geo-historic trajectories effect collective action

One of the complications with activities (tasks) that needs collective action is understanding where to place boundaries. Boundaries can exist at two scales: the scale of 'structure-culture' of society in terms of socio-political boundaries (e.g. local villages, towns, municipalities, provincial governments or countries) or at the scale of the geo-historical (e.g. geographical boundaries – hydrological boundaries, ecosystem, biome or biosphere, and historical boundaries – colonial influences such as the splitting up of southern Africa). Some of the literature suggests that the boundaries for collective action should be defined by stakeholders themselves particularly when this comes to collective action around a particular task and or practice that is already in place (for example, farmers involved in a particular crop). In this case the boundary is set around an object (the crop), the user group (farmers) and in terms of scale (this settlement or this group of farms).

Swallow argues that mobilising political support for collective action across political boundaries is difficult. Although it seems logical in the water sector to set boundaries around catchments, research shows that the most successful collective action happens at the village level and scaling up from this level is extremely rare without coordination of some kind. Collective action at a larger scale is more successful when areas are small and fall into a single government areas. It is for this reason that he suggests that practices that need collective action are situated within social and administrative boundaries rather than hydrological boundaries (Pollard and du Toit 2008). This has implications for the water sector in South Africa where collective action is needed at all scales if we are going to implement our current strategies. One of the issues with current practice is the mismatch between the boundaries of water resource management structures, which are based loosely on large catchment scales, and water service delivery structures, which are based on political boundaries. As Swallow highlights, collective action in these circumstances will not be possible without some coordination. McCulloch et al. also argues for the need of coordination particularly when collective action is needed across private and communal property. His case refers to farming technologies and in particular controlling the use of fertilizer but it could equally apply to the activities of IWRM. The nature of water as a resource means that collective action needs to be facilitated. Unique aspects of water resource management include: the size of geographic area, diversity of stakeholders involved, combination of both private and common property (Johnson et al. 2001), and, a disruption in the integrity of the resource happening at one point in the catchment and moving to another effecting a completely different context.

Bahuguna et al. (1994) argues that "as long as a resource is plentiful and treated as an open access system it is only when it is under stress that people want to control and manage it and

so the potential for conflict or collective action arises." This gives rise to the fact that the resource unit itself can enhance or inhibit collective action. Ostrom (2005) identifies four attributes of a resource unit that enhance collective action:

- Focus of the resource unit is predictable. In the case of water in South Africa availability is variable and volatile particularly with the growing threat of climate change.
- Resources scarce but not destroyed. Collective action responses depend on the level of degradation.
- Reliable and valid indicators of the condition of the resource are available at local level at affordable cost.
- Resource system is moderately sized. (Ostrom 2005)

This all has implications for collective action in South Africa. As a system gets more stressed it will change dynamics of collective action and the ability of the collective to reach resolution on an action.

Global trends that influence Collective Action

The strength of a systems approach is that acknowledges influences or, in the terminology of systems thinking, drivers at multiple levels. When dealing with collective action at a local scale the effect of global trends are often forgotten or ignored but these powerful trends have huge impacts on the way in which water resource management is played out at a local scale. The very fact that South Africa has adopted an *integrated* Water resource management approach is due to the global trend towards this approach, which in turn is influenced by global trends in democracy, participation and a rights-based approach to governance.

Other global trends that impact at a local level are global environmental challenges such as climate change. As mentioned above, climate change will increase the variability of rain fall leading to unpredictability and possibly more stress on already stressed catchments.

Padmanabhan (2006) explores the effects of gender on collective action. She asks the question: "Since action resources are very much determined by the existing construction of gender, the question is how does collective action enlarge or inhibit the choices of men and women?" She tracks the influence of global economic trends on local agricultural practices and how these change the activity of labour leading to women being excluded from the production of food and thus the rules that govern collective action. Here two global trends are being played out at a local level, that of patriarchy and the current economic regime. This is not an isolated case in India. Chikunda (2011 – Dialogue 2011)) reports that "in Zimbabwe, the government's efforts to empower people and alleviate poverty by giving subsidies for cash crops such as cotton farming, has had detrimental gender consequences with women becoming a labour force for a large industry rather than controlling the production of their own food. As the cotton industry boomed, incidences of women committing suicide has increased and systematically children have become more and more malnourished." Padmanabhan (2005) concludes that by neglecting gender 'as an analytical dimension' leads to a flawed assessment of community institutions in terms of "participation, distributional equity and efficiency".

In summary, when we are dealing with collective action we need to appreciate that all the levels of reality are acting simultaneously on a given context and cannot be resolved in isolation. For example, Global trends will have an impact on people's response at a socio-cultural level. An example of this is the concept of 'poverty traps' where feelings of disempowerment further inhibit collective action. Poverty is not only a local concern but the mechanisms for its continual re-enactment are located at all levels of society and within our global structures and ideologies. Expecting poverty to be resolved through local collective action is naïve. This is not to say that collective action at a local level cannot impact all levels of society but it is less likely to do so if there is no understanding of how global movements influence a local context. For example, ignoring issues of gender or on a positive note, drawing strongly on the principles of democracy.

Another key observation is that collective action is not suspended in a fixed context. Although there is a growing understanding as to what enhances or inhibits collective action there is no formulaic way in which collective action can happen. With a continually changing context, learning to adapt becomes a core principle of collective action.

3. SECTION C: COLLECTIVE ACTION IN THE SOUTH AFRICAN WATER SECTOR AS COOPERATIVE GOVERNANCE

3.1. The South African legal commitment to integration and collective action

In this section we explore the legal framework and deliberate on how it supports collective action in IWRM tasks. In analysing a number of laws that have relevance to water resource management key concepts of such as "co-operative governance" and "public participation" support working collaboratively and collectively towards the policy goals of "some, for all, for ever, together".

The following legislative instruments have been assessed for their references to cooperative governance, integration, collaboration and public engagement in water management:

1. The South African Constitution
2. The Intergovernmental Framework Relations Act
3. The National Water Act
4. The National Environmental Management Act

The Constitution is the overarching legislation and provides the basis for primary legislation in the various sectors. All extracts pertaining to co-operative governance are contained in Appendix 1.

3.2. The South African Constitution

The South African Constitution is primary legislation that integrates government and administrative action. Government is constituted as national, provincial and local spheres of government which are distinctive, **interdependent** and **interrelated**[18] however they must all observe and adhere to the principles in Chapter 3 (co-operative governance) in the constitution and must conduct their activities within the parameters that the Chapter provides[19].

Fundamental to Chapter 3 are the principles of **co-operative government** and **intergovernmental** relations which state that all spheres of government and all organs of state within each sphere must **co-operate** with one another in mutual trust and good faith by[20]:

(i) Fostering friendly relations
(ii) Assisting and supporting one another;
(iii) Informing one another of, and consulting one another on, matters of common interest
(iv) Co-ordinating their actions and legislation with one another;
(v) Adhering to agreed procedures; and
(vi) Avoiding legal proceedings against one another.

[18] S40 (1)
[19] S40 (2)
[20] S 41 (1)

These provisions provide the grounding for governmental collective action. We will reflect on these provisions when reporting on the case studies later in this report.

3.3. The Intergovernmental Framework Relations Act (Act 13 of 2005)

The object of the Intergovernmental Relations Framework Act (IGFRA) is to provide (within the principles of co-operative government as set out by Chapter 3 of the Constitution) a framework for national government, provincial government and local governments, and all organs of state within those governments, to facilitate co-ordination in the implementation of policy and legislation. [21]

Section 35 of IGRFA recommends implementation protocols to coordinate government action. It states:

Where the implementation of a policy, the exercise of a statutory power, the performance of a statutory function or the provision of a service depends on the participation of organs of state in different governments, those organs of state must co-ordinate their actions in such a manner as may be appropriate or required in the circumstances, and may do so by entering into an implementation protocol

Some of the aims of an implementation protocol are to: identify challenges, describe the roles and responsibilities of parties involved with regards to policy implementation, determine the resources available; and provide for dispute-settlement procedures and mechanisms should disputes arise in the implementation of the protocol.[22] IGFRA also provides for instances where such a protocol "must be considered",[23] these include three instances relevant to this paper: firstly, where an implementation protocol will materially assist the national government or a provincial government in complying with its constitutional obligations to support the local sphere of government or to build capacity in that sphere;[24] secondly where an implementation protocol will materially assist the organs of state participating in the provision of a service in a specific area to co-ordinate their actions in that area;[25] and finally where an organ of state to which primary responsibility for the implementation of the policy, the exercise of the statutory power, the performance of the statutory function or the provision of the service has been assigned lacks the necessary capacity.[26]

The constitutional duty to avoid intergovernmental disputes is also enshrined in Chapter four of the Act ('Settlement of intergovernmental disputes'), and places a positive duty on all organs of state to make every reasonable effort to firstly, avoid intergovernmental disputes when exercising their powers or performing their respective statutory functions; [27] and secondly, if such a dispute should arise – to settle it without resorting to judicial proceedings.[28]

There are certain criteria that must be followed before an organ of state can resort to judicial proceedings to resolve a dispute against another organ of state.

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[21] S 4

[22] S 35(3)(a-i)

[23] S 35(2)

[24] S 35(2)(b)

[25]S 35(2)(c)

[26] S 35(2)(d)

[27] IGRFA s 40(1)(a)

[28] Ibid, s 40(1)(b)

3.4. The National Water Act (Act 36 of 1998)

The National Water Act provides the foundation for a new and fundamentally different way of managing the nation's water resources. Together with the White Paper for National Water Policy (which sets out 28 principles; DWAF 1997), it challenges the policies and values of the past by framing water resources management within the context of two fundamental principles: equity and sustainability (RSA 1998). These principles of transformation seek to move towards integration, redistribution and equity in allocation, sustainable use, resource protection and participation (see preamble).

Central to the re-orientation embodied in the National Water Act (henceforth referred to as the Act) is the concept of Integrated Water Resources Management (IWRM) (Pollard and Du Toit 2011). In this regard, the Act explicitly recognises 'the need for the integrated management of all aspects of water resources'. The Department of Water Affairs & Forestry (DWAF 2003a) defines IWRM[29] as "*a philosophy, a process and a management strategy to achieve sustainable use of resources by all stakeholders at catchment, regional, national and international levels, while maintaining the characteristics and integrity of water resources at the catchment scale within agreed limits*". In its entirety IWRM therefore aims to strike a balance between the use of resources for livelihoods and its protection for future generations, whilst promoting social equity, environmental sustainability and economic efficiency

Under the Preamble the NWA states: "recognizing the need for the **integrated management** of all aspects of water resources and, where appropriate, the delegation of management functions to a regional or catchment level so as to enable everyone to participate". This provides, in principle, a means whereby residents can act collectively in managing their water resources. In performing its functions a catchment management agency (CMA) must "strive towards achieving **co-operation** and consensus in managing the water resources under its control;"[30] In Case 2 (this report) we turn our attention to the establishment of Catchment Management Forums (CMF) as a means to promote this co-operation.

As mentioned above the nature of water resource management requires that collective action be coordinated. The CMAs are an important institutional structure that can facilitate regional collective action. Subject to Chapter 2 and section 79 of the NWA, the initial functions of a catchment management agency are–
*(c) To **co-ordinate** the related activities of water users and of the water management institutions within its water management area;*
*(d) To promote the **co-ordination** of its implementation with the implementation of any applicable development plan established in terms of the Water Services Act, 1997 (Act No. 108 of 1997)."*
With respect to this provision we investigate the efforts of the Inkomati CMA and a local government to plan for and co-ordinate wastewater management in the region (see Case 3).

Monitoring, recording, assessing and disseminating information on water resources is taken by the Act as critically important for achieving the objects of the Act. Part 1 of Chapter 14 (S138) places a duty on the Minister to establish national monitoring systems to "*facilitate the continued and **co-ordinated monitoring** of various aspects of water resources by collecting relevant information and data, through established procedures and mechanisms, from a variety of sources including organs of state, water management institutions and water users.*"
This provision provides a guiding framework for **collective** resource monitoring which is at various stages of development throughout South Africa (see WRC website for related projects).

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[29] Both the Global Water Partnership and the NWRS (DWAF 2004a) define IWRM thus "as a process which promotes the co-ordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems".

[30] 79 4 (b)

Also worth noting, but not a topic covered in this project, is that the NWA is explicit in providing for **regional co-operation**. This means that downstream needs of countries such Mozambique needs to be integrated into water allocation planning so that international agreements can be met. This is not a simple task in that the establishment of in stream flow requirements and water quality standards need to recognised and aligned by two or more sets of governance structures. The Act provides for the establishment of specific bodies the "**governance**, powers and duties of these bodies are determined by the Minister in accordance with the relevant international agreement, but they may also be given additional functions, and they may perform their functions outside the Republic"[31]. The nature of integration and consequently collective action at an international scale is beyond the scope of this report suffice to note that it is a particular area that warrants future attention as the honouring of international agreements is dependent on the development of trans boundary collective action.

The NWA gives powers to the responsible authority, in the interests of **co-operative governance**, to promote arrangements with other organs of state in combing "respective Licence requirements into a single Licence requirement"[32]. This provision supports and promotes collective regulation of particular water uses.

Additional areas for collective action that are supported under the NWA are public **consultation** in: the declaration of controlled activities by the Minister[33], the publication of permission to use water under a General Authorisation in the Gazette[34], establishing a pricing strategy which may differentiate among geographical areas, categories of water users or individual water users[35]

3.5. National Environmental Management Act (NEMA)

The National Environmental Management Act is overarching environmental management legislation aimed at co-operative environmental governance. The purpose of the NEMA is articulated as:_"*to provide for **co-operative, environmental governance** by establishing principles for decision-making on matters affecting the environment, institutions that will promote **co-operative governance** and procedures for **co-ordinating environmental functions exercised by organs of state**; and to provide for matters connected therewith.*"

In the Act the Preamble stipulates that the "law should establish procedures and institutions to facilitate and promote **co-operative government** and **intergovernmental relations**; as well as recognising that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must **co-operate** with, **consult** and support one another.

The NEMA makes provision for Environmental Implementation Plans and Environmental Management plans[36] the purpose of which is, amongst other, to

(a) **Co-ordinate** and harmonise the environmental policies, plans, programmed and decisions of the various national departments that exercise functions that may affect the environment, and of provincial and local spheres of government, in order to- (i) minimise the duplication; and (ii) promote consistency; and

(b) Give effect to the principle of **co-operative government** in Chapter 3 of the Constitution.

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[31] Chapter 10
[32] S 22
[33] Ch 4 Part 5
[34] Ch 4 Part 6
[35] Ch 5 Part 1
[36] S12

In Case 2 we look at the competence of authorities to give effect to this provision of NEMA and consider the consequences of integrated planning and implementation in relation to waste water management in the Inkomati WMA.

Not only does the NEMA call for be **intergovernmental co-ordination** and harmonisation of policies, legislation and actions relating to the environment[37] it also makes provision for committees for environmental co-ordination[38] whose function is to promote the **integration and co-ordination** of environmental functions by the relevant organs of state, and in particular to promote the achievement of the objectives of environmental implementation plans and environmental management plans. The Committees shall, amongst others, make recommendations to **co-ordinate** the application of integrated environmental management as set out in Chapter 5, including cooperation in environmental assessment procedures and requirements and making determinations regarding the prevention of duplication of efforts.

The Act is also clear on **co-ordination** and **co-operation** between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state stating that procedures for the investigation, assessment and communication of the potential impact of activities must, as a minimum, ensure the **co-ordination** and **co-operation** between organs of state[39]

With regard to international Obligations and Agreements the Minister must report to Parliament once a year regarding international environmental instruments for which he or she is responsible and such a report may include details of the efficacy of **co-ordination mechanisms**[40]

Chapter 13 (S14) under "Procedures for Co-operative Governance" provides one of the most important mechanisms for formalising collective action. The Act is clear in stipulating what information is required to ensure co-operative engagement between relevant government departments in the content of the environmental management plans (EMP). This content will be considered in Case 3.

The Municipal Systems Act

The Municipal Systems Act focuses on intergovernmental co-operation giving express meaning to the need for co-operative governance under the Constitution. Section 6.1.3 (1) Clearly states that "municipalities must exercise their executive and legislative authority within the constitutional system of **co-operative government** envisaged in section 41 of the Constitution." And in S 6.1.3 (2) that "the national and provincial spheres of government must, within the constitutional system of **co-operative government** envisaged in section 41 of the Constitution, exercise their executive and legislative authority in a manner that does not compromise or impede a municipality's ability or right to exercise its executive and legislative authority".

Section 6.1.3 (3) (d) stipulates for the purpose of effective **co-operative government**, that it should seek to "facilitate compliance with the principles of **co-operative government** and **intergovernmental relations**."

Chapter 5 which deals with integrated planning says that "planning undertaken by a municipality must be aligned with, and complement, the development plans and strategies of other affected municipalities and other organs of state so as to give effect to the principles of **co-operative government** contained in section 41 of the Constitution S24. (1)."

S 12 2_(b) stipulates that local government should "establish mechanisms for facilitating **co-ordination** between sectorial regulation with respect to local government matters." The Act calls for the i**nterdepartmental Co-operation/Co-ordination in chapter 5 S31 (c) by**

[37] S2 (l)
[38] S7
[39] S24 (7)
[40] S26 (1)

facilitating the **co-ordination and alignment** of the "integrated development plan of a municipality with the plans, strategies and programmes of national and provincial organs of state;"

3.6. Promotion of Administrative Justice Act (PAJA)

The PAJA is silent on issues of co-operative governance it calls for "co-ordination of programmes for educating the public and the members and employees of administrators regarding the contents of the Act and the provisions of the Constitution relating to administrative action". This is significant in that the legal case highlighted the importance of PAJA in settling legal disputes through the Water Tribunal (see Part 2 of this report) and that legal disputes resulting from unlawful use charges are often brought by stakeholders through PAJA.

4. SECTION E: THE WAY FORWARD FOR COLLECTIVE ACTION

This research has highlighted learning points that can be added to Ostrom's guidelines for collective action (See Box 1) there are a number of additional issues we wish to elaborate on. These are listed here as a collection of points for deliberation.

Following on these points of deliberations we argue that collective action should be focussed around activities and activity systems. We propose that Cultural Historical Activity Theory (CHAT) can provide us with a way of dealing with collective activities in a systemic and systematic manner. CHAT helps practitioners understand that activities always involve:

- Subjects (individual stakeholders involved in an activity)
- Rules (this includes taboos, cultural rules, legislation etc.)
- Mediating artefacts or instruments (these are the signs and tools that mediate action and learning. They can be explicit e.g. meetings, training workshops, pamphlets, or implicit e.g. cultural beliefs)
- Community (this is the broader collective who are involved or impacted on by the activity)
- Division of Labour (how labour is divided up between collectives and individuals)
- Object (these are the motives for the activity)

These come together towards achieving a particular outcome that is usually defined by the group engaged in the activity. CHAT, as an analytical tool, helps researchers and IWRM practitioners understand where contradictions or problems lie in an activity system and therefore where intervention or learning (often in the form of collective action) needs to take place in order for the activity to reach the expected outcome.

In the case of IWRM activity systems the principles of the NWA (equity, efficiency and sustainability) will determine the nature and the scope of the activities.

Key considerations for collective action in IWRM

In this section we provide a list of points for deliberation extracted from the three research cases.

4.1. Developing a shared meaning of sustainability

If there is not shared meaning between stakeholders there is a little likelihood of collective action. This is particularly important with regards activities being in line with the principles of

the NWA, for example sustainability. What this research has shown is that stakeholders who are expected to act collectively do not share an understanding of what it means to manage a resource sustainably.

4.2. Supporting practices rather than individuals

Natural resources management within a systems approach does not focus on the individual, what matters is developing and supporting practice across scales and levels within that system. Here social structures, governance, self-organisation, communication and collaboration become critical.

4.3. Clear Communication

Stakeholders often come from diverse institutional environments. Clear communication between different stakeholders by institutions that adopt a coordinating role can support collective action. It is important to note that communication does not necessarily mean understanding and in some instances attention needs to be given to developing a clear understanding of process and practice rather than simply communicating information.

4.4. The importance of dialogue and learning in the collective

If we accept the complexity of our experience of the world then uncertainty is an unavoidable aspect of that experience. Accepting this means learning coping with change together. The way we know and generate knowledge to deal with this complexity is not by being receivers of information, rather knowledge is constructed in context and through social interaction. Stakeholders are co-creators of knowledge that is contextually relevant to local experience and practice. This means that learning as a social process is core to ensuring collective action.

4.5. Sharing a common vision for IWRM

A shared vision is critical for the guiding collective action. This is achieved through dialogue and discussion where stakeholders articulate a desired 'future state' for their resources and the relationship of the vision to national policies and goals is acknowledged and critically reflected upon. This is important as the partners of particular collective activity need to have a basis from which to work as different role players are guided by different policy mandates, practices and sector interests. Without a shared vision and statement of intent there is no mechanism for accountability from which to evaluate progress.

4.6. Collective action requires preparation and accuracy

In the legal case that collective activities need to be well planned, documented and executed specifically where there are legal implications. Administrative tasks have clear processes that must be followed (e.g. PAJA) for tasks to be completed. This is equally relevant for other IWRM tasks that require collective action. Collective action takes time to develop and partners need to be prepared to invest in the processes associated with completing particular activities.

4.7. Trust between diverse, responsible partners

A level of trust is needed in the process for collective action. Different partners are guided by different mandates and the completion of a collective task relies on different partners picking up the responsibilities sometimes under informal agreements. Ways to develop this trust are:

- 'formalising' the collective's activities

- stakeholders need to 'trust' each other but there is a greater need for stakeholders to trust the process. For mediators/facilitators of collective action this means clear communication and an understanding of the context of stakeholders involved.

4.8. Enough information amongst the relevant partners

It is difficult for stakeholders to take on shared responsibility if they don't have adequate information and an understanding of the task at hand. This is particularly important where tasks are complex or technical by nature. Where there are inadequate information interactions between stakeholders centre around clarifying processes rather than on action.

4.9. Translation of collective decisions into practice

Collective decisions need to be carried through to practice by practitioners. For example in the case described in Part 3 of this report and the classification of the reserve, the process is meaningless for stakeholders if the decision to manage a river according to a particular class is not operationalized. Accountability mechanisms and regular review mechanisms need to be in place to ensure that the activity is carried through to completion.

4.10. Clarity and agreement as to who handles what

The delineation of roles for a particular activity is central to successful collective action. The CHAT framework (discussed later) helps us organise and clarify roles around specific activities.

4.11. The need for a mandate from senior management

It might be necessary for government officials operating at the local and regional level to obtain mandates to participate in collective activities. This is so that resources can be made available for these stakeholders to participate. The legal case makes the point that a coordinating body that facilitates interdepartmental co-operation be established between major departments (DEA, DoA, DWA, DMR) responsible for implementing primary legislation.

4.12. Learning for sustainability needs to be planned for

River systems are degrading despite the presence of enabling legislation and sustainability tools. This is presumably because current practice is unable to respond to or take up the responsibilities associated with the tasks of integrated water resource management. The question then is how diverse stakeholders are learning about sustainability and new orientations to water management. It is hard to see how sustainability will be embedded in regional water management processes if stakeholders are not familiar with sustainability concepts and associated tools (such as the Reserve) and how to apply them to their local context. We believe that multiple stakeholder platforms and activities are critical for developing a shared discourse on sustainability across all sectors and for holding adaptive management processes at a catchment level. Seeking to elucidate collective benefits at a catchment scale in a way that holds meaning for participants will be an important step. Without such platforms at which the *status quo* of the catchment is discussed, together with a sustained programme of on-going learning and thus change in practice, is unlikely.

4.13. An agreement to work toward the common goal – not just a common understanding

Working collectively requires that participants commit to coordinated action—an agreement to work and act rather than develop a shared understanding of a particular activity. This means that particular roles need to be assigned and rules for functioning need to be defined.

The activity framework (CHAT) discussed in the next section provides assistance in this regard.

4.14. A call for integration

Decentralising water governance to the river basin level so that stakeholders could participate in decision making was conceived to adapt decisions to the local context. National objectives are seen to hold stakeholders accountable so that they did not only respond to their own individual interests. In order to achieve this coordinated interaction between different stakeholder groups is needed so that they can collectively, timeously, wisely and cost effectively reflect upon the consequences of their past, present and future actions.

The plethora of policy and legal documents surrounding water resource and environmental management are clearly expressing an imperative to act collectively. The 1998 National Water Act, the National Environmental Management Act (NEMA), the Integrated Development Planning system, and the Strategic Development Initiatives are some of the many legislative documents which call for collective action. This is generally expressed as co-ordination or co-operation.

Chesbrough and Teece (1996) believe that systemic innovations pose a unique set of management challenges regarding information exchange, sharing and coordinated adjustment throughout the entire product system and often the organisation. One of the main purposes of co-operation is to develop the ability to innovate in a systemic manner. , But despite the clearly formulated benefits of coordination it is often incredibly difficult to achieve in practice. Part of the reason for this difficulty is that the phenomenon of coordination and particularly the impediments to coordination are not well understood. In this report we have explored some of the key issues that hamper practitioners from acting collectively and have offered a number of guidelines for supporting collective action. We however believe that the most important issue relates to the understanding of practices in the domain of the collective. In the section that remains we introduce the framework proposed by activity theory as a way of better understanding integrated practice and suggest that it could make a considerable contribution to collective action in the water sector.

4.15. Understanding practice: Activity theory

Activity theory is not a specific theory of a particular domain, with specific techniques and procedures. It is a cross disciplinary approach offering conceptual tools and methodological principles which can be used to understand and support collective human activity and learning. The core assumption of activity theory is that consciousness and activity are dynamically interrelated (Loent'ev 1972). This is a fundamentally different assumption to traditional knowledge transfer approaches which rest on the assumption that knowledge precedes action. Activity theorists reject this as false, rather *conscious* learning is understood to emerge from "activity (performance), not as a precursor to it (Jonassen et al. 1999, p. 62). There are two other aspects of activity theory that influence the way in which one would engage with stakeholders and support collective action and learning, these are:

- Activities are socially and contextually bound which means that an activity can only be understood or developed by understanding the context within which it has emerged or needs to exist
- Activities develop through time. Understanding the historical development of an activity is key to being able to support further development of the activity and learning (Jonassen 1999).

In collective action the outcome of an activity can only be reached if actions and operations of a particular activity are co-ordinated. This requires an understanding of the activity and how actions and operations are taking place towards an agreed upon outcome.

From the research findings it has become clear that in order to support collective action for IWRM it is necessary to:

a) understand all the potential constraints that may inhibit collective action at the different levels of action (See the literature review of collective action)
b) understand and support contextually situated activities of IWRM around which stakeholders need to engage in collective action.

Activity theory sees an activity as consisting of the following:

- A subject. This is a person or individual who engages in the activity and acts upon the object.
- An object. The physical or mental object that is sought by the subject. The nature of this object will influence the way in which the subject acts upon it. For example, collective action usually occurs around a local object such as a crop, in IWRM the object be it water allocation or regulation is not situated within a local context. This influences the way the subject (all the effected stakeholders) will act upon the object.
- Tools. Tools are anything that influences the way in which people act and think. Tools can be physical objects but they can also be cultural beliefs or mental models. The kind of tool that is used will alter the activity, and be altered by the activity.

This interplay of subject, object and tools towards a collective goal (or production of a goal) happens within a broader frame of rules, community and division of labour. Rules being explicit and implicit rules of behaviour that govern action that are agreed upon by the community. The community is the broader social space within which the activity is taking place. Division of labour is how action within the activity system is divided between different subjects. Figure 1 is a graphic representation of an activity system.

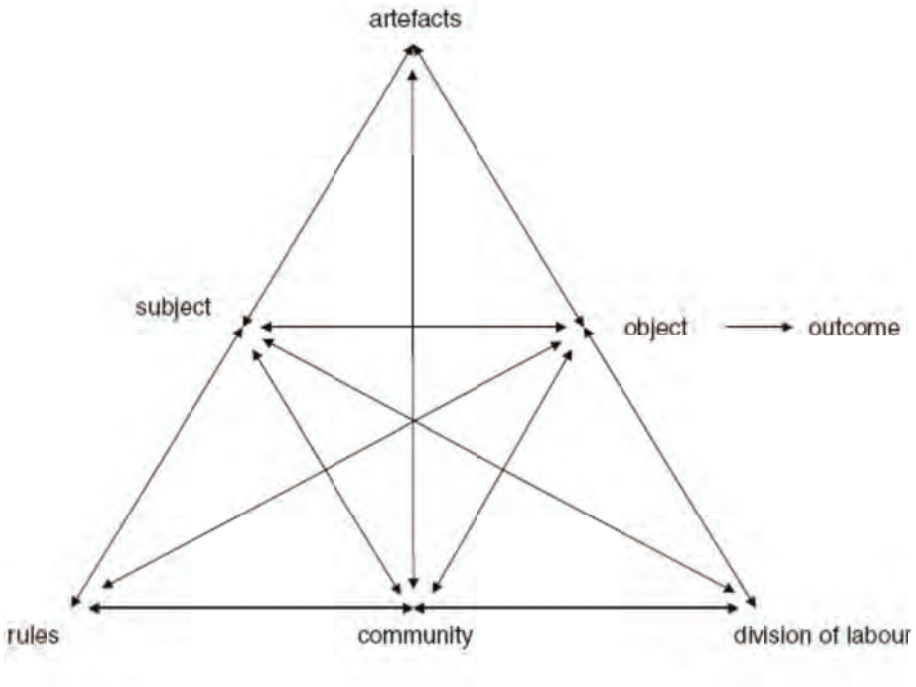

Figure 1. The second generation activity system (Engestrom et al. 1999)

In this model the subject tries to change something (object) in order to achieve a goal (outcome). This is mediated by tools (artefacts), the rules that apply in that activity, the community that is involved in the activity and the division of labour between members of the community.

The activity system is again situated within a broader frame (as mentioned above), a cultural context and a historical context. Understanding context then becomes vital for being able to support IWRM activities and the learning that needs to happen within an activity system.

Basic principles of activity theory

Activity theory is based on three general principles that are mainly concerned with the analysis and interpretation of data that record and describe human behaviour and action. They are as follows:

4.15.1. The entire activity system is the unit for analysis

Engelstrom (1996) maintains that conventional cognitivist views identify the given problems and knowledge domains – or the individual's mental models and cognitive structures – as the context of problem solving, thinking and learning. This view excludes the fact that an individual exists within a society whose actions are contained and influenced by a cultural-historical context. Engelstrom explains: …"if we take a prolonged look at any institution, we get a picture of a continuously constructed collective activity system that is not reducible to series or sums of individual discrete actions". The challenge then is to understand the indirect or even hidden influence of individual actions on the creation and reproduction of activity systems and how the different components of the activity system create and reproduce the action of the subject (individual or group). This means people not only use tools, they also renew and develop them, whether consciously or not. They not only obey rules, they also mould and reformulate them.

People, through their practices within a given activity, both change and transform the world. This in turn changes the way we practice. "Humans are thus both producers of knowledge and the co-creators of the world around them." (Burt et al. 2012, r 23)

4.15.2. The activity and its actions need to be analysed historically

This principle distinguishes between modes and historical types of a given activity. The mode refers to the way the activity is organised and carried out by its participants at any given time. Historical types can be characterised by means of two variables: degree of complexity and degree of centralisation (Engelstrom 1996). For example, if the complexities of interactions are very high for a given activity, then centralised control and extreme division of labour create motivation and quality problems. As complexity increases in systems so does the tendency for decentralised work teams to reconceptualise and plan the objects and products as well as the organisational forms of their work. This means that questions of How? Are extended to why? For whom? Etc. with the consequence that activity systems start to reconstruct.

4.15.3. Inner contradictions as the source of change and development

Activity systems are characterised by inner contradictions. In all activity systems there are fundamental contradictions that reside in each component of that system. For example, the intentions of subjects in an activity system emerge from contradictions such as the contradiction between what they believe they need to know in order to accomplish a goal and what they do know at any point in time (Jonassen 1999).

Secondary contradictions may introduce a 'disturbance' or perturbation that may lead to an overall crisis in the activity system. These contradictions are not something to be avoided rather they are the source of innovation and change. Contradictions usually jolt automatic habitual operations (operations are actions which have become automatic and require less conscious effort) back into conscious actions that need to be reviewed and possibly changed.

4.16. Step-by-step process for working with Activity Theory

Activity theory can frame research, practice and learning from understanding the context of an activity system all the way through to engaging with change-orientated learning which the purpose of changing practice. Below are a series of steps developed by Jonassen (1999):

Step 1: Clarify the purpose : understanding the context within which action (or activities) are occurring, the motivation for a particular activity and any contradictions in relation to the context and motivation, in order to develop a thorough understanding of 'the intentional dynamics of the activity system' (Jonassen, 1999, 71)

Outcome: To guide the construction of the problem space (in terms of goals and motivation)

Step 2: Analyse the activity system: defining the components of the activity system (subject, object, community, rules and division of labour) and understanding contradictions.

Outcome: Description of all aspects of the problem/project. This process can also lead to recommendations of how the subject can address the problem or what learning/skills the subject needs to address the problem.

Step 3: Analyse the Activity Structure: This means analysing all the activities that the subject engages in both consciously and unconsciously. The underlying question here is "Why are people doing what they are doing?"

Outcome: A description of activities, actions and operations that are required to engage with the problem or contradictions. An understanding of how the subject engages and can engage with the object.

Step 4: Analyse tools and mediators: Understanding the tools and signs that mediate the interactions between subject, community and object).

Outcome: An understanding of what constrains action according to the tools that are used and what tools are needed (such as educational processes) within the activity system

Step 5: Analyse the context within which the activity occurs. This includes both the internal context of the activity (such as the objects and goals) as well as the external context (such as tools and broader movements in society)

Outcome: Identifying the interactions that will be needed to enhance learning in this particular context.

Step 6: Analyze the Activity System Dynamics Looking at description of activity system that one has developed and assessing how all the components affect each other. Jonassen calls this a 'final reality check of the system" (Jonassen 1999).

Outcome: Interconnection between different aspects of the system and an understanding of what is needed for learning to occur. Any new processes that emerge out of a learning process are tested.

Below is a table of potential questions for each step, adapted from Jonassen (1999).

Table 1. Guiding questions for Activity System analysis (drawn from Jonassen 1999)

Step	Questions
Clarify purpose of Activity system	
a) Understand contexts in which activities occur	• Generate a list of problems that the subject(s) of the activity system deal with. • What groups/people successfully complete the activity? • When and where do problems usually occur? • What communications surround the situation or activity?
b) Understand the subject (motivations & interpretations and perceptions of contradictions)	• Generate list of motives and goals of each group involved in activity • What expectations are there? • Who sets those expectations? • Which expectations may change the dynamics of the activity? • What are the perceived contradictions associated with the activity and how are these seen to affect the

Step	Questions
	activity?
Analyse the Activity System a) Define the subject	• Who are the participants? • What are their roles? • What are their beliefs? • What is the expected outcome of the activity? • What criteria will be used to evaluate activity? • What are the implied rules or roles for each subject? • What struggles did the group overcome to reach its current state? • What are the goals/motives of the activity and how do they relate to the goals/motives of others and society? • What is the division of labour within the activity system? • What perceived rewards does the subject envisage if the goal is accomplished?
b) Define the relevant communities	To what extend does the subject's community impact on the subject-object interaction? What are the rules of interaction? What is the structure of social interactions? How do conflicts influence interactions? How do other communities view and value the goals of the activity?
c) Define the object	What is the expected outcome of the activity? How is the success of the outcome evaluated/known?
Analyse the activity structure a) Define the activity	• How is the practice(s) being done? • What practices do subjects participate in? • How has the practice(s) transformed over time? • Can this transformation be viewed in terms of historical phases? • Are there documented norms, rules and procedures? • What theoretical foundations/ways of thinking have dominated action? • What do subjects think about these foundations? • What are the goals/motives of the activity and how do they relate to other goals? • What are the contradictions from the viewpoint of subjects that drive the activity?
b) Describe activity into component actions and operations	• Observe, describe and analyse actions that are performed and by whom.
Analyse mediators a) Tool mediators and mediation	• What tools might be used in this activity? • How readily available are these tools to subjects? • What are the physical and cognitive tools used to perform different activities, in different settings and across activities? • How have tools changed over time? • What theories or methods guide activities? • How do subjects use these?
b) Rule mediators and mediation	• What formal or informal rules, laws or assumptions guide the activities? • How might these rules have evolved?

Step	Questions
c) Role mediators and mediation	Are they task-specific? • How widely understood are these rules? • Who has assumed various roles and how does this affect the group? • What forces a role to change?
Analyse the context a) Internal or subject driven contextual bounds b) External or community driven contextual bounds	• What are the beliefs, assumptions, models and methods that are held by the subject(s)? • How do subjects refer to their experiences in other groups? • What type of language do they use? • What tools do they find unhelpful? How willing are they to try new tools? • What is the structure of social interactions around an activity? • What actions are considered to be critical? • What type of limitations will be placed on the activity internally and externally? • How are the tasks organised among subjects? Is this dictated or emergent? • How are tasks shared? How – is division of labour flexible? • Is there a difference between formal rules and implied rules? • What formal, informal rules, laws and assumptions guide the activities that people engage in? To what degree are these explicitly stated?
Analyse Activity System Dynamics a) What are the interrelationships that exist within the components of the system? b) How formally established are these relationships? c) How have those interrelationships changed over time?	• How formal-informal are relationships described? • Are their contradictions or inconsistencies within the needs of this population and the goals of these learning activities? • How do the individuals perceive these goals? • How formally will relationships between members be determined? • What are the drivers of change? • What factors have driven the formation of relationships? • How lasting and permanent have these been? • What factors have kept relationships together or driven them apart?

What activity theory gives IWRM is an analytical tool that can help us:

a) Understand how activity systems are currently functioning by analysing the different components of an activity highlighting where contradictions and gaps lie.
b) A clear understanding of an activity as it is situated in a cultural-historical context.
c) Develop and simulate learning environments based on an understanding of learning as emerging from activity, where diverse stakeholder groups get to review their practice within a particular activity.

d) Ongoing monitoring and evaluation of practice by reflecting on how a change in practice influences the different components of the activity and whether this leads towards reaching the collectively agreed outcome of the activity.

The application of this theory will be explored in future work by AWARD in the Olifants River Basin.

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