Social learning within participatory, catchment-based water management processes in South Africa and Namibia

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Abstract

Over the past decade, South African and Namibian governments have initiated processes of water-sector reform via new legislation (RSA, 1998; GRN, 2004), designed to promote increased equity, efficiency and economic and environmental sustainability of water resources. These objectives correspond to those of the discourse of integrated water-resource management (Heyns, 2005; Woodhouse, 2008). Institutional reform is a key feature of the recent legislation. Participatory institutions are being formed, which are aligned to hydrological spatial units, such as water-user associations and basin management committees. These institutional spaces represent 'communities' of learning (Wenger, 1998; Johnson, 2007), and synergise with the concept of 'social learning' that links collective interaction and learning to concerted action in the collective and environmental interest (Roling & Wagemakers, 1998; Keen *et al.*, 2005; Pahl-Wostl *et al.*, 2007a; Ison *et al.*, 2007). Drawing on the 'constant comparison' principle of grounded theory (Glaser, 1992), the thesis explores this concept of social learning using two case studies: the South African Kat River Water User Association (KatRWUA) and the Namibian Kuiseb Basin Management Committee (KuisebBMC). A multi-method research approach was used to elicit qualitative information, with data-collection methods including semi-structured interviews, ethnographic observation and secondary data sources (Denzin & Lincoln, 2002). Subsequent data analysis revealed a mismatch between the nature and outcomes of social learning processes within the case studies and the ideals of socially and environmentally sustainable behaviour, which are desired by both the integrated water-resource management discourse and by the South African and Namibian national Water Acts. Social learning, as a process for achieving these goals of social equity and sustainable social behaviour, was prevented by the five Ps: power relations, politics, personality, precedence, and the past.

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List of contents

List of figures

List of tables

List of acronyms and abbreviations

ANC	African National Congress
AR	Action research
BMC	Basin management committee
CMS	Catchment management strategy
COMMOD	Companion modelling
DARG	Developing Areas Research Group
DEES	Directorate of Extension and Engineering
DRFN	Desert Research Foundation of Namibia
DRWS	Directorate of Rural Water Supply
DSA	Development Studies Association
DWA	Department of Water Affairs (Namibia)
DWAF	Department of Water Affairs and Forestry (South Africa)
ELAK	Environmental Learning and Action in the Kuiseb
ERC	Erongo Regional Council
FAO	Food and Agriculture Organisation
GT	Grounded Theory
GTRC	Gobabeb Training and Research Centre
GTZ	Gesellschaft für Technische Zusammenarbeit (German Federal Development Agency)
ICWE	International Conference of Water and the Environment
IDP	Iintegrated development plan
IWRM	Integrated Water Resource Management
KatRCF	Kat River Catchment Forum
KatRIB	Kat River Irrigation Board
KatRVP	Kat River Valley Project
KatRWUA	Kat River Water User Association
KRC	Khomas Regional Council
KuisebBMC	Kuiseb Basin Management Committee
MDGs	Millenium Development Goals
MET	Ministry of Environment and Tourism (Namibia)
NWRMA	National Water Resource Management Act (Namibia)
OLSBMC	Omaruru Lower-Swakop Basin Management Committee
PAR	Participatory action research
RU	Rhodes University
RUCRG	Rhodes University catchment research group
SANWA	South African National Water Act
SWAPO	South-West African Peoples Organisation
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
WAP	Water Allocation Plan
WBM	Walvis Bay Municipality
WMA	Water management area
WRC	Water Research Commission
WRM	Water resource management
WUA	Water user association

Chapter 1

Introduction

1.1) Introduction

This research focuses on processes of managed social learning within the context of decentralised water management. Managed social learning broadly encompasses multi-actor interaction, learning, decision making, action and reflection. Case studies of two decentralised and participatory water-management institutions from Southern Africa are used to explore social learning processes and outcomes, in order to inform relevant theory and understanding.

1.2) Background to water resources and water management in Southern Africa

Water plays an important role in a number of social, economic and ecological functions (Falkenmark & Rockstrom, 2004), with UNESCO (2003) citing poor water availability as a major constraint to poverty alleviation, public health, economic development and environmental improvement. Water resources in developing countries are widely considered to be in a critical state due to scarcity and depletion, with increasing populations likely to exacerbate these problems in future (Wescoat & White, 2003; Hranova, 2005; USAID, 2009). Southern Africa is classed as a water-scarce region where water is distributed highly unevenly over time and space, creating a complex hydrological regime of flooding followed by periods of drought (UNEP, 2002). In addition to physical water scarcity, the concept of 'social scarcity' is relevant to Southern Africa (Ohlsson, 2000), where recent political history has led to the control of and access to water resources by an elite white minority whilst simultaneously denying the black majority population adequate water for economically productive, sanitary livelihoods (Bohensky, 2008). South Africa and Namibia are therefore considered close to the 'water barrier' due to a combination of social and natural circumstances (Falkenmark *et al.*, 1990), with the 'water barrier' being a theoretical limit of 1 million cubic metres of water per 2000 people, after which a country experiences extreme water scarcity.

The 2006 World Water Report describes this "ongoing, serious and growing water crisis" as "increasingly about how we govern access to and control over water resources and their benefits" (UNESCO, 2006: 46). Producing improved approaches to water management is therefore an important issue within the society-environment nexus in southern Africa for several reasons. In particular, growing environmental awareness and the concept of sustainable development have transformed water-resource management ideals over recent years, with increased emphasis on the value of ecological systems and social equity. The concept of

integrated water-resource management (IWRM) is promoted as a holistic management approach that combines hydrological and ecological realities with social and economic needs (GWP, 2009), via a shift from centralised, single-sector and technical-based water management, towards integrated, multi-stakeholder and dialogue-based approaches. This global discourse has influenced recent national water policy and legislation in South Africa and Namibia, such that new structures and institutions for decentralised water management have been created in the wake of new Acts, in order to engender participatory water management (RSA, 1998; GRN, 2004a).

The concept of social learning has also gained increasing importance within discourses relating to natural resource management due to its potential for yielding improved collective decision making and concerted action outcomes in the social and environmental interest (Pahl-Wostl & Hare, 2004; SLIM, 2004a-f; Keen *et al.*, 2005). Building on participatory approaches, social learning in this sense broadly denotes collective learning, decision making, action and reflection towards sustainable natural-resource management (Ison & Watson, 2007). As such, it is a useful concept for investigating catchment-management processes (McDaniels & Gregory, 2004).

1.3) Research overview

The overarching aim of this research is to explain how social learning processes influence decision making and behavioural outcomes within the context of decentralised water-resource management, in order to enhance understanding of how processes of social interaction and cognitive learning intersect with collective action and behaviour change. This aim is highly relevant to contemporary debates on environmental management because social learning is increasingly advocated as an approach for achieving sustainable water-resource management (Pahl-Wostl, 2002a; Pahl-Wostl, 2002b; Keen *et al.*, 2005; Ison & Watson, 2007). However, to date, there has been little empirically grounded research into the role of social learning within participatory processes (Muro & Jeffrey, 2006). The dearth of empirical research is of particular relevance to developing-country contexts, where the theories underpinning both social learning and participatory processes have strongly influenced national policies and legislation pertaining to the management of water resources. It is therefore important that critical research evaluates the utility of such approaches when applied to practical contexts. Accordingly, this research investigates how social learning plays out in practice within two water-management institutions: the Kat River Water User Association (KatRWUA) of the Eastern Cape, South Africa; and the Kuiseb Basin Management Committee (KuisebBMC) of the central Namibian Erongo region. Figure 1.1 locates the hydrological catchments under their respective jurisdictions within the Southern African region.

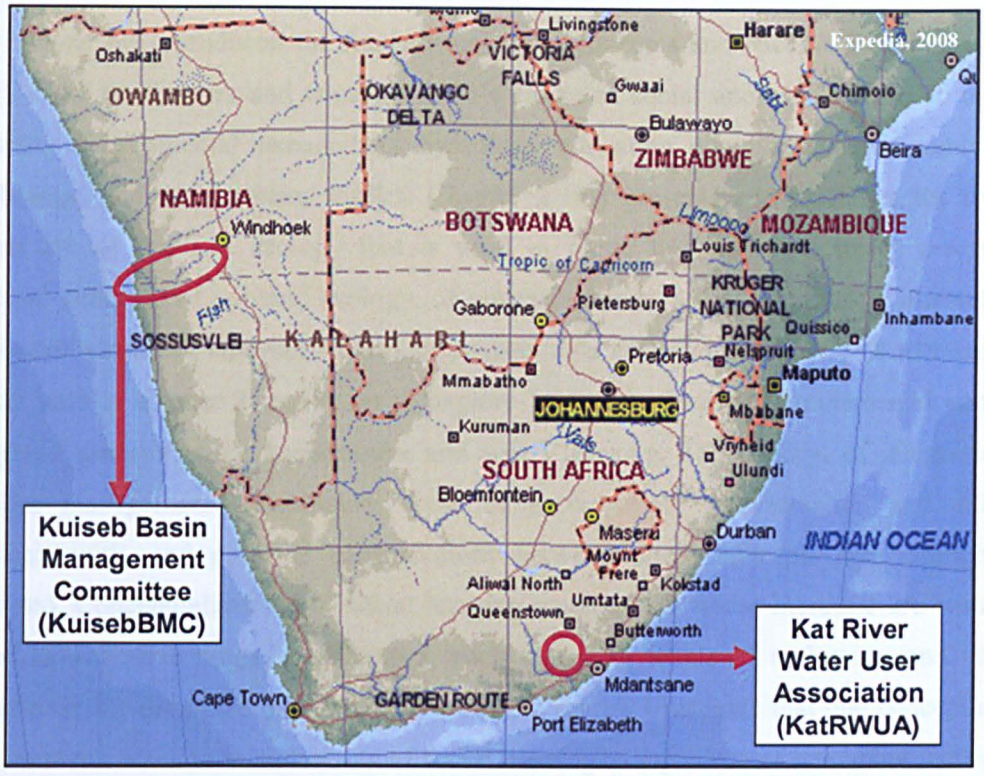

Figure 1.1. Location of the case-study catchments within Southern Africa

A qualitative research methodology addresses the broad research aim through four objectives:

1. To explore social learning processes in the context of participatory and decentralised water-resource management;
2. To investigate the factors that support, and those that hinder, social learning processes in the case-study contexts;
3. To evaluate social learning as a framework for achieving 'optimal' water-resource management;
4. To compare the findings from this study with those from the wider body of literature on social learning.

It is anticipated that the research will contribute towards a growing body of 'lessons learned' by practitioners involved in participatory processes. These outcomes are anticipated to be of value to policy-makers, water-management practitioners and the wider academic community; in particular, for assessing the value and applicability of social learning approaches to the context of water-resource management.

1.4) Outline of the thesis structure

This chapter has introduced the fundamental aims, concepts and background of this research, which draw on theories and concepts from a range of social and natural science disciplines including environmental management, hydrology, education, sociology, public administration, psychology, and development studies. Chapter 2 first presents and discusses the theoretical perspective of political ecology that is used to frame this interdisciplinary research. The principal concerns of political ecology, of power relations, social-biophysical interaction, and multi-scale structural analysis, inform subsequent data collection and analysis techniques. The second half of chapter 2 moves on to explore in further detail the fundamental concepts of integrated water-resource management and social learning. The concept of integrated water-resource management encompasses those of participation, representation and integration. Problems with, and potential contradictions between, these concepts are highlighted and discussed. Conceptualisations of social learning amongst the wider literature are variable and linked to a diverse range of outcomes, such that high levels of ambiguity and vagueness characterise the discourse. However, the literature review illustrates that one conceptualisation is of most relevance to this research: of social learning as a process of interaction between, and learning by, diverse stakeholders within a defined 'community', which produces social, relational and technical outcomes. The literature review also generates further questions, as well as a set of assumptions, which form the backbone of this research.

Chapter 3 describes the research process and the qualitative methodological approach of this study. Brief overviews of the case-study institutions and catchments are presented, in order to justify the comparative approach of this research. Both similarities and differences between the social and physical characteristics of the case studies are used to isolate and identify the salient explanatory factors of social learning (Batterbury *et al.*, 2002). Several conventional qualitative methods improve the validity of data interpretation according to the principle of triangulation. The advantages and limitations to these methods of ethnographic observation, interviews, questionnaires, focus groups and secondary data are discussed, after which the analytical process of data coding is detailed. In the final chapter section, issues of researcher positionality and reflexivity are addressed. The discussion on positionality raises the issue of power relations, which is a recurrent theme subsequently within the thesis.

Chapter 4 places the water-management processes of the case-study areas in their wider social and physical contexts, as called for by the political ecology framework of the research. The unique socio-political histories of South Africa and Namibia, including colonialism and Apartheid, and their influence on aspects of contemporary South African and Namibian society are considered, including income, wealth distribution, education, service provision and access to natural resources. Cultural factors, such as language, norms and social hierarchy, are also

introduced and discussed in relation to social learning. A comparison of the recent South African and Namibian Water Acts then leads on to a discussion of the reformed institutional frameworks for water-management and the roles and responsibilities envisaged for post-reform water-management agencies. Such information is necessary for the comprehension of subsequent analyses and explanations of the case-study social learning processes and outcomes.

Chapter 5 moves on to reconstruct the historical development of the case-study institutions to allow an analysis of the social learning processes in terms of their stakeholders and the relations between stakeholders and other social actors within the catchments and the water-management process, as advocated by Craps & Maurel (2003). The nature of water-related conflict and issues in the Kat and Kuiseb River catchments, and the roles and activities of the respective institutions are also discussed and compared. The second half of the chapter discusses and compares the implementation of, and involvement in, the social learning processes, including stakeholder identification, stakeholder issues, stakeholder inter-relations, and the role of state water-management agencies. Despite similarities in the legislative background and the top-down imposition of water-management structures and roles, contrasts between the case studies are caused by differences in institutional reform and implementation at the practical level. The themes of self-interest, economic motivation and power relations start to emerge in this chapter.

In chapters 6 and 7, the processes that make up social learning within the case-study institutions are analysed in more detail. Factors affecting information exchange, knowledge construction, interaction, learning, decision making and action are presented and discussed. In line with the central findings of chapter 2, analytical focus is placed upon: the types of information that are used within group processes, how knowledge is constructed by the group, the nature of decision making, stakeholders interaction, and the outcomes of the institutional processes. Chapter 7 concludes with an overall analysis of how the action and outcomes of the KatRWUA and KuisebBMC compare with the goals of integrated water-resource management and the theoretical assumptions of social learning. In chapter 8, the final analysis sections move on to explore the reasons for observed differences between reality, contextual ideals and theory. In this way, the hindering factors to the case-study social learning processes are revealed.

Finally, chapter 9 integrates the analysis of antecedent chapters to produce an overall evaluation of social learning as a theoretical framework and water-management approach. The central themes that emerged from previous analysis, including power, scale, and context, dominate this discussion. The chapter then focuses on the broader methodological and theoretical implications of the research findings. In particular, the wider applicability of globally envisaged ideals and objectives, and the implications of amalgamating interdisciplinary theories, are considered. The thesis ends with a summary of the research findings and a consideration of future research areas.

Chapter 2

Positioning Social Learning: The Theoretical and Academic Context

2.1) Introduction

In this chapter, I introduce and discuss the theoretical literature that is of relevance to the focus of this research: social learning within the context of water-resource management. At the outset of the chapter, the complex and multifarious nature of water, and its links to ecology and society are highlighted. "Interdisciplinary subjects", such as water management, under study in "real world contexts" require an interdisciplinary theoretical perspective (Tait & Lyall, 2007: 1). I therefore move on to demonstrate how the theoretical framework of political ecology provides an appropriate analytical perspective for the purposes of this research. The core concerns of political ecology theory are distilled from an extensive body of literature.

Whilst social learning is the central focus of this research, the context of natural resource management – to which social learning approaches are increasingly being applied – is also significant. Section 2.4 introduces the specific changes within the field of water-resource management. Dominated historically by technical disciplines and powerful water-users (Pearce, 2006), integrated and multi-stakeholder approaches are widely becoming the new natural resource management orthodoxy (Bell, 1991; Hulme & Woodhouse, 2000; Carpenter *et al.*, 2001; Pahl-Wostl, 2002a). Many participatory approaches are premised on a concept of 'social learning'. However, understandings and concepts of social learning are multiple and variable. I therefore review the literature outlining the history, development and composition of the various concepts of social learning in section 2.5. According to this review, 'social learning' within the context of environmental management broadly denotes a managed process of collective learning and interaction that leads to concerted action for the realisation of social and environmental sustainability, as discussed further in section 2.6.

The adoption by policy and legislation of the concept of integrated water-resource management has created new 'spaces' and 'communities' of social learning, via its decentralising and participatory ethos. However, through a critical analysis of the literature, I illustrate that the application of social learning to water management incorporates a series of theoretical assumptions and potential contradictions. Of central importance to the concept of managed social learning is the assumption that learning within a group setting leads to collective behaviour change. However, little research exists to support this presupposition vis-à-vis the increasing promotion of the approach, especially in relation to developing countries. This research therefore aims to provide further insight into the process by which collective learning leads to concerted action and behaviour change, through an analysis of two empirical case

studies of multi-stakeholder social learning processes in the South African and Namibian contexts of water management.

2.2) Conceptualising water: multifaceted, multi-purpose and multi-scale

Put simply, water is a naturally occurring chemical substance that is essential to all life on Earth (Falkenmark & Rockstrom, 2004). Yet beyond this physical definition, water is highly complex owing to its multi-functionality and polyvalent nature. Gonzalez-Villareal & Solanes (1999: 14) emphasise that, "water is not an ordinary resource; the peculiar characteristics of water resources stem from its polyvalent environmental, economic and social roles". The FAO (2000) summarises the 'natural' aspect of water, which encompasses a plethora of physical, chemical and biological functions and services. Aquatic flora and fauna require a variable quantity and quality of flow in order to provide these services. Human life has traditionally been viewed as an 'external' disrupting factor to this natural system (Priscoli *et al.*, 2004). Increasingly however, social and natural systems have been re-conceptualised as a single holistic system, with aquatic ecosystems as providers of 'goods and services' to society (Freyfogle and Newton, 2002; Falkenmark & Folke, 2002; Wescoat & White, 2003; Dyson *et al.*, 2004). This inter-connectivity between 'natural' and 'social' aspects of water (see figure 2.1), necessitates an interdisciplinary research perspective.

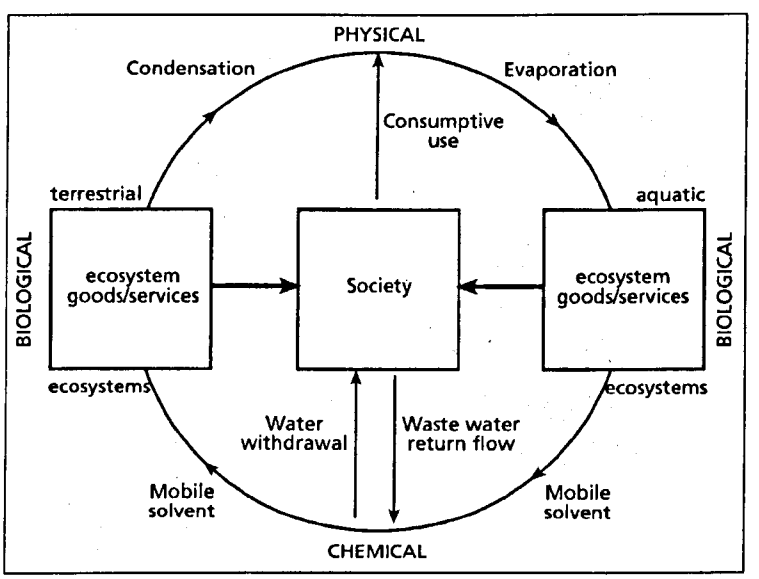

Figure 2.1. Representation of water resources (Source: Falkenmark & Rockstrom, 2004: 5)

As depicted above, the human use of, and impact upon, water resources create a social aspect that generates a further subset of complexities through its incorporation with cultural, economic and political factors (Serageldin, 1995; Allan & Karshenas, 1996; McLaren, 1996; Camerer, 1997; Cleaver, 1998; Wach & Reeves, 2000; Kuria, 2005). Most economic activity is underlain by water-use (Haddadin, 2001) such that water availability and use are considered influential in

determining the economic success of a country (Salal, in Mitchell, 1990). Water is also linked to poverty (Sullivan *et al.*, 2003; DFID, 2004), with inadequate access to clean water diverting economic resources into healthcare rather than economic and education activities (Khan, 1997). Recognition of these linkages resulted in the concept of 'basic needs', which defines an amount of water sufficient for survival and personal hygiene to sustain good health (Gleick, 1999; Thompson & Cairncross, 2002). This concept of basic water needs has since been redefined as a 'human right', which in turn has been enshrined in global ideals such as the millennium development goals (MDGs), despite a lack of clarity regarding who should and/or can ensure that such 'rights' are enacted in practice (Gleick, 2006; WHO, 2003; Makdisi, 2007).

Of further relevance to the context of this thesis are the binary conceptualisations of water as scarce versus water as being of infinite supply. Since the beginning of the post-World War II era of science and technology, water has largely been managed according to the general 'conquerist' attitude towards nature, in which people have the ability and right to subjugate nature (e.g. Merchant, 1994; Cronon, 1996). Under what Reisner (1993) terms the 'hydraulic mission', it was assumed that physical barriers could be overcome by technological and engineering-based solutions: water was infinite in supply. However, the practical failure and detrimental ecological impact of several such technical 'solutions' to water-supply problems caused a reassessment of the perceived validity of engineering-based water-management approaches, and of the doctrine of logical positivism that implicitly underpins many of these solutions (Savenije, 1996; Massey 1999; Brooks, 2002; Brown, 2004).

In addition, physical water limits were reconceptualised as being compounded by social factors leading to the concept of 'social' or 'second-order' scarcity, a relative phenomenon arising from the unequal distribution of a resource due to a concentration of power by a minority of the population; with the implication that scarcity is *variably* experienced by different social actors (e.g. Ohlsson, 2000). This latter type of scarcity applies to the Southern African context, where water resources have historically been controlled by minority ethnic groups (see chapter 4). Another relevant concept is that of 'hydropolitics' (e.g. Allan, 2001; Turton & Henwood, 2002), in which the use and status of water resources are strongly influenced by national political machinations and global geopolitics. Hence, for the purposes of this research, water is conceived as multi-faceted; both within its social and biophysical dimensions, but also interconnected across them. Furthermore, within the social domain, human understanding and experience of water resources are recognised as being pluralistic and variable amongst individuals. Research into a social process surrounding water management consequently necessitates a theoretical perspective that is ontologically interdisciplinary and constructivist, and is epistemologically flexible, wide-ranging and critical.

2.3) Framing the research: the political ecology 'gaze'

Political ecology is thought to provide an appropriate theoretical lens for this research. The theoretical perspective of political ecology is grounded in a critical realist ontology (Zimmerer & Bassett, 2003; Neumann, 2005), which allows for political ecology's concerns of "ecology and a broadly defined political economy" within a perspective of nature-society relations that "encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself" (Blaikie & Brookfield, 1987: 17). Forsyth (2003: 2) similarly asserts that political ecology refers to "the social and political conditions surrounding the causes, experiences, and management of environmental problems", which thereby renders political ecology research highly relevant to this research into water-management. Nonetheless, definitions of political ecology are broad-ranging and loosely defined. Thus, within this section, I initially present the epistemological and ontological perspectives associated with the theoretical approach, before drawing on the relevant literature to illustrate how this framework is appropriate to this research.

Critical realism is considered to be a 'moderate constructionist' philosophy that encompasses an anti-naturalist ontology, which essentially views social systems as different from physical systems (Milton 1996: 51). Whilst critical realism acknowledges the existence of a physical reality, it simultaneously rejects the observable cause-effect relationship of logical positivism as being applicable to social systems, wherein the non-realisation of a posited mechanism does not mean that the mechanism does not exist, rather that it is unactivated, unobservable, or counteracted by other influential mechanisms (Bhaskar, 1975). Drawing on a humanist perspective, social systems under critical realism are considered to be more complex than physical systems due to the human faculty of consciousness. Consciousness, including belief, rationality, intent and desire, means that the social domain is variably constructed, and experienced, by different actors (Philips, 1987). Yet of significance to the political ecology concept is that this ontological differentiation does not preclude the interaction of social and biophysical domains (Bhaskar, 1975). The semi-constructivist perspective means that human awareness and understanding of the real biophysical world can, however, only ever be limited and socially constructed (Wad, 2001). Critical realism further recognises that social actors are capable of being aware of the social structures that they inhabit and can therefore change their behaviour upon reflection of them, or their *perception* of them; a reflexive ability that gives rise to a multitude of potential social and biophysical outcomes (Sayer, 2000). The interaction of a constructed social realm with a real biophysical domain underlies the theoretical perspective of political ecology. The recognition of complexity and interconnection engendered by this ontological position means that political ecology research permits a wide range of thematic foci (see table 2.1). For this reason, Paulson & Gezon (2005) propose that political ecology

constitutes a 'tool kit' of concepts, including scale, power, knowledge, nature-society relations and social inequity.

Table 2.1. The key theoretical elements of political ecology

Ontology	Thematic description	Examples
Integrated social and biophysical systems, which interact on a dynamic two-way basis across a variety of scales	The impact of the political economy on environmental change, with a focus on structure	Hecht & Cockburn, 1985; Peet & Watts, 1996; Stott & Sullivan, 2000; Walker, 2005
	The impact of environmental change on people, in particular on economically-marginalised actors	Ives & Messerli, 1989; Ferguson & Derman, 2000
The complex behaviour of socio-ecological systems	The rejection of single-factor, in favour of 'multi-layered analyses', of human behaviour and biophysical change	Blaikie & Brookfield, 1987; Watts, 2000; Bryant & Bailey, 1997
The subjective nature of social and society-nature relations and power relations	Knowledge about, and values regarding, the biophysical environment are socially constructed so they require critical examination from different perspectives, in order to prevent the dominance of powerful narratives and perspectives	Stott & Sullivan, 2000; Thomas & Twyman, 2004; Batterbury, 2001

From a political ecology perspective, the biophysical environment "is not a malleable thing outside of human beings, or a tablet on which to write history, but instead a set of relationships that include people, who, more radically, are themselves produced" (Robbins, 2004: 209). That the natural world is not seen as a separate entity from anthropic systems, but as mutually-influential via a web of relationships, is a perspective that parallels other theoretical approaches from both social and ecological sciences, including actor network theory (Callon, 1991; Latour, 2005), complex systems (Holland, 1992; Bar-Yam, 1997), panarchy (Gunderson & Holling, 2002) coupled human and natural sciences (Lui *et al.*, 2007), and non-equilibrium ecology (Sullivan, 1996; Kreuger & Gibbs, 2007). Political ecology is therefore conceived as one approach, amongst others, which encompasses a new understanding of society-environment relations and rejects previous scientific assumptions of biophysical equilibrium and linearity (Neumann, 2005). In particular, these understandings contrast with antecedent discourses of cultural ecology and environmental determinism (e.g. Steward, 1955; Rappaport, 1967), which predominantly focussed on mono-causal explanations and one-way relationships between people and the biophysical environment, or *vice versa*.

Robbins' assertion above that intra-social, and society-environment, relations are socially produced highlights the constructivist stance of political ecology. For example, in Peet & Watts' (1996) 'environmental imaginary', 'nature' is subjectively constructed by individuals or societies according to political and economic circumstances, which in turn results in the contested realities, histories and beliefs that political ecology research has revealed (e.g. Ives & Messerli, 1989; Fairhead & Leach, 1996). Similarly, Bryant (2001: 162) posits that "ideas about ecology and political economy *actively shape* human perceptions and uses of nature". Using this

rationale, Escobar (1995) strongly critiques the concept of 'sustainable development' as constituting an agenda on the part of developed nations to maintain the global economic and social status quo. Political ecologists are therefore concerned with the process of knowledge construction, e.g. *how*, and by *whom*, the biophysical realm is constructed, and how social processes (e.g. power relations) intersect with such constructions to manifest as 'truths' about biophysical change upon which decisions regarding natural resources are made. This concern is of direct relevance to this research, which investigates a water-management approach with origins in a global discourse of environment and development, yet whose enactment is proposed for smaller-scale management entities. The discourse of environment and development is deconstructed later, in order to illustrate its rationale, and the implications for social learning in the context of water-resource management (section 2.4).

As critical realism occupies a space lying between two historically exclusive ontologies, political ecology research encompasses a range of analytical and methodological perspectives (see Bryant & Bailey, 1997; Zimmerer & Bassett, 2003; Robbins, 2004). Thus, while some political ecologists place a stronger emphasis on the explanation of biophysical change by broader structural processes (e.g. Hecht & Cockburn, 1989; Blaikie & Brookfield, 1987), others focus on the agency of environmental 'actors' (e.g. Carney & Watts, 1990; Braun & Castree, 1998; Rocheleau, 1999; Walker, 2005). Although Vayda & Walters (1999) imply that the prioritisation of political factors means that most political ecology research predetermines its outcomes (Robbins, 2004), a grounded theory methodology (see chapter 3) is used to negate the potential pre-determination of findings within this study. Above all, political ecology can be conceived as an intersection of theories and concepts that relate to human-biophysical interaction, which does not preclude either structure or agency for the explanation of observed outcomes *a priori*. This flexibility renders political ecology highly appropriate as a theoretical framework for this research because it allows for methodological and theoretical iteration as the researcher's understanding evolves over the duration of the research. The flexibility afforded by political ecology was drawn upon for this research, as illustrated in section 3.3.

Overall, despite the absence of a rigorously defined theoretical framework, a broadly defined political ecology discourse is concerned with two key relationships that are of high relevance to this research: between humans and the biophysical environment, and between individuals and social groups within society. These central concerns generate a set of central questions that are returned to throughout this thesis:

1. What is the power dynamic between local, regional, national and international actors and levels of organisation?
2. How do different actors control and influence natural-resource management?

3. How does the biophysical domain relate to social processes (i.e. interaction, management)?

The following two sections illustrate why and how these central questions are relevant to the concept of social learning in the context of water-resource management. In particular, research by political ecologists has contributed to increased conceptual awareness of a holistic, inter-related system, which is reflected in the recent shifts in environmental management discourse and practice, towards integrated water-resource management.

2.4) Managing water: Integrated water-resource management policy and practice

The growing understanding of nature-society interconnection and complexity, as revealed by political ecology research, spawned a series of international conferences on the *combined* theme of 'environment and development', such as the International Conference of Water and the Environment (ICWE) in Dublin 1992 and the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro 1992, with the purpose of reconciling visions of environmental concern and viability with economic and social progress for more equitable and sustainable decision making. The resultant concept of 'sustainable development' implies the coordinated development and management of natural resources, in order to optimise the economic and social benefits they provide whilst simultaneously ensuring natural ecosystem functionality for future generations (WCED, 1987). The three basic tenets of sustainable resource use under this concept are considered to be efficiency of use, equity of access, and prolonged ecological integrity (Postel, 1992), such that *optimal* decision making is conceptualised as a balance between economic, social and environmental considerations. This concept is widely referred to as the 'triple-bottom line' (e.g. Hirsch, 2006; UNESCO, 2009), and is represented diagrammatically in figure 2.2.

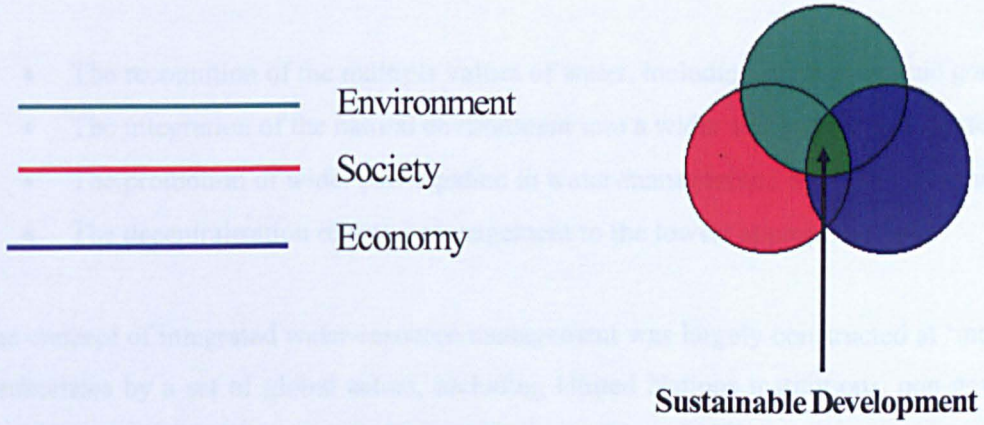

Figure 2.2. Diagrammatic representations of sustainable decision making

The concept of sustainable development is not critiqued in detail here, except to acknowledge that there is ongoing debate about, and increasing criticism of, its relevance, validity and meaning, particularly when applied to countries struggling to meet the economic and social needs of current populations (e.g. Escobar, 1995; Dobson, 1999; Fernando, 2003; Hove, 2004; Biswas, 2004). Nonetheless, this vision of sustainable development has come to be synonymous with a goal of 'optimal' natural-resource management (Goodbody & Thomas-Hope, 2002; Keen *et al.*, 2005; Hirsh, 2006), and is directly reflected in the concept of integrated water-resource management, as illustrated later in this section.

Increasing concern over diminishing water resources, due to over-abstraction and degradation of available freshwater supplies, resulted in the vision of sustainable development being applied to the field of water management. In line with the plethora of conceptions of water outlined in section 2.2, it was increasingly recognized that physical limits to water could not be overcome indefinitely, nor by technical fixes alone (Falkenmark, 1989; Reisner, 1993; Turton & Ohlsson, 1999; Pahl-Wostl, 2002c; Pearce, 2006). The acknowledgment of water complexity and interconnectedness across different sectors and scales necessitated a holistic, multi-dimensional management perspective, in order to balance an uncertain and non-linear hydrological and ecological reality with variable social and economic needs (Falkenmark & Folke, 2002; Figueres *et al.*, 2003). The concept of integrated water-resource management therefore invokes the notion of sustainable development and the triple bottom line for water-related decision making (Mitchell, 1990; GWP, 2000; Lenton & Muller, 2009).

The conceptual vision of integrated water-resource management was enshrined in Local Agenda 21 (an output of the Rio 1992 conference) and in the set of 'best practice' water-management principles drawn up at the ICWE in Dublin in 1992. These principles are commonly referred to as 'the Dublin principles', and include (ICWE, 1992):

- The recognition of the multiple values of water, including as an economic good;
- The integration of the natural environment into a wider socio-ecological system;
- The promotion of wider participation in water-management, notably by women;
- The decentralisation of water management to the lowest appropriate level

The concept of integrated water-resource management was largely constructed at 'international' conferences by a set of global actors, including United Nations institutions, non-governmental development organisations, academic institutions, and largely Western governments. Their 'buy in' to the concept of integrated water-resource management drove a global process of water reform, designed to enact such principles (van Koppen, 2003; Swatuk, 2005a). Consequently, the past two decades of water management have seen a global shift from technically dominated,

centralised management strategies towards decentralised, participatory approaches that place increased emphasis on the human dimension of water management rather than a techno-engineering approach (e.g. Evans, 2004; Warner, 2005; Savenije & van der Zaag, 2008). The integrated water-resource management approach is rooted in the concepts of participation, decentralisation and integration, which also intersect with the process of social learning that is the focus of this research. These concepts are explored in further depth in the following sections, in which particular attention is paid to their underlying assumptions, as they are likely to affect how related processes of social learning play out in practice. Based on the central concerns of the political ecology theoretical framework, a set of questions relevant to the integrated water-resource management discourse are highlighted at the end of each section, which are subsequently used to guide data collection and analysis (see chapter 3).

2.4.1) Participation and social justice

A distinct concept of social justice concerned with the impact of inequality caused by disparities in wealth and/or influence arose following the post-World War II economic boom (Clayton & Williams, 2003; McMillan & Buhle, 2003; Smith, 2005). The resultant public concern with social justice and human rights broadened government objectives to include social justice goals, as well as strengthening civil society's ability to pressure for their realisation (Scholte, 2004). Under the philosophy of environmental ethics, this social justice ethos is extended to inequalities in control over, and access to, natural resources (Light & Rolston, 2003; Blackmore, in press), thereby matching a central thematic concern of political ecology (section 2.3). Increased participation in decision making by civil society and previously marginalised actors was consequently promoted as a solution for the improvement of social justice (e.g. Chambers, 1997; Nelson & Wright, 1995; Manor, 1999; Raik *et al.*, 2008).

Participatory approaches involving public and multi-stakeholder participation in formal decision making processes are widely portrayed as a solution for overcoming power asymmetries in natural resource control (e.g. Nelson & Wright, 1995; Beierle, 1999; van Koppen, 2003; Irvin & Stansbury, 2004). Implicit in this approach is the belief that a process of collective participation empowers previously marginalised social actors, and/or fosters altruistic concern for them on the part of historically powerful actors, which in turn leads to policy, decisions and outcomes that favour wider civil society over specific interest groups (Manor, 1999; Thomas, 1995). Further justification for participatory approaches includes their potential to: generate more context-appropriate and publicly acceptable governance outcomes because the public have played a role in designing them (e.g. King *et al.*, 1998; Putnam, 1995; Petheram, 2000; Hoddinott *et al.*, 2001); and to improve the success and sustainability of natural resource management through the fostering of resource ownership (Ostrom, 1990; Narayan, 1995;

Baland & Platteau, 1996; Hinchcliff *et al.*, 1999). Multi-stakeholder and/or civil-society participation in decentralised management is also considered to increase the accountability and transparency of decision-makers (Agarwal & Ribot, 1999; Larson, 2002; Jaspers, 2003) and, as a consequence, to increase the social equity of natural-resource access and allocation (Manor, 1999; Ribot, 2002). However, the latter process overlooks the issues of corruption and nepotism that are frequently associated with the management of natural resources, especially, but not exclusively, in the African context (e.g. Lewis & Lenton, 2008). A final reason for the proliferation of participatory approaches is grounded in the education perspective, in which informed and involved citizens are more likely to enact behaviour that is positive in relation to the group and the natural environment if they understand the need for change as well as the needs of others. Such understanding is gained through participation and interaction (Freire, 1972; Chambers & Jiggins, 1987; Milbrath, 1989; Gaventa, 1999; Johnson, 2007). This latter justification for public participation has strong parallels with the concept of managed social learning that is discussed later in section 2.5.3.

For these reasons, community participation is viewed as the new development orthodoxy by Page (2003), and is widely seen as a panacea for improved natural-resource management (e.g. Nurullokhoja, 2005; Meinzen-Dick, 2007; Harrington *et al.*, 2008). However, the use of participatory approaches as a means of fostering social justice and empowerment is increasingly challenged by practical experience highlighting limitations to the approach, such as elite capture, power relations and 'voluntary' participation that is limited to those with strong vested interests (Cooke & Kothari, 2001). In particular, Cash *et al.* (2006) observe that power relations between state agencies and local-users can disempower local resource-users through their ability to mobilize information and resources to reinforce their authority and worldviews. Such critiques raise important questions for this research into social learning, which is premised on multi-stakeholder participation, including:

- Which resource-users participate in the participatory learning process, and why?
- How do participants interact?
- Do state agencies participate? How and why?
- What is the history of relations between participants?
- How does the manner of interaction influence the learning outcomes and action that arise from the process?

2.4.2) Decentralisation and the hydrological catchment

The Dublin principles propose that water be managed at the 'lowest appropriate level' (section 2.4), making the decentralisation of water management an increasingly popular environmental

policy approach (Manor, 1999). The principle of decentralisation is underlined by both social and eco-hydrological objectives. From a social perspective, decentralisation is held to facilitate the logistical aspect of participation (Brannstrom *et al.*, 2004), which is purported to engender improved management of natural resources (previous section). Yet, the critical realist perspective of a 'real' biophysical domain means that integrated water-resource management is also strongly influenced by hydrological understandings of the water cycle as a reality. Of relevance to water management, is that this hydrological model encompasses distinct units of interconnection; the lowest of which are catchments or river basins[1]. According to physical principles, hydrological interconnection between water-users within catchments means that they form a logical unit of management (Jaspers, 2003; Savenije & van der Zaag, 2008). However, other actors' understandings and perspectives may not synergise with this *scientific* perspective (e.g. Borowski & Hare, 2007; Borowski *et al.*, 2008). These observations generate further relevant questions that are addressed in later analysis chapters, including:

- What is the history of the catchment in terms of management boundaries?
- How do administrative and other 'socially-constructed' boundaries intersect with the hydrological catchment?
- What is the nature of the hydrological system within the catchment (e.g. surface or groundwater)?
- To what extent do social actors identify with the hydrological catchment boundary?

The vagueness of the 'lowest appropriate level' of the Dublin principles inherently invokes a process of subjective interpretation for its practical implementation. The notion of decentralisation is also problematic, as it has different connotations within the literature. For instance, Aghion & Tirole (1997) propose a differentiation depending on whether formal (*de jure*) or actual (*de facto*) authority is involved, where formal authority is the right to decide and real authority is the effective control over decisions. Based on their distinction, it is appropriate to distinguish between the decentralisation of tasks from central to lower levels of governance (e.g. Crook and Manor, 1998; Ribot, 2002), a process involving the geographical deconcentration of central authority, versus the devolution of decision making power and control over process outcomes, whereby decision making authority is transferred to actors/institutions that are *beyond* direct central government control (e.g. Edmunds & Wollenberg, 2003; Meinzen-Dick *et al.*, 2008). This distinction is important in the context of integrated water-resource management because within the development literature, the goal of social justice-oriented participatory approaches involves the redistribution of decision making

[1] The term 'catchment' is more commonly used in the South African literature whilst 'river basin' is more widely used in Namibia. The terms are therefore used interchangeably within this thesis but both denote the area within which any precipitation falling on the ground will drain to a common lowest point.

power amongst stakeholders in a devolution process. The scientific literature conversely denotes decentralisation in the geographical sense, involving a realignment of the locus of decision making to that of lowest-level and dominant hydrological interaction, chiefly in order to prevent or resolve environmental 'problems'. Ultimately therefore, decentralisation can, *but does not necessarily*, lead to wider stakeholder participation and decision making. Chapter 5 therefore addresses the following questions in relation to the case studies:

- Which issues have the case-study institutions addressed or are addressing now?
- How do such issues relate to the wider catchment and its stakeholders?
- What tasks are being carried out by the case-study institutions to address these issues?
- Which stakeholders historically addressed such issues and/or completed such tasks?
- Which stakeholders participate or not in the case-study institutions?

2.4.3) Water as a 'common good': integrated management

The concept of integration has several dimensions (van Hofwegen & Jaspers, 1999; Falkenmark & Rockstrom, 2004). Fundamentally, the integrated water-resource management framework is grounded in a holistic worldview of inter-connected social and ecological systems, which is reflected in its normative recognition of both human and ecological water rights. This stance is considered necessary for achieving the balance between ecological and socio-economic water needs (Rockstrom *et al.,* 1999; Falkenmark & Folke, 2002). Secondly, integrated water-resource management proposes integration across anthropic water-use sectors because the nature of a finite, collective resource means that decisions by one user-group impact on the quantity and quality of the resource for others (Solanes & Gonzalez-Villareal, 1999). As such, institutions or platforms comprised of multi-sector stakeholders are considered necessary for the optimal management of communal resources (Ostrom, 1990; Knox *et al.*, 1998). In particular, the integrated water-resource management framework emphasises the integration of land and water systems, as it recognises that land use is a key factor governing biophysical system outcomes via impacts on eco-hydrological processes, such as soil erosion and water quality (GWP, 2000).

Integrated water-resource management also encompasses integration across spatial and temporal scales of water-management, thereby acknowledging that the catchment scale is impacted on by smaller (e.g. community) and larger (e.g. international) scales of management, which are often associated with different spatial and temporal concerns (Gibson *et al.*, 2000; Young, 2003; Cash *et al.*, 2006; Savenije & van der Zaag, 2008). For this reason both vertical and horizontal management integration is promoted by integrated water-resource management (Mitchell, 1990; Lenton & Muller, 2009). Yet, through its normative goal of sustainable development, which includes maintaining and/or restoring the health and functioning of water resources for future

generations, the integrated water-resource management discourse inherently assigns importance to a longer-term management vision that is usually associated with higher-level management. This aspect of the integrated water-resource management discourse, and environment and development more generally, forms a major basis of critiques of sustainable development in terms of its applicability to developing countries, which already struggle to meet the needs of current populations (e.g. Dodds, 1997; Escobar, 1996; 1998; Jacobs, 1999).

The preceding sections have demonstrated that the integrated water-resource management discourse encompasses several concepts that are semantically ambiguous. As such, policy, legislation and guidelines that have arisen from this discourse are open to inadvertent variable interpretation by different social actors. From a political perspective, it may even be politically expedient to exploit or include ambiguity, in order to ensure broad-based, and therefore increased, voter support. Based on this critical review of the integrated water-resource management discourse, a further set of questions are applicable to the analysis of social learning in the context of water management:

- How do social actors perceive social and environmental rights to water?
- How do the activities of the case-study institutions recognise social and environmental rights to water?
- Are all the relevant stakeholders represented on the case-study institutions? How, and by whom, were stakeholders determined as relevant?
- Are a variety of management levels represented on the case-study institutions?
- Do agendas and concerns of the different actors differ? If so, how and why?
- Do social actors in the catchments recognise an inter-connection between the society, economy and environment?

These questions synergise with the theoretical perspective of political ecology (section 2.3), further justifying its use as a theoretical basis for this research, which aims to investigate social learning in the context of water-resource management (chapter 1). These questions are addressed in relation to the dataset over the course of chapters 5-8.

2.5) Social learning: interacting, learning and acting

Social learning is a concept that has gained increasing importance within the discourse of environment, development and natural-resource management, in order to realise the goals of integrated water-resource management and sustainable economic development (e.g. Pahl-Wostl & Hare, 2004; Fazey *et al.*, 2006; Ison *et al.*, 2007; Folke *et al.* 2002; Mostert *et al,* 2007). Social learning is therefore of interest and relevance to me for two reasons: my interdisciplinary

background in physical and social science, which assists with an appreciation of the multiple perspectives and dimensions of water; and because I desire personally to see the fulfilment of social justice and environmental protection. However, conceptually, social learning remains wide-ranging because the term has been used by different disciplines in variable ways. In the following section, I therefore discuss the evolution of the social learning concept, during which three different concepts of social learning are explained. I also explore links between social learning and other concepts within the environment and development discourse, and highlight the theories that underpin the various conceptualisations, after which I present and explain the conceptual framework of this research.

2.5.1) Social learning and the individual

The term 'social learning' originated in psychology, in reference to individual learning within social contexts based on the modelling and mimicking of others' behaviour (Bandura, 1977a). Bandura's theory incorporated a cognitive[2] element into learning theory by demonstrating that individual behaviour is influenced by expectations of reward or punishment for mimicking an observed behaviour. Bandura (1977b) also proposes that self-efficacy[3] plays a significant role in explaining behavioural change because, as Milbrath (1989) later points out, people need to think that change is possible and that they can influence its direction. The cognitive aspect of Bandura's learning theory was built on by Kolb's (1984) experiential learning cycle, which entails four essential processes of learning: concrete experience, reflective observation, abstract conceptualisation and active experimentation. An important distinction is that, whilst Bandura's theory implies that learning can take place without subsequent action, Kolb proposed that all four stages must occur to ensure learning, such that learning is always expressed as a behavioural outcome. Despite this difference, both theories link behavioural outcomes with cognitive responses to sensory information, and both refer to an individual learning process.

2.5.2) Social learning and society

In a second sociological perspective, social learning is conceived as a process that 'organically' occurs within the web of society; whether aware of it or not, individuals constantly learn through the inherent social contact and experiences of their daily lives (Lave & Wenger, 1991). As a result, behaviour is replicated by actors within a society, leading to dominant group-level, or 'normal', behaviour (Sheppard, 2005). Social learning in this second concept is concerned with the processes of knowledge and behaviour propagation amongst component 'parts' of a

[2] 'Cognition' is the mental process of knowing through awareness, perception, reasoning and judgement; the outcome of which is knowledge.

[3] Self efficacy is defined as, "people's judgements of their capabilities to organise and execute courses of action required to attain designated types of performances" (Bandura, 1977b: 391)

wider system – society – through the social interaction that transforms the individual learning process into an emergent social phenomena (Conte & Castelfranchi 1995; Conte & Paolucci, 2001). Social researchers use this notion of social learning, or lack thereof, to explain the success/failure of approaches for engendering wider social behaviour change (e.g. Munshi, 2004; Miguel & Kramer, 2003; Wu & Pretty, 2004). In this sense, social learning implies that individuals have low power of self-determination, and are instead subject to an overwhelming process of socialisation (Jarvis *et al.*, 1998). This implication directly contrasts with the following concept of social learning (section 2.5.3), which draws on the concept of human agency for realising social and environmental change in response to a learning 'trigger'.

Rather than individual-level cognitive reasoning, this second model of social learning draws on the concepts of social networks and social capital, broadly conceptualised as the networks and trust between individual social actors as well as social norms (Putnam, 1995; Woolcock & Narayan, 2000); where the quantity and quality of these inter-actor networks influence the propagation potential of knowledge and information and, consequently, behaviour. This concept of social learning therefore moves beyond the centric role of human agency implicit in the previous concept, to privilege the role of structure as a determinant of social behaviour. Despite the transferral of focus from the individual to social scale, both concepts presented thus far can be conceived of as an 'organic' process of learning that occurs via everyday life, and are therefore defined by a plethora of spatial scales and settings. These two concepts of social learning are summarised in table 2.2, at the end of section 2.5.3.

2.5.3) Social learning and natural-resource management

In a third and final concept, social learning is conceptualised as a management approach for stimulating concerted action via a process of collective learning (e.g. Keen *et al.*, 2005; Pahl-Wostl *et al.*, 2007a; Ison & Watson, 2007). This approach aims to create learning partnerships, platforms, and ethics, in order to "support collective action towards a sustainable future" (Keen *et al.*, 2005: 3) and involves people learning and acting within 'bounded' learning and action spaces, which Wenger (1998) terms 'communities of practice'. The social learning approach encompasses a shift in learning focus, from individual 'acquisition' to collective participation and knowledge, based on the rationale that meaningful behavioural change results from task-related, participatory learning (e.g. Sfard, 1998; Blann, 2002; Salomon & Perkins 2003; SLIM, 2004f; Grin & Loeber, 2006). Conceptually, this process is also termed 'learning by doing' (e.g. van den Bergh *et al.*, 2007) and 'interactive learning' (e.g. Lundvall, 1992).

Craps & Maurel (2003) propose that a social learning process is comprised of several elements: relational practices (task-centred actions with relational qualities of reciprocity and reflexivity);

social involvement (problem construction, negotiation, interaction, leadership and facilitation, resources); and content management (the problems and actions that actors are confronted with and engaged in). These themes are used to structure data collection and analysis (described in chapter 3). Thus, according to Ison *et al.* (2007), social learning includes the set of human interactions amongst multiple stakeholders engaged in the task of managing natural resources, which may include negotiation, conflict resolution, and/or decision making. Conceptually, this is represented by the following stepwise ladder (modified after Ison & Watson, 2007: 1):

1) **Stakeholders** engage in:
2) a facilitated **interaction process,** which allows:
3) **collaborative learning** (based on action and reflection), which leads to:
4) **concerted action** towards sustainability, which is enabled by:
5) a conducive **policy and institutional** context

In this representation, emphasis is given to the importance of a favourable policy and institutional context to social learning. An analysis of the national policies and institutional contexts of South Africa and Namibia is accordingly carried out in chapter 4, which summarises the key enabling and hindering factors of policy and legislation that impact on the case studies.

Social learning in this collective sense constitutes a collective adaptation of Kolb's individual learning cycle, which is evident from Tabara's definition of social learning as a "continuous *reflexive* learning process" (quoted in Craps, 2003: 7). The need for a continual learning process also matches the political ecology perspective of ecological systems in a dynamic state of equilibrium or non-equilibrium, as opposed to stable systems, hence the need for an ongoing learning process rather than learning towards a teleological knowledge. In their group learning model, Argyris & Schon (1996) differentiate between two types of learning that arise from the reflection element of Kolb's cycle: (i) single-loop learning, which simply involves a change in the action strategy if the outcomes are observed to be erroneous, and (ii) double-loop learning, in which the values, assumptions, knowledge and goals, upon which the action rests are altered. Keen *et al.* (2005) propose that double-loop learning leads to systemic change, which is thought to be necessary for achieving sustainable and social behaviour with regards to human impact on the natural environment. In its broadest sense, this final concept of social learning involves the enactment of Kolb's learning cycle by a 'community' of social actors, e.g. multi-stakeholder platforms, participatory processes, multi-stakeholder forums, or multi-stakeholder institutions. This interpretation of social learning has clear relevance to the context of water-management, which is increasingly decentralised, participatory and demanding action in the interests of society and the environment (section 2.4). In essence, the integrated water-resource management approach creates 'spaces' for this process of social learning.

This increasingly prescriptive concept of learning can be traced back to researchers interested in sustainable land-use practices, where technological solutions failed to overcome social and ecological problems (e.g. Chambers & Jiggins, 1987; Roling & Wagemakers, 1998; Ison & Russell, 2000). As a result, such researchers rejected 'expert', technological and externally imposed solutions for solving environmental problems, instead promoting a learning approach for the realisation of environmental and social sustainability in which social actors are *facilitated* to identify problems and find solutions through interaction and practical experience (Wals, 2007). In this vision, social learning is a process of interaction and knowledge construction, from which knowledge, meaning and understanding 'emerge' out of facilitated collective interaction spaces (Cole & Engestrom, 1993; Pea, 1993; Mavin & Cavalieri, 2004). The theoretical perspective of political ecology is appropriate for analysing this concept of social learning, as it demands a critical analysis of knowledge production processes, including: who constructs collective knowledge, whose objectives are supported by such knowledge, and how 'alternative' knowledge is used or excluded. These questions are addressed in section 6.2. Furthermore, as managed social learning denotes facilitation by non-participant actor(s), their motives, role and interaction must also be considered, as is later conducted in chapter 5. This consideration is important in light of Swatuk's (2008: 1) assertion that:

> As activist academics, we function as a nodal point in this local/global communication network. We are the bearers of ideas and ideologies (...) we speak to and for local people

Swatuk further posits that the practice of action research in facilitating integrated water-resource management is "akin to a religious belief" rather than the "application of a scientific method to an amenable problem" (*ibid*). These assertions underscore the ambiguous, yet ideological, nature of integrated water-resource management (section 2.4).

The managed social learning approach to natural-resource management relates to the concept of the Prisoner's Dilemma, which encompasses the dichotomy between individual behaviour in the self-interest versus cooperative behaviour in the collective-interest (Poundstone, 1992). Hardin's (1968) polemic essay, the 'Tragedy of the Commons', connects this dilemma with the biophysical environment. Recognising social and biophysical system interconnection, Hardin underscores the predicament that the behaviour enacted by individual actors, which is optimal to the individual, may not be concurrently optimal to society as a whole due to the alteration of biophysical system properties through the cumulative impact of individual behaviour. Such alteration is often considered to reduce the ability of the natural environment to function and provide society with 'goods and services' (e.g. Wals, 2007). Social learning as a management approach is therefore implicitly envisaged as a mechanism for realising cooperative behaviour and overcoming individual self-interest. Within this concept, sustainable water-management is

implicitly envisaged as an emergent property of social processes rather than a technical property of an ecosystem and, in keeping with the more recent pluralistic understandings of water that are highlighted in section 2.2, the environmental 'crisis' as compounded by competing values, beliefs, perceptions and political positions (e.g. Roling & Wagemakers, 1998; Checkland, 2000; Steyaert & Jiggins, 2007). Under this conceptualisation, a social learning approach necessitates the collective construction of issues and knowledge, as well as collective learning about social and biophysical interactions and impacts from diverse perspectives, in order to build up the shared concerns and understandings that are considered necessary as a basis for concerted action by the group (Pahl-Wostl, 2002b; Blann, 2002; Blackmore *et al.*, 2007).

The frameworks of participatory action research (PAR) and action research (AR) have strong parallels with this managed concept of social learning, as they draw similarly on the notion of the learning cycle and the work of Paulo Freire (1972) (e.g. Chambers, 1994a; Reason, 1995; de Koning & Marion, 1996; Fulmer *et al.*, 1998; Tyler, 2006). For example, PAR aims to strengthen the participants' learning process by making it relevant and experience-based, in order to maximise the potential for subsequent social change (e.g. Chambers, 1994b; de Konig & Marion, 1996; Wadsworth, 1998; Vernooy *et al.*, 2003). PAR and AR can therefore be conceived as managed social learning processes that are instigated, facilitated and/or participated in by researchers with an agenda of contributing to a process of change. Thus the utilisation of an action research approach by the implementing institutions of the KatRWUA and the KuisebBMC further allow the case studies of this research to be interpreted as social learning processes, as justified further in chapter 3.

Overall, this final concept of social learning denotes a *managed* change in the knowledge and worldview of actors, in order to stimulate behavioural change on their part via the chain of consequence that is represented in figure 2.3.

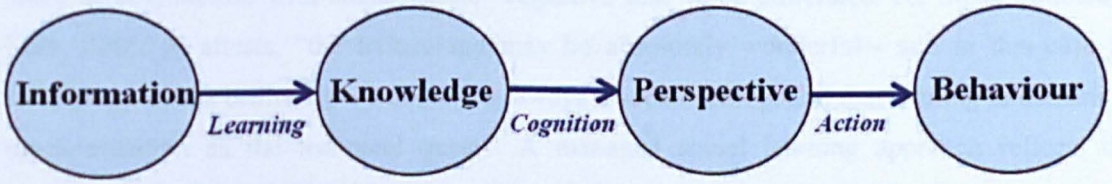

Figure 2.3. From learning to behaviour: the connection within social learning concepts

A social learning approach is therefore conceptualised as a non-coercive strategy for effecting group-level behavioural change towards more environmentally appropriate behaviour. Thus, in contrast to the second notion of social learning (section 2.5.2), but in similarity with the first (section 2.5.1), this third concept encompasses a humanist perspective, in which human agency

is able to influence social and environmental consequences and outcomes, as illustrated by Meganck's (2005: 1) description of social learning as, "behavioural change" that is governed by "information and knowledge as well as empowerment and motivation". The key aspects of the concepts of social learning presented hitherto are summarised in table 2.2 for ease of reference.

Table 2.2. Summary of the key aspects of the three concepts of social learning

Section	Purpose	Learning process	Social scale	Mechanism of behaviour production	Underlying determinant of behaviour
2.5.1 (concept 1)	Theory of learning and behaviour	Conscious	Individual	Cognition and experience (Kolb) Cognition and observation (Bandura)	Human agency
2.5.2 (concept 2)	Theory of learning and behaviour	Unconscious	Society	Socialisation and replication	Structure
2.5.3 (concept 3)	Management approach; conceptual framework of a social process	Conscious through group activity and interaction	Defined social group	Experience and cognition	Human agency

2.5.4) Social learning and integrated water resource management: learning or education?

In light of widespread recognition of the detrimental impact of society on water resources worldwide (e.g. Falkenmark, 1998; Falkenmark & Rockstrom, 2004; Gleick, 2006; Jury & Vaux, 2007), it is unsurprising that the managed concept of social learning described in the previous section has been adopted by the water-management domain (such as the social learning-based HarmoniCOP and SLIM projects[4]). Furthermore, it is increasingly recognised that such complex 'wicked problems' (Rittel & Webber, 1973) cannot be resolved by single disciplines or stakeholders, technological 'fixes', or structural approaches alone (e.g. incentive, punishment) (Pahl-Wostl, 2002c; Conklin, 2006; Hirsch, 2006), because such approaches also work in conjunction with social actors' cognitive and value structures. As Smart (quoted in Dale, 2003: 3) attests, "the technology may be absolutely wonderful – and in this case the technology works brilliantly – but there's always a social setting, and that's going to demand as much attention as the technical quest". A managed social learning approach reflects this management shift, with Pahl-Wostl (2002c: 409) asserting that, "technology is only the 'hardware' and it is becoming increasingly obvious that the 'software', the social dimension, has to become part of the planning and management process".

[4] For further information on these two European based social learning projects see their websites (available at: http://www.harmonicop.uos.de/ and http://slim.open.ac.uk/page.cfm)

Based on hydrological understandings of interconnection, it logically follows that concerted action towards the resolution of water-related issues necessitates multi-actor involvement in the learning process, both by actors who impact on, or are impacted on by, the water resources of a catchment. Stakeholder participation is therefore of fundamental importance to this concept of social learning. However, Ison & Watson (2007: 1) observe that "stakeholder interaction is not causal", such that whilst participation is necessary, "it may not be sufficient for sustainability outcomes to appear" (*ibid*). The social learning approach therefore attempts to move beyond participation *per se*, by incorporating a learning ethos to a participatory, interactive process, in order to move beyond participation towards concerted action according to Kolb's learning cycle. Thus, although early conceptual work on participation from development studies is predominantly framed from a social justice and empowerment perspective (section 2.4.1), the managed concept of social learning specifically links participation with a vision of concerted action towards social *and* ecological sustainability, which in turn rests on the theoretical stance of inter-linked human and natural systems. This interpretation inherently contains a pre-determination of social learning process objectives. The degrees to which pre-existing understandings and worldviews equate with both the ontological perspective and this process objective are therefore considered influential factors in determining social learning outcomes and action (see section 8.6.1).

In the natural resources management context, the ultimate goal of a managed social learning process is collective agreement on concerted future action that engenders "win-win solutions" (Jiggins, 2002: 4) – meaning those in the interests of wider society and the biophysical environment. Consequently, the application of social learning as an approach, framework or management policy inherently entails a paradox. Despite adopting an overtly constructivist position by recognising that both social and natural systems and issues are constructed differently by different actors (e.g. High *et al.*, 2004; Pahl-Wostl, 2002b; Keen *et al.*, 2005), the normative objective of social and/or environmental change is itself underlain by a pre-existing worldview that the current relationship between humans and the biophysical realm is flawed and unsustainable. For example, Tabara (in Craps, 2003: 7) defines social learning as:

> A continuous reflexive learning process of questioning, rejecting and/or readdressing some fundamental and socially created assumptions such as time, space, nature and happiness so that it is possible to yield high standards of living while reducing *the negative* impact on socio-environmental systems [emphasis added].

The difficulty therein is that, as already highlighted in section 2.4, the notion of sustainability remains highly contested, ambiguous and therefore subjective (see Dobson, 1999; Jacobs, 1999; Adeyeri, 2002; Carroll, 2002). Thus, whether social learning is deemed successful as a management or policy approach is ultimately dependent on the interpretation of sustainability

that is used for evaluation. One way of overcoming this dilemma would be to allow a definition of sustainability to emerge from the social leaning process itself (e.g. Ukagu & Maser, 2003).

This concept of managed social learning introduces a key departure from the two previous concepts of social learning as an organic process, through its notion that *someone* knows *something* that *should* be learned by *someone else*; thereby inherently implying that the status quo is problematic and that a 'better' outcome is possible. Outcomes of managed social learning processes are therefore assumed to depend on factors such as: by whom the process was instigated; for what purpose; what information was made available; and by what methods. These questions are answered in relation to the case studies in chapters 5 and 6. Fundamentally, this conceptualisation also renders stakeholders unequal in terms of the validity of their knowledge, understanding and perspectives.

2.5.5) Objectives and outcomes of social learning

Whilst it is acknowledged that the purpose of a social learning process may be multiple, a typology is presented in table 2.3, which is based on the purposes and rationales derived from the wider social learning literature.

Table 2.3. Typologies of managed social learning, categorised according to their objective(s)

Social learning objective	Rationale	Examples
To generate sustainable development policy and/or secure public support for changes that policy incurs	Stakeholder participation engenders more appropriate outcomes and education, resulting in increased public acceptance of policy and practice	Flynn & Kroger (2003); McIntosh & Leotaud, (2007); van den Bergh *et al.* (2007)
To increase human adaptive capacity, and therefore sustainability, of socio-ecological systems	Learning about the inter-relationships between social and biophysical systems will foster better management of, and livelihoods in relation to, them on the part of social actors	Roling & Wagemakers (1998); Folke *et al.* (2002); Gunderson & Holling (2002); Hunt & Berkes (2003); Wals (2007)
To build social capital and networks	Increased networks (across sectors and scales) foster better management	Ostrom, (1990); Schusler & Decker (2003); High *et al.* (2004)
To facilitate double-loop learning and, therefore, better natural resource management	To prevent mismanagement of resources based on single-perspective knowledge, and to avoid 'traps'[5]	Lee (1999); Keen *et al.*, (2005); SLIM (2004f); Pahl-Wostl (2002b); Hagmann & Chuma (2002)
To reduce conflict and foster collaboration over natural resources	That social and ecological systems will benefit from multi-actor environmental 'problem' definition, learning and action	Wildemeersch *et al.* (1998); Pahl-Wostl (2002c); Schusler & Decker, 2003; Keen & Mahanty, 2006

Wildemeersch *et al.* (1998) observe that a social learning process (involving communication and cooperation) means that participants are involved in implicit and explicit negotiation processes, which reduce conflict through the convergence of stakeholder perspectives on an

[5] 'Traps' are "a way of thinking that is inappropriate for the context or issue" Keen *et al.*, (2005: 12).

issue (Pahl-Wostl, 2007b). This rationale synergises with the objective of improved policy and practice for sustainable development, as it assumes that the participation of policy-makers in the learning process will foster more appropriate policy choices, and that public participation will engender increased public understanding and acceptance of the practical implications through the mutual convergence of understandings and perspectives (Flynn & Kroger, 2003; van den Bergh *et al.*, 2007). However, this rationale makes the implicit assumption that perspectives and assumptions of stakeholders will converge to a single group understanding and/or perspective. The degree of convergence in the perspectives and understandings of participants within the case studies is therefore significant and is flagged as an item for inclusion in participant observation notes (see section 3.5.2).

In addition to conflict-resolution, a social learning approach is thought to trigger changes in practice, which in turn lead to more sustainable natural resource management (Roling & Wagemakers, 1998; Carpenter *et al.*, 2001; Folke *et al.*, 2002; Hunt & Berkes, 2003). For example, Rolling & Wagemakers (1998) illustrate how changes to Australian and Asian agricultural sectors were realised through collective learning processes, which, according to their analysis, rendered the sectors more economically and socially viable whilst simultaneously reducing their negative biophysical impacts. Hence, social learning is thought to produce adaptive behaviour on the part of social actors, which has a less detrimental impact on the biophysical domain. This outcome of social learning, of sustainable behaviour, parallels the discourse of adaptation and adaptive management (e.g. McDaniels & Gregory, 2004; Adger *et al.*, 2005), which views policies and actions as "experiments" to be learned from (Lee, 1993: 9). However, others recognise that social learning does not automatically result in adaptation due to hindering factors (Leach & Pelkey, 2001; Mostert *et al.*, 2007). Thus, a key objective of this research (chapter 1) is to provide further insight into the factors that hinder and facilitate social learning, as is later addressed in chapter 8.

As the managed concept of social learning entails interaction between social actors, and includes a specific aim of fostering improved inter-stakeholder relations (table 2.3), the notion of social capital is highly relevant to this research. Social capital is usually divided into three categories: bonding, bridging and linking (e.g. Bebbington, 1999; Lehtonen, 2004). 'Bonding' refers to the informal ties between families and friends, 'bridging' to the linkages across social groups, and 'linking' to the vertical dimension of links between actors and formal institutions. On one hand, Pretty (2003) and Hugh *et al.* (2004) uphold the viewpoint that social learning constitutes a process by which social capital is *produced.* Certainly, the integrated water-resource management context, of multi-stakeholder participation and horizontal and vertical integration, creates the optimal conditions for the formation of all three types of social capital. On the other hand, social capital is perceived by others, as a pre-existing societal characteristic

that *determines* the success of a managed social learning process (e.g. Baland & Platteau, 1998; Enserink *et al.*, 2007). For the purposes of this research, social capital is conceived in a dualistic manner as a pre-existing feature of societal structure, yet which also has the potential for modification by social learning processes. This conceptualisation allows changes in stakeholder relations and trust to be evaluated and perceived as an outcome of the social learning process, as illustrated further by the conceptual framework of the research in section 2.6.

2.5.6) Overcoming the 'fuzziness' of a social learning approach

The concept of managed social learning is variously referred to as a process, conceptual framework, policy approach, philosophy, and management tool within the wider social learning literature. Thus, Ison *et al.* (2007: 505) assert that social learning "has not yet crystalised into simple language, or a consistent discourse, and still entails a plethora of terms such as social learning, social capital networks, multi-stakeholder processes, soft systems, community, institutional development, and innovation systems". Furthermore, Mostert *et al.* (2007: 1) observe that social learning is closely linked to other management approaches, such as, "public participation, polycentric governance, collaborative governance, co-management of natural resources, and common-pool resource management". Notwithstanding the plethora of associated terms and purposes, social learning in this third sense has broadly come to denote desirable social transformation via a collective learning process and concerted action, where 'desirable' relates to more sustainable social *and* ecological systems. These assertions, alongside the observed parallels between social learning and the concept of action research (section 2.5.3), attest to the high similarity and overlap between social learning and other conceptual frameworks. As a result, a 'social learning' approach may not be referred to explicitly as such, by either its participants or instigators. Nonetheless the ethos and approach of social learning may be practiced and enacted under the related terms. For this reason, even though the case studies of this research were not specifically referred to as social learning process by their implementers and/or participants, they may still be analysed as such (e.g. Jiggins, 2002).

2.5.7) Critiquing social learning

The concept of social learning, as a collective learning process leading to action, strongly relates to the academic and policy context of environment and development, which encompasses the need for an alteration of societal behaviour due to its increasingly detrimental impact on the biophysical realm (section 2.5.4). Managed social learning approaches are purported to achieve this goal. However, when combined with the integrated water-resource management discourse, I discern that a social learning approach makes one (or more) of the following assumptions, that:

1. Participating stakeholders are sufficiently influential that, when they act on what they have learned through participating, their actions will benefit the wider catchment, or;
2. The change in worldview and behaviour of participating stakeholder representatives will in turn be replicated by their wider stakeholder group, to the ultimate benefit of the whole catchment (in synergy with a more organic concept);
3. The forum, institution or organisation will be sufficiently empowered to enact concerted action at a catchment-level i.e. that the context is conducive to action;
4. All participants have an equal ability to influence decision making and outcomes of the social learning process (for socially-equitable outcomes);
5. A balance between economic, social and environmental objectives can be realised.

These assumptions, which I interpret from a critical analysis of the social learning and integrated water-resource management literature in sections 2.4 and 2.5, inform the objectives of this research, which are presented at the outset of the following chapter (section 3.2) and provide a basis for the analysis of empirical case studies in chapters 5-8. Whilst the goal of social learning is to foster collective benefit at a wider social level, it is also recognised that individual-level benefits are likely to result from managed social learning processes, as explored in section 7.4.1.

2.6) Conceptual framework

Based on the literature reviewed in section 2.4, water-management policy at the national level worldwide is conceptualised as having been influenced by an overarching global discourse whose origins arose from academic and policy-making forums of Western developed nations. This conceptualisation, which is represented in figure 2.4, supports Swatuk's assertion that water-sector reform is largely driven by "the interests and ideologies of Western states and civil societies" (2005a: 872). Figure 2.4 also emphasises the viewpoint that national-level legislative and institutional reforms have been designed to foster 'optimal' water-resource management, which, according to this discourse of integrated water-resource management, are widely heralded to be outcomes that encompass social and environmental sustainability (Savenije & van der Zaag, 2000; Conca, 2006; Mollinga *et al.*, 2006).

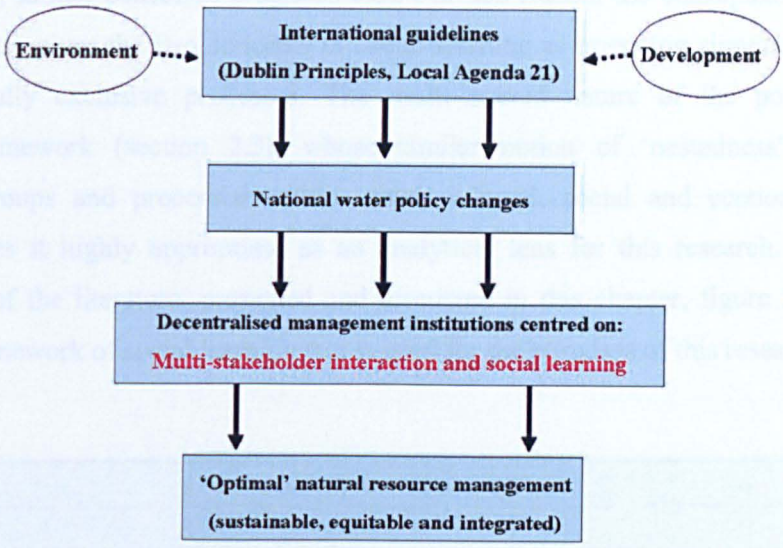

Figure 2.4. Conceptualisation of the academic and policy context of this research

As depicted above, a key proposed mechanism for the realisation of integrated water-resource management principles involves the decentralisation of water-management and, accordingly, the formation of new institutions to facilitate multi-stakeholder input and/or involvement. Although initially constituting a top-down process, this conceptualisation does not preclude bottom-up influence, nor reflux processes associated with decentralised participation, as it is recognised that local participation in water management may also simultaneously be driven by bottom-up interest and motivation. The extent to which the social learning processes in the case-studies were initiated and influenced by top-down versus bottom-up actors is considered in chapter 5.

The literature reviewed in section 2.5 framed social learning as a natural occurrence or an implementable approach, and between an outcome of a natural social process or an instigated process designed to produce outcomes. The terms 'organic' and 'managed' social learning have been, and are hereafter, used to distinguish between the two concepts that these categories encompass. Organic social learning collectively corresponds to the first two concepts of social learning (sections 2.5.1 and 2.5.2 respectively), while managed social learning refers to the third concept (section 2.5.3). In spite of their differences, a common thread between all three concepts is that they encompass a notion of behaviour change arising from social interaction, albeit within different communities of practice and as a result of different stimuli. This acknowledgement links the two concepts of social learning, as it is recognised that any managed learning process is inherently made up of individual actors who are also part of a wider social context outside the boundaries of the managed learning space. Thus, whilst this research focuses on the learning process within the defined 'communities' of the case-study institutions, it is also acknowledged that participants are concurrently subject to organic social learning processes, through their everyday life, which may also encompass other managed learning experiences

(e.g. education, farmer education programs etc). For this reason, the conceptual framework of this research conceives the two concepts of social learning as operating simultaneously, rather than as mutually exclusive processes. The multi-layered nature of the political ecology theoretical framework (section 2.3), whose similar notion of 'nestedness' also situates individuals, groups and processes within wider political, social and economic structures, therefore makes it highly appropriate as an analytical lens for this research. Based on my interpretation of the literature, presented and discussed in this chapter, figure 2.5 depicts the conceptual framework of social learning that is used for the purposes of this research.

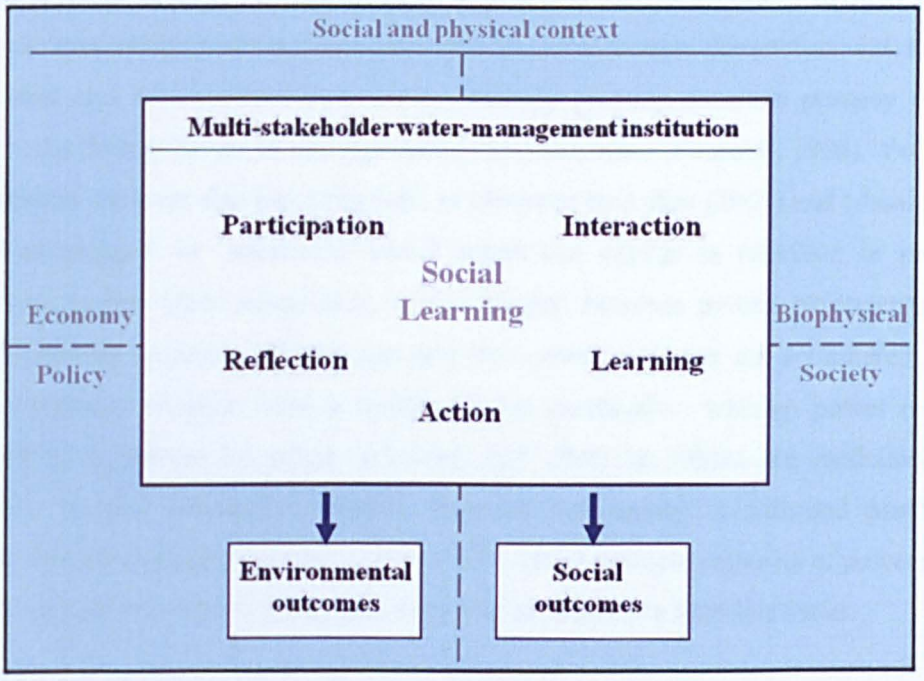

Figure 2.5. A conceptual framework of social learning

Figure 2.5 reveals five key aspects of a social learning process, including:

1) Stakeholder involvement (participation, representation);
2) Social interaction (relations, leadership, facilitation);
3) Learning (information access, knowledge construction, cognitive change);
4) Action (problem definition, objective-setting, activities, behaviour change);
5) Reflection (evaluation, monitoring, assessment).

These processes are posited to generate a set of outcomes, which are in turn considered to result in environmental and social change, and which this thesis aims to evaluate.

However, the wider social learning literature does not make significant reference to debates surrounding concepts of power (cf. Pelletier *et al.*, 1999; McCullum *et al.*, 2004). This

pervasive omission is significant, as power relations amongst social actors are widely thought to have constituted a significant obstacle to the achievement of the goals of participation that are outlined in section 2.4.1 (e.g. Cooke & Kothari, 2001; Kirby *et al.*, 2003; Sinclair, 2004; Tisdall & Davis, 2004; Percy-Smith, 2006). Thus, as necessitated by the political ecology theoretical perspective of this research, and due to the inherently participatory nature of social learning (Haxeltine & Amundsen, 2005; Muro & Jeffrey, 2006), an analytical focus of this research is to critically examine how power relations intersect with social learning processes.

Foucault (1975: 194) asserts that, "power produces; it produces a reality; it produces domains of objects and rituals of truth". In this perspective, power is used deliberately, in order to subjugate people into constrained positions. Foucault particularly associates domination with the activities of the State and its associated bureaucracy, thereby granting structure primacy over human agency in the determination of social processes and outcomes (Foucault, 1984). Yet the 'power of domination' concept also has a flip side, as observed by Lukes (2005) and Masaki (2006), in that 'disadvantaged' or 'oppressed' social actors can engage in rebellion or resistance to domination. In this latter perspective, human agency becomes pivotal in understanding and explaining social processes. Whilst agreeing that power relations are an inherent feature of social interaction, Giddens takes a middle-ground perspective, wherein power relations are conceived as a process by which influence and effect on others are mediated by social interaction. In this perspective, neither structure nor agency is afforded priority in the determination of outcomes (Giddens, 1976; 1979). These multiple concepts of power are used to critically analyse the social learning processes that are studied within this thesis.

Foucault (1980) also connects power with knowledge in the neologism 'power-knowledge'. In this concept, power arises from access to knowledge, after which empowered actors engage in knowledge reproduction, in order to reinforce said power. Thus, there exists a connection between knowledge and interests. This concept of power is highly relevant to this research, which is focused on water management; a discipline that has, in recent history, been associated with physical science and expert oriented knowledge. Nevertheless, in keeping with the constructivist perspective of political ecology research, it is also recognised that understandings of power may be socially constructed and, therefore, diverse (Guzzini, 2007). Perceptions of power and influence amongst the social actors engaged in the case-study processes were therefore ascertained from interviews and questionnaires during fieldwork. Findings indicated that power is associated with criteria including: wealth, individual ability to articulate ideas and opinions, institutional membership, proximity to central government, ability to access information and knowledge, and synergy with legislation. These insights are in accordance with the multiple conceptualisations that exist amongst the wider literature (e.g. Morriss, 1987; Scott, 1994; Hauggard, 2002; Lukes, 2005).

2.7) Chapter summary

Social and ecological integration and complexity are increasingly accepted as an ontological reality within both natural-science and social-science disciplines. The subject of water is particularly complex because it has many facets, which span the historic divide between social and natural sciences within academia. Political ecology is therefore considered to provide a suitable theoretical framework for this research because it encompasses an integrated ontological outlook, and allows for scientific and social considerations of processes and phenomena (Robbins, 2004). Despite being comprised of several theories and concepts (section 2.3), political ecology encompasses the core concerns of power relations, environmental management, human behaviour, and nature-society relations. These thematic areas are of relevance to this research because research findings and media reports increasingly concur that the unsustainable use of shared natural resources by humans is the root cause of their degradation. Furthermore, a recent concept of social learning sets itself up as a practical approach for overcoming these 'problems' via collective learning, and is consequently gaining in recognition and importance within the field of water-resource management (Pahl-Wostl, 2002b; SLIM, 2004a-f; Blackmore, in press). This concept of social learning has been deconstructed and analysed within this chapter, before being reconceptualised as a managed process of learning involving interaction, dialogue and learning amongst diverse stakeholders engaged in task-based activity (section 2.6).

The acceptance of the integrated water-resource management discourse by a set of global actors has triggered national-scale institutional and policy change. The consequent formation of decentralised, participatory water-management institutions at the sub-national scale has in turn created 'spaces' (Buck *et al.*, 2001), in which the managed social learning process can take place. Nonetheless, as the concept of integrated water-resource management draws on a wider discourse of environment and development with normative goals of social equity and environmental protection, managed social learning in the context of water-resource management has a specific connotation: learning that concerted collective action is necessary, in order to alter social behaviour towards that which manifests in a more sustainable future relationship between society and the biophysical domain. Social learning in the water-management context is, therefore, conceptually linked to an ideal of social and environmental transformation. Having outlined the theoretical perspective, academic context and conceptual framework of the research, the next chapter moves on to introduce the methodology that is used to investigate social learning processes within the two case studies.

Chapter 3

Using Qualitative Methods to Evaluate Social Learning

3.1) Introduction

This chapter outlines the processes and methodology that inform this research, and links the selected approach with the theoretical perspective of political ecology that was outlined in chapter 2. After summarising the research objectives, an overview of the research process is provided, including a justification for the case-study approach. The qualitative research methodology that is used to elicit the information required to address the research objectives is outlined in section 3.5. In recognition of the constructivist stance of political ecology, a multi-method approach drawing on primary and secondary data sources is adopted, in order to improve the accuracy of data interpretation and the validity of research conclusions.

The research draws on a combined inductive-deductive approach (e.g. Ragin, 1994; Boxhill *et al.*, 1997): whilst pre-existing theories of social learning are investigated and used to inform the research design and methodology, the use of a grounded theory approach brings an inductive element to the research. Grounded theory is a qualitative research methodology that allows the emergence of themes and concepts from empirical data, which in turn provide a basis for theoretical development through the 'constant comparison' of data (Glaser & Strauss, 1967; Kelle, 2005). How a grounded theory data-coding process was utilised to develop the research findings and conclusions presented in chapters 4-9 is described in section 3.6. In view of the interpretivist nature of this research, it is acknowledged that research findings and resultant knowledge can never be objective and value-free, as the researcher is subject to pre-understanding, tradition and prejudice (Easton, 2001; Corbetta & Patrick, 2003). The themes of researcher positionality and reflexivity are therefore addressed in the final chapter section.

3.2) Setting the research objectives

The critical realist epistemology that underpins political ecology is compatible with a variety of research methods, with Sayer (2000; 19) observing that "the particular choices should depend on the nature of the object of study and what one wants to learn about it". As interpreted in chapter 2, concepts of social learning broadly encompass a process of social interaction and learning that leads to behavioural outcomes. This process has been applied as an implementable approach to the field of water-resource management, with the objective of fostering social action towards positive environmental and social outcomes. This research aims to test such theories in practice. Based on the applicability of social learning approaches in the wake of

policy intervention, this research is also relevant to debates on how effectively policy unfolds in practice. Therefore the aim of this research is to enhance understanding of the social learning process in the context of water-resource management. This will be achieved through the following activities, which relate to corresponding objectives listed in section 1.1:

1. An identification of the interrelationships between the components of the social learning process, including:
    - between the context and the collective learning and interaction processes;
    - between the learning and interaction process and its outcomes;
    - between the outcomes and the context;
2. An identification of the factors that facilitate or hinder social learning;
3. An assessment of the applicability of social learning as an approach to integrated water-resource management; and
4. A comparison of the research findings with the wider literature.

Collectively, these objectives will further inform theoretical debate about participatory approaches. Hence, the research is concerned with both theory testing and theory development. Based on the conceptual framework (chapter 2), the key components of social learning that require data collection and analytical consideration in order to meet the research objectives are:

1. the wider physical and social context;
2. the involvement and interaction of stakeholders;
3. the nature of the learning forum, within which participation and interaction take place;
4. the outcomes and actions that arise from the multi-actor interaction; and
5. the feedback links between the above aspects of social learning.

Two case studies were selected to yield data on these aspects of social learning, in order to inform theoretical development from an empirically-grounded perspective. A case-study approach also complements the political ecology perspective of this research through an emphasis on people in places, which allows for the attainment of a depth of understanding that larger-scale research omits (e.g. Yin, 1984; Stake, 1995; Pare, 2002). Thus, whilst some researchers have criticised case studies for the selection bias that they potentially incur (e.g. Geddes, 1990; Njolstad, 1990), others argue that they are able to provide the explanatory insight into causal mechanisms and relationships that large-scale generalisations overlook (e.g. Scapens, 1990; Sayer, 1992; Ragin & Becker, 1992; Gerring, 2007). Although case studies are generally used to yield a more in-depth comprehension and explanation of relationships (Flyvbjerg, 2006), this observation does not preclude case studies from being used to ground more generalised assertions based on "judgements of typicality" (Giddens, 1984: 328). Working

outwards in time and space from the case study also incorporates the influence of multi-scale determinants, as necessitated by the political ecology perspective of this research, in which context-specific processes and events are nested within wider social, political and economic structures (e.g. Blaikie & Brookfield, 1987; Batterbury *et al.*, 2002).

A comparative approach is based on the principle that a comparison of differences and similarities in circumstance will enable the teasing out of important causal mechanisms for the explanation of processes and phenomena (Ragin, 1987; Wad, 2001). For example, Batterbury *et al.* (2002) observe that, whilst local contextual details may differ, broad themes and emergent issues are generated through a comparative case-study approach. Moreover, Hantrais (1995: 1) asserts that comparisons provide an analytical framework for examining and explaining social processes and cultural differences, which in turn generate, "fresh, exciting insights and a deeper understanding of issues that are of central concern in different countries". In this way, the juxtaposition of a limited number of case studies helps to overcome the oversight of explanatory factors that may be absent in one case study whilst still permitting the depth of understanding that large-scale research overlooks (Janoski & Hicks, 1994). Notwithstanding the availability of resources, the number of case studies selected for a comparative approach ultimately reflects a trade-off between research objectives of 'representativity', which is of enhanced importance for positivism-oriented research aiming to derive general laws and predict outcomes, versus the in-depth comprehension of processes that is important for realist research approaches and aims to explain causal mechanisms. As this research primarily aims to provide further comprehension on the process, or praxis, of social learning rather than the generation of general laws, two case studies were strategically selected for comparison to test and develop social learning theory. Two cases provide the minimum quantity required for a comparative approach, yet remain feasible in light of the time and resource potential of a PhD. The selection procedure and information pertaining to the case-study areas are provided later in section 3.4.

3.3) The research process

Two separate fieldwork phases were undertaken; with the South African Kat River Water User Association (KatRWUA) from June to December 2006, and with the Namibian Kusieb Basin Management Committee (KuisebBMC) between April-September 2007. The decision was taken to split fieldwork into two separate periods in order to allow for the preliminary analysis of data collected in the first phase prior to the commencement of the second. This decision is consistent with the grounded theory perspective, which recognises that theoretical development progresses with iteration back and forth from data collection and analysis (Corbin & Strauss, 1990; Hall & Callery, 2001). This iterative procedure resulted in changes between the first and second phases; for instance, interview questions in the second phase were subsequently targeted more

selectively around concepts emerging from the first dataset, which also assisted in reducing the time imposition on interviewees (see section 3.5.3). The iterative research process used to address the objectives provided in the previous section is illustrated by figure 3.1.

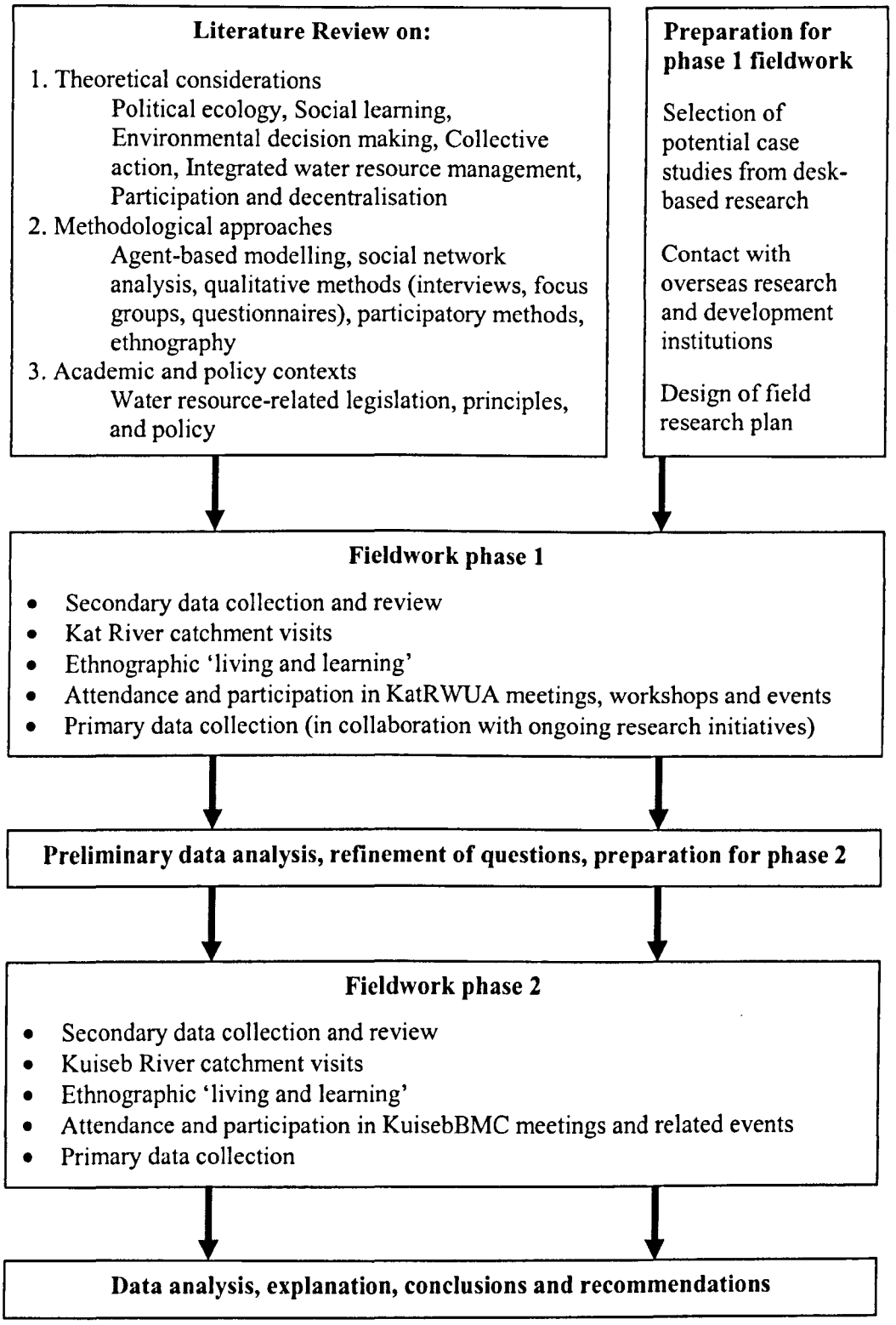

Figure 3.1. The research process

As part of the iterative research approach, ethnographic 'immersion' periods were scheduled for the outset of the fieldwork phases, with the purpose of facilitating cultural awareness and assimilation. Such periods also presented an opportunity for reflection on the appropriateness of *a priori* methodological choices that were necessitated by funding agencies and Sheffield University's PhD progress evaluation system. Consequently, ongoing reflection in these phases resulted in several methodological changes that are described in section 3.5.1. Such changes were enabled by the flexible multi-method approach of this research.

3.4) The pre-fieldwork phase

3.4.1) Reviewing the literature

At the outset of this research, prior to fieldwork, a literature review was carried out in order to identify the dominant discourses of water management (Apthorpe & Gasper, 1996). In line with the political ecology framework of this research, attention was focused on the construction of the water 'problem' and the approaches proposed as solutions by the policy frameworks. In particular, the key actors and institutions involved in problem constructions and solutions were identified (Adams, 1990; Bryant & Bailey, 1997). Concepts and terminology associated with this discourse, such as participation and decentralisation, were explored further, in order to elucidate their contextual meaning for subsequent comparison against empirical observations. These concepts were then used to analyse critically the national water policies and legislation of South Africa and Namibia, the results of which are presented in chapter 4. A literature review of social learning was also conducted, in order to better understand the origins and rationale for the approach as a means for realising optimal natural-resource management. The interpretations and understandings derived from the wider literature (presented in chapter 2), were used to generate research questions that informed the aims and objectives (section 3.2), as well as a series of relevant themes and questions that were used to inform the interview and observation guidelines that are presented later in this chapter. In addition, the literature review identified a qualitative research methodology as appropriate to this research, an approach that is presented following the subsequent justification and overview of case-study selection.

3.4.2) Selecting the case studies

Southern Africa was identified as an area from which to select case studies, as several countries in the region have enacted new water policies and legislation within the past decade (Leestemaker, undated; Nicol & Mtisi, 2003; Brown & Woodhouse, 2004; Swatuk, 2005b; Heyns, 2005) that promote multi-stakeholder participation in water management, which in turn creates a context for social learning (see chapter 2). Given the recent political instability of

Zimbabwe and the larger linguistic barriers involved in conducting research in Malawi and Mozambique, South Africa and Namibia were considered the most viable for conducting fieldwork. Two institutions were selected from desk-based research: the KatRWUA in the Eastern Cape, South Africa and the KuisebBMC in western-central Namibia. Introductions to their respective catchments follow, whilst thorough analyses of their institutional histories and composition are provided later in chapters 4 and 5.

The KatRWUA and KuisebBMC were selected for this research for the following reasons:

- They are located in South Africa and Namibia, where recent national Water Acts propose participatory approaches to water management via decentralised institutions, thereby setting the scene for social learning processes to occur in practice. In addition South Africa and Namibia have a similar socio-economic history of disempowerment and unequal access to natural resources that the new policies and legislation attempt to overcome;
- They are established institutions that have been widely promoted as successful examples of participatory water management (e.g. Botes *et al.*, 2003; Amakali, 2005; Holtzhausen, 2006). It should also be pointed out here that few operational alternatives exist at present due to the delays in promulgation of the Acts;
- The KatRWUA (at the time of this research) and the KuisebBMC (in the past) are/were facilitated as "action research" projects, which are thought to constitute a social learning process according to the conceptual framework presented in chapter 2. Consequently, it was expected that a process of social learning was already in progress, which could be investigated by this research;
- The KatRWUA and the KuisebBMC have been closely associated with facilitating institutions: Rhodes University (RU) and the Desert Research Foundation of Namibia (DRFN) respectively. Such institutions were identified as being conducive to research through their ability to provide the practical support necessary for conducting research in South Africa and Namibia (e.g. visa support, access to office facilities) and to facilitate access to the water-management institutions through their networks. Both RU and the DRFN agreed to host me as a visiting researcher for the duration of respective fieldwork periods, which is addressed as a potential source of bias in section 3.7;
- Catchments under the KatRWUA's and KuisebBMC's jurisdiction have been relatively well-researched compared to other catchments in South Africa and Namibia respectively. As a result, pre-existing secondary data enabled a more comprehensive picture of the physical and social context of the research areas to be ascertained than would have been possible by primary data collection alone. Such data are critically assessed in section 3.5.4;
- Both institutions were located in areas that were logistically feasible to access and of a manageable scale for the temporal and financial possibilities of this research project;

- Both the KatRWUA and the KuisebBMC agreed that this research could take place.

The dearth of participatory water-management institutions in South Africa and Namibia means that selection bias towards 'successful' case studies occurred, as particular and significant circumstances have allowed the KatRWUA and the KuisebBMC to exist in the face of their more prevalent absence. Nonetheless, this bias is not thought to present a significant risk to the overall research, as it is not the intention of this research to generalise widely from these case studies nor to be perceived as 'representative' of the wider national situation. Indeed Castree (2003) and Lotz-Sitsika & Burt (2006) warn of the 'uniqueness' of examples and therefore caution against generalisation and derivation of 'wider lessons' from supposedly representative local examples, a warning that is especially salient to the case studies because 'Africa' is often perceived as a single entity amongst the research community despite exhibiting significant inter-regional and intra-regional variation (Mercer *et al.*, 1999). As set out in section 3.2, the overarching aim of this research is to improve understanding of social learning processes.

After an initial desk-based literature review, Rhodes University (RU) in South Africa, was approached for permission to conduct this research as part of their ongoing research activities in the Kat River catchment. Essentially therefore, this research 'piggy-backed' on an existing research project (Mohan, 2002). In retrospect, I am uneasy about this approach; I since recognise that the KatRWUA members themselves should also have been approached at the planning stage of the research, in order to secure their permission in advance even though it was unlikely that my research could have taken place without the approval of RU, who were a key player in the development of the KatRWUA (section 5.2.1). The impact of my alignment with RU on this research is discussed in section 3.7. Thus, for the second fieldwork phase, concerted effort was made to contact the KuisebBMC, in order to secure their consent to this research prior to my arrival in Namibia.

The following two sections move on to present limited information on the historical, social and physical characteristics of the Kat and Kuiseb River catchment, in order to highlight the similarities and differences between the case studies and to provide a basis for comparison. Further detail and analysis is provided in chapter 4. Most publicly available statistical data is collected at the administrative level rather than the catchment-scale. Proportional statistics taken from regional figures are therefore included for the purpose of being generally illustrative of the case-study catchments, rather than a highly accurate representation.

3.4.3) The Kat River catchment, South Africa

South Africa is generally arid but experiences high spatial and temporal variability in rainfall, where much of the rain falls on a small portion of the land surface (DWAF, 1997; Reason *et al.*, 2002; Petja *et al.*, 2004). Rivers mirror the rainfall pattern, with those of the eastern escarpment generally exhibiting perennial flow (Kundell, 2007). The majority of the Kat River catchment falls within the Nkonkobe Municipality of the Eastern Cape (see figure 3.2), where the perennial Kat River flows 80 km southwards from headwaters in the Amathola and Katberg mountains into the Great Fish River approximately 100 km north of Grahamstown (DWAF, 2005). The physical catchment is demarcated into three sub-areas that are referred to throughout this thesis: the Upper Kat, Middle Kat and Lower Kat. These delineations have been widely used by RU researchers, such that participants of RU research and development activities are largely familiar with the spatial areas that they denote. For historical reasons, these sub-areas feature distinct socio-economic characteristics, as described below.

Figure 3.2. Maps showing the location of the Kat River catchment within South Africa

The Kat River catchment has a turbulent history of struggles for land. 'Frontier Wars' between British settlers and Xhosa groups in the eighteenth century caused the British to give land rights to Coloured settlers in the present-day Middle Kat, in order to provide a buffer between themselves and Xhosa populations (Motteux, 2003). Subsequently, under apartheid, the boundary of the Ciskei homeland was drawn across the hydrological catchment of the Kat River (roughly corresponding with the Middle and Upper Kat boundary in figure 3.2b), whereupon all white and coloured South Africans were moved into the southern section of the catchment, while Xhosa people were forcibly relocated to the Ciskei (Lerotholi, 2005). The majority of the

Ciskeian population was constrained to subsistence-base livelihoods with the exception of a small wealthy elite amongst whom corruption and nepotism was widespread (Vail, 1989; Lodge, 1998). The 'Upper Kat' therefore connotes a Xhosa-ethnic population that was formerly under the Ciskeian rule, and which continues to be characterised by resource-poor subsistence agriculture and small-scale stock-farming. In contrast, the majority of land in the 'South African'[6] portion of the Kat River catchment was allocated to white farmers, who developed the area for large-scale citrus, lucerne and tobacco cultivation (Motteux, 2001). Land tenure in the Lower and Middle Kat is predominantly freehold by commercial farmers, compared with state or communal ownership in the Upper Kat. Despite post-democracy land-reform initiatives, land ownership remains complicated and largely unresolved in the Upper Kat (McMaster, 2002) and is a 'burning issue' amongst its residents according to Gumede (2008).

Farolfi *et al.* (2005) estimate the total catchment population at approximately 49,000, with 18,135 living in the town of Fort Beaufort (Statistic South Africa, personal communication, 2006). According to Nkonkobe Municipality (2007), an estimated 80 % of population live in villages or scattered farms, with only 20 % classed as urban. However, an average 43 people/km^2 means that rural population density is relatively high. A legacy of the Ciskei means that the majority of the Kat River catchment's population is concentrated in the upper half of the catchment, with the exception of Fort Beaufort. A decade of population decrease is attributed to economic out-migration and the increasing prevalence of HIV/AIDS (Nkonkobe Municipality, 2007; Dorington *et al.*, 2006). Aside from the service sector centred on Fort Beaufort, export-oriented citrus farming centred on the middle and lower sections continues to dominate economic activity of the catchment, whilst the upper catchment supports subsistence-level crop and stock farming, alongside limited commercial forestry (state-owned) and tourism activities (Soviti, 2002). Formal-sector employment is low, with the majority of employed inhabitants reliant on seasonal agricultural work. According to Nkonkobe Municipality (2006), the area is characterised by 'high unemployment and poverty levels', with 93 % of Nkonkobe residents earning less than R800 monthly income and a large proportion dependent on social welfare.

The geology of shale, mudstone and sandstone does not yield significant groundwater potential (Vegter, 2001), such that the majority of residents rely on surface water. A reliable source of water was secured by the construction of the Kat Dam in 1969, with a reservoir capacity of 24 million cubic metres (Rowntree; *pers. comm.*, 2007). However, the reservoir has historically only served the interests of large-scale commercial irrigators and the Fort Beaufort municipality, with commercial farmers operating a payment scheme for dam releases under the auspices of the Kat River Irrigation Board (KatRIB). Using 60 % of catchment water, the citrus industry

[6] Homelands were not recognised by the Apartheid government as part of the South African nation-state

remains the major water-user, followed by domestic use (13 %) and forestry (12 %) (Dinar *et al.*, 2005). In 2001, Nkonkobe Municipality terminated their contract with a private water company and has since assumed responsibility for urban water supply and reticulation in Fort Beaufort, Balfour and Seymour (Mxotwa, 2001). Few communities outside these urban areas are served by piped water. Thus, aside from occasional boreholes, rural communities source water from rain-fed dams or directly from the Kat River. Since the end of Apartheid rule, previously disenfranchised citizens within the catchment have been pushing for land reform and access to water, in order to pursue more economically productive, agriculture-based activities.

3.4.4) The Kuiseb River catchment, Namibia

Water availability in Namibia is limited by a climate characterized by infrequent, extreme precipitation events, such that surface water availability is scarce nationwide (Heyns *et al.*, 1998; Mendelsohn *et al.*, 2002). In addition, extremely high evaporation prevails; it is estimated that, of rain falling in Namibia, 83 % evaporates, vegetation uses 14 %, 2 % is runoff and 1 % infiltrates the ground (Heyns, 1994). The Kuiseb River is an ephemeral river, which spans the Khomas and Erongo regions of western-central Namibia (Mendelsohn *et al.*, 2002). At 440 km in length, the Kuiseb River is comprised of distinct climatic, hydro-geological and socio-economic zones that are delineated in figure 3.3. Importantly, the size of the Kuiseb River catchment is an order of magnitude greater than that of the Kat River catchment, whilst its population density is an order of magnitude lower. This difference has implications for stakeholder involvement (see section 5.5.3). Only a small portion of the Upper Kuiseb experiences annual rainfall exceeding 300 mm, while the Lower Kuiseb is located in a region that generally experiences zero rainfall (Fitter, 2004). Following precipitation events in the Upper Kuiseb, which is underlain by solid geology, the Kuiseb River flows westwards into its lower reaches where increasing porosity of alluvial sand and gravel deposits support a riparian aquifer (Christelis & Struckmeier, 2001). Infiltration into this aquifer and evaporation losses prevent the Kuiseb River outflow into the Atlantic Ocean except in years of extreme rainfall.

Out of Namibian regions, Erongo and Khomas regions have the lowest percentages of people receiving no income or a pension, the highest proportion of salaried inhabitants, and the lowest Human Poverty Indices (Mendelsohn *et al.*, 2002). However, in line with the high inequality of Namibian society nationally (UNDP, 2007), the regional figures hide extremes of poverty and wealth that vary predominantly with ethnic group. Commercial farmers of European descent in the Upper Kuiseb retain a livelihood comparable to those of First-World inhabitants, while most rural black residents experience severe socio-economic poverty (Shilomboleni, 1998; UN 1999).

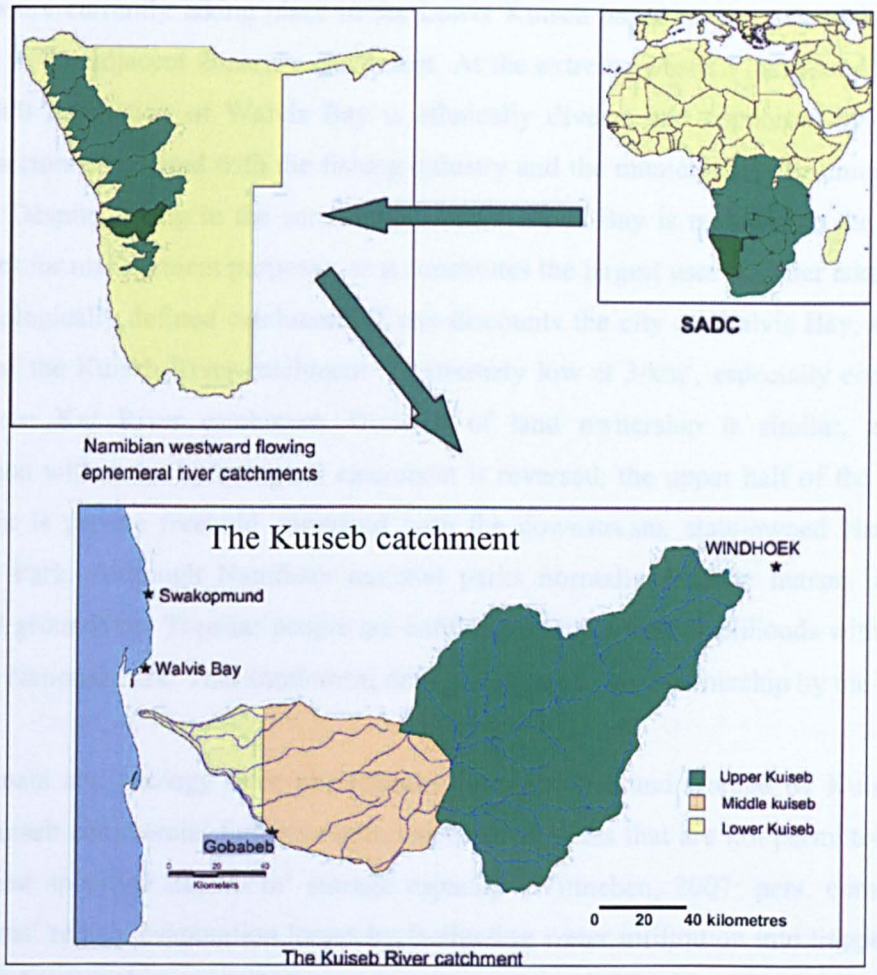

Figure 3.3. Location the Kuiseb River catchment within Namibia (after Botes *et al.*, 2003)

Prior to colonial arrival, the Kuiseb River catchment was characterised by a lack of permanent settlements (see maps in Mendelsohn *et al.*, 2002: 132), except for sporadic indigenous Topnaar settlements in the lower Kuiseb delta and sporadic settlement in the Middle Kuiseb (Eynden *et al.*, 1992; Dierks, 1992). After the German settlement of Windhoek in 1890, the Upper Kuiseb was divided into farming plots for German settlers (WCC, 2008). Today 4000 people, made up of farm owners of European descent plus indigenous worker families, are supported by roughly two hundred commercial cattle farms (Brummer, 2007; pers. comm.). Approximately 400 Topnaar remain in scattered settlements in the delta area pursuing subsistence-based livelihoods centred on goat husbandry and !Nara melon[7] harvesting (Lifalaza, 2006), although the majority of Topnaar now live in Walvis Bay townships (Widlock, 2000). In the last decade, commercial farms and Topnaar communities have begun diversifying into tourism activities (Henschel, 2006; Swartbooi, 2007; pers. comm.), while a growing number of salaried urbanites are purchasing farms in the Upper Kuiseb for 'hobby farming' and recreation (Wittneben, 2007;

[7] The fruit and seeds of the endemic !Nara melon are used by the Topnaar community as a source of food and income (e.g. Seely, 1973; Henschel *et al.*, 2004; Ito, 2005).

pers. comm.). Following recent increases in world uranium prices, prospective uranium mining activities are currently taking place in the Lower Kuiseb based on the successful extraction of uranium in the adjacent Omaruru catchment. At the extreme western margin of the catchment, the 50,000 population of Walvis Bay is ethnically diverse and supported by industrial and service sectors associated with the fishing industry and the municipality (Brummer, 2007; pers. comm.). Despite falling in the zero-rainfall belt, Walvis Bay is included in the Kuiseb River catchment for management purposes, as it constitutes the largest user of water taken from within the hydrologically defined catchment. If one discounts the city of Walvis Bay, the population density of the Kuiseb River catchment is extremely low at $3/km^2$, especially comparison with that of the Kat River catchment. Division of land ownership is similar, although their distribution within the hydrological catchment is reversed; the upper half of the Kuiseb River catchment is private freehold compared with the downstream, state-owned Namib Naukluft National Park. Although Namibian national parks normally exclude human settlement, on historical grounds the Topnaar people are entitled to pursue their livelihoods within the Namib Naukluft National Park. This entitlement does not equate to land ownership by the Topnaar.

Both climate and geology have implications for water-use and storage by Kuiseb residents. Upper Kuiseb commercial farmers retain rainwater in dams that are not permitted to exceed a government specified 20,000 m^3 storage capacity (Wittneben, 2007: pers. comm.). Shallow 'earth dams' reduce evaporation losses by facilitating water infiltration into trapped sediments; water is subsequently accessed via an adjacent borehole. In the past, government support was provided to white farmers for dam construction and maintenance but farmers are now expected to meet such costs (*ibid*). In the absence of *in situ* rainfall, downstream rural communities rely on floods to recharge groundwater. Traditionally groundwater was accessed by downstream communities via hand-dug wells. Now such communities are provided with water from boreholes that are owned by the Namibian Government's 'Directorate of Rural Water Supply' (DRWS) or the parastatal NamWater, albeit on a cost-recovery basis (Werner, 2003). Water from the Kuiseb aquifer is supplied in bulk by NamWater to Walvis Bay Municipality (WBM), who then distribute it to domestic and industrial users. Municipal water-demand correlates strongly with the economic health of the fishing industry (Brummer, 2007: pers. comm.).

The similar histories and resultant socio-economic disparities of the Kat and Kuiseb River catchments outlined above, together with the overarching similarity between water-sector policies and reform (chapter 4), provide a strong foundation for comparative research. The significant differences between the physical contexts of the Namibian and South African case studies are not considered to present an obstacle for a comparative approach to this study, which, as already highlighted in section 3.2, is focussed on a social rather than physical process. Indeed differences in the physical context of case studies, and potentially the issues at stake,

may serve to assist with the analysis of social learning, according to the comparative principle that this research process draw on, which facilitates improved explanation and understanding through the combination of similarity *and* difference between case studies. In this regard, further differences in the operational time period of the two case studies may also shed insight on the temporal dimensions of social learning processes. It is reemphasised that although neither the KatRWUA nor the KuisebBMC were billed specifically as 'social learning' processes; they are nevertheless considered to encompass social learning processes due to the ethos of participation and action research that have guided their formation and, therefore, their synergy with the concepts of social learning presented in sections 2.5.3 and 2.5.6.

3.5) Carrying out research: qualitative inquiry

Qualitative research is primarily concerned with "how the world is viewed, experienced and constructed by social actors" (Smith, cited in Johnston *et al.*, 2005: 660). According to Kaplan & Maxwell (1994) and Denzin & Lincoln (2002), the richer description of social phenomena yielded by qualitative methods, in particular from the perspective of participants, increases the ability for more accurate understanding and subsequent explanation of social processes. A qualitative approach is considered most appropriate for this research because it synergises with the constructivist epistemology underpinning the theoretical perspective and conceptual framework of this (chapter 2), and its aim to improve understanding of social learning processes (section 3.2). This research is also grounded in interpretivism, as alluded to in chapter 2, which essentially views all knowledge as a matter of interpretation rather than a 'truth' (Glesne & Peshkin, 1992). The goal of interpretivism is to make analysis and argument about the phenomena under study as sophisticated as possible (Rabinow & Sullivan, 1987). This goal is pursued within this research by using a multi-method approach, which 'triangulates' across multiple sources of data in order to maximise the understanding and validity of research results and the conclusions that are drawn from them (McKendrick, 1999; Valentine, 2005). With respect to lifestyle and decision making questions, a socially influenced normative answer may often be given irrespective of the behaviour actually practiced (Atkinson *et al.*, 2001). For example, in this research several interviewees highlighted the importance, and consequent use, of pit latrines rather than the bush/riverbank as a toilet facility. However, on several occasions such interviews were followed-up by the researcher asking to use the pit latrine, whereupon the lack of a defined path and well-established vegetation blocking the latrine doorway indicated this practice to be far from the norm. This example illustrates the need for a multi-method approach involving both direct and indirect research methods. Thus, in order to meet the objectives outlined in section 3.2, the concept of a methodological 'tool kit' was adopted for this research (e.g. Narayan & Srinivasan, 1994).

Social learning research does not have a single pre-defined methodology but relies on a variety of standard qualitative techniques, including focus groups, interviews (structured and semi-structured), questionnaires, participant observation, discourse analysis and participatory methods (e.g. Hunt & Berkes, 2003; Reed & Hubacek, 2005; Ison & Watson, 2007; Dewulf *et al.*, 2007). In keeping with this existing tradition of social learning research, both primary and secondary data collection methods were used to elicit information pertaining to the aspects of social learning that were listed in section 2.6. Specific methods that were drawn on included: ethnography (participant observation and informal interaction); interactive methods (individual interviews, focus groups and questionnaires); and content analysis of documents and secondary data. These methods are detailed in sections 3.5.2 to 3.5.4, including an assessment of their associated merits and limitations, after the following section on how the iterative process inductively influenced the method selection and the research process that was followed.

3.5.1) Reflecting on the research process and using the tool kit

The tool-kit approach involves the evaluation of a range of qualitative methods for *potential* use during fieldwork prior to its commencement. The scope for flexibility afforded by an awareness of several methods was important due to the overseas location of case studies that were largely unknown to me (beyond secondary data sources) prior to the fieldwork periods; methods therefore needed to be quickly and easily adaptable once in the field as the understanding of the researcher evolved. For example, the use of workshops to elicit more general views and understandings was discontinued beyond the initial occasion, as traditional social hierarchies meant that workshops proved unsuccessful as a technique for obtaining the views of the diverse members of the community. Additionally, a scoping visit carried out from South Africa to the research site in Namibia highlighted the impracticality of workshops there, because of the large physical distances between stakeholders (section 3.4.4). Consequently, alternative approaches from the tool kit were drawn on, including interviews with key consultants, informal conversations and secondary data sources. In this way, the tool-kit approach allowed the research to be iterative from one case study to the next, rather than confining the research process to a pre-determined and rigid strategy. This flexibility is important, as it is recognised that data availability and method suitability vary between countries due to differences in the social, economic and/or historical context. As a result, time was spent prior to fieldwork researching diverse methods including interviews, surveys, agent-based modelling, participatory methods and social network analysis.

The latter three methods were later rejected due to their inappropriateness to the field research context, which mainly arose from the the time burden that they place on participants vis-à-vis the lack of direct benefit that they engender (discussed further later in this section). For

example, despite the original fieldwork plan incorporating 'participatory methods', such as force-field analysis and diagramming exercises, in order to elicit stakeholders' understanding, knowledge and social networks, these methods were subsequently rejected at an early stage of the field research. A key premise is that participatory methods are designed to engender a greater degree of learning, comfort and empowerment on the part of participants through an emphasis on: understanding complexity and multiple realities; priority research with marginalised social actors; and relating learning to action (e.g. Chambers, 1992; Chambers, 1994b; Pretty, 1995 Rennie & Singh, 1995). Soon after fieldwork commenced, I reflected that the aims of this research would not be enhanced by initiating such approaches because extensive participatory research activities were already being carried out by RU researchers as part of the social learning process under study, such that an understanding of the multiple realities and complexity of issues and knowledges could be gained from observing and, where possible, participating in activities already in progress. Thus, rather than use participatory methods simply because they have recently become the *de rigueur* practice for development-related research (e.g. Mikkelson, 1995; Narayan, 1996; Laderchi, 2001; Campbell, 2002), I felt that conventional qualitative methods of observation, interviews and questionnaires, would be more appropriate for meeting the research objectives despite critiques of their being extractive in nature (Kesby, 2005; Reason & Bradbury, 2006; Pelling, 2007). This study is expected to contribute to ongoing wider academic understanding and future praxis. Although it was anticipated in the early stages of this research that the findings would potentially be useful for institutional members, it was realised in the early stages of fieldwork that this was unlikely to be the case for the reasons of power relations that are discussed later in the thesis. This realisation further influenced the decision to place a greater emphasis on ethnographic methods of observation and informal conversation than originally anticipated, as it was considered unethical to place demands on people's time to participate in a process that was of limited direct benefit to them. Nevertheless, it was believed that focussed reflection on the collective learning process engendered by a formal interview would be of individual benefit to participants through their conscious evaluation of participation and institutional progress to date, thereby stimulating the reflexive element of the learning cycle.

The time burden engendered by interactive research methods was compounded by the historical context of the case studies. Both the wider Kat and Kuiseb River catchments, and the KatRWUA and KuisebBMC, have been subject to research activities conducted largely (but not exclusively) under the auspices of RU and the DRFN and/or Gobabeb Training and Research Centre (GTRC)[8] respectively (section 3.4.2). The extent of their research histories was not fully

[8] Although two separate institutions, the Gobabeb Research and Training Centre and DRFN are strongly associated for historical reasons (GTRC, 2009). Moreover, for reasons of proximity, a significant proportion of their research has taken place in the Kuiseb River catchment.

realised until the commencement of the field research, as a significant proportion of prior research is only reported in grey literature and was, therefore, not readily available in advance of the fieldwork (see section 3.5.4). I felt that social actors within the Kat and Kuiseb River catchments suffered from a high degree of research fatigue, as a consequence of extensive previous research. This concern was shared by other researchers. For instance:

> Although =Aoni [Topnaar] have had little or no say in environmental planning so far, their views are now on record in transcribed interviews...This has aggravated the situation insofar as many =Aoni [Topnaar] today feel that they have given their opinion many times and have answered many questions without any noticeable improvement of their situation (Widlock, 2000: 8). [Brackets inserted]

Thus, as far as possible, the research strategy was altered to minimise the direct time demand on the members of the KatRWUA and the KuisebBMC, as well as other actors within the catchment, in order to prevent further research fatigue through the replication of research activities (including unconscious repetition). This objective was achieved by reducing the level of formal interaction with social actors engaged in the case-study social learning processes and involved increased emphasis on ethnographic methods of observation and informal interviews, as well as increased consideration of secondary data. A consequence of this minimisation of direct interaction with the participants of the process under study is that the interpretation of phenomena is increasingly subject to the bias of the researcher (Denzin & Lincoln, 2002). However, based on ethical considerations, it was felt that in the case studies of this research, the risk of further contributing to research fatigue far outweighed the risk of a reduction in the validity of conclusions. Moreover, given the power dynamics at play in interactive research situations (Mosse, 1994), the procurement of large amounts of data collected via formal means, is anyhow considered unlikely to significantly improve the validity of conclusions (see also section 3.7.1). Nevertheless, in line with the constructivist perspective of this research, a formal interview with each KatRWUA and KuisebBMC member was conducted, in order to allow for multiple perspectives on the respective processes. The need to engage directly with participants was highlighted in the first fieldwork phase: whilst early conversations indicated that the involvement of DWAF in the process had been a negative experience for participants, one interviewee subsequently asserted that "the best thing that ever happened is the involvement of DWAF so when they came we were happy". This example is not intended for analysis here (cf. section 5.5.4), but to justify the use of interactive methods despite the aforementioned research fatigue, in order to reduce the error margin of conclusions drawn from the dataset.

In the South African case study, further efforts to reduce the time burden on KatRWUA members entailed a collaborative approach with RU researchers. This approach was also driven by my impressions that this research was imposing on existing researchers' 'territory', as interpreted from experiences of hostility and informal conversations. Several potential reasons

may have contributed to this experience, including: irritation that overseas researchers usually leave the country after conducting fieldwork, meaning that locally based researchers bear the brunt of any negative research experiences, e.g. 'broken promises' or perceptions thereof; jealousy that overseas researchers often have higher research budgets; and personality clashes between myself and others. Thus, in order to minimise inter-researcher hostility and to respect local needs of research sustainability via the minimisation of time demands on KatRWUA members, collaborative and informal approaches were pursued. The positive aspect of this collaborative ethos was that 'raw' data, such as interview transcripts obtained by other researchers, were made available for my use. Transcripts from my interviews and focus groups were correspondingly left with the RUCRG for reciprocal use. The downside was that this approach inherently involved increased reliance on secondary data. However, this reliance is not thought to affect negatively the reliability of subsequent conclusions that are drawn from the secondary data for the following reasons:

- the collectors of the secondary data were known to me to be of high personal integrity;
- on some occasions, joint interviews were carried out with the collectors of the secondary data, during which I was able to ascertain their high levels of interviewing skills and data recording reliability; and
- the collectors of the secondary data have a long and positive history of working in the Kat River catchment, and a good rapport with residents generally.

Further details pertaining to the use of secondary data, and their limitations, are provided in section 3.5.3. Another reason for differences in the activities carried out between the KatRWUA and KuisebBMC case studies is that the original objective of this research was modified after the first fieldwork phase. According to Hammersley & Atkinson (1995: 37), this alteration is not unusual in ethnographic research where "the development of research problems is rarely completed before fieldwork begins; indeed the collection of primary data often plays a key role in that process of development". In line with the observation of Hargreaves *et al.* (1975) that too many research questions are often generated at the outset of ethnographic research, it was realised during the first fieldwork phase that the original research objective was too broad in scope for the temporal and financial parameters of the research. Originally, the aim had been to investigate fully both organic and managed concepts of social learning (chapter 2.5), which would have required extensive interactive research activities with wider social actors i.e. those outside of the formal learning spaces of the water-management institutions. Upon reflection, it was decided to adjust this original aim to focus instead on the managed social learning process of decentralised water-management institutions. This decision did not preclude a relationship between organic and managed social learning process (cf. section 2.6), but reduced the *main* unit of analysis to that of the formal institutions. Thus, whilst several interactive research

activities (described in the following section) were carried out with catchment actors beyond the KatRWUA in the Kat River catchment, this aspect of fieldwork was reduced in the Namibian fieldwork phase. Nevertheless, such information remained useful for yielding a more complete picture of the wider social context, within which the managed social learning processes took place, which is considered important for political ecology and qualitative research (e.g. Denzin & Lincoln, 2002; Neumann, 2005).

3.5.2) Practising ethnography: Watching, waiting and assimilating

Trochim & Donelly (2007) propose that qualitative research involves viewing social phenomena in their context, in order that they are viewed within their whole rather than an artificially divided 'reality'. This outlook is based on the premise that a higher degree of understanding of social practices and beliefs can be attained when "interpreted in a contextual and holistic manner" (Jackson, 2005: 238), which in turn implies an ethnographic approach. This approach necessitates a significant temporal period of field-based research (Cook *et al.*, 2005). Two six-month periods of fieldwork were conducted, in order to yield a fuller comprehension of the social learning processes within the context in which they are embedded (Cook & Crang, 1995; Johnson, 2000). In practice ethnography involves, "watching what happens, listening to what is said, asking questions – in fact, collecting whatever data are available to throw light on the issues that are the focus of the research" (Hammersley & Atkinson, 1995: 1). The ethnographic approach was adopted based on its ability to meet all the objectives outlined in section 3.2 through my participation in, and observation of, the processes of social learning within the KatRWUA and the KuisebBMC. Of note is that I opted to live close to, but outside of, the Kat and Kuiseb River catchments during field work periods. The main reason for this decision was a desire not to become strongly associated with any particular stakeholder group and to retain 'neutrality', which may have inordinately skewed my evaluation and perceptions of the social learning processes through differing personal relations with the research participants. In addition, this research was predominantly focussed on the institutional processes of the KatRWUA and KuisebBMC, whilst the rural nature of the research catchments afforded low conduciveness to the pursuit of other research activities and personal life in between their respective activities.

For the duration of both fieldwork phases, I attended the meetings, events and workshops associated with the respective institutions. Depending on the circumstance, my role at KatRWUA and KuisebBMC meetings varied between passive and active. In the Kat River catchment, RU reseachers were in the process of facilitating institutional transformation using an action research approach (section 5.2.1). Thus, as part of the RU catchment research group (RUCRG), I took an active part in these research activities when required, usually as group

facilitator, scribe or participant; otherwise my role remained that of a passive observer. At KuisebBMC meetings, I was asked to assume the role of secretary. Occasionally I asked for clarification on issues within the meeting setting if I felt that the matter was relevant to the proceedings. Otherwise, I waited until breaktimes when I was able to approach the relevant participant(s) for clarification.

An active research strategy to maximise contact with KatRWUA and KuisebBMC members beyond the direct institutional events was also pursued, not only in order to improve my understanding of the social context of the catchment and the issues of relevance to stakeholders, but also to build up a rapport of trust and familiarity with participants. Ethnographers (e.g. Stanfield & Rutledge, 1993; Kvale, 1996; Agar, 1996) observe that such familiarity increases the quality of the subsequent interviews and informal conversations. Thus in order to maximise interaction with institutional members, events beyond the KatRWUA and KuisebBMC meetings, at which one or more members were likely to be present, were also targeted for attendance. This outreach strategy was particularly important in the KuisebBMC case study, which only meets quarterly; otherwise the seven-month fieldwork duration would only have permitted very limited direct contact and familiarity with KuisebBMC members. Of note, were a series of meetings pertaining to the formation of the Omaruru Lower-Swakop Basin-Management Committee (OLSBMC), which were attended by several KuisebBMC members, and, in the KatRWUA case study, the meetings of the Kat River Catchment Forum[9] (KatRCF), as they were also attended by several KatRWUA members.

Participant observation at events described in the previous two paragraphs addresses the social involvement and content management aspects of the conceptual framework of social learning (section 2.6). My observation notes at meetings drew on Wolcott's (1990: 32) key observation questions, as they fit well with the objectives of this research:

- What is going on in the setting?
- What do people in the setting have to know, in order to do what they are doing?
- How are skills and attitudes transmitted and acquired?

The series of questions and topics that were derived from the theoretical literature and identified throughout chapter 2 were also used to focus observations (see appendix 1). Consequently, my observation notes adhered more closely to Sanjek's (1990) approach of 'systematic' recording than to a 'stream of consciousness' technique (Emerson *et al.*, 1995). As far as practically

[9] The KatRCF is a loose association of small-scale farmers and domestic users formed as a result of a previous action research project (Motteux, 2001; Burt, 2006). Activity by the KatRCF was largely dependent on funding by RU or other research projects (Simpungwe, 2006)

possible, observations from meetings and events were recorded in situ, as the quality of notes is observed to diminish with time after the event (*ibid*; Hammersely & Atkinson, 1995).

The disruptive impact of the 'observer effect' on the process under study is frequently highlighted as a limitation to participant observation (e.g. Morrison, 2002). However, in addition to my explicit attempts to increase familiarity with KatRWUA and KuisebBMC members (above), this impact is likely to be of relatively low significance in the case studies due to their high previous exposure to researchers. Moreover, despite constituting a clear acknowledgement of my presence, my role as scribe at several of their meetings rendered me effectively unobtrusive because I was, in outward appearance at least, recording the minutes rather than writing notes about people ostensibly. When my participation in an activity prevented me from making notes at the time of occurrence, initial observation notes were made as soon as possible afterwards. As advocated by Tolich & Davidson (1999), observation notes were expanded on after the event, usually on the same day, in order to incorporate mental reflections on the situation that had just passed. This strategy allows the retrospective reflection on incidences that occurred over the duration of an event in relation to one another, compared with in situ note taking, which is more focused on describing the unfolding event.

Ethnography also confers research utility on informal conversations as 'interviews' (Agar, 1996; Patton, 2002), as they allow the researcher to view a process through others' eyes and are often held to offer a more honest insight into social actors' opinions, worldviews and practices (Kvale, 1996). Due to the research fatigue predicament that was highlighted in the previous section, the use and role of informal conversations in this research was augmented over the research duration. The strategy of maximising researcher-subject interaction (outlined above) increased the opportunity for such informal interviews, in addition to its original purpose of building trust and familiarity. Several informal interviews with KatRWUA and KuisebBMC members were obtained in this way. My attendance at wider relevant events (see earlier) also allowed me to obtain informal interviews with 'key informants', such as policy-makers, institutional representatives, independent consultants and government officials. Key informants allow the researcher to tap into the knowledge of others who have lived and/or practiced within the area under study for a significant time period, and are consequently thought to provide a more comprehensive understanding of the research context (Corbetta & Patrick, 2003; Delgado, 2007). Key informants of this research included government agency officials, independent water-sector consultants, and research and development organisation staff. This approach yielded insight into the issues pertaining to catchment stakeholders, the modes and magnitude of stakeholders' water-use, the historic changes in the catchment's social and physical context, and the outcomes and actions arising from collective processes. However, caution is used when drawing on quotes from informants, as it is acknowledged that conversations reflect the

opinions, experience and observations of social actors, who are neither objective, nor value-free (e.g. Tolich & Davdison, 1999). For example, a key informant remarked that:

> If they [members of a case study institution] are not going to do anything with the information then what's point? They have to act on it, that's the whole point, otherwise this whole thing is a waste of time.

The quote clearly expresses the informant's personal expectations and hopes for the case-study institution, as well as their interpretation of relevant policies and discourses. The positionality of key informants' assertions is therefore considered within this research (section 3.7.1).

The main drawback of informal interviews is that notes could not be made on the spot, as this counters the purpose of a more relaxed, informal setting and can make the subject nervous (Hammersley & Atkinson, 1995). Any recollection of such conversations may therefore suffer from inaccuracies associated with recall (*ibid*). To minimise this source of error, a set of keywords were memorised and the conversation written up as soon as and as accurately as possible afterwards. Hence quotes taken from such conversations are not verbatim but are thought to constitute a sufficiently accurate reflection for the purposes of this research. A more significant drawback to the use of informal conversations in the context of this research is that they were more likely to be conducted with participants who shared a common language with the researcher. Time constraints prevented the learning of Xhosa and Afrikaans, such that informal conversations were inevitably biased towards English-speaking KatRWUA and KuisebBMC members and informants. Though of low relevance to the KuisebBMC, amongst whom English fluency is high, this drawback is significant to the KatRWUA case study. In an attempt to overcome such bias, informal conversations with my translator (discussed further in the next section) were relied on for added insight into the KatRWUA process (e.g. Mathers, 1996; Herod, 1999). Through ongoing employment by RU researchers over the duration of the KatRVP, my translator was very familiar with the Kat River catchment and had been able to forge a more substantive relationship with Xhosa-speaking KatRWUA based on their shared language and cultural background (Mathers, 1996). Conversations with him therefore allowed me to interpret more effectively the KatRWUA process from Xhosa-speaking participants' perspective in light of the linguistic barrier to personally holding informal conversations with them. Although translation inevitably raises the potential for misinterpretation (Denzin & Lincoln, 2002; Scheyvens, 2003), the translator's high level of English fluency, experience of research related to water-management concepts and familiarity with the Kat River catchment and its residents, is considered to have *minimised* misinterpretation of questions and responses. Moreover, in the wider context of interpretivist research, which entails concerns about the subjective translation of language more generally (Clifford & Marcus, 1986; Barnes & Gregory, 1997), the impact of English to Xhosa translation and *vice versa* is considered negligible.

3.5.3) Asking questions: Interviews, questionnaires and focus groups

Standard methods for assessing adaptive water-management include the participants' evaluation of the process via interviews or questionnaires alongside the researcher's observations (Dewulf *et al.*, 2007). Thus, in order to view the social learning processes from the perspective of those engaged within them (Kvale, 1996), interviews with KuisebBMC and KatRWUA members were conducted. Semi-structured interviews were chosen to elicit participants' perspectives on the social learning process because they allow for a structured dialogue, yet retain flexibility for tailoring to individual respondents depending on the nature of responses already provided during the course of the interview (Kvale, 1996; Valentine *et al.*, 2005). These interviews were used to variably solicit information on: institutional history; information and knowledge transfer; participation and motivation; institutional objectives and activities; relational changes; learning (personal); and institutional outcomes. Although literal transcription is generally considered optimal (Crang, 2001), this was not always possible for maintaining the flow of conversation at interviews and focus groups. In accordance with the precedence set by RU researchers, interviews with KatRWUA members were not tape-recorded. However, detailed in situ notes were made possible by the collaborative approach (section 3.5.1), which allowed one reseacher to conduct the interview whilst another took notes. In contrast, interviews with KuisebBMC members were tape-recorded once permission from interviewees had been granted.

At the time of my fieldwork in South Africa, ongoing research activities and institutional development continued to place a significant time burden on KatRWUA members, such that research fatigue was high (section 3.5.1). Interview questions for this research were therefore combined with an evaluation of the companion modelling (ComMod) approach, which is being piloted in several countries (e.g. Gurung *et al.*, 2006; RMAP, 2006), and the KatAWARE model (see section 5.2.3). Many of the evaluation questions were similar to those identified as relevant for the purposes of this research, albeit designed for explicit reference to the KatAWARE model. However, based on the trial interviews, it was widely felt and reflected amongst the interviewing researchers that the majority of KatRWUA members had been unable to distinguish between the model activities *specifically* and other research and Kat River Valley Project (KatRVP) activities, as illustrated by an interview extract:

> [Interviewer] Why are you participating in the KatAWARE process using the model?
> [Respondent] The reason why I am participating is because I'm a member of the WUA. I want to be involved in the Kat River management team because I am also one of the guys that uses water from the river so it is good that I am there or someone that represents me with these issues.

Further analogous examples are presented in section 6.2. Results from the KatAWARE evaluation process were therefore considered suitable for extrapolation to the KatRVP as a whole for the purposes of this research. Participating researchers agreed that the results of such interviews could be used by all parties for respective purposes following acknowledgement of this collaboration. It is accordingly gratefully acknowledged that Jane Burt, Monde Ntshudu and Hlengiwe Gumede also undertook the interviews with KatRWUA members that are drawn upon in the thesis. Whilst many of these questions incorporated the evaluative and reflective element of questioning required for the purposes of this research, a limited number of my own questions were also added to the interview schedule.

Accessing KuisebBMC members was comparatively easy. I used my introduction at a formal KuisebBMC meeting to highlight the purpose of my research and my intentions to interview KuisebBMC members. After my attendance at further events (to secure increased familiarity), KuisebBMC members were contacted to solicit an interview with them. Although Delaney (2007) and Fontes (2008) advocate a neutral setting to both researcher and participant for interviews, interviewees of both case studies were given the opportunity to select times and locations most convenient to them in view of the logistical implications of large catchment distances, a lack of public transport, and the socio-economic disparities amidst KatRWUA and KuisebBMC members. KatRWUA and KuisebBMC members were also asked to complete short questionnaires (appendices 2 and 3), which were available in Xhosa for KatRUWA members. Although research participants were not compensated for their time, they were given small tokens of appreciation on relevant occasions. For example, KuisebBMC respondents were given soft drinks for their journey home from meetings whilst KatRWUA members were given a 'mystery gift' (e.g. penknife, playing cards etc), as it was the last meeting before Christmas.

In order to get a further sense of the issues and concerns alongside more general knowledge and understandings, of the catchment stakeholders, focus groups and interviews were carried out within two communities of the Kat River catchment (see appendices 4 and 5). After conversations with RUCRG researchers, a village of a 'manageable' size and where little previous research had been conducted was selected, in order to be practically feasible and to minimise my contribution to research fatigue amongst catchment residents. The village committee was then approached via the KatRCF representative, for permission to conduct interviews in the village. This was initially granted, such that occasions to interview households and hold focus groups were arranged. It was decided to approach every household in order to build up a picture of the level of intra-community variation and because my translator felt that it would be better to interview everyone so that suspicion was not cast on households via random selection. After all the household interviews and two focus groups had been undertaken, many villagers secured employment digging channels between a proposed cheese-making factory and

the Kat River. Given the topic of this research, and my translator's and my association with the KatRWUA, we expressed an interest in this activity. On our subsequent visit to conduct the remaining focus groups, the village committee informed us that we were no longer permitted to carry out research in the village and that we should leave. From this reversal and the activity witnessed, it was assumed (but not substantiated) that water was going to be withdrawn from, or effluent released into, the Kat River. As a result, villagers were probably concerned that we would attempt to stop them and/or report them to authorities, which could result in their subsequent loss of employment. A further two focus groups and two in-depth interviews were thus carried out in the adjacent village.

Focus groups, in which four to eight people were present, were also used to provide an insight into the worldviews, understandings and desires of catchment residents with regards to water management strategies and the place and functioning of water resources within the 'world'. Several households were approached and asked if they would be willing to participate and procure participants. Although some households declined for reasons of mistrust, apathy or illness, five requests were affirmative. Convenient times were arranged with the initial contact and it was left up to them to decide who to invite. Inadvertently therefore, focus groups reflected a mix of age and gender, although a gender bias towards women was observed. This bias would have been difficult to overcome, as many males of the Kat River catchment seek employment outside the area or are occupied locally with farming activities during the day. Translation of focus group proceedings was difficult, as the conversation would often flow rapidly and simultaneously between participants. Real-time notes were summarised to a higher degree than interview notes, but were subsequently expanded on. A downside of focus groups is that they may be strongly subject to the impact of social hierarchies, allowing 'elite' actors to dominate proceedings (Goss, 1996). 'Elite' may denote gender, age, socio-economic class or social status according to the cultural context (Kendall, 2002; Veneklasen & Miller, 2007). Further analysis of social hierarchy in the South African and Namibian contexts is therefore salient to this research and is provided in chapter 4. Whilst individual dominance within focus groups was observed to be variable, such variation was apparently according to personality rather than overwhelmingly demarcated according to gender or age.

As the population in the Namibian catchment is low and spread over large distances (section 3.4.4), secondary data sources and informal interviews with key informants were utilised to obtain data pertaining to the hydrological knowledge of, issues of concern to and water use by Kuiseb River catchment stakeholders. Although questionnaires were also given out to members of the public at the Gobabeb open day (appendix 6), only ten completed questionnaires were ultimately returned. Moreover, due to the event location of a remote research station, their contents are also likely to be biased towards a minority affluent socio-economic group, whose

water issues and understandings of hydrological processes are likely to have differed from those of the majority population. Due to their limited representativeness, these questionnaires were not used subsequently to answer specific research questions but nonetheless provided limited insight into public understanding of water resources and water use, compared with those of the global discourse and national policy. Additional questionnaires that were given to individual KuisebBMC members (see appendix 3) were, however, used to assess changing stakeholder relations over the course of the social learning processes, the results of which are presented in figure 6.1 (section 6.4.1).

3.5.4) Drawing on secondary data

Secondary data, pre-existing data generated by other actors, provides an important source of information for qualitative research (Patton, 2002; Schutt, 2006). Indeed the literature review in chapter 2 largely draws on published secondary data. Of further relevance to this research is unpublished data, widely termed 'grey literature', which can have the advantage of being recent in nature, detail-rich, and highly influential on social practice (Debachere, 1995). However, due to its lack of commercial publication, grey literature is harder to source and often remains locally distributed (Augur, 1989). For this research, initial periods at the outset of fieldwork phases were specifically incorporated for the collection of grey literature. Key sources of grey literature that were drawn on by this research include:

- Unpublished theses and academic interview transcripts; in particular, Jane Burt and Helen Fox are gratefully acknowledged for having provided transcripts from their 'Kat story' and 'ecological goods and services' interviews respectively;
- Legal and policy documents e.g. White Papers, statutes;
- Government statistics and survey data e.g. Census data;
- Research and/or development project reports, including reports produced by the DRFN's ELAK project (section 5.3.1) and by RU's KatRVP (section 5.2.1);
- KatRWUA and KuisebBMC official documents e.g. meeting minutes, constitutions; and
- Local media articles about the KatRWUA and KuisebBMC.

Secondary data was used for two purposes in this research: to provide background information on the historical, physical, socio-economic and policy contexts, in order to inform case-study and methodological selection; and to analyse the aspects of the social learning process according to the conceptual framework in section 2.6. It is recognised that a critical approach is necessary when using secondary data, as the collection of such data incorporates subjective selection process, inaccuracies and agendas (Lancaster, 2004; Swart, 2005). However, given that this research is less concerned with the accurate representation of a 'reality', which is

considered subjective under the interpretivist stance of critical realist political ecology, the accuracy of specific figures sourced from secondary data is not thought to reduce the validity of this research significantly. Concerns also exist about qualitative data being analysed 'out of context', leading to errors in meaning and explanation (e.g. Corti, 2000). This concern is mimised in terms of my use of raw interview transcripts, as the ethnographic fieldwork yielded high familiarity with the participants and researchers, and their physical and social settings. Indeed, my lack of control over the information within secondary data meant that such data that was free from my own bias and theoretical sensitivity but remained of high relevance to this study, due to its water management-related nature. Secondary interview transcripts therefore had high utility in terms of preventing data 'forcing' (section 3.6). KatRVP and ELAK project reports were analysed more critically, as they primarily constitute reflections on the case-study processes from the implementers' and facilitators' perspectives. As RU and DRFN have a vested interest in reporting 'projects' in a successful light, in order to secure kudos, academic outputs and future funding, such reports may be positively biased. Interviews with KatRWUA and KuisebBMC participants incorporated evaluation questions on the process, in order to mitigate this effect and to view the respective processes from multiple perspectives. Table 3.1 summarises all the data collected from the research activities described above.

Table 3.1. Summary of the data collected for this research

Data type	Fieldwork phase 1: South Africa	Fieldwork phase 2: Namibia
Participant observation notes	• KatRWUA meetings (6) • KatRCF workshops and meetings • Kat River Valley Project planning meetings and progress meeting • Catchment-management plan workshop (main workshop and pre-workshops) • KatAWARE model workshops (2) • Upsher farmers meeting	• KuisebBMC meetings (2) • KuisebBMC stakeholder forum • OLSBMC meetings (2) • Kuiseb Master Plan development meeting
Interviews, focus groups & questionnaires	• KatRWUA member interviews (9) • Household interviews (24) • Community focus groups (4) • Questionnaire to participants at the catchment-management plan workshop (21) • KatRWUA member questionnaires (9) • DWAF official (1)	• KuisebBMC member interviews and questionnaires (11) • Commercial farmer (1) • Agricultural extension officer (1) • DWA official (1) • Topnaar community member (1) • Questionnaires at GTRC open day (10)
Field diary	• Record of field observations in the Kat River catchment and informal conversations with Kat residents, KatRWUA members, translator and RU researchers	• Record of field observations in the Kuiseb River catchment and informal conversations with KuisebBMC members, Kuiseb residents, DRFN and GTRC staff, DWA officials and independent consultants
Secondary data	• KatRVP reports • PhD and Masters theses centred on the Kat River catchment (from RU library) • KatRWUA meetings minutes (incomplete record) • Goods and services interview transcripts (Fox, 2006) • Kat story interview transcripts (Burt, 2006)	• ELAK reports • KuisebBMC meeting minutes • KuisebBMC constitution • Research reports centred on the Kuiseb River catchment (from DRFN and GTRC libraries)

3.6) Analysing the data

All interview transcripts, observation notes, field diaries, questionnaires and secondary data were analysed according to the qualitative technique of data coding, which is central to the Grounded Theory (GT) approach (Glaser & Straus, 1967). Coding involves "sorting and categorising data", in order to assist conceptual and theoretical development (Lofland & Lofland, 1995: 186). This process encompasses data storage, retrieval, comparison and linking, which can be assisted by computer software (Patton, 2002). Thus, for this research, coding was carried out using the qualitative software package NVivo™ (QSR International, 2005). The decision to use NVivo over other software packages was due to its relative ease of use (see Morse & Richards, 2002) and the availability of NVivo training offered by Sheffield University.

Importantly, whether performed manually or with the assistance of software, coding essentially involves a human process of selection and ascription of meaning (Berg, 2001; Patton, 2002).

The selection process is influenced by the researcher's 'theoretical sensitivity'; which is determined by a relative awareness of pre-existing literature (Glaser, 1992; 1998). A literature review of social learning and water management (section 3.4) was used to develop a set of themes and research questions that guided preliminary analysis (appendix 7). Thus, data 'forcing' may inadvertently apply to the research findings, in spite attempts to mitigate this effect. For example, an inductive element was maintained by 'open coding' the initial dataset, in order to overcome the preclusion of additional relevant themes as recommended by Strauss & Corbin (1990). Through this process, collected data was assigned to 'codes' (termed 'nodes' in QSR NVivo), which can then be used to build a core set of thematic headings. These headings were derived from both the theoretical literature and the data itself (e.g. Hall & Callory, 1990). Codes were then aggregated into concepts through a process of grouping and merging. Successive coding of the initial dataset, and coding of the second dataset, then involved a more selective or 'focused' process of coding according to these concepts (Strauss & Corbin, 1990). Importantly, the essence of GT also invokes a process of theoretical and conceptual development in tandem with data collection (Glaser & Strauss, 1967). To meet this philosophy, working documents entitled 'theoretical thoughts' and 'similarities and differences' were continually added to, reflected on and reworked throughout the duration of fieldwork periods.

In addition to ongoing theoretical development, a second stage of analysis specifically involves theorising and conceptual development once the coding process is complete. Informed by Lofland & Lofland (1995) and Tolich & Davidson (1999), this process was achieved by four main processes for this research: grouping similar concepts into categories in a process of data 'winnowing'; comparison of categories against core themes identified from the theoretical and empirical literature (chapter 2); the continual re-reading of the dataset, in order to increase sensitivity to the significance and meaning of various data; and the constant comparison between people, places, and times, in order to increase explanatory insight through the presence of differences, anomalies and contradictions. These activities triggered a process of drafting and redrafting after the completion of both phases of fieldwork, which ultimately led to the conclusions that are presented in chapter 9. As necessitated by the interpretivist perspective of this research, it is recognised that coding and conceptual development both constitute subjective processes, which are affected by the worldview, value system and experience of the researcher.

3.7) Reflecting on the researcher

It has been highlighted in other sections of this chapter that neither data collection nor data analysis is a neutral process. The interpretivist stance of this research views the researcher as inescapably part of the research process, whilst the social realm can only be understood from a relative position and experience within it (Rabinow & Sullivan, 1987; Mullings, 1999; Limb &

Dwyer, 2001). According to Hammersley & Atkinson (1995: 15), "there is no way in which we can escape the social world in order to study it", such that subjective judgement cannot be avoided. Reflexive deliberation on researcher positionality within the system under study is therefore considered an important aspect of interpretive research (Rose, 1997; Twyman *et al.*, 1999; Clifford & Valentine, 2003). For instance, Robson & Willis (1994) and Mullings (1999) illustrate how researcher attributes of race, gender, religion and language affect the research process and choices, especially in fieldwork in other cultures. Batterbury (1994), Mohan (2002) and Haney (2002) also call for the researcher to critically reflect on their position within networks in relation to loci of power, which affects participants' responses. In view of these insights, the following section explores how my positionality may have influenced this research.

3.7.1) Positioning the researcher

Personal characteristics of the researcher are salient to social research, mainly because they influence the degree to which a researcher is perceived as an 'insider' or 'outsider' (Hammersley & Atkinson, 1995; Watts, 2006; Hellawell, 2006). Whilst it is impossible to overcome physical aspects of race, age and gender, conscious efforts were made to minimise awareness of my presence and 'otherness'. For example, based on Turner's (2008) consideration of self-presentation, I opted to wear neutral-coloured, unbranded clothing and remove jewellery when attending meetings in order to reduce 'ostentatious' symbols of wealth and to minimise distraction to participants. I also endeavoured to follow the advice of Torrington (1991) regarding interview behaviour, adopting a 'neutrally interested demeanour' and the avoidance of overt expressions of shock and surprise. Nevertheless, it is acknowledged that my personal background of a first-world upbringing means that I come to this research from a *relatively* socio-economically privileged background, and a *relatively* equitable socio-economic and gender context. My interpretations of social features and processes, such as poverty and empowerment, are likely to be influenced by this positionality. For example, based on one participant's lack of verbal contribution to several consecutive meetings and seeming disengagement from the proceedings, my observation notes recorded that "[Participant] is totally marginalised and disempowered at this meeting, she may as well not be here". However, when subsequently interviewed, the participant asserted that she was enjoying participating and felt that she could say what she wanted at meetings. However, later in the interview, she further reflected that, "I never thought that I could sit with large-scale farmers (...) and so I am glad that I can sit around the table with those people". Informed by this new insight into her personal history, my subsequent notes on this interview recorded that, "she seemed grateful even just to be there, that she could be part of a process which has long excluded black South Africans and women, so it doesn't really matter so much whether she gets to say anything or whether it meets her objectives but just to be there is significant". Whether this event has been 'correctly'

interpreted or not, the example remains useful for illustrating how personal experience and history are likely to affect the meaning and judgement of both the researcher and the researched. This example also justifies research efforts to acquire an in-depth comprehension of the socio-cultural histories of the case-study catchments, which are summarised in chapter 4, and highlights the importance of data triangulation – both between different sources of primary data and across primary and secondary data sources. Thus, the data collected for this research was triangulated during the analysis phase, in order to reduce the potential for its misinterpretation.

Gender also constitutes a significant dimension of the researcher-researched relationship (Hammersley & Atkinson, 1995; Warren & Hackney, 2000). Research variously illustrates how being female may lead to exclusion or sidelining (e.g. Gurney, 1985; Golde, 1986; Robson & Willis, 1994), or conversely, that being female can be advantageous for eliciting information (e.g. Warren, 1988; Bell *et al.*, 1993). Extracts from my field diary suggest that my gender was unlikely to have negatively impacted on data collection activities. Moreover, despite taking place within a patriarchal society that generally confers higher social status and decision making authority on male members (section 4.4.5), my position as an 'outsider' largely freed me from such normal host-country gender restrictions (Rainbird, 1990; Venkatesh, 2002). Of more likely significance to this research is my racial origin, in view of the historical context of South Africa and Namibia (Kobayashi, 1994; Besio, 2003), as being 'white' comes with a context-specific history of privilege and power. On one hand, this history may have engendered a degree of expectation on the part of some research participants. Alternatively, in light of the white ethnic groups' past discrimination of other indigenous ethnic groups, hatred and hostility may also have been felt by others towards me. Both of these responses were observed at various times during the wider fieldwork periods but were not identified to have affected my relationship with the KatRWUA and KuisebBMC members specifically, whom, if not ethnically white, were used to interacting with white researchers and development practitioners as a consequence of the process histories that are presented in detail in section 5.2.

My association with RU and DRFN is likely to have had an impact on this research due to 'power by association' (Twyman *et al.*, 1999; Mohan, 2002). The two fieldwork phases entailed different levels of association and collaboration with host-country institutions. In Namibia, DRFN facilitated this research process by assisting with official stipulations for conducting research in Namibia, and by providing me with a workspace. However, as DRFN was not actively engaged with the KuisebBMC at the time of this research (section 5.2), no active role on behalf of DRFN was conferred upon me through this affiliation. Hence my status as an overseas researcher was ultimately retained. In contrast, RU have been actively involved with the KatRWUA since its transformation from the Kat River Irrigation Board in 2003 (also discussed further in chapter 5), such that my alignment with RU conferred a more active role

through my inclusion in the research group as well as a strong associated identity. However, as the following extract from my Namibian field diary illustrates, my identity with the host-country institutions is likely to have been pervasive:

> I am annoyed today. [Mr X] has been complaining to DRFN that I have not invited them to the KuisebBMC's meeting [wider stakeholder forum] so why hadn't DRFN invited them, and why were DRFN ordering them about etc etc. I simply offered to help organise the forum because I have time available and I know the others are busy. But because I'm based at DRFN, [Mr X] apparently thought that DRFN was therefore 'organising' the event and was put out that he hadn't been invited. Also, because I had sent an email to the KuisebBMC members asking them to pass on the invitation details to people they thought might be interested, another person was annoyed that DRFN was 'ordering him about'. So they complained to the [ex-Director] of DRFN! I only did the invitation because I thought it would help! [Emphases in original]

In this example, an identity was demonstrably conferred upon me, due to my association with a local institution. Nonetheless, Mullings (1999) also posits that identity and positionality can be consciously altered. For example, the relationship between the researcher and host-country institution was deliberately played down when the target interviewee was known to have had a troublesome relationship with the host-institution, but was drawn upon when it was felt that this association was more to secure interviews. However, negotiating this identity was difficult, as alignment with host institutions may have had contradictory effects on the research process depending on the historical relationship between the host-institution and the research participant, which I may not have been aware. For example, DRFN is a relatively high-profile research and development institution with a focus on environmental issues. Although it has a history of positive relations with the communities amongst which it has operated, working relations with government institutions or personalities have not always been smooth. Whilst my alliance with DRFN may have been beneficial in terms of securing interviews, rather than 'just another researcher from abroad', it is recognised that other interviewees may have been more guarded with their responses as a result.

Ascertaining the type and level of impact of association with RU is also complex, due to the myriad history of research projects in the Kat River catchment that have shaped residents' relations with, and opinions of, RU. Research and development projects associated with RU have provided economic income (e.g. translation, food provision, and project work), skill development (IT courses), and assistance with infrastructure development (see Perks, 2003). Residents who had been positively affected by such projects in the past were therefore likely to have been keener to participate in research than those who had not benefitted. Community expectation and attitudes towards RU are also likely to have been complicated by individual research histories. For example, one researcher had invested personal time and resources into assisting a community achieve their aspiration of a bridge. Although the project's success is

likely to have resulted from the efforts of the community *in conjunction* with the researcher, the researcher's overlapping identity as an RU student is likely to have generated an expectation of the institution as a whole and, consequently, subsequent research activities associated with RU. Thus, in contrast, subsequent research activities may be perceived as a disappointment in their failure to produce tangible benefits thereby contributing to ill-feeling towards RU. Extensive community consultation, in order to satisfy RU's participatory research approach and the demands of DWAF for 'participatory' water-management, vis-à-vis the lack of tangible benefits for communities to date may have contributed to a negative perception of RU. After a hostile reaction in one village, my translator revealed the salience of this issue, commenting that "some people here have been saying bad things about Rhodes because [next community] got the jobs and the money from the Landcare project and they didn't get any here".

These power relations may account for differences between observations made at KuisebBMC and KatRWUA interviews. For example, KuisebBMC members appeared relaxed and candid when being interviewed. In contrast, some KatRWUA members appeared uncomfortable and nervous during interviews. Such behaviour is interpreted later to signify a fear of giving the 'wrong' answer and thereby jeopardising chances of future employment by RU projects (section 5.5.5). Thus, the presence of RU researchers (including myself) may consequently have elicited positively biased answers with respect to participation in, and evaluation of, the social learning process. My 'piggy-backing' on existing research processes meant that the majority of interview questions were circumscribed by the requirements of the KatRVP and that my research was subordinate to pre-existing, ongoing research projects, thereby placing RU in the role of 'gatekeeper' in terms of my access to the KatRWUA (Mandel, 2003). I was thus less able to triangulate results as critically, or to follow the extent of my own research questions, as desired on occasions. This association also meant that the prevailing methodological norms were followed, as illustrated by the decision not to tape-record interviews (section 3.5.3).

Aside from my own positionality, section 3.5.3 also highlighted the need to consider the positionality of participants in ethnographic research. Section 2.2 underscores the recognition that water issues vary with water-user type, relationships with the water resource, water-management scale and personal characteristics. To this end, limited informant attribute data are provided alongside quotes where it is felt that specific characteristics influenced their content. The ethics section below justifies why the provision of attribute data are nevertheless restricted.

3.7.2) Considering others

Prior to conducting this research, ethics approval was granted by Sheffield University. Ethical guidelines of the Development Studies Association (DSA) and the Developing Areas Research

Group (DARG) were then followed during field activities, such as pointing out the right of participants to withdraw from, or terminate their involvement in interviews and focus groups at any stage. Host institutions initially introduced me at KatRWUA and KuisebBMC meetings, at which short overviews of this research were provided. Attending members were given the opportunity to ask further questions. Although the research was carried out openly, in order to meet ethical considerations (Hammersley & Atkinson, 1995), my ability to provide a comprehensive overview of research was constrained in the early stages by the grounded theory approach of this research, which advocates continual reflection on and revision of research objectives and methods (section 3.6). Research descriptions were also kept deliberately broad, in order to prevent responses from being influenced by interviewees' perceptions of 'desirable' answers (Patton, 1987; Kvale, 1996). Finally, a copy of my thesis was promised to RU and DRFN to facilitate subsequent access to my research findings. Copies of this thesis will be sent once the viva process is complete.

During data collection phases, concerted effort was made to respect people around me by seeking cultural advice regarding host-country norms of appearance and behaviour. In accordance with 'good practice' guidelines (Saunders *et al.*, 2003), interviews commenced with: an expression of gratitude for the interviewees participation; an outline of the research; an assurance of confidentiality; iteration of the right to pass on questions and/or terminate the interview; and an estimation of the length of the interview and rough content of questions. Confidentiality was thought to be of high importance, as water is a political issue in Southern Africa (section 4.2.3). In light of the victimisation and harassment of Southern Africans and Namibians who hold opinions that are contrary to those of the dominant political parties (also in section 4.2.3), the anonymity of sources is therefore protected (Baez, 2002). A further reason for maintaining source anonymity is based on the acknowledgement that the assertions, observations and conclusions within this thesis are subjective and subject to being inadvertently taken out of context or ascribed erroneously. Given that this research investigates an ongoing social process, which is affected by stakeholder inter-relations; it was felt that the consequence of potential errors in interpretation and/or attribution of quotes may have severe and negative implications for the social process under study (e.g. Bryson *et al.*, 2002).

Another ethical dilemma that was experienced during fieldwork was associated with the concept of action research, as, on several occasions, I observed that an action needed to be undertaken related to the process under study. For instance, from conversations with several KuisebBMC members, I uncovered differences in understanding over who was responsible for organising the stakeholder forum. I therefore intervened on a couple of occasions and pushed for things to get organised by offering to assist with preparations (see field diary extract provided two pages earlier). However, through such intervention, I was simultaneously affecting the process that I

was observing, which did not then occur in its 'normal' fashion. Nonetheless, taking part in institutional activities in this way gave me a greater insight into the process, especially into the challenges experienced by the participants – both individually and collectively – when trying to realise collective action.

3.8) Chapter summary

This chapter has discussed the research process in terms of pre-fieldwork activities, field-based research methods, and post-fieldwork data analysis. Early sections justified the selection of the case studies and highlighted how a multi-method approach was adopted to meet the research objectives presented in section 3.2. The multi-method approach also allowed an iterative approach to research, which was important in light of ethical concerns regarding the time burden imposed by interactive research methods in the face of high research fatigue in the case-study catchments (section 3.5.1). The research consequently draws significantly on the use of ethnographic methods of participation and observation. Data gathered by these methods were complemented by individual interviews with KatRWUA and KuisebBMC members and secondary data sources of grey literature, which was accessible during the fieldwork phases. Drawing on multiple sources in this way allowed me to understand more fully the wider context of the social learning processes, and to interpret the data more 'accurately', in view of the multiple perspectives and realities that characterise the relevant contexts (Twyman *et al.*, 1999).

Section 3.6 summarised how the data were then analysed according to a grounded theory approach, involving the coding of data into themes and categories, from which emergent themes were used to structure the following analysis chapters. Nevertheless, it is acknowledged that my positionality inherently permeates this research, such that section 3.7 considered how these may have affected the data collection and subsequent interpretations. Furthermore, although data-triangulation and the multi-method approach help to prevent misunderstanding, it is recognised that this process does not necessarily reduce the dataset to a single truth. Consequently, multiple plausible and, potentially, contradictory interpretations may be provided within the following data analysis chapters, which begin with an analysis of the social, physical and policy contexts of the Kat River and Kuiseb River catchments in the next chapter.

Chapter 4

Social Learning and Water Management in the Southern African Context

4.1) Introduction

In this chapter, I initially present the socio-political history of South Africa and Namibia because the political ecology framework of this research recognizes that the comprehension of national society, politics, economy and history is fundamental to understanding and explaining contemporary patterns of power and social differentiation (Neumann, 2005). Drawing on the relevant literature, each section therefore analyses how contextual features of South Africa and Namibia are likely to influence social learning processes that take place within them, which in turn flag issues for further attention in subsequent analytical chapters.

As water resources in Southern Africa have historically been commandeered by specific social groups and economic sectors (Turton & Meissner, 2002; Bohensky, 2008), recent legislation has been endorsed by the South African and Namibian governments, in order to redress such imbalances. Such legislation is largely premised on institutional change in favour of decentralised, participatory structures, which were conceptualised as constituting spaces for social learning processes to operate (section 2.5.6). Thus, in light of Ison & Watson's (2007) assertion that a favourable policy environment is a pre-requisite for social learning (section 2.5.6), I critically analyse these policy and institutional frameworks in the second part of this chapter in terms of how they challenge, support or obstruct the process of social learning that is conceptualized in chapter 2.

4.2) Socio-political history of South Africa and Namibia

Enserink *et al.* (2007: 1) believe it is important to consider "the relationship between national culture, the historical and political differences in respective countries, and their practical experience with participation", as their findings demonstrate that history and politics impact significantly on social learning through their impact on public participation. The significance of history in determining stakeholder relationships and power relations within the context of resource management is high in South Africa and Namibia, even when compared to other countries with colonial backgrounds, due to their experience of extreme, officially-sanctioned apartheid. The ensuing period of white privilege alongside the political, legal, and economic marginalisation of non-white citizens has synchronized personal identity with ethnicity (Seekings & Nattrass, 2005). The next sections demonstrate how this legacy of colonialism and apartheid continues to drive contemporary governance agendas, making an understanding of the

Region's history fundamental to understanding the current legislative and policy environment that is presented in section 4.7.

4.2.1) Colonialism and apartheid: shaping history, society and social relations

South Africa and Namibia have a long history of internal migration and displacement, originating about 2500 years ago with the movement of different ethnic groups across the wider Southern and Central African region, in search of food and natural resources (Thompson, 2001; Gall, 2002). The gradual displacement of Khoisan hunter-gatherers by migrating Bantu peoples was exacerbated by European colonisation (Meredith, 2006; Bradt, 2007), whose quest to obtain the best pastoral land frequently involved the brutal and violent subjugation of indigenous peoples (O'Gump, 1996; Gewald, 1999; Hitchcock & Vinding, 2004; Kaapama, 2007; Zimmerer & Zeller, 2008). Following World War I, South Africa was assigned control of 'German South-west Africa' (now Namibia) under a League of Nations mandate (Dierks, 1999). Despite a later UN resolution against the mandate, South Africa continued to administer Namibia as a national province until 1990 (Leys *et al.*, 1995; Dierks, 1999). The election of the South African National Party in 1948 intensified and formalised apartheid in South African territory, including present-day Namibia, and lead to the creation of indigenous, 'self-governing' Homelands or Bantustans in the most unfavourable areas of the country (Kossler, 2000; Welsh, 2001). One such Homeland, the Ciskei, fell within the Kat River's hydrological catchment (section 3.4.2). Following strong internal and external pressure, Namibia was granted independence in 1989, and apartheid rule in South Africa ended shortly thereafter in 1990.

Such displacement, repression and injustice under colonialism and apartheid have contributed to the inter-ethnic tension, resentment and mistrust within contemporary Southern African society (Horowitz, 1992; Krog, 1999; Ferguson, 2000; Zegeye & Harris, 2003; The Citizen, 2005; Meredith, 2006; Mangena, 2007; Naki, 2008), with the major consequence that personal identity in Southern Africa is more strongly linked to race than any other socio-economic variable (Butler 2007; Seekings & Nattrass, 2005; MacDonald, 2006). However, Schulz-Herzenberg (2007: 133) points out that the variables of race and socio-economic status are hard to separate in the Southern African context, because "the differences in living conditions along racial lines has led to the relative homogeneity of economic and political interests within racial groups". This history means that personal identity is predominantly associated with wider ethnic groups and their associated spatial areas of administration and habitation; such boundaries rarely correspond with hydrological units of space, such as river basins or catchments.

As a consequence of this history, social capital within South African and Namibia society is considered to be relatively low according to the definitions articulated in section 2.5.5, with the

exception of bonding capital. Yet, as posited goals of social learning include to foster more harmonious natural resource management and to improve social capital (table 2.3), the concept of social learning has clear practical relevance to the Southern African context, which has featured high levels of conflict and tension between social actors over recent history. Relational changes arising from the social learning process are therefore addressed in chapter 6, whilst the influences of race and history are taken into consideration in later analyses of: stakeholder interaction; institutional activities; and the assertions and perspectives of research participants.

4.2.2) The role of the state: politics, power and decision making

Water and politics inter-relate in several ways. Above all, water can be used as a political tool (e.g. Cieslik, 2006). For example, control over water resources has historically been used to suppress South African citizens: when Zwelitsha residents protested against Sebe's governance of the Ciskei, he threatened to cut off their water and electricity supplies (Vail, 1989). In Southern Africa, promises of free water, amongst other services, featured prominently in liberation-movement election campaigns, in order to secure votes (Eales *et al.*, 1996; Thompson, 2003). Many South African and Namibians continue to believe that free water is their right, which manifests in non-payment for services when imposed on communities (Bond, 2004; McDonald & Ruiters, 2005; Blanc & Gesquieres, 2006).

Both contemporary South African and Namibian politics are now dominated by their former liberation movements, with the African National Congress (ANC) and the South-West African People's Organisation (SWAPO) securing 69.7% and 76.8% of the national vote respectively in post-Apartheid elections (Butler, 2007; Williams, 2000). Schulz-Herzenberg (2007) asserts that the overwhelming majority vote not only presents a challenge to governmental 'responsiveness' towards its citizens, but also means that the policies and agendas of former liberation parties have considerable influence over present-day economic, social and environmental processes and outcomes (Butler, 2007). Furthermore, SWAPO and the ANC are frequently criticised for their intimidation of 'anti-government' sentiments and intolerant attitude to freedom of expression (Erasmus; 2000; Ogunsanyo, 2004; MISA, 2003; MISA, 2005; AllAfrica, 2006; IRIN, 2007a). In contrast, social learning theories are rooted in principles of democracy, equality and respect for plural realities and perspectives; ideals that have not been widely encouraged under recent successive governments in South Africa and Namibia. An implication for social learning processes in South Africa and Namibia of this political dominance is that government influence is more pervasive than in political contexts where alternative perspectives and pressure exist, i.e. from other political parties and/or civil society. The political primacy of SWAPO and the ANC is therefore likely to hinder social learning via the inhibition of public participation in 'participatory' forums, and the prevention of consideration of alternative knowledge and

perspectives with the process proceedings, either explicitly or implicitly due to public fears of political reprisals, e.g. future economic or social marginalisation.

Of specific relevance to integrated water-resource management is Forrest's (1998: 4) assertion that the notion of decentralisation carries a "negative, pro-apartheid connotation for most post-independence government officials and for most Namibian citizens", which Hopwood (2007: 175) holds responsible for the slow implementation of a Namibian decentralisation programme launched in 1998. This prevailing negative attitude towards decentralisation at national levels of government has implications for the autonomy and role of decentralised institutions, such as basin-management committees. Current, highly centralized government structures mean that decisions made at lower levels can easily be overridden by central government, as illustrated by the case of Ramatex in Namibia, where national Government overturned a local-level decision when their perspectives differed (see section 4.3.1). This example stands in direct contrast to the theoretical considerations outlined in chapter 2, in which decentralisation is proposed as a way of rendering decision making processes more reflective of 'local' concerns and agendas. South Africa's and Namibia's history of centralised, authoritarian rule suggest that the transition to increased public participation in decision making may be problematic. According to the findings of Enserink *et al.* (2007), countries with a tradition of centralised decision making structures tend to eschew public participation.

Finally, political agendas also influence water-resource management through their impact on water demand. For example, although Namibia is able to overcome a physical water scarcity by importing food crops from South Africa (Heyns *et al.*, 1998), this incurs geopolitical dependency on South Africa. Thus, despite the high water demand of irrigated agriculture (Day, 1997a; Gomex-Limon & Berbel, 2000), increasing agricultural capacity features as a high political priority in Namibia where Government proposals intend that "Namibia will be, within the next 25 years, a healthy and food-secured nation" (GRN, 2004b: 20). Due to hydrological interconnections between land and water resources, such goals impact significantly on water resources. Furthermore, in order to ensure that their political ambitions can be achieved, Namibian and South African Governments retain strong control over water-resource decision making via legislation (see section 4.7.4).

4.2.3) Traditional leadership: history and tradition

In addition to democratically-elected governance, the Namibian and South African constitutions recognise limited governance rights of traditional leadership in communal areas. Despite official recognition, ambiguity remains regarding the precise roles and responsibilities of Namibian traditional authorities in relation to elected government structures (Mendelsohn *et al.*, 2002).

Traditional leadership systems vary between ethnic groups but are usually hierarchical, vesting the majority of power in a king, chief or council, as is the case with the indigenous Topnaar and Xhosa population of the Kuiseb and Kat River catchments respectively. As traditional positions are usually hereditary rather than democratically elected, resource capture and power abuse by traditional authorities are facilitated, which may cause in-fighting and divisions within communities that are widely perceived as homogenous entities (Rangan & Gilmartin, 2002; Harring & Odendaal, 2006; Odendaal & Harring, 2007). Observations of widespread nepotism, corruption and in-fighting amongst Topnaar and Ciskeian (Xhosa) traditional authorities (Vail, 1989; Lodge, 1998; Mandami, 1996; Widlock, 2000; Wimble, 2003; Malzbender *et al.*, 2005) make this a relevant consideration for social involvement in KatRWUA and KuisebBMC social learning processes. Such examples demonstrate that traditional authorities do not always act in the interests of the community they purport to represent and, furthermore, challenge social learning in the context of water-resource management, as a process for improving social equity, because 'participatory' processes in South Africa and Namibia are under pressure to include all social actors listed on generic 'stakeholder' lists, which typically include traditional authorities (Kujinga, 2002). Stakeholder participation in, and representation on, the KatRWUA and KuisebBMC are discussed in detail in chapter 5.

4.3) The dual economy in South Africa and Namibia

Political economists conceptualise political and economic processes as highly intertwined, such that economic considerations of the national political arena are thought to play a significant role in the status of water resources (e.g. Banks, 1995; Basu, 2002). Furthermore, economic factors are considered to have a significant impact on decision making pertaining to water use and management from the individual to the national scale, as water is vital for most revenue-generating processes and economic development (Appelgren & Klohn, 1999; Sanctuary & Tropp, 2004; USAID, 2007). Although South Africa and Namibia are relatively wealthy compared with the wider African continent, both feature dual, or 'two-tiered', economies, where a formal first-world economy based on industry, commercial agriculture, service and mining sectors operates alongside an informal 'secondary' economy based on small-scale agriculture and trade. Despite low contributions to GDP, South African and Namibian agricultural sectors contribute significantly to this informal economy upon which, many rural livelihoods also depend (ISS, 2002; OCED, 2006: World Bank, 2008a; 2008b). The employment potential of economic sectors is significant because, whilst economic reform in South Africa and Namibia has yielded economic growth (IMF, 2007), it has not reduced unemployment. Though official rates of South African and Namibia unemployment range from 26-36%, these calculations are based on those 'actively seeking work' thus the actual unemployment rate is likely to be closer to unofficial estimates of around 40-60% (Kingdon & Knight, 2004; 2006; Treiman, 2005;

Banerjee *et al.*, 2006; StatsSA, 2007; IPPR, 2006; Jauch, 2007). High unemployment and the dual economy perpetuate and maintain the societal inequality (Nowak & Ricci, 2005; World Bank, 2008a) that remains strongly but not exclusively aligned to racial origin (see next section). High public and political pressure therefore exists in South African and Namibia for economic development and associated employment opportunities.

Faced with high unemployment and poverty, Southern African governments are under strong pressure to further prospects for economic development. For instance, it is thought that economic pressure for job creation led national government officials to allow the construction of the Ramatex factory in Windhoek, despite widespread concerns over water availability and pollution that have since been vindicated (Namibian, 2002; Namibian, 2006; Isaacs, 2007; Winterfeldt, 2007; Kohrs, 2007). Similar pressures and concerns apply to mining sector expansion in South Africa and Namibia (UNECA, 2002; Naicker *et al.*, 2003; Marshall, 2008; CIA, 2007; World Bank, 2008a; IRIN, 2008; WISE, 2008). The Namibian economy is especially vulnerable to external shocks associated with fluctuating world mineral and food prices – the main export and import respectively (World Bank, 2008b), hence the Namibian government is keen to diversify its economy, create jobs and reduce food imports through increased national agricultural output. These examples demonstrate how economic rationale strongly underscores political decision making in contrast to social learning and integrated water-resource management ideals, which aim to promote more holistic decision making processes and outcomes based on the 'triple bottom line' (section 2.4). The 'political economy' is therefore assumed to influence decision making processes at all levels of water management, as further interpreted from the assertion of a Namibian geohydrologist that, "there is a lot of pressure to find them [uranium mines] some water". This 'pressure' is interpreted to be political, and ultimately, economic in nature.

4.4) Dual societies: the social legacies of colonialism and apartheid

A variety of societal features, many of which are linked to the economic circumstances described above, are salient to social learning through their impact upon participation and stakeholder relations (Craps & Maurel, 2003). Of particular impact are inequalities stemming from the historical discrimination against specific social groups (section 4.2), which continues to impact on South African and Namibian society:

> The legacy of apartheid is all too apparent in the everyday lives of the majority of the population. South Africa is a society where deeply-entrenched poverty, illiteracy, unemployment and loss of human dignity among the majority of the black population co-exist with economic wealth, scholastic achievements, and a 'first world' lifestyle among the white population and black elite at par with the richest countries in Europe. About 95% of the poor are black. Women are particularly affected: female-headed households

have a 50% higher poverty rate than male-headed households, with rural women suffering more than urban. (World Bank, 2008a: 1)

The above statement highlights the multiple facets of inequality that are considered relevant to subsequent discussions and analysis within this thesis because of their influence on individual identities, experiences, perspectives and worldviews, which in turn affect stakeholder relations, decision making, participation capacity and the self-efficacy of social actors involved in the social learning processes under study.

4.4.1) Poverty and income inequality

Although South Africa and Namibia are both classed as middle income countries[10] (Saleson, 2007), their highly skewed income distributions (table 4.1) mean that significant proportions of their respective populations experience poverty. Income-generating activity is racially imbalanced, with white Namibians and South Africans constituting economically powerful elites (Nowak, 2005; MacDonald, 2006). Despite national economic growth and affirmative action having contributed to the emergence of a black elite, many argue that post-Apartheid governance has intensified the gap between rich and poor (Harsch, 2001; Hoogenveen & Özler, 2004; Seekings & Nattrass, 2005; Terreblanche, 2005; Leibbrandt *et al.*, 2005; Rossouw, 2006; Argivan, 2006; Melber, 2007; Economist, 2007a), with LaRRI (2005) concluding that extreme inequality is now based on class *and* race.

Table 4.1. Indicators of inequality in South Africa and Namibia (N.B. Figures in brackets indicate the world ranking out of 177 countries) (Sources: World Bank, 2007; UNDP, 2007)

Indicator	South Africa	Namibia
Gini coefficient (Measure of income distribution equity where 100% is most unequal)	57.8% (121/177)	74.3% (125/177)
Income inequality: poorest 20% share of income/GDP	3.5	1.4
Income inequality: richest 20% share of income/GDP	62.2	78.7

In addition to race, poverty exhibits spatial and gender-based disparity, with higher poverty experienced by rural (Taylor, 2002; Machethe, 2004; Treiman, 2005; ANC, 2007) and female Southern Africans (Treiman, 2005; UNDP, 2007). Regionally, the Eastern Cape, in which the Kat catchment is located, remains one of the poorest South African states (Schwabe, 2004), whilst the Kuiseb catchment is mainly located in the Erongo region, one of Namibia's wealthiest states (Mendelsohn *et al.*, 2002). Nonetheless, both catchments contain a racially mixed population, among which racially based socio-economic inequalities persist. The widespread poverty in Southern African is thought to impact on stakeholders' capacity to

[10] Middle-income countries have a per capita GNI between US$875-$10,726 (World Bank, 2008)

participate in social learning and decision making processes, which require financial, logistical and technical capacity (Cooke & Kothari, 2001; Manzungu, 2004). Moreover, income disparity is considered important for social learning in the context of water management because economic strength is considered to confer power on actors within decision making contexts whilst, conversely, the poor are often excluded from voice and power in social processes and institutions (Narayan *et al.*, 2000). According to del Tufo & Gaster (2002: 1), "people experiencing poverty do not influence decision making and policy", in contrast to the overall goal of the social learning approach, of allowing *all* stakeholders to influence decision making through their inclusion. Such insights into the relationship between poverty, power and participation influence later analyses of stakeholder participation.

4.4.2) Formal education

Amongst other variables such as culture and religion, formal education has a strong impact on individual worldviews and perceptions of how environment and society both function and inter-relate (Costa, 1995; Coburn, 1996; Raza & Singh, 2004; Gauch, 2006). Under Apartheid, the Bantu Education Act restricted the education of black South Africans to vocational training for manual employment rather than the science-based, European system of education that was provided to whites. Consequently, black South Africans educated during apartheid, and those who continue to receive a sub-standard formal education as part of its legacy (Van der Berg, 2007), are less likely to be aware of scientific discourses surrounding water, such as the hydrological water cycle and the concept of ecological services. Individuals' level of formal education may consequently influence the degree to which they are able to actively engage with, and act upon, public participation processes and social learning forums. Thus the degree to which the information that was presented and used within the KatRWUA and KuisebBMC forums requires IT literacy and familiarity with scientific concepts is analysed in section 6.2, as they are thought to influence people's ability to participate within them.

4.4.3) Basic service provision

Considerable disparity in terms of access to basic services persists as a result of apartheid, under which favourable living areas, schools, hospitals and jobs were exclusively for white South Africans, compared with the least favourable for black South Africans (UNICEF, 1989). Makgetla (2007) also highlights persistent racially-based inequality of electricity, water and sanitation access. As with poverty, inequality in service-provision is spatially variable. The Eastern Cape stands out amongst South Africa provinces for its lack of development and service delivery (Atkinson, 2007; DWAF, 2008), with an interviewee referring to the Eastern Cape as "the black hole of South Africa". The disparity of service provision between different social

groups may impact on the social learning processes through its effect on motivation to participate in social learning forums, whilst a lack of basic infrastructure, especially in rural areas, is assumed to reduce ability to participate on logistical grounds.

Addressing such inequality in basic service provision is a key political priority of both South African and Namibian governments. Legislation therefore affords priority water allocation to 'Historically Disadvantaged Individuals' (see section 4.5.1). A 'Historically Disadvantaged Individual' (HDI) is defined as, "a South African citizen who, due to the apartheid policy that had been in place, had no franchise in national elections prior to the introduction of the Constitution of the Republic of South Africa, 1993; and/or who is a female; and/or who has a disability, provided that a person who obtained South African citizenship on or after the coming into effect of the interim Constitution, is deemed not to be an historically disadvantaged" (RSA, 1993: Act 200). The expression 'historically disadvantaged' is widely and similarly used in Namibia. The pre-determined legislative priority of water allocation constrains water-related decision making, and may also affect motivation to participate, in social learning processes.

4.4.4) Land ownership

The World Bank (2008b: 1) maintains that, in South Africa, "land distribution is one of the most unequal in the world with 55,000 white farmers owning 85% of the agricultural land". Under German and South African administration, Namibia's best farmland was apportioned to white settlers for commercial farming, while the remaining poor-quality land was divided amongst indigenous groups for subsistence farming under collective tenure (MAWRD, 1991; Deiniger & May, 2000; Bradt, 2007). Since democracy, only 4% and 12% of farmland has been redistributed in South Africa and Namibia respectively (BBC, 2005a; BBCb, 2005b; Economist, 2007b; Odendaal & Harring, 2007). The expropriation of land and property from black South Africans is linked to their widespread experiences of poverty (e.g. Nel, 1997), which is in turn thought to negatively affect capacity to participate in public decision making processes (section 4.4.1).

Furthermore, the issue of land ownership remains highly symbolic and emotive to populations of both Nations (Simpungwe, 2006; Odendaal & Harring, 2007), where growing public resentment and frustration with the slow pace of land reform and social change fuel 'radical demands' for land reform (Adams *et al.*, 1999; Odendaal, 2005). Mixed political responses have contributed to fears of a Zimbabwe-style land takeover (e.g. CNN, 2004; Sipanda, 2001; Pan, 2003; BBC, 2005b), while land-reform legislation has rendered the former Homelands, "terrains of contention regarding issues of control over land" (Rangan & Gilmartin, 2002: 637). The resultant uncertainty surrounding land ownership meant that many farmers were hesitant to

invest in water infrastructure, especially capital-intensive water-saving technology. Land tenure is consequently thought to play a part in determining the outcomes of social learning processes through its impact on perceptions of other social actors.

4.4.5) Gender

Gender is thought to be of particular relevance to water-resource management in developing countries, as traditional roles mean that women are normally responsible for the collection, storage and domestic use of water (Serageldin, 1995; Upadhyay, 2003). Yet despite national constitutions promoting gender equality, the indicators presented in table 4.2 attest to its persistence within Southern African society, alongside research by Davis *et al.* (2004), Odendaal (2005), Diko (2007), Maletsky (2004), and Jauch (2007).

Table 4.2. Indicators of gender inequality in South Africa and Namibia (Source: UNDP, 2007)

	Estimated income (US$)	Literacy (%)	% seats in Parliament
South Africa			
Female	6927	80.9	32.8
Male	15446	84.1	67.2
Namibia			
Female	5527	83.5	26.9
Male	9679	86.5	73.1

Socio-cultural factors are though to sustain these gender inequalities. For example, Byrnes (1996) and Pandor (2005) cite prevailing patriarchal attitudes, which social bias against women. A strong cultural precedence of female exclusion from positions of power in Xhosa society arises from the patrilineal lineage system (Magubane, 1998), the secondary decision making role of Xhosa women compared to males (Monyai, 2003), and the requirement for married women to secure permission from their husbands to attend meetings (*ibid*). These reasons are likely to hinder both the attendance, and the *active* participation, by women in participatory forums, that are called for by the Dublin principles (section 2.4).

4.4.6) HIV/AIDS

It is estimated that 5.5 million South Africans and 230,000 Namibians are HIV-positive, roughly 15% of respective populations (UNAIDS/WHO, 2006a). HIV prevalence rates are higher amongst, but not exclusive to, black South Africans (Karim & Karim, 2002), young people (Dorington *et al.*, 2006) and women (Edwards, 2007). Irrespective of the reasons, high HIV/AIDS rates amongst specific social groups may affect their participation in social learning forums due to the inhibition of participation through ill-health. The economic burden of HIV/AIDS deaths e.g. through loss of labour and funeral costs, is likely to reduce further the

financial capacity of affected social groups to participate. Overall, previous sub-sections briefly illustrate the multitude of cultural factors that may be of salience to later analyses of participation and representation in the case-study processes.

4.5) Overcoming inequality

Government strategies for reducing social inequality are outlined in the following sub-sections, as they portend to themes that are later revealed to affect social learning processes via power relations, politics, and motivation and empowerment for collective and individual action.

4.5.1) Affirmative action and historically-disadvantaged individuals

Since embracing democracy, South Africa has pursued affirmative action strategies, in order (i) to reach out to, and encourage, historically disadvantaged individuals to compete equitably; and (ii) to permit preferential treatment in the belief that preference will remedy past discrimination (ECO, 2003: 1). In both South Africa and Namibia, 'preferential treatment' is based on the quota system, which involves a minimum number or percentage of places of a team, organization, or committee being reserved for historically disadvantaged individuals (Both, 1998; Visser & Hanlo, 2005). There is now a widespread public reluctance to accept social groupings that are mainly comprised of white South Africans and Namibians due to their past hegemony. Thus, in order to secure 'legitimacy' within wider society, most committees, organisations and institutions strive to obtain membership that equals or exceeds national quota allocations. The racial make-up of decision making bodies and associations is therefore considered relevant to perceptions of institutional legitimacy amongst the general public, and is accordingly addressed with regard to the KatRWUA and KuisebBMC (section 8.2.1).

4.5.2) Social welfare and the entitlement mentality

Apartheid and affirmative action aside, some argue that the ANC's own welfare system contributes to an 'entitlement mentality', in which people expect the government to provide financial assistance and/or services (Wimble, 2003; Natrass, 2006; IRIN, 2007b; Barchiesi, 2007). The ANC asserts that:

> A passive expectation of 'delivery from on high' is itself part of the apartheid legacy, the perpetuation of a victim mentality. The idea that the 'world now owes me a favour because I was a victim of apartheid oppression' may well be understandable, but it simply confirms and continues a cycle of dependency (1997: 2).

For example, the ANC's Reconstruction and Development Programme (ANC, 1994) was designed to lift people out of poverty through the provision of free housing, land, education and

health infrastructure (Isaacs *et al.*, 2005). In addition, in order to preserve social equity goals in the face of post-democracy neoliberal economic reforms, South African and Namibian Governments simultaneously increased eligibility for welfare grants, which although premised on disability, old-age, single parenthood and care-giving, are widely perceived as poverty alleviation grants (Samson *et al.*, 2004; Natrass, 2007). These government practices reinforced the liberation movements' promises of free water, invoking a "crisis of expectations" among previously disadvantaged communities (Chikulo, 2003: 1), and contributing to a pervasive perception that the government should provide basic services to the populace at no cost. Such services generally depend on resource availability and, therefore, under integrated water-resource management, *should* be paid for by those who utilise and/or contribute to their degradation. This observation highlights a clear differentiation between the principles of water management that people are expected to enact and the expectations of the majority of the population. Moreover, the entitlement mindset, and expectation of government agencies as service-providers, suggests that the general public may be unwilling to engage in social learning processes that are related to resource management, as they believe that such activities are the responsibility of 'higher level' agency.

4.6) Culture and social learning

Tippett *et al.* (2005) and Enserink *et al.* (2007) identified cultural factors that affected the social learning processes that they observed. Drawing on their insights, this section presents aspects of the cultural context of Southern Africa, which can impact upon social learning processes. First, despite only being spoken by 1.9% of the population at home (Maho, 1998), Namibia's official language is English, while ten other major linguistic groups exist (Gordon, 2005). In South Africa, although eleven languages are officially recognised, English is the dominant language of government, education and media. The language used in participatory learning forums affects learning for reasons of comprehension (Bandesha & Litva, 2005; Hoddinott *et al.*, 2002). In addition, the *type* of language used, i.e. lay versus scientific, also affect learning processes, as it similarly impacts participants' ability to understand and contribute to the proceedings (Mosley, 1996; Mostert *et al.*, 2007; Maurel *et al.*, 2007). Given the educational disparities (section 4.4.2) and the ethnic diversity of the case-study catchments (section 3.4.2), both the spoken language and the language types used within the KuisebBMC and KatRWUA social learning processes are analysed further in section 8.2.2.

As land use is considered to be a key determinant of the state of water resources, land-water interconnectivity forms a key rationale for the integration principle of integrated water-resource management (section 2.4). Traditional, cultural practices of land use are therefore thought to be of significance for a social learning process, which fundamentally attempts to change social

behaviour. According to Kroll and Kruger (1998) Namibian communal farmers like to keep as large a herd as possible, in order to maintain or increase household socio-economic status, allow the observation of traditional responsibilities at social occasions, and provide security against difficult periods e.g. drought. Rangan and Gilmartin (2002: 641) similarly observe that land and cattle are "crucial markers of social status and wealth" amongst indigenous South Africans. Such cultural traditions influence water-related decision making through their demands and impact on water resources.

Although not unique to South Africa and Namibia, Transparency International (2006) highlights significant levels of corruption within the institutions and society of both nations. Corruption is frequently associated with government agencies, where resources are available and where controls are weak (NID, 2007). Similarly, Van Vuuren (2006: 1) reports that, in South Africa, "almost no day has gone by without media reports highlighting the extent of the scourge [of corruption]". In the past, corrupt behaviour by homeland officials (Arenstein, 1996; 1998) was overlooked by [white] South African authorities, as long as the homeland did not 'cause trouble'. The culture of impunity surrounding the perpetrators of corruption persists, which discourages confidence in public officials (Maletsky, 2005; Melber, 2007) and means that many people do not regard the police or government as being competent or impartial law-enforcement mechanisms. Attempts to influence social behaviour through top-down enforcement alone are therefore considered unlikely to succeed, making social learning approaches potentially very relevant for developing country contexts. However, the perception of corruption within government agencies may simultaneously hinder the successful realisation of dialogue-based social learning processes (section 2.5.5) if social actors believe that informal 'official' channels are more likely to result in their personal interests being met.

4.7) Water governance in South Africa and Namibia

Ison & Watson (2007) advocate the need for a conducive policy context, in order that social learning can take place. Since democracy and independence, South Africa and Namibia have undertaken water-sector reform involving both policy and institutional change. The implications of these changes for social learning processes within the context of water-resource management are explored next.

4.7.1) Driving change in water management: the impetus for change

During colonial rule, water rights in South Africa and Namibia were awarded to riparian landowners under British Common Law. Despite the South African Water Act of 1956 bringing large water bodies under increasing state control (DWA, 1986: 8.9), most water continued to be

used by white riparian landowners, while 'public' water was allocated to support the social, economic and political objectives of the Apartheid State (Turton & Meissner, 2002; Odendaal, 2005). Centralised government agencies were responsible for constructing water-supply systems and allocating water, in support of favoured social groups and sectors (Bakker & Hemson, 2000; Bohensky, 2008). Exceptions to direct government control were agricultural irrigation boards, which represented large-scale [white] farms, and water boards that supplied urban [white] areas. In Namibia, the remoteness of farms and lack of permanent surface waters meant that financial support from government was provided to construct and maintain private dams on individual farms (Strauber, 2006; *pers. comm.* Wittneben, 2007; *pers. comm.*). Centralised authorities in South Africa were characterized by a management system under which, "civil society was rarely, if ever, consulted" (Burt *et al.*, 2006a: 4). Amakali (2005: 1) similarly notes that, for Namibia, "the main function of central government was then to control, conserve and use water...this was done with a top-down government without involvement of relevant stakeholders". The authoritarian attitude of historical water authorities is in direct contrast to the democratic, participatory ethos of integrated water-resource management, and constitutes a tradition that Enserink *et al.* (2007) conclude is of hindrance to successful social learning.

The socio-economic disparities of the Southern African context at the end of apartheid, compounded by the discriminatory legislation linking land and water rights, triggered post-democracy water-sector reform. Furthermore, the authoritarian tradition of water management contrasted sharply with the emerging global discourse centred on holistic and democratic management (section 2.4). Amakali (2005: 1) observes that, "the doctrine of riparian rights is not consistent with modern tenets of water resources management, because it does not provide equitable access to water", whilst distributive reform was considered a necessary water-management approach in South Africa (van Koppen, 2003). In light of the physical and social scarcity of water, and guided by the international discourse of best practice, water-sector reform involved changes to legislative and institutional frameworks. In line with the global discourse of integrated water-resource management (section 2.4), post-reform water management in South Africa and Namibia is concerned with equality and environmental-awareness, premised on integrated management, decentralisation and participation (e.g. Brown & Woodhouse, 2004; Heyns, 2005). Features of traditional water-resource management and new strategies are compared in table 4.3 in terms of their goals, values, and systems of operation.

Table 4.3. Overview of traditional versus post-democracy water management in South Africa and Namibia (after DWAF, 1997; MAWRD, 2000)

	Traditional water management	Post-reform IWRM
Goals	• Water supply to white citizens • Water for economic development	• Social equity • Holistic management
Organisation	• Top-down authoritarian • Hierarchical • Centralised • Technical and engineering	• Participatory decision making • Decentralised, catchment-level • Multi-stakeholder management • Cost recovery
Environment	• Domination of nature • Infinite resource • Ecosystem and social separation • Pollution as an externality	• Integrated land and water use • Finite resource • Ecosystem right to water • Polluter pays principle
Function	• Supply-side management • Agricultural sector support • Support directed to specific population and economic sectors	• Supply- & demand-side management • Ensure balanced water allocation • Resource protection • Pro-poor support

The shift to the integrated water-resource management approach is important from an economic perspective to developing countries, as it governs access to international donor funding, which often attaches conditions to aid provision (e.g. Kanbur, 2000; Svenson, 2003; GTZ, 2009). Thus, the relationship between the international discourse and national management policy and practice in developing countries is not an equal two-way relationship, but one that is subject to power relations based on economic asymmetries, as illustrated by Bakker (1999), Morrissey (2004) and Hall *et al.* (2005). This power differential contributed significantly to the legislative and policy changes adopted at the national level, especially in Namibia where European development organisations are the major funders of water-management initiatives. Within South Africa, the early commitment of high level DWAF employees and of the former Minister of Water Affairs and Forestry, Kader Asmal, to the process of water-sector reform suggests that the reform process was more strongly driven by internal forces. In either case, the following sections explore how national level shifts in goals, values, and system organisation are reflected in recent legislative and institutional frameworks, which have in turn set the scene for social learning-based approaches to decentralised water-resource management.

4.7.2) The South African National Water Act, 1998 (SANWA)

The White Paper on a National Water Policy for South Africa (DWAF, 1997) led to the promulgation of the South African National Water Act (hereafter SANWA) (RSA, 1998). Based on the principles set out in the White Paper, SANWA aims to promote equity, efficiency and economic and environmental sustainability, through the decentralisation of water-management to local and regional institutions, water-user registration and licensing, and the emergence of a water-rights market (Perret, 2002). The key features of SANWA and associated rationale are summarised in table 4.4. Another Act that is of relevance to this research is the Water Services

Act (RSA, 1997), which enshrines the right of all South Africans to basic water and sanitation services. However, as Schreiner (2002) notes, the 'water right' is intended in the sociological sense of a formal right to water rather than a legal entitlement to state service-provision

Table 4.4. Key features and rationales of SANWA (RSA, 1998)

Key features of SANWA	Rationale
Water under State custodianship (riparian principle overturned)	Improved equity and holistic management through the decoupling of water rights and land ownership
Ecological reserve	Holistic management, as ecological and human needs are afforded equal rights
Decentralised water-management institutions	Enables participatory, and therefore more effective, appropriate and equitable catchment management; Social justice and poverty eradication
Catchment-based institutions	Holistic management through the recognition of physical reality of inter-connected systems; Social justice and poverty eradication
Water-rights market	Demand-management through economic measures

4.7.3) The Namibian National Water Resource Management Act (NWRMA)

A similar process of water-sector reform has more recently been initiated in Namibia (see table 4.5). The Namibian water resources management review (MAWRD, 2000), proposed a series of legislative and policy recommendations to enact the principles of collective responsibility, equity, economic value of water, integrated management, ecosystem services, sustainability and decentralisation. These principles were subsequently reflected in the National Water Resource Management Act (NWRMA) (GRN, 2004a; Act 24).

Table 4.5. Key features and rationales of NWRMA (GRN, 2004a)

Key features of NWRMA	Rationale
Water brought under State ownership (surface and groundwater)	To increase social equity and redress historical inequality in water access
Promotion of duty of care towards environment	Holistic management through the recognition of ecological water requirements
Decentralised water-management institutions	Enables participatory, and therefore more effective, appropriate and equitable catchment management
Catchment-based institutions	Holistic management through the recognition of hydrological understanding of interconnected systems
Recovery of water supply and treatment costs	Demand management via economic mechanisms
Promotion of efficient water-use allocation	Demand management via reward of 'good' behaviour
Pollution control	Protection of available resource

Although NWRMA was enacted in 2004, it has not yet been widely promulgated or implemented, as it is currently undergoing modification following a review that proposed the Act be rewritten rather than amended further (Amakali, 2007; pers. comm.). Therefore, since its establishment, the KuisebBMC has operated within an uncertain institutional environment compared with the KatRWUA, the implications of which are discussed in section 8.5.

4.7.4) National policy vis-à-vis global principles

The main difference between the South African and Namibian Water Acts is that NWRMA does not specifically provide for ecosystem rights to water, except for the vague declaration promoting "the harmonisation of human needs with environmental ecosystems and the species that depend upon them, while recognising that those ecosystems must be protected to the maximum extent" (GRN, 2004a: Section 3(d)). Differences in the physical context are thought to account for this policy discrepancy, since the episodic and ephemeral nature of the Kuiseb renders the determination of a quantifiable ecological reserve highly problematic (Seely, 2005). This example highlights the difficulty of, and therefore questions the practice of, applying a generalised set of guidelines to physical contexts that differ from the Western one in which they were developed (see section 2.4), a point that is also made by Savenije & van der Zaag (2000) and which is returned to in chapter 9 of this thesis.

Despite this limitation, the adoption of this global discourse of integrated management as best practice for national contexts in Southern Africa has involved the transferral of objectives, ideals and norms from the international scale of water management to the national level. SANWA and NWRMA therefore also inherit the need to consider the social, economic and environmental dimensions of integrated water-resource management (see figure 2.1), which is thought to be of particular significance to the developing context of Southern Africa. For example, as per the Dublin principles, both Water Acts specify cost-recovery as a mechanism for demand-management, yet simultaneously incorporate national goals of inequity reduction through the inclusion of mandatory historically disadvantaged actor representation on water-management institutions and priority water-allocation rights to historically disadvantaged actors. However the poverty experienced by the majority of historically disadvantaged actors (see section 4.4) prevents the economic recovery of water-supply costs, such that these objectives directly contradict each other, in turn presenting a potential dilemma for water-management institutions tasked with implementing the Acts.

Overall, despite the difference between the two Water Acts regarding environmental rights, SANWA and NWRMA exhibit strong similarities in terms of their objectives to: redress historical inequalities, enact holistic management, recover costs associated with water use, and enable participatory water-management. Therefore, at the national level, catchment 'issues' are framed in two main ways: as a social issue arising from the historical inequitable distribution of water, and as an environmental issue, which stems from the negative impact of humans on ecological functioning. Within the Water Acts, an ontological link between environment and society is assumed through their repositioning of the environment as a legitimate stakeholder

and justified by the ultimate detrimental effect on human livelihoods of decreased ecosystem ability to provide goods and services. These national-level 'frames' of water issues and the state of resources match the perspectives of the sustainable development discourse (chapter 2).

In this way, the Water Acts have not only redefined the objectives of water management in South Africa and Namibia, but have also reinterpreted the social actors of relevance to water-resource management according to concepts of stakeholding, in which a stakeholder is broadly understood to denote a human or non-human agent who affects, or is affected by, a process, issue, problem or outcome (Ravnborg & Westermann, 2002; DFID, 2003). Thus, in line with the integrated water-resource management discourse, a stakeholder in the context of water-resource management includes both human and many non-human actors within a catchment due to their use of, and ability to impact on, a catchment's water resources via the water cycle (Renard, 2004). As a management process involving every individual within a catchment is practically unfeasible, the notion of representation applies to water-resource management processes that are engendered by such legislation. Social involvement in the case-study processes is therefore returned to in the next chapter, whilst the limitations to the concept of representation are discussed in section 8.3. As SANWA and NWRMA propose decentralised, participatory institutions as the central mechanism for realising the objectives of integrated water-resource management and national policy, the next section therefore introduces the post-Water Act institutional frameworks, in order to highlight how water-management institutions fit into a wider water-management structure, and to assess their implications for social learning.

4.7.5) Post-Water Act institutional frameworks

To implement SANWA, the National Water Resource Strategy (DWAF, 2004) introduced a three-tiered management structure, over which the Minister of Water Affairs and Forestry has overall responsibility for national water-resources (see figure 4.1). Located hierarchically below the central government Department of Water Affairs and Forestry (DWAF), the proposed catchment management agencies have jurisdiction over nineteen decentralised water management areas (WMAs) identified by national DWAF hydrologists according to hydrological criteria, such as watershed boundaries, eco-hydrological characteristics and rainfall patterns (DWAF, 2007a).

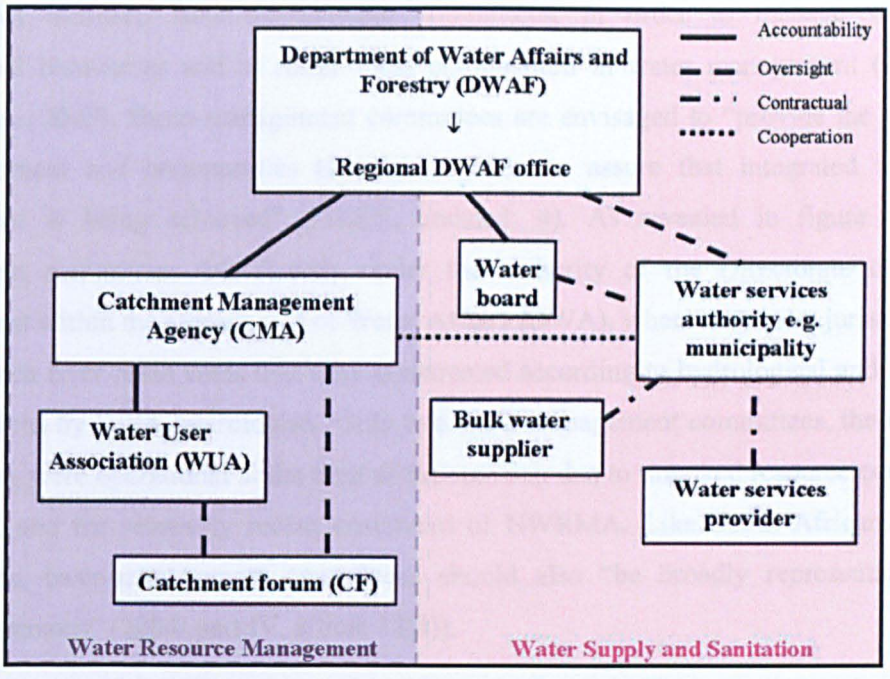

Figure 4.1. The institutional framework of South African water-management institutions (after DWAF, 2004; DWAF, undated; and Burt *et al.*, 2006b)

The third tier of water-resource management is made up of water-user associations; "associations of individual water-users that undertake water-related activities for their mutual benefit" (DWAF, undated: 3). Water-user associations may be comprised of single- or multi-sector water-users and are subordinate to catchment management agencies, whilst it is not mandatory that their areas of operation correspond with hydrological criteria (*ibid*). Under SANWA, the apartheid-era Irrigation Boards (section 4.7.1) are required to become water-user associations. Of further relevance to this research is SANWA's proposition that water-user associations "have appropriate community, racial and gender representation" (RSA, 1998: section 2), as this stipulation has direct implications for stakeholder involvement in social learning processes within such institutions. As illustrated in the next chapter, this requirement significantly influenced the historical development of the KatRWUA case study. DWAF priorities since the enactment of SANWA have focused on establishing catchment management agencies rather than water-user associations (Karodia, 1998; DWAF, 2004). However, their establishment has been slow, with only one functioning catchment management agency to date (Vuuren, 2007). In the absence of a catchment management agency, water-user associations fall directly under the authority of regional DWAF, as with the KatRWUA, making the relationship between the participatory forum and state agency a key one (see section 5.5.4).

The Namibian Review proposed a similar "physically based framework of operation across regional jurisdictions and economic sectors", based on the belief that "community participation is one of the major ingredients of success in achieving good integrated water resources management" (MAWRD, 2000: 51). Hence a key aspect of reform in Namibia has been the

adoption of localised basin-management committees, in order to manage water along hydrological boundaries and to foster local participation in water management (Amakali & Shixwameni, 2003). Basin-management committees are envisaged to "provide the opportunity for government and communities to work together to assure that integrated water basin management is being achieved" (DRFN, undated: 4). As revealed in figure 4.2, basin-management committees fall directly under the authority of the Directorate of Resource Management within the Department of Water Affairs (DWA), where they have jurisdiction over one of eleven river-basin areas that were demarcated according to hydrological and topological considerations by DWA hydrologists. Only two basin-management committees, the Kuiseb and the Lishana, were operational at the time of the research due to time and resource constraints of the DWA, and the relatively recent enactment of NWRMA. Like South African water-user associations, basin-management committees should also "be broadly representative of all interested persons" (2004: part IV, article 12(4)).

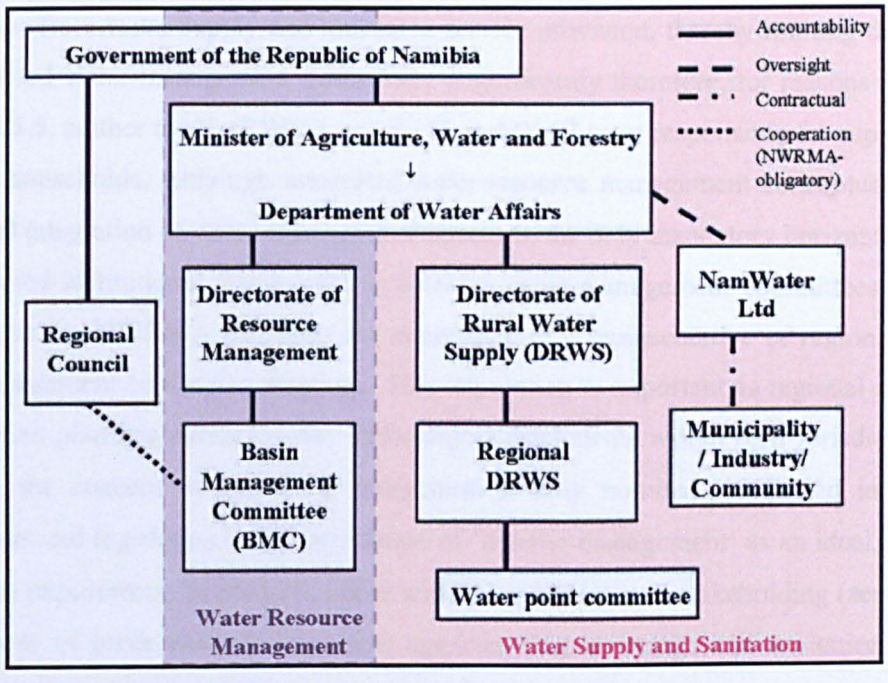

Figure 4.2. The institutional framework of Namibian water-management institutions (after MAWRD, 2007; GRN, 2004a)

4.7.6) Institutional frameworks, integrated management and managed social learning

The delineation of basin-management committees' jurisdiction areas according to hydrological criteria, and strong pressure for water-user associations to do likewise under prevailing integrated water-resource management principles, means that institutional areas of operation cut across zones of ethnicity, political administration, land-use and economic activity. However, as identified in section 2.4.2 and observed by Borowski *et al.* (2007), 'social' issues rarely

correspond to hydrological boundaries, such that the decision to demarcate areas of authority on hydrological grounds presents a potential challenge for a social process aligned to such boundaries. Indeed a mismatch between spatial units of social identity and hydrological interaction has been observed to result in group failure to resolve interrelated social-environmental 'problems' (Young, 2003; Berkes, 2006). This issue is considered to be of particular relevance to the Southern African context where social actors' identity is strongly linked to social boundaries of ethnicity and socio-economic status for reasons provided in section 4.2.3. From an environmental management perspective, such observations imply that education is needed at the outset and/or duration of participatory processes where a catchment identity does not already exist, in order to align local stakeholders' and participants' understandings with the scientific ontology and its associated need for change. Understandings of the case-study catchments are therefore returned to in sections 5.4 and 8.6.1.

Importantly, the institutional frameworks in both countries separate water-resource management institutions from water supply and sanitation service provision, thereby limiting the function of decentralised water-management institutions. Significantly therefore, for reasons returned to in section 5.5.5, neither the KatRWUA nor the KuisebBMC were responsible for supplying treated water to households. Although integrated water-resource management conceptually advocates horizontal integration of water-management agencies, the only mandatory horizontal link within the proposed institutional frameworks is between basin-management committees and regional councils, as the NWRMA mandates the attendance of a representative of regional councils at basin-management committee meetings. This stipulation is important as regional councils have development planning authority over hydrological catchments within their jurisdiction. Overall however, the concept of horizontal integration is only nominally reflected in institutional frameworks and legislation by the promotion of 'holistic management' as an ideal, rather than a mandatory requirement. In contrast, under widely used notions of stakeholding (section 5.5), the involvement of other water-management agencies (e.g. sewerage and sanitation services) is critical, as their responsibilities impact significantly on future water use and demand. As ascertaining both use and demand is interpreted from the relevant Water Acts to be a key aspect of the proposed activities for water-user associations and basin-management committees (sections 4.7.2 and 4.7.3 respectively), the participation, or otherwise, of other official institutions in the case-study processes is returned to in section 5.5. The demarcation within the Namibian and South African water management frameworks, between water supply and water-resource management institutions, is also returned to in section 5.5.5 due to its perceived impact on stakeholder motivation to participate in social learning processes.

Of further relevance to this thesis is that the institutional frameworks propose clear vertical connection between national and local-level water-management institutions. Combining this

connection with the link between global and national discourses presented in chapter 2 implies a linear 'chain of connection', along which the two-way transfer of concepts, objectives and information between different scales of water-management is theoretically possible, as envisaged by Savenije & van der Zaag (2000). However, such 'equal' two-way transfer precludes power relations and is influenced by the nature of the relationship between the different levels of water management. For example, North (1990) asserts that 'formal' institutions (those defined by statute) generally over-represent central state or dominant political party interests, whilst Meinzen-Dick *et al.* (2002: 652) observe that, often, "user groups are constrained in the extent of institutional autonomy, especially in the ability to set rules". Their findings highlight the significance of the relationship with state authorities in terms of understanding the outcomes of collective, multi-stakeholder organisations. When these assertions are considered in conjunction with an awareness of the Southern African context, it is presupposed that the transfer of information and ideology from a bottom-up perspective is limited in the Southern African context for two reasons: the subordinate position of water-management institutions in the institutional hierarchy (section 4.7.5), and the historical authoritarian approach of state water-management authorities (section 4.7.1). The nature of the relationships between the relevant state authorities and case-study water-management institutions are therefore subject to further critical consideration in chapter 5.

4.7.7) Post-reform roles and responsibilities

The Water Acts mean that emerging basin-management committees and water-user associations comprised of diverse social actors are expected to assume specific roles and functions. Two broad roles are encompassed by the integrated water-resource management concept: governance and management (Maritz, 2001; UNDP, 2008). Whilst governance is associated with decision making, monitoring and protection, the management role is envisaged as a more operational and activity-based enactment of the governance process (UNDP, 2008). The Dublin Principles and Local Agenda 21 both promote the devolution of governance, including decision making, to the catchment scale on the premise that it leads to more effective, equitable and efficient water-management activities (section 2.4). The envisaged functions of water-user associations and basin-management committees by SANWA and NWRMA are therefore important, as they determine the legislative scope for governance and management by the KatRWUA and KuisebBMC. Their functions are therefore summarised in table 4.6, which shows that, subsequent to institutional reform, responsibility for water governance in both Namibia and South Africa remains with the State, as the 'custodian' of the Nations' water resources, whilst specific management tasks are invoked for decentralised and non-governmental institutions.

Table 4.6. Envisaged functions of basin-management committees and water-user associations

Basin-management committee functions (GRN, 2004a; DRFN, undated)	**Water-user association functions** (DWAF, undated)
• Promote, coordinate and implement NWRMA at the basin level • Protect, develop, manage, conserve and control water-resource use • Promote community participation • Prepare and implement a water-resource Master Plan • Establish and maintain waterworks and infrastructure • Monitor and report on policy, action and allocation impacts • Identify and resolve water-related conflict within the basin • Collect, manage and share data • Develop a water research agenda appropriate to the need of the institutions and water-users of the area	Either: • To allocate water amongst users • To manage flow-reduction activities • To manage and control water treatment and water pollution activities • To operate, maintain and/or control water-supply infrastructure • To control recreational and environmental water-use

Table 4.6 reveals that the leeway for decision making responsibility depends on the hierarchical 'level' of the institution. Figures 4.1 and 4.2 reveal that Namibian basin-management committees are an institutional magnitude greater than water-user associations, a status disparity that is reflected in their greater flexibility of functions and scope for decision making, compared with the specific tasks of water-user associations. Thus, according to the relevant Acts, basin-management committees encompass management and decision making roles, whilst proposed activities for water-user associations are limited to management activities. However, the Acts fail to specify explicitly who is responsible for any action-related decision making. For example, although an allocation role is suggested for water-user associations, it is not indicated who should be responsible for the *decisions* regarding such allocations. This omission in authoritative guidance leaves the extent of institutional decision making authority open to interpretation and, therefore, subject to differences in envisaged roles and functions by different social actors. Thus, the extent to which the activities of water-management institutions constitute devolution or a limited process of institutional decentralisation (section 2.4.2) also varies in practice, as observed later in sections 5.2.3 and 5.3.3. Furthermore, although the Water Acts envisage a role of water-resource protection and control for basin-management committees and water-user association, its companion role of enforcement is defined poorly. For instance, table 4.6 illustrates how both basin-management committees and water-user associations are expected to "control" water use within the catchment. However, neither basin-management committees nor water-user associations are legally mandated to act on contraventions of permitted water-use and effluent discharge. When asked if basin-management committees would be permitted to enforce such control, a Namibian DWA official replied that, "basin-management committees will be the eyes and ears of the catchment, so that if they are aware that people are not doing things properly then they must come to us and we will be able to deal with it". This view of the envisaged relationship between state institution and decentralised

water-management institution strongly relies on: state agency enforcement capacity; and the alignment of institutional members' perspectives with those of the official state perspective. These assumptions are explored within the case studies contexts in chapter 8.

Previous analysis within this chapter hints that the devolution of governance and management roles under integrated water-resource management may be difficult in the Southern African context, as central state agencies have historically enacted both roles (4.7.1). Furthermore, concerns of South African and Namibian state agencies, regarding the capacity of decentralised institutions to implement and enact 'satisfactory' water management (Amakali, 2005; Van Vuuren, 2007), mean that significant control over decentralised institutions has been retained by the State through caveats in the Water Acts. For instance, the NWRMA states that, "the Minister, by notice in the Gazette, may dissolve a basin-management committee if, in the Minister's opinion, it is necessary to do so" (2004: IV, article 15), whilst SANWA similarly empowers the South African Minister of Water Affairs to disestablish a water-user association for a host of reasons (DWAF, undated: 36). Through these caveats, the functions of basin-management committees and water-user associations remain strongly subordinate to state agencies, whose approval of a constitution is not only necessary before water-management institutions can obtain legal standing, but who can over-ride such recognition if the water-management institution does not subsequently assume the approved role. These caveats indicate an unwillingness to devolve real power to non-state institutions and set up a power asymmetry that impacts upon case-study social learning processes, as explored in later sections.

Finally, both SANWA and NWRMA reflect the perception of the global discourse and of state authorities, that current water use is close to or exceeding sustainable limits, such that the new framework for decentralised, participatory institutions is perceived as a mechanism for achieving more equitable and context-appropriate water allocation and use (Schreiner & Van Koppen, 2002; Pollard & du Toit, 2008). However, this objective makes the critical assumptions that the involvement of both historical 'winners' and 'losers' in terms of access to water resources can be secured, and that their interaction will subsequently result in holistic and equitable allocation. In cases where water availability has been fully or over-allocated, this aim fundamentally depends on historically advantaged actors becoming less 'selfish' and relinquishing [some of] their rights. These assumptions are explored in reference to the case studies in the following chapters.

4.8) Chapter conclusion

This chapter has provided the necessary information for understanding the wider social, historical, and political context, in which social learning within the case studies took place.

Initially, section 4.2 illustrated how recent South African and Namibian histories of colonialism and apartheid shaped power relations and social divisions, which have in turn significantly influenced contemporary use of, and issues surrounding, water-resources. Under Apartheid governance, the control of natural resources by elite social groups, based on race, created significant social and economic disparities that are discussed in sections 4.3 to 4.5. Cultural factors further contributed to the plurality of social divisions and structures within 'Southern African' and 'Namibian' populations (section 4.6). Simpungwe (2006: 12) therefore asserts that the concept of 'multi' (scale and sector) participation in water-resource management presents a complex challenge due to the "varying goals, wealth disparities, culture and norms".

Section 4.7.4 then revealed that recent changes to national policy and legislation drew upon the best practice guidelines of the global discourse of integrated water-resource management (chapter 2). National water-resource management objectives, and the frameworks for realising them, were also redefined in this process. The recent legislative and institutional reforms attempt to redress scale and sectoral imbalances in water-related decision making, access and management through decentralised, participatory water-management institutions and processes (section 4.7.5). Such institutional spaces theoretically enable social learning processes and subsequent collective and concerted action by multi-sector groupings (section 2.5). Nonetheless, significant top-down control was retained by state water-management authorities through the set of legislative constraints identified in section 4.7.4.

Although the Water Acts aimed to achieve holistic water management, they also reflected national political agendas that were specific to the colonial and apartheid history of Southern Africa. The two agendas are highlighted as being potentially contradictory in practice (section 4.7.4). Furthermore, as influential international guidelines on water-resource management and participation were written generically so that their principles could be applied in multiple national contexts (section 2.4), the national Water Acts of South Africa and Namibia retained similar ambiguity. Consequently, scope existed for differing interpretations of the role and functions of the decentralised institutions by the institutions and actors involved in the process of policy enactment (section 4.7.7). How the role and functions of the KatRWUA and the KuisebBMC were interpreted subsequently by implementing agencies and participants is therefore addressed in the next chapter. Thus, overall, the critical assessment of the national-level legislation and policy context within this chapter has generated a set of further salient topics and questions related to social learning in the context of integrated water-resource management, which are addressed in the subsequent analysis chapters.

Chapter 5

Social Learning: the Past, the Present, and the People

5.1) Introduction

As outlined in chapter 2, recent concepts of social learning denote a learning process that takes place within socially bounded 'communities of practice' (Wenger, 1998; Johnson, 2007). Chapter 3 justified the focus of this research on two such 'communities': the KatRWUA and the KuisebBMC. In this chapter the historical development of the KatRWUA and KuisebBMC is reconstructed, in order to set up and analyse the social learning processes in terms of:

- Their stakeholders, and those of the Kat River and Kuiseb River catchments;
- The informal relations between stakeholders and social actors in the two catchments;
- The nature of water-related conflict and issues in the Kat and Kuiseb River catchments;
- The role, functions and activities of the KatRWUA and KuisebBMC.

Throughout this chapter, these aspects of the social learning processes are related to the theoretical insights drawn from the relevant literature in chapter 2 and the legislative and policy contexts in chapter 4, in order to critically analyse social learning theory vis-à-vis practice in the case studies and to highlight processes that are relevant to social learning. Insights derived from this chapter are later linked to an analysis of the processes and outcomes of the respective social learning process in chapters 6 and 7 and provide the basis for further discussion in chapters 8 and 9, which relate to the attainment of objective 2 of this research (section 3.2).

5.2) Identifying the roles and activities of the KatRWUA (South Africa)

5.2.1) Rhodes University, research, and river-management

The KatRWUA is strongly associated with Rhodes University (RU). Pioneering research by Motteux in the Kat River catchment was initiated in 1997 (Motteux, *et al.*, 1999), which was followed by several subsequent research projects (e.g. Nel & Hill, 2000; Motteux, 2003; Shackleton *et al.*, 2002a; Lerotholi, 2002; Rowntree, 2006; Farolfi *et al.*, 2008). Participants in Motteux's initial action research project identified a need for an inter-community environmental action group, resulting in the establishment of the Kat River Catchment Forum (KatRCF) with RU researchers' assistance. Membership of the KatRCF consists of elected villagers, who use water for small-scale agriculture and/or domestic purposes (Burt *et al.*, 2007). Around the same

time, the ratification of SANWA in 1998 meant that the former Kat River Irrigation Board (KatRIB) was required to convert to a water-user association and to become more representative of the ethnic diversity of the catchment. In the previous chapter, the lack of informal relations and trust between different social groups in Southern Africa was highlighted. This societal feature extends to the Kat River catchment, with Motteux (2001: 15) observing that, "elements such as distrust, distance, discomfort, and misunderstanding characterize relationships between white, coloured and black groups and within them". Members of the Irrigation Board therefore approached RU researchers for assistance with the required transformation. This process was funded by the South African Water Research Commission, in an initiative known as the Kat River Valley Project (KatRVP)[11]. Under the stewardship of RU researchers, the initial objective of the KatRVP was to render the KatRWUA more representative of the ethnic diversity of the catchment, according to the notion enshrined in SANWA that representative institutions would engender more equitable water allocation and use (section 4.7.2). To achieve this objective, an action research approach was pursued (Birkholz & Rowntree, 2006). The action research philosophy exhibits strong parallels with the approach of social learning (see section 2.5.3), as it fundamentally aims to transform a participatory learning process into action-oriented outcomes by participants, with the assistance of researchers who also work towards objectives of change.

However, it was anticipated that the subsequent ability of the KatRWUA to enact changes in water allocation practices, would be hampered by "delays foreseen in regional DWAF being able to determine the ecological Reserve and develop a Water Allocation Plan (WAP)" (Rowntree & Hughes, 2005: 2), which required information on:

- The catchment's socio-economic and biophysical characteristics;
- The legal status of existing water-users;
- The size of the resource (yield analysis);
- The ecological reserve; and
- The water required to meet the socio-economic needs and desires of catchment society.

As the collection of this information necessitated expert input, a second phase of the KatRVP was initiated following an informal conversation between a WRC employee and an unscheduled commercial farmer. They conceived the idea of a project, in which RU researchers would determine such information on behalf of the KatRWUA. This project idea was subsequently developed by a RU researcher, to whom the project was initially assigned (*ibid*) [12]. Thus, despite being a response to the policy change crafted by national DWAF actors, the impetus for the KatRVP did not originate with the regional branch of DWAF, but with RU researchers,

[11] Corresponds to WRC Project number K5/1435

[12] This extension of the original KatRVP falls under WRC Project no. K5/1496. Throughout this thesis, 'KatRVP' is used to refer to this latter phase of the process unless stated otherwise.

commercial farmers of the Kat River catchment and the WRC. This initial exclusion of regional DWAF at the development stage is later linked to the problematic relationship between the KatRWUA and regional DWAF (section 5.5.4). Despite recognising that the next hierarchal tier of the national institutional framework, a Catchment Management Authority (section 4.7.5), was not yet established for the water management area in which the Kat River is located, RU researchers went ahead with the project, as this structure was anticipated to be put in place by DWAF in future (Burt, 2005). Meanwhile, the KatRWUA would be under the direct jurisdiction of regional DWAF.

When asked who had been responsible for getting the KatRWUA to where it is today, KatRWUA members mainly specified RU. Thus, in spite of the formal entitlement of the KatRVP as "a *stakeholder driven* process to develop a catchment-management plan for the Kat River Valley" [emphasis added] (e.g. Rowntree & Birkholz, 2004), observations and interview data indicate that the KatRWUA social learning process was driven primarily by RU researchers. This finding is relevant to a later discussion on stakeholder participation (section 5.5.5), in view of research suggesting that 'top-down' formation of, and control over, participatory processes reduce community engagement (Pound *et al.*, 2003; Fraser *et al.*, 2006) and that top-down participatory processes are unsustainable if they are driven and funded by external actors who later withdraw their support (e.g. Negi, 2001; Hagmann & Chuma, 2002; Sandstrom, 2009).

5.2.2) Ascertaining and addressing the issues of Kat River catchment stakeholders

Analysis of the wider published and grey literature (e.g. Motteux, 2003; Birkholz & Rowntree, 2006; Farolfi *et al.*, 2008), as well as interviews and conversations with KatRWUA members, exposed several emergent areas of contention related to the Kat River water resource, including:

- Increased demand on the Kat River catchment's water resources due to the rise in 'legitimate' water-users, following the reintegration of the Ciskei into the Republic of South Africa and the key goal of the Water Services Act (1997) of providing a free basic water allocation to all South African citizens by 2008 (Bond, 2004; Tvedt & Oestigaard, 2006);
- The desire amongst Kat River catchment residents for localised economic and social development, especially agricultural development, which utilise water;
- Increasing demand for formal water rights by emerging farmers;
- Increasing demand for formal water rights by historically unscheduled farmers, whose legality of water use was brought into question by SANWA's abolishment of the riparian rights principle;

- Increasing demand on the water resource due the mandatory ecological reserve of SANWA for each South African river catchment;
- Water quality concerns due to inadequate sanitation infrastructure and overgrazing; and
- The lack of catchment-wide, water-supply infrastructure for domestic and economic use (except for commercial farmers, some urban residents, and private tourism enterprises).

These issues stem from the recent political, social and economic changes described in chapter 4, and divide into two main groups: the first four relate to increased demand on water resources, and the latter two relate to inadequate water-supply and treatment services, which affect the majority of the catchment population. Both types correspond to issues raised by the international discourse surrounding water resources (chapter 2), with the first issue group relating to concerns about ecological and human conflict and the second group relating to social justice concerns. In the Kat River catchment, two groups of water-users requiring formal water use licenses had become increasingly vociferous in their demands for access to water resources: emerging farmers, and historically unscheduled farmers. Their demands had generated two key sources of contention amongst the catchment's water users, between emerging and historical water users, and between historically scheduled and unscheduled commercial farmers. Discord between unscheduled and scheduled commercial farmers arose from the fact that scheduled farmers had been unable to increase their irrigated hectarage due to the stipulation attached to their formal water rights. Conversely, unscheduled farmers had continued increasing their irrigated hectarage using the riparian right to access water from the Kat River unrestrained. Since SANWA revoked this right, unscheduled farmers have sought formal rights to water from the Kat River dam. In this way, unscheduled farmers viewed the changes in the legislation, regarding the representativeness of water-management institutions, as an opportunity for securing formal rights to water resources. Responding to these issues, the KatRVP envisaged that the KatRWUA would address the issue of rising demand on the catchment's water resources through a multi-stakeholder negotiation and allocation process, to be based on information generated by RU researchers and consultants (Rowntree & Birkholz, 2004; Birkholz & Rowntree, 2006). As the KatRWUA was constrained from addressing water and sanitation service provision by the national institutional framework (section 4.7.5), the KatRVP addressed inequality in the notional sense of a formal 'right to water' rather than in practical terms of providing water infrastructure that would allow access to this right.

The historic marginalisation of ecological needs was also overturned via the ecological reserve mandated by SANWA, which must be reflected in catchment-managements plans. In theory, this ecological allocation is more easily enacted than human water-use allocations due to the in-situ nature of riparian vegetation and consequent lack of need to transport water from the resource location to user. However, as the Kat River dam impounded much of the physical input

of the Kat River, even this natural allocation required concerted human action to be realised. How the mandatory ecological allocation influences decision making within the KatRWUA is addressed in section 7.2.

The social water scarcity that was produced by the historical context of the Kat River catchment, i.e. over-allocation to the white ethnic social group for commercial farming, has a further implication for social learning processes in the context of water management because its successful resolution (an aim of integrated water-resource management) inherently necessitates not only the involvement of such historical 'winners', but furthermore their relinquishment of power and/or advantages (Sharp *et al.*, 2000). Thus, the constraints that are pertinent to participatory processes with social equity objectives remain relevant to social learning processes: specifically those of securing the participation of historically advantaged actors at the outset, and then of providing sufficient incentives for them to relinquish power and associated advantages (Lipman-Blumen, 1994; Stringer *et al.*, 2004; Veneklasen & Miller, 2007). The degree to which this was achieved by the case-study processes is evaluated in chapter 9.

5.2.3) Defining the roles and responsibilities of the KatRWUA

The activities set out for the KatRVP collectively correspond to the fulfilment of this requirement for a catchment-management plan, in order to ascertain and guide future water allocations amongst catchment-based water users (Rowntree & Birkholz, 2004; Rowntree & Hughes, 2005). The original activities foreseen for the KatRVP encompassed the following distinct phases (summarised from Rowntree & Birkholz, 2004; Birkholz & Rowntree, 2006):

1. Data collection and knowledge production regarding the size of the water resource and the demands upon it, both social and ecological;
2. Negotiation involving an exploration of water-allocation scenarios, and subsequent agreement on a strategy for the Kat River catchment and the principles that will govern allocation-related decision making in future;
3. The production of a catchment-management plan based on the outcomes of phase 2;
4. DWAF approval of the catchment-management plan, and RU withdrawal from the KatRWUA; and
5. Water allocation by the KatRWUA (after DWAF approval of allocation proposals)

These activities invoke various roles for the KatRWUA, DWAF, RU and wider catchment actors. Phase 1 primarily involves tasks requiring expert technical knowledge, such that the role of the KatRWUA at this initial stage is restricted largely to the provision of social, economic and water use data. In particular, the requirement of a mandatory catchment-management plan

necessitates significant input by experts, thereby affording high priority to the production and use of technical and scientific knowledge within the water-management process. This bureaucratic imposition contradicts the notional constructivist principles of social learning, in which all social actors are equal and knowledge is plural and equally valid (Strydom, 2000; Garrison, 2008), whilst the privileging of expert knowledge has implications for the outcomes of the social learning process, as explored in sections 6.2 and 8.2.2.

Data provided to RU researchers by KatRWUA members and other catchment-based actors were subsequently analysed and formatted by researchers before being re-presented to the KatRWUA for use in the second phase of the KatRVP. At the WRC's request, the KatAWARE model (hereafter referred to as KatAWARE) was adopted to assist the KatRWUA, as a negotiation-support tool. KatAWARE is a context adapted version of the generic AWARE model; a GIS-based, computer-simulation model that allows the impact of changes in water use on a catchment's water balance to be simulated and then assessed in terms of their impact on environmental (water scarcity), economic (job provision) and social (job type) variables (Farolfi & Rowntree 2005; Farolfi & Bonté, 2005; Farolfi *et al.*, 2008). In order to make KatAWARE relevant to the Kat River context, large amounts of socio-economic data pertaining to stakeholders' livelihoods and water use were required (Birkholz & Rowntree, 2006). Once operational as a negotiation support tool, KatAWARE placed a need upon the KatRWUA participants to understand and interpret the model results and, subsequently, to use these results to negotiate preferred scenarios of future water use for incorporation into the catchment-management plan. However, this process was challenged by the educational disparity between historically advantaged and historically disadvantaged KatRWUA members (section 6.2).

Subsequent phases 3 and 4 of the KatRVP, involving the write-up of the catchment-management plan and its approval, were envisaged as responsibilities of RU and DWAF respectively. An active, *independent* role for the KatRWUA was therefore only foreseen by the KatRVP to commence after the catchment-management plan had been approved by DWAF. According to the KatRVP the ultimate management role envisaged for the KatRWUA would then include the allocation of water licenses amongst all catchment-based stakeholders (Rowntree & Birkholz, 2004) and the management of the Kat River dam (Dinar *et al.*, 2006). Overall, the process of role assignment by the KatRVP had resulted from RU researchers' interpretations of national guidelines promoting the decentralisation of water management (e.g. Gorgens, 1997; DWAF, 1997) and principle 23 of SANWA, which states, "the responsibility for the development, apportionment and management of available water resources shall, *where possible and appropriate*, be delegated to a catchment or regional level in such a manner as to enable interested parties to participate" [emphasis added]. Researchers therefore interpreted the aforementioned functions as 'possible and appropriate' for the KatRWUA. Yet in more recent

authoritative guidelines, the development of a catchment-management strategy (CMS) is more specifically associated with catchment management agency, whilst the purpose of a water-user association is "to provide a mechanism through which the CMS can be enacted locally", rather than developing the management strategy *per se* (DWAF, undated; DWAF, 2007b). However, due to the absence of a catchment management agency in the Eastern Cape (section 5.2.1), RU assumed responsibility for producing a catchment-management plan with the approval of the WRC and a project steering committee of water-sector professionals, so that the KatRWUA could sooner assume the subsequent task of water allocation, and therefore enact change in terms of access to, and control over, water resources of the Kat River catchment.

The adherence of the KatRVP to integrated water-resource management principles meant that the KatRWUA was envisaged as a 'multi-stakeholder' and 'multi-sector' initiative (e.g. Birkholz & Rowntree, 2006; Farolfi *et al.*, 2008). Furthermore, although SANWA allows water-user associations to be single-sector, the adoption of the catchment-management plan as a KatRVP activity essentially necessitated that the KatRWUA became a multi-stakeholder association, as catchment-management plans require input by, and consideration of, all water users and actors who impact on water resources within a catchment (DWAF, 2006; 2007b). In this way, both the discourse of integrated water-resource management (specifically its principles and concepts of stakeholding) and the KatRVP's framing of the 'issue', as one of competition and conflict over the water resource of the Kat River catchment (5.2.2), altered the nature and function of the KatRWUA from its antecedent KatRIB. Hence a further implicit role for the KatRWUA was that of outreach to the wider catchment stakeholders.

A final dimension of the KatRVP was the researcher-identified need for capacity building of participating stakeholders, before the KatRWUA assumed an independent management role, as:

> People cannot be expected to participate in or manage that which they lack understanding about. As there is no specific strategy for capacity building within the broader project framework, researchers have seen one of their roles to be equipping people with a basic understanding needed in order to participate (Birkholz & Rowntree, 2006: 14).

This assertion is in keeping with the perspective of UNCED's Local Agenda 21 (1992: chapter 37), that capacity building enhances the ability to evaluate and address questions related to policy choices and development options. However, this interpretation of capacity-building depends significantly on the *capacity builder's* interpretation of the nature skills and/or knowledge that is required 'to participate in or manage' water, which is in turn influenced by their own ontological perspective and agenda. Essentially, every individual 'manages' water by virtue of a need to use it, yet in the broader context of integrated water-resource management, the term 'management' has associations with a specific connotation – that of water management

in the common good at the catchment scale (chapter 2). This interpretation indicates that capacity building is necessitated *if* a social learning process is linked to specific pre-determined outcomes, in order to foster an ontological perspective that would render such outcomes rational and, therefore, probable on the part of the actors involved. This perspective clearly underscores the assumption made by social learning theory, that knowledge and understanding primarily govern behaviour. In addition to the high personal priority and commitment to capacity-building activities on the part of some RU researchers (Burt *et al.*, 2008), the inclusion of capacity building as a KatRVP objective may also have been influenced by WRC funding selection criteria of "potential contribution to capacity-building and competence development" (WRC, 2009: 1). Irrespective of the rationale, this interpretation of capacity-building also supports the conceptualisation of social learning in section 2.5, as a process that ranges across a spectrum from formal education to organic learning in an everyday-life context. The identification of 'appropriate' knowledge and subsequent design of capacity-building activities by external actors indicate that social learning in the KatRWUA context is closer to a formal education process.

Overall, the KatRVP envisaged four key roles for the KatRWUA: data provision; inter-stakeholder relationship and network building; negotiation and decision making about water-resource allocation; and water-management activities including water-user registration, issuance of water-use licenses and operation of the Kat River dam. The following chapter explores how these envisaged roles played out in practice. The next section moves on to analyse the roles and responsibilities of the second case-study institution and the participants of both case studies.

5.2.4) Positioning this research within the context of KatRVP activities

At the time of this research in 2006, much of the first phase of the KatRVP had been completed and, as the project was due to end in early 2007, the second negotiation phase had been initiated despite the lack of formal endorsement by DWAF of the Kat River yield analysis and ecological reserve determinations. At the time that this fieldwork phase was carried out, KatRWUA members were focused on two main activities: generating water-allocation scenarios using KatAWARE and obtaining a development vision for the Kat River catchment. Participant observation that is drawn upon for this research was carried out at workshops and meetings related to these activities. Attendance at KatRCF meetings and a community farmers meeting also increased comprehension of wider social and physical aspects of the Kat River catchment.

5.3) Identifying the roles and activities of the KuisebBMC (Namibia)

This section provides a similar overview of the historical development of the KuisebBMC, and includes a comparative analysis of the envisaged roles and issues with those of the KatRWUA.

5.3.1) Desert research, development and a dry catchment

The KuisebBMC originated in a GTZ-funded[13] project entitled 'Environmental Learning and Action in the Kuiseb' (hereafter ELAK project), which was implemented by the NGO Desert Research Foundation of Namibia (DRFN) in 2001 as part of a broader EU initiative to enact integrated water-resource management in developing countries. Around the time that the ELAK project was engaging with land- and water-users of the Kuiseb catchment, the DWA was involved in drafting the NWRMA, which promoted the formation of BMCs (see section 4.7.3). Thus, according to interviewees, it was jointly proposed by DRFN and DWA that Namibia's first BMC should come about as a natural extension to the ELAK project. In this way, the KuisebBMC arose partly from a development project initiated by an external organisation, albeit one with a history of research and development activity in the Kuiseb River catchment, in contrast to the KatRWUA, which evolved from a pre-existing catchment-based organisation. As such, the KuisebBMC had no pre-existing associations with structures that had historically reinforced Apartheid state policies of exclusion and discrimination. This difference is significant, as historical connotations are later considered to be one explanation for the lack of perceived participation in, and wider legitimacy of, the KatRWUA by the Xhosa population of the Kat River catchment (sections 8.5 and 8.6).

Although the ELAK project terminated in 2003, its history as a pre-cursor to the KuisebBMC meant that it remained relevant to the social learning process of the KuisebBMC. The aim of the ELAK project was to "facilitate communication, co-operative learning and action amongst all decision-makers and those dependent on the Kuiseb River Basin" (ELAK/DRFN, 2002a: 4), with specific project objectives including (Botes *et al.*, 2003: 855):

1. To focus on an innovative approach to facilitation of communication, cooperative learning and action among all decision makers within and dependent on the Kuiseb basin;
2. To ensure that a common vision across the sectors or stakeholders is developed, well understood, shared and maintained on an interactive basis; and
3. To ensure that all levels of decision makers in the Kuiseb catchment have the capacity to understand and manage freshwater and other terrestrial natural resources in a sustainable manner.

In order to meet these objectives, ELAK project activities focussed on: providing a forum for stakeholders to interact (i.e. ELAK workshops), collating and sharing information on the Kuiseb

[13] GTZ is a German international development agency, which "promotes complex reforms and change processes...to improve people's living conditions on a sustainable basis" (GTZ, 2008).

(i.e. stakeholder feedback; production of the Kuiseb profile), and organising educational events for stakeholders (i.e. field visits) (Botes *et al.*, 2003). The use of such activities as a means of stimulating collective action towards sustainable natural resource management clearly synergise with the conceptual framework of social learning that is presented in section 2.5.3, which is similarly premised on face-to-face interaction, learning, negotiation and information sharing amongst stakeholders. The roles that the ELAK project activities and objectives invoke for the KuisebBMC are discussed following an analysis of the salient issues.

5.3.2) Ascertaining and addressing the issues of Kuiseb River catchment stakeholders

The information-sharing ethos of the ELAK project specifically required participating stakeholders to contribute to its proceedings. A discourse analysis of ELAK reports, alongside KuisebBMC minutes and interviews with participants, therefore revealed a range of water-related issues and concerns amongst stakeholders of the Kuiseb catchment, including:

- [Lack of] water availability
- Impacts of climate change
- Increasing demand on water resources, especially from mining activities in the vicinity
- Increasing cost of water-supply services and [non-]payment for such services
- Ecological change e.g. vegetation death
- Flooding issues, including monitoring, detection, and protection
- Water retention by commercial farm dams in the Upper Kuiseb

These issues are related to aspects of the physical and socio-economic context, which are referred to in chapters 3 and 4. Ultimately, the extreme climatic aridity of Namibia manifests in a high level of water scarcity that is exacerbated by geological conditions and evaporation (section 3.4.4). The resultant physical scarcity engenders competition within, and between, human and non-human water-users. Socially, this scarcity had created high inter-stakeholder tension and mistrust, which had been exacerbated by the historical segregation of different social groups and, therefore, water-users. In particular, tensions between upstream and downstream water-users had been fuelled by perceptions that the commercial farmers of the Upper Kuiseb had been withholding too much rainwater and preventing it from reaching the Lower Kuiseb (Amakali, 2005). Thus, whilst the historic exclusive allocation of the Kat River catchment's water resources had produced extreme social water scarcity, physical scarcity played a more significant role in determining the water issues of the Kuiseb River catchment.

Water use amongst stakeholders of the Kuiseb River catchment was further complicated by the physical nature of the resource, such that water-users accessed and utilised water resources in different ways: commercial farmers in the Upper Kuiseb used mainly surface water, whilst

communal farmers and indigenous communities in the Lower Kuiseb used groundwater. Yet, in either case, and for institutional water-service providers, the climate and geology engendered high water-recovery, storage and, therefore, supply costs. Historically, higher levels of assistance were provided to white citizens for water-related infrastructure vis-à-vis the wider social discrimination against black Namibians, thereby contributing to social scarcity, albeit in a more indirect manner than in the Kat River catchment. Consequently, the key issue of physical water scarcity was compounded, rather than driven, by the Namibian context of extreme inequality and widespread poverty (chapter 4) at the time of this research. Nonetheless, the historical inequalities and power differentials between social groups in both catchments render the concept of social scarcity, as introduced in section 2.2, highly relevant to this research.

5.3.3) ELAK and KuisebBMC activities

The constitution of the KuisebBMC proposes a set of functions, which directly correspond to those identified in NWRMA as suitable for a generic basin-management committee (section 4.7.7). In addition, three additional functions were decided on, and adopted, by the KuisebBMC members (KuisebBMC, undated: 3), including:

1. Liaise on a local, regional and national level with all stakeholders, thus embodying full consultation and participation by local communities and stakeholders;
2. Identify and resolve natural resource conflicts, where the KuisebBMC will act in a facilitative capacity; and
3. For the purposes of attaining its vision and functions, the KuisebBMC will put in place, review and execute a Strategic Plan on an annual basis, which Plan shall be in line with national Policies.

These functions specifically confer the roles of networking, mediation and planning on the KuisebBMC, in addition to those associated with the functions listed in NWRMA, which variably constitute: education, training, monitoring data collection, integrated water-resource management implementation, planning, infrastructure operator, data analyst, and water-use and allocation oversight. This range of possible functions for the KuisebBMC is extensive, especially when compared with that of the KatRWUA. Specific activities for the KuisebBMC are therefore less well-defined than those of the KatRWUA due to: the lack of specific activities identified by ELAK for the KuisebBMC beyond inter-stakeholder interaction and information exchange, the ambiguity regarding the function of basin-management committees in NWRMA; and the uncertain status of NWRMA to date (section 4.7.3). The implication of this difference on the outcomes of the social learning processes is discussed in the following chapter.

As with the KatRVP, the ELAK project aimed to increase the capacity of all stakeholders to manage water resources. To this end, "a greater-than expected emphasis" was placed on working with the Topnaar community (Botes *et al.*, 2003: 856). Fitter (2004) links this emphasis on capacity building under the ELAK project to the status of DRFN as an NGO with an institutional focus on training and education of communities that have historically been denied access to formal education and decision making processes. In contrast to the KatRVP, the ELAK project implementers explicitly stated their vision of 'capacity' as being the ability of catchment-based actors to enact "sustainable management" (see objective 3 in section 5.3.1). This capacity-building focus inherently assumes that catchment-based social actors cannot enact 'appropriate' water management, until they acquire the requisite understanding and knowledge through an appropriate education process. This concept of capacity building, involving the transfer of knowledge, skills and concepts from one (set of) actor(s) to another, implies that capacity building is a euphemism for education, which is supported by Eade's (1997) assertion that, practically, capacity-building involves training and education on how to carry out an activity more appropriately. Nevertheless, in accordance with integrated water-resource management principles, both the ELAK project and the KatRVP envisage future independent and active management roles for the KuisebBMC and KatRWUA respectively, *once* capacity building has taken place.

This interpretation of the case-study social learning processes as education processes, implies that the respective forums act as a channel by which knowledge, information and perspectives trickle down from higher-level to localised actors in a top-down process. The use of a capacity-building approach by RU and DRFN thereby reinforces the conceptual framework of managed social learning (section 2.5.3), as an approach that is used by external actors to transform the outlook, and ultimately the behaviour, of local social actors via education. This interpretation further invokes the roles of learner and subsequently, an agent of change for catchment-based stakeholders participating in social learning processes. Learning and change that have resulted from the KatRWUA and KuisebBMC forums are discussed in chapters 6 and 7.

5.3.4) Positioning this research within the timeline of the KuisebBMC

At the time that fieldwork in Namibia was carried out in 2007, the 'independent' KuisebBMC had been meeting on a quarterly basis for three years. According to a discourse analysis of meeting minutes and interviews, the KuisebBMC had mainly been preoccupied with logistical issues, such as sourcing funding and drawing up a constitution, whilst operating on an 'information-sharing' basis. The latter activity meets the constitutional function of inter-stakeholder liaison and communication, as well as the objectives of multi-stakeholder participation and collective learning of both integrated water-resource management and social

learning discourses. During this fieldwork phase, the KuisebBMC secured GTZ funding to undertake a Water Master Plan for the Kuiseb River catchment.

5.4) Implementing and facilitating social learning processes

Whilst chapter 4 demonstrates that, ultimately, the roles and functions of both the KatRWUA and KuisebBMC are strongly governed by the global discourse of integrated water-resource management via national Water Acts, preceding sections in this chapter have also demonstrated the influential role of implementing institutions of participatory processes that encompass social learning. Although the broad goals and objectives of the KatRVP and ELAK projects align with integrated water-resource management and government perspectives according to global principles and National Water Acts, the semantically ambiguous wording of the latter (sections 2.4 and 4.7) have nevertheless produced *interpretations* of the roles and functions of decentralised water-management institutions. In their process implementation roles, RU and DRFN acted as 'translators' of the global discourse, and national policies and guidelines, in order to implement and enact them at the catchment scale. RU and DRFN are therefore conceived as metaphorical 'filters', through which global and national principles and ideals trickle down to localised actors. This filtration process is highly relevant to social learning processes of the KatRWUA and KuisebBMC, as recommended facilitation approaches, conventionally promote 'neutral' facilitation (e.g. Robinson, 1999; Clarke, 2004; Kaner *et al.*, 2007). In contrast, RU and DRFN were previously linked with distinct ontological perspectives and ideological stances, such as RU researchers' action research ethos, which incorporates social justice, and the DRFN's pro natural-resource protection sympathies (sections 5.2.1 and 5.3.1). Moreover, academic and development institutions are considered to be influenced by the need to be associated with 'successful' projects, in order to secure future research and/or development funding. For instance, researcher motivation to ensure project success was interpreted from an occasion when one historically disadvantaged KatRWUA member observed that they would be unable to attend a meeting because of their new employment. A RU researcher subsequently proposed contacting the member's boss, in order to request his release from work, such that he could attend said meeting and, therefore, ultimately that objectives of representation would be met – the process would otherwise be illegitimate according to DWAF guidelines (section 4.7).

The ideology and objectives of RU also affected the outputs of the social learning process, through the advertent selection of stakeholder objectives and desires for inclusion in such outputs. For instance, during a workshop to ascertain residents' development visions for the Kat River catchment, some participants identified that alluvial sand deposited on the river banks was a good source of income, and proposed an increase in sand harvesting as an economic

development activity in future. A RU researcher involved in writing up 'the peoples' vision later reflected that an increase in sand deposits would necessitate and, in turn, generate increased soil erosion. As this outcome is considered negative from an environmental perspective, they asserted that this aspect of the economic visioning process "will not be going in the report!" (Field notes, August, 2006). Although it is recognised that a government body with the mandate of protecting the Nation's water resources would anyhow be unlikely to sanction such activity, this example nevertheless illustrates how RU was able to control the flow of information that was filtered 'up' from catchment residents to official decision-makers. The impact of facilitation on social learning processes of the KatRWUA is discussed further in chapters 6 and 7.

Despite these examples of manipulation and bias on the part of an implementing and facilitating agent, most KatRWUA and KuisebBMC participants identified the involvement of RU and DRFN as positive, largely due to perceptions of their neutrality. For example, a KatRWUA member observed that "outside people [RU] came who weren't so emotional about it [issue of water use]". Although RU and DRFN can be described as neutral in terms of historic non-alignment with particular social group(s) within the 'conflict' situations of the Kat and Kuiseb River catchments (sections 5.2.2 and 5.3.2), insights derived from examples in this chapter illustrate that they are neither wholly independent nor free from bias. Nevertheless, the perception of their neutrality amidst stakeholders was highlighted as having enabled varying degrees of multi-stakeholder involvement (see the following section) within the respective contexts of conflict, historical enmity and/or mistrust between catchment stakeholders (section 4.2.1). Consequently, the convening role of 'neutral' institutions can be considered to facilitate the realisation of managed social learning which inherently require multi-actor participation.

RU and DRFN both administered capacity-building activities with KatRWUA and KuisebBMC members and wider stakeholders within their catchments. An analysis of ELAK project reports, KatRVP reports, and unpublished Master's and Doctoral theses (e.g. McMaster, 2002; Motteux, 2003; Gumede, 2008) reveal a core set of objectives associated with such activities:

- Improving stakeholder awareness of the hydrological catchment as a unit of social and natural interconnection;
- Improving knowledge of hydrological processes, land-surface interconnections, and stakeholder interdependencies;
- Improving stakeholder ability to understand and interpret scientific and technical data; and
- Improving the ability of stakeholders to identify their own problems, needs and solutions.

Whilst some capacity-building activities targeted the entire memberships of the KatRWUA and KuisebBMC, others were mainly focussed on stakeholder groups whose members were

typically defined as historically disadvantaged. This observation underscores the paradox of managed social learning alluded to in section 2.5.4, as it inherently implies that some stakeholders are 'less capable' than others, versus the normative position of social learning, in which all social actors and their perspectives are equal. Moreover, the selective nature of capacity building may reinforce negative assumptions pertaining to historically disadvantaged actors ability amongst others stakeholders, whilst simultaneously impacting detrimentally on the self-efficacy of historically disadvantaged members themselves (Percy-Smith, 2006). However, the reality of a process that continues to be strongly driven by formally-educated actors, and which occurs in a setting where scientific and technical information is pervasive and privileged (section 6.2), means that some actors do need to be prepared, or 'capacitated', *for such circumstances*. Nonetheless, this need for capacity building should therefore be perceived as arising from the need to meet the globally and nationally defined specifications and purpose of the water-management process, in order to achieve *their* objectives and desired behaviour, rather than those, necessarily, of the actors being capacitated. This interpretation indicates that, in addition to defining the roles and objectives of the case-study social learning forums (sections 5.2.3 and 5.3.3), the information exchange and knowledge construction processes within social learning processes will also be influenced by external actors, as explored in sections 6.2 and 6.3.

5.5) Participating in social learning and water-resource management

5.5.1) Identifying stakeholders for social learning

Social learning involving multi-stakeholder participation is thought to lead to improved natural-resource management (section 2.4). As part of the KatRVP and ELAK projects, stakeholders for the KatRWUA and the KuisebBMC were initially identified by RU and DRFN based on their own knowledge of the catchments actors. In both cases the snowball method was also used, as it reduces the inadvertent exclusion of stakeholders (Griffiths *et al.*, 1993). The stakeholders listed in tables 5.1 and 5.2 were identified according to the widely accepted definition of a stakeholder, as an actor who has an interest in, impact on (positive or negative), or responsibility for, decision making and action pertaining to the issue in question (e.g. WHO, 2008; Schmeer, 2008; Reed *et al.*, 2009). Water governors, managers, and users, as well as land-users, are specifically identified as important stakeholders for the realisation of holistic water management (UNDP, 2008; IWMI, 2008). However, important differences in the timing and nature of stakeholder identification activities on the part of RU and DRFN were observed. The ELAK project used preliminary workshops to engage in a collective process of stakeholder identification following their own initial identification and invitation of stakeholders. The ELAK project then handed responsibility for deciding which stakeholders should comprise the

formal KuisebBMC to the wider forum of ELAK participants. A two-tiered structure was consequently proposed, comprising of a wider 'unofficial' forum of catchment stakeholders and a formal basin-management committee that would represent the wider stakeholders and engage in decision making on their behalf (ELAK/DRFN, 2002c). In this way, catchment-based stakeholders decided themselves who was 'relevant' to catchment-management, albeit following workshops introducing the principles of integrated water-resource management and the NWRMA. Table 5.1 shows the stakeholders, who the ELAK participants identified for KuisebBMC membership.

Table 5.1. Stakeholders identified by ELAK participants for the KuisebBMC (ELAK/DRFN, 2002c)

Stakeholder	Rationale	Attendance
Commercial farmers	Commercial water-user	Frequent
Topnaar community/communal farmers	Domestic- and communal farmer-user	Infrequent[14]
Gobabeb Training & Research Centre (GTRC)	Domestic water-user and interest group	Always
Walvis Bay Municipality (WBM)	Bulk water purchase and redistribution (on cost recovery basis)	Always
NamWater	Bulk water supplier on cost recovery basis	Frequent
Department of Water Affairs (DWA)	Custodian of national water resources	Frequent
Erongo Regional Council (ERC)	Development planning	Frequent[15]
Khomas Regional Council (KRC)	Development planning	Never
Directorate of Rural Water Supply (DRWS)	Bulk water supplier on cost recovery basis	Frequent
Directorate of Extension and Engineering (DEES)	Ministry of Agriculture's farmer support-service	Frequent
The Walvis Bay Wetland Trust	Walvis-based environmental NGO	Frequent
The natural environment	Ecosystem goods and services	
Desert Research Foundation Namibia (DRFN)	NGO interest group and historical facilitator of the ELAK project	Infrequent

In contrast to the KuisebBMC, the objectives, roles and activities of the KatRWUA were largely defined prior to securing the involvement of all stakeholders deemed necessary for either the realisation of the KatRVP, or integrated water-resource management objectives. RU researchers originally identified a core set of stakeholders for inclusion in the initial transformation process: DWAF, scheduled farmers, non-scheduled commercial farmers, communal farmers and domestic water users (Rowntree & Birkholz, 2004). The resultant KatRWUA committee membership included a commercial farmer, small-scale farmer and domestic water user from each of the catchments sub-areas. Out of the commercial farmers, one was scheduled, one unscheduled, and one emerging. As such, the KatRWUA had a higher percentage of members from historically disadvantaged social groups than the KuisebBMC. RU anticipated that further

[14] Communal farmers in the Kuiseb River catchment are all from the Topnaar ethnic group, such that these two identities were equated to one for stakeholding purposes by ELAK participants.
[15] ERC are represented indirectly via the DRWS representative, as he also attended ERC meetings. He was therefore authorised by ERC to attend KuisebBMC meetings on their behalf as well as DRWS.

relevant stakeholders would be identified and would participate once the second phase of the project was underway (*ibid*). Stakeholders subsequently identified as relevant are presented in table 5.2. The pre-determination of the KatRWUA's role, prior to more extensive stakeholder involvement, may have negatively impacted on participation (section 5.5.3).

Table 5. 2. Stakeholders identified as relevant for KatRWUA membership by Burt & Vanderford (2006), and their levels of attendance during the research period

Stakeholder	Rationale	Attendance
Small-scale farmer	Small-scale agricultural water-user	Frequent
Emerging commercial farmer	Large-scale agricultural use	Frequent
Scheduled commercial farmer	Commercial agricultural water-user (legal)	Frequent
Unscheduled commercial farmer	Commercial agricultural water-user (legal status uncertain)	Frequent
Domestic users	Domestic water-use	Frequent
Department of Water Affairs & Forestry (DWAF)	Custodian of national water resources	Alternate meetings
Nkonkobe Municipality	Planning, bulk water-user	Rare
RU researchers	Academic institution and facilitator	Frequent
Nature/game reserves	Tourism user and ecosystem goods and services	Never
Commercial forestry	Water-user	Rare
Traditional leaders	Traditional 'community' representatives	Never
Tourism operators	Tourism sector water-user	Never
Stock farmers	Commercial stock farming water-user	Never
The natural environment	Ecosystem goods and services	N/A
NGOs and community groups (e.g. World Vision, schools)	Interest group	Never

A limitation of identifying stakeholders according to water-use sector involves the ascription of identity according to a single identity variable, versus the reality of multiple intersecting identities at the individual level (Agarwal & Gibson, 1999). Identification in this way can mean that stakeholders come to the process in 'defensive mode', rather than to learn about, and engage with, the alternative perspectives and knowledge of other stakeholders (Ison & Watson, 2007). However, the extent to which this phenomenon presents a hindrance also depends on the posited objectives and outcome(s) of the social learning process. For instance, the activities of the KatRWUA are later revealed to engender defensive behaviour, compared with the ambiguous and unthreatening nature of the KuisebBMC forum (section 7.3). Above all, the stakeholder identification processes made two critical assumptions: that all stakeholders identified as relevant from an integrated water-resource management perspective recognise a need or motivation to participate, and that single actors are representative of whole stakeholder groups. These assumptions are explored in relation to the case studies in sections 5.5.5 and 8.3.

5.5.2) The non-human stakeholder: representing the environment

In contrast to the socio-economic needs of human actors, environmental needs cannot be articulated literally by the physical environment itself. Thus, either actors (individuals or

institutions) or structures (legislation), or both, are required to provide a 'voice' for the natural environment. In South Africa, the environmental right to water is strongly represented by stipulations in SANWA (section 4.7.2). Initially, ecological reserve values for various categories of river are calculated by experts, ranging from A (unmodified, natural) to F (critically modified). A participatory process then allows the development visions of the catchment-based stakeholders to be taken into decision making consideration before a final ecological class is assigned by DWAF to the river (Van Wyk *et al.*, 2006; DWAF, 2007a). The DWAF-approved ecological class must then be reflected in the catchment-management plans (Palmer *et al.*, 2005). In this way, the ecological reserve and, therefore, the state of the biophysical system are influenced by social values and desires. As part of its progress towards operation as a water-allocation entity, the KatRWUA held a catchment visioning workshop during the fieldwork for this research, to which wider catchment stakeholders were invited. Significantly, this process sets up a potential conflict at decentralised levels of decision making in the preferred allocation of water resources between stakeholders who operate at different scales. A further exploration of this process, and its implications for social learning, is carried out in the following chapter.

In contrast, the environmental requirements of the Kuiseb River are represented on the KuisebBMC by the institutional stakeholders DWA and GTRC. These two stakeholders differed in terms of the ethos that underscored their representation of environmental interests. Whilst DWA was the 'custodian' of water resources in the contemporary and future national interest, its position within the broader apparatus of the Namibian State means it would be naïve to assume that it operated without political interference. In contrast, GTRC is linked to an ethos of environmental restoration, protection and sustainability (GTRC, 2009). In either case, their representation of the environment requires comprehension of the environmental 'voice'. Biophysical monitoring and evaluation are widely considered to provide such understanding (e.g. DWAF, 2007a; EPA, 2008). However, such understanding is subject to two processes: human ability to produce or access biophysical data, and the subsequent interpretation and translation of this 'raw' information into knowledge. The first process requires financial and human resources and, despite standard procedures for making inferences from biophysical data, the second process varies between social actors. The extreme variability of the Namibian climate presents difficulties for: determining environmental water needs (Seely, 2005); monitoring environmental change; and ascertaining the cause of observed environmental change (Ward *et al.*, 2004). In addition to human errors in interpretation (Fewtrell & Bartram, 2001; Chen *et al.*, 2007), political ecology research (overviewed in section 2.3) illustrates that the interpretation of biophysical data may not be neutral, as it can be influenced by socio-economic and political agendas. In this regard, the status of GTRC as an environmental representative on the KuisebBMC, as well as being the major source of information and knowledge on the Kuiseb

catchment, potentially presents a conflict of interest; especially in light of Sullivan's (2000) research implicating Namibian research and development NGOs in the overestimation of the extent of desertification. The interpretation that resource availability and institutional bias affect the collection, production and dissemination of information, informs later analyses, as it implies that understandings and worldviews are affected by agendas and power relations, which are in turn of high relevance to the multi-actor context of water management where competing values exist and/or the resource status is often contested.

5.5.3) "We cannot make people participate": realising multi-stakeholder participation

Tables 5.1 and 5.2 include the physical attendance of stakeholders, as a proxy for a basic indication of participation (Arnstein, 1969; Powell *et al.*, 2004). Despite efforts by RU to engage a range of institutional stakeholders and non-agricultural water-users, in order to render the KatRWUA a multi-stakeholder organisation, participants were predominantly agricultural stakeholders with the exception of domestic users. As irrigated agriculture is the largest water-user of the catchment, accounting for an estimated 60% of total use (Dinar *et al.*, 2006), and because the KatRWUA's origins lie with the agricultural KatRIB, the predominance of agriculture-related stakeholders is unsurprising. Moreover, as legislative changes (section 4.7.2) particularly impacted on the livelihoods of agricultural water-users, it is consequently logical that their motivation to participate was higher. For example large-scale farmers were historically able to operate according to riparian rights, whilst the reintegration of the Ciskei and priority allocation to historically disadvantaged members increased demand for water on the part of small-scale and emerging black farmers. This example emphasises the significance of external stimuli, in the form of legislation, for bringing about change. The KatRWUA remained primarily agricultural and livelihoods oriented, which differed significantly from the multi-stakeholder and mainly institutional make-up of the KuisebBMC.

Although the KuisebBMC has a comparatively wide range of stakeholders, the low population density of the Kuiseb River catchment means that the majority of KuisebBMC participants are institutional stakeholders, whose areas of jurisdiction encompass the Kuiseb River catchment but whose institutions are generally located in the cities of Windhoek or Walvis Bay, which are located outside the Kuiseb River's hydrological catchment boundaries (section 3.4.4). Only the commercial farmer and Topnaar (communal farmer) representatives constitute livelihoods-based stakeholders. On one hand, the predominance of institutional actors was considered by participants to increase the ability of the forum to realise action, via improved access to existing decision-makers and actors within the field of water management. Yet on the other hand, institutional representation can marginalise livelihoods-based stakeholders through power

differentials, or perceptions thereof. For example, a non-institutional KuisebBMC member reflected that:

> The farmers not necessarily got a back-up via an institution to support them, you stand there as an individual, got no backing after there, not like the municipality or the government. You are personally there and you can't stand up to those guys because they've got big institutions behind them.

From this livelihood-based stakeholder's perspective, the status and resources of formal institutions rendered them more influential than individuals. However, this quote reveals that notions of power are subjective when compared to that of an institutional participant in section 8.2.3, who exhibits feelings of disempowerment due to his *institutional* identity. Notwithstanding the subjectivity of perceptions, power is considered central to understanding social learning processes because power differentials not only shape social relations (section 2.6; see also Radtke & Stam, 1994; Molm, 1997; Lee, 2000 Few, 2002), but also affect biophysical outcomes according to the political ecology perspective of this research (section 2.3). The subject of power is therefore returned to throughout subsequent analysis sections, before being addressed as a key discussion theme in chapter 9.

In an analysis of European social learning case studies, Mostert *et al.* (2007: 6) identify "the involvement of all major stakeholders as an important aspect of the process". Despite securing the participation of government water-management agencies, tables 5.1 and 5.2 reveal that not all the stakeholders identified as relevant by the legislation and/or implementing agencies in section 5.5.1 participate in the KatRWUA and KuisebBMC processes. Whilst stakeholder participation in the KuisebBMC is significantly more varied than the KatRWUA, KuisebBMC members identified a lack of involvement by the Ministry of Environment and Tourism (MET) and the regional councils. In view of the stipulation by NWRMA that attendance by a representative of the regional council is mandatory (section 4.7.6), a KuisebBMC member accurately observed that, "unless they [regional councils] can be made to come, or this thing [stipulation] in the Act is changed, all the work so far is useless". This quote highlights the practical problem of legislation and theories that assume a willingness and/or ability to participate. In reality, the non-participation of the regional councils has meant that the KuisebBMC has remained unrecognisable by statute for the past three years. In this way, legislation confers power on certain stakeholders, whose absence invalidates the process, thereby effectively disempowering, and negating the participation of, the other participants.

The lack of participation by local government structures is also significant because it was widely felt amongst KatRWUA and KuisebBMC members that such authorities not only account for a significant percentage of water use, but that they [should] represent the issues and

concerns of the 'average' catchment resident, i.e. person who is not a large-scale or economic sector water-user, at participatory decision making forums. For example, in response to a question on who should have been involved but was not, a KatRWUA member responded:

> The Municipality. For me it was very bad that they are not involved. They draw the best and the most out of the system yet there is no participation. Also the emerging farmers are dependent on them so they should have participated (...) the municipality in more ways than one, the people that are employed here – it is a big economic effect, a massive amount of people work in this area so they should have come because that is what they are supposed to be concerned with.

Whilst the KuisebBMC theoretically overcomes the lack of municipal input by hosting wider stakeholder forums on an annual basis, in order to allow wider catchment residents to influence the issues addressed by, and activities of, the KuisebBMC, the poor public attendance of the forums indicated that, in practice, such input did not occur. The KatRWUA similarly attempted to incorporate wider representation through its designation of three committee places for domestic water-users. However, the extent to which such stakeholders were able to participate actively in the activities of the KatRWUA, in addition to their ability to represent domestic and subsistence users of the entire catchment, is thought to be limited (section 8.3.1).

In order to achieve goals of social equity, both SANWA and NWRMA promote the inclusion of 'historically marginalised' actors in water-management institutions, which should have "appropriate community, racial and gender representation" (DWAF, undated: 11). With only one female member each, neither the KatRWUA nor the KuisebBMC met national goals of female representation. The policy rhetoric overlooks the practical difficulties of securing participation by historically marginalised actors, especially by women in a cultural context that favours male participation in public forums and decision making processes (section 4.4.5). This implication is significant in light of research, which demonstrates that water-management initiatives involving women may be more successful in engendering positive outcomes over the long-term (Agarwal, 2000; Panda, 2007). Overwhelming male participation is explained by the dominance of agriculture-based livelihoods in the case-study catchments, traditionally a male activity, and by stakeholder nomination of representatives, such that observations are thought to be reflective of the wider societal gender imbalances outlined in section 4.4.5. This interpretation supports assertions that the socio-cultural environment influences organisational settings and social learning processes (e.g. Sagie & Aycan, 2003; Enserink *et al.*, 2007). Nevertheless, a final plausible reason for the lack of female non-participation is that the issues addressed by, and the activities of, the KatRWUA and KuisebBMC are not relevant to female catchment residents, such that there is little motivation for them to participate. This notion that an incentive is required for participation is returned to in section 5.5.5. KuisebBMC members also highlighted the lack of participation by the Topnaar community, whose original

representative stopped attending KuisebBMC meetings for the reasons presented later in section 8.3.1. Nonetheless, the Topnaar community is still considered to be represented via the participation of the DEES extension officer, who is a member of the Topnaar ethnic group himself, and who is employed to support communal farmers (who are all members of the Topnaar community – see section 3.4.4). Thus, he is considered by other KuisebBMC members to be "speaking on their [Topnaar] behalf". These observations suggest that members of the KuisebBMC are more concerned about securing the *appearance* of multi-stakeholder participation, irrespective of whether such participation is *meaningful*. For instance, when asked if the activities of the KuisebBMC itself needed to be made more relevant to the Topnaar community, in order to activate their participation, a response was, "no, I don't think so. This is a very small group in the basin numbers...the important thing is that one must just get them involved". This interpretation alludes to the significant pressure on 'participatory' institutions to appear thus, in order to achieve legitimacy according to the goals of national and international actors. The topic of institutional legitimacy is returned to in chapter 8.

Overall, this section demonstrates that not all stakeholders, considered relevant to water management under the discourse of integrated water-resource management perspective, were involved in the KatRWUA and KuisebBMC processes. This lack of multi-sector participation has detrimental implications for theories of social learning as an approach for realising integrated water-resource management, which envisage that *all* catchment agents impact on, and are affected by, water resources. Sustainable water-resource management and use are therefore considered to be contingent on "all members of society changing their behaviour to some extent" (White *et al.*, 2005: 14). According to this logic, a process in which all relevant actors do not participate is less likely to yield the cumulative change in action that catchment-scale positive outcomes depend upon. Furthermore, the concepts of participation that have been applied to the KatRWUA and the KuisebBMC entail a limited group of stakeholder representatives representing a broader group of actors. The concept of managed social learning further conceives that this representation process ultimately brings about wider social and environmental change, through the implicit assumption that representatives are able to influence the behaviour of the wider stakeholder group that they represent. This conceptualisation underscores the central role of representation within social learning processes, and visualises it as a two-way process whereby participating representatives communicate with their wider stakeholder group, in order to represent their interests, and then report back, and share information, from the proceedings of the social learning forum, in order to trigger appropriate behavioural change. This process, and associated assumptions, of representation are critiqued in relation to empirical findings in chapter 8.

A final reason for viewing the absence of some stakeholders as a detrimental feature of the processes, is that social learning refers to the process by which "different actors become aware of the different stakes and perspectives on the river basin reality, and together they learn to deal with it in a more integrated, encompassing way" (Craps & Maurel, 2003: 17). Hence the smaller the range of stakeholders represented on social learning forums, the more the learning process and access to different perspectives are constrained. The barriers to participation are therefore explored in chapter 8, as failure to participate in turn fundamentally restricts the potential for collective learning and subsequent concerted action. Although this section has focused on the physical attendance of stakeholders as a means of analysing participation, the importance of, and reasons for, a differential between attendance *per se* and subsequent levels of actual participation are discussed in the following chapter.

5.5.4) Involving government water-management authorities

Relations between state water-management authorities and the KatRWUA and KuisebBMC are considered to be of particular importance to social learning processes, as the function and activities of the KatRWUA and KuisebBMC were subject to the former's approval (section 4.7.6). In the KatRWUA case, RU researchers also assumed that DWAF approval of the KatRVP would be more forthcoming if DWAF was involved. Yet securing the participation of regional DWAF was problematic. Birkholz & Rowntree (2006) ascribe this problem to resource constraints of DWAF and personality conflicts between RU researchers and DWAF employees. Another plausible interpretation is that staff members at the regional DWAF office were affronted by the project origins, as the process for institutional change and devolution was originally envisaged *by* DWAF for implementation *by* DWAF. Such implementation was foreseen to occur on a priority basis due to human and financial resource constraints (Karodia, 1998). The Kat River catchment was unlikely to have been viewed as a 'priority' due to the relative abundance of water, high water-quality status, and lack of severe social scarcity compared to other South African river catchments. The KatRVP effectively sidelined the role of DWAF, as illustrated by RU researchers' objective, "to work with catchment stakeholders effectively as agents of DWAF" (Rowntree & Hughes, 2005: 1). This action is unlikely to have endeared itself to DWAF staff, as the institution has traditionally operated on a 'command and control' basis (section 4.7.1). In addition, the KatRVP was facilitated by a combination of researchers' and a commercial farmer's personal contacts within national DWAF and the WRC (section 5.2.1). Thus, in light of recognition of the potential for delays in the determination of the catchment's reserve and yield by DWAF (Rowntree & Hughes, 2005), another interpretation is that commercial farmers essentially used the KatRVP to 'jump the queue' for ascertaining the yield of the Kat River, in order to set about their personal agenda of securing access and/or increased access to water (participants' agendas are analysed further in sections 5.5.5 and 7.2).

According to the interpretations above, it is highly conceivable that regional DWAF only conceded to participate in the KatRWUA due to internal hierarchal pressure, as interpreted from the initial unwillingness of DWAF to attend KatRWUA meetings, at which RU researchers were present. The extremity of such un-cooperation was subsequently resolved, with all parties later attending meetings concurrently. Nonetheless, DWAF was able to delay and obstruct the social learning process. For instance, at the time of this research, DWAF approval had not been granted within one year of RU researchers' submission of yield analysis and the ecological reserve determinations. As a result, the production of the catchment-management plan was delayed and, therefore, the realisation of the KatRWUA's envisaged role as a license-granting institution. Notwithstanding normal delays imposed by institutional bureaucracy (section 8.4), this example highlights the significant degree of power that government water-management authorities still retain and further supports assertions that devolution had not occurred within the water sector of South Africa (sections 4.7.7 and 5.2.3). Furthermore, this example highlights how relational factors acted to subvert global and national policy intentions of multi-stakeholder cooperation, especially across vertical scales of management, as historical agents of power perceived that intended power shifts were not in their favour.

Although relations between the DWA and DRFN were more cordial in the Namibian case study, as illustrated by figure 6.1, initial tensions were also experienced according to several interviewees, one of whom recalled that "whenever we [implementing group] tried to do anything, they [DWA] would just turn around and say that we were doing it all wrong!" Another interview extract (in section 7.2.4) reveals a similar sentiment. Such quotes attest to the difficulty in changing institutional norms, as the authoritarian tradition of water-management (section 4.7.1) was challenged by the democratic ideals inherent within the proposed devolution of water-management processes. The quote also reveals that history continued to impinge on the social learning process, as KuisebBMC members were subsequently reluctant to push for future action and change. This example therefore highlights the retention of power by government water-management agencies and their continued ability to influence the capacity for action and, ultimately, the existence of, social learning forums. Despite these tensions, DWA nonetheless collaborated in the KuisebBMC process, even providing limited financial support to the KuisebBMC after the termination of the ELAK project. This support is interpreted as having played a key role in the continued existence of the KuisebBMC beyond the externally-driven and -funded ELAK project (section 5.3.3). Although DWAF and DWA representatives both regarded their involvement in decentralised water-management institutions as 'observers' and 'advisors' of the process, rather than a stakeholder *per se*, a significant difference between their attitudes towards the respective water-management institutions is interpreted from quotes

provided in table 5.3, based on their content and the nature of the language used by the interviewees.

Table 5. 3. Quotes from government-agency representatives on the KatRWUA and the KuisebBMC

	DWA (KuisebBMC)	DWAF (KatRWUA)
Attitude towards learning and participation	"That's difficult, I learned at every one of them. The one I learned the most is when, ok when some agricultural people speak and about the field carrying capacity and that type of thing because I'm not from that sector and I find that interesting, just in general".	"The only thing that I have learnt was that the water users in catchment are not organised and they work very independently and that is not the objective of the WUA. WUA by definition is the group of water users with common objectives and who wish to use water for their mutual benefits. I have learnt that they do not have enough understanding of water resource management; they just want to use water and produce. They require comprehensive training on WRM".
Perception of the nature of the relationship between the decentralised institution and the government agency	"The one thing is that we can tell them how to run the BMC. And the other thing is what decisions are the best ones. Now the second one we can't do because it's against the principle and then you have a rubber stamping thing. The first thing is on how to get the committee going because we don't know how ourselves. We are starting now with all those committees and we are going a bit faster because we have used the Kuiseb as a guinea pig, I'm sorry to say that but we learned what works and what not, OK and in other basins the conditions are different and you cannot just copy it but it's a bit easier and sometimes I feel that we must just tell people what to do and it will go faster and go better but then we mustn't do that because then we will lose the people and also they may take them somewhere in the wrong place. It is not so easy to say".	"It is the role of DWAF to capacitate the WUA in order to enable them to carry out their mandate. It is not the responsibility of dwaf [sic] to manage the WUA. For example I had to take over the KatRVWUA Management Committee meeting for a year and the reason for that was to show them what they should do. I was paying for all the meetings from my budget. WUA is supposed to arrange their own meeting from their own budget. They still have the problem with the water users who are not paying the water account. They have the problem with the communication among the members. The main role of DWAF is to insure that the WUA is organised to do its job. And if they become more and more disorganised and later none functional the Minister of DWAF has power to disestablish them".

From the interview extracts in table 5.3, the attitude of the Namibian DWA's representative towards the KuisebBMC is considered to have been positive towards, and supportive of, the KuisebBMC, as well as being reflective of personal learning. In contrast, their South African counterpart perceived the KatRWUA in a relatively negative light. Moreover, the implication within both his quotes is that, from the onset of the process, DWAF is *the* authority on water management with nothing more to learn. His subsequent judgement of the KatRWUA as "dysfunctional", despite the help that the DWAF representative felt that they had provided, suggests that his 'learning' will lead to the future denial of support to the KatRWUA and/or as a basis to disestablish the KatRWUA. However, the implication that his adoption of the Chairmanship was of positive impact on the process is challenged by personal observations at one such meeting:

> The meeting was not participatory in any way shape or form. DWAF chaired in an officious manner from the head of the table and raced through the agenda points moving on when he felt they had been covered rather than allowing a discussion through to its ultimate conclusion and consensus. When the agenda points required his advice or input

> on a point that was raised at a previous meeting – these continued to remain unanswered or unrealised especially the requirement for DWAF to provide the KatRWUA with a list of currently registered water-users. At one point, when [historically disadvantaged participant] expressed an interest in a proposal put forward by RU to provide the KatRWUA with a GIS database containing information on the Kat River catchment, the DWAF official sneeringly pointed out that "you don't have access to a computer" (Field notes, June 2006).

Whilst making a salient point about the necessity of access to IT facilities that such a proposal would require *viz.* the pervasive lack of IT availability amongst KatRWUA members (section 8.2.1), the manner by which this was done (in front of the entire group and condescendingly), resulted in the silencing and humiliation of the participant in question, as interpreted from their subsequent lack of contribution to the proceedings. It is therefore plausible to further assume that the DWAF representative's individual personality may have reinforced low self-efficacy amongst historically disadvantaged participants, which is later considered detrimental to social learning processes and outcomes (section 8.2.3).

The interpretations within this section have positioned government water-management agencies as largely autocratic organisations. Whilst significant differences in the nature of the relationships existed between the case studies, between the water-management institutions and government water-management agencies; both cases nevertheless illustrated that relational tensions between historically empowered and historically disempowered actors arose from legislative change intended to transfer decision making power from one set of actors to another.

5.5.5) Motivating participation in social learning forums: economic and altruistic drivers

Due to the time and/or cost burden of participation in social learning processes (section 8.2.1), stakeholders require motivation either to participate directly, or to organise and sanction their representation, in such processes (Eversole, 2003; Manzungu, 2004; Mushauri & Plumm, 2005). Based on primary and secondary data, this section therefore explores the motivation and agendas of individuals *a propos* their participation in the KatRWUA and KuisebBMC, before comparing the findings with the institutions' envisaged aims, objectives and activities.

Research indicates that participation in resource-management initiatives correlates strongly with affluence, with actors from lower socio-economic groups less likely to participate due to their daily struggles to ensure the basic necessities of survival (Chambers, 1997; Eyben, 2004). As the Kat River catchment features high socio-economic poverty (section 3.4.3), it may be assumed that residents' ability to participate in processes on a voluntary basis is restricted. However, despite the widespread poverty, a parallel example suggests that communities are willing to contribute towards a representative's participation costs *if* they perceive that their

financial outlay will be tangibly rewarded in future. For example, one Kat River community collectively covered the transport costs for a community member to attend municipal development meetings. As the municipality was responsible for service provision and economic development of the catchment, it is interpreted that community members perceived that their attendance at such meetings could yield direct and tangible benefit(s), which would outweigh the cost outlay. This example not only demonstrates the community's ability to self-organise in the collective interest, but reveals that the activities and function of institutions and forums affect stakeholder motivation to participate. In particular, a perception of associated tangible benefits was thought to have positively influenced participation outcomes. This observation supports the assertion made in section 5.5.2, that the posited aims and objectives of the KatRWUA may discourage historically disadvantaged participation because they address the issue of the moral right to water in a conceptual sense, rather than practically addressing the tangible aspect of inequality, i.e. the water-supply infrastructure.

Without suggesting that all participants act solely out of economic self-interest, further data indicated that economic incentives influenced stakeholder participation in the case-study processes. For example, field notes reflect on an interview with a KatRWUA member:

> [Mr X's] answers were as short as possible and he was obviously very uncomfortable being interviewed, especially when we tried to probe them [his answers]. He seemed to be terrified of saying the wrong thing even though there was no right or wrong to the things we were asking [which we had stressed at the beginning of the interview].

The interviewee had been employed by RU researchers on several previous occasions. His apparent discomfort during the interview is therefore attributed to a fear of saying the wrong thing, which he is likely to have perceived as a threat to any potential future employment. This interpretation suggests that the interviewee in question was participating out of *personal* economic reward-based motivation. Interviews carried out by Mbatha support this example, from which he concluded that participation in the KatRWUA and KatRCF was strongly influenced by members' perceptions of indirect financial rewards through employment, personal development opportunities and associated 'projects'[16] (Mbatha, 2006; pers. comm.). Whilst these particular motivations are likely to apply mainly to historically disadvantaged members, commercial farmers also revealed underlying economic motivations to participate: an unscheduled commercial farmer through his desire to secure formal water rights, underlying which is the desire to increase economic stability; and a scheduled commercial farmer through his reflection that:

[16] The term 'project' has a specific connotation in the South African and Namibian contexts, of an economic development project, usually run by state or non-governmental agencies. They often provide employment and, therefore, economic revenue. RU has been associated with such projects in the past (e.g. Perks, 2003).

> We want to have a say what happens and an influence...it's vital to our business. We need sustained access to water for our business and to be able to plan for the future.

In addition to being illustrative of economic motivation to participate, this quote supports Warner (2006), who observes that participatory processes are normally attended by social actors who have a strong vested interests in the prospective outcomes vis-à-vis those who will never participate, "as they do not see how it benefits them and/or because they find it more advantageous to work around the platform" (*ibid*: 1). Nevertheless, his assertion also attests to the need for awareness of the benefits that may arise from participation in, and/or the intended outcomes, of the forum or institution. Furthermore, as the purported benefits of social learning processes are of a longer term nature (Craps & Maurel, 2003), participants' synergy with longer-term timeframes are also thought to impact on their motivation to participate, as discussed later in section 8.6.1.

Compared with the dominant economic motivation of KatRWUA members, participation in the KuisebBMC was driven by awareness that "looking at the bigger picture was necessary" and that "it was high time to get all the different role-players together and get some continuity". As reflected in such quotes, many interviewees justified their participation in, and, simultaneously the existence of, the KuisebBMC using the ethos and vocabulary that had previously been promoted and used by the ELAK project implementers. The concept of information sharing, as used by the ELAK project, had been strongly embraced by KuisebBMC stakeholders and continued to motivate KuisebBMC participants. A commercial farmer further reflected that:

> I like it because you obviously meet some other people, you go around a little bit and you get different views and perspectives. Yes, and personally you get growth through that. Especially if you are a farmer, one must remember that you work for, let's say three hundred days a year, all by yourself, you are all alone in the field so if you can get out and meet other groups then from our side that is very important, to get out and get that information.

This social interaction element featured more strongly amongst KuisebBMC participants than economic incentives to participate. The continued presence of most original KuisebBMC members had also generated a sense of loyalty towards each other, which further reinforced commitment to participation in the KuisebBMC, as expressed by one member:

> I like the interactions with the others who are also interested in the same questions but from different perspectives. It is like a "little club" – but I don't mean that in a bad way, we are not a closed group but the social interaction is very important, we have come a long way together since the ELAK project.

This example indicates that strong forms of all types of social capital had been created via the KuisebBMC interaction process, as is discussed further in section 6.4. The differences in motivation between KatRWUA and KuisebBMC members can be explained in part by the differences in stakeholder type that were observed in section 5.5.3, in which the KuisebBMC was dominated by institutional representation compared with the livelihoods-oriented stakeholders of the KatRWUA. Whereas institutional stakeholders were 'doing their job' in representing an institutional perspective, livelihoods-oriented stakeholders were personally dependent on respective water resources for their livelihoods. Such reliance on water resources is considered to be of high significance to the Southern African context, where agriculture constitutes a dominant source of rural income and sustenance in the absence of significant alternative economic development (section 4.3). Participation by such actors in the KatRWUA was therefore more directly linked to personal economic gain or loss. Moreover, it was also observed (section 5.5.3) that a larger proportion of the KuisebBMC members were of a higher socio-economic class, compared with the KatRWUA, of which two thirds of members were classed as historically disadvantaged. This observation suggests that participation on altruistic grounds is positively influenced by socio-economic status.

When considered in conjunction with the activities and roles of the respective water-management institutions, the difference in motivation according to stakeholder type becomes significant. The KatRWUA was engaged in activities pertaining to water allocation, which had direct consequences for the livelihoods of catchment residents, as illustrated by the first quote of this section by a scheduled commercial farmer. In particular, the legislative changes in SANWA meant that certain stakeholders stood to lose water rights whilst others stood to gain them. The high stakes invoked by the decision making process of the KatRWUA, especially for potential 'losers' in terms of SANWA, are interpreted to have raised the interest, awareness and motivation amongst the commercial farming stakeholder group to participate and to stay informed, as illustrated by the observation of a commercial farmer that, "Mr X is on the phone to me as soon as these things [meetings] are over". This observation contrasts with data from the KuisebBMC case study, whose activities are thought to be non-threatening to wider stakeholders (section 5.3.3), and whose participants acknowledged low and/or waning interest in the process amongst their wider stakeholder group. Furthermore, the acknowledgement in SANWA of the priority right to water of historically disadvantaged members (see section 4.7.2) conversely created a low incentive for them to participate in a process, in which they are, theoretically, conceived as 'winners' from the outset. Nonetheless, this interpretation assumes that such pre-determined winners *realise* themselves as such, through an awareness of the aims and objectives of the institutional process, and then perceive the process and/or any outcomes to be of benefit. Wider stakeholder awareness and understanding of the roles of the water-management institutions are therefore returned to in chapter 8.

The South African institutional framework also deterred motivation of historically disadvantaged social actors to participate in the KatRWUA, as water-user associations were constrained from addressing more tangible aspects of water-supply and sanitation provision (section 4.7.6). Although a lack of sanitation ultimately affects all humans, who are dependent on an affected water resource, the lack of water-supply and sanitation infrastructure especially related to historically disadvantaged members in terms of direct livelihood-related needs and desires (chapter 4). Thus, whilst the KatRWUA addressed entitlements to water, a water allocation *per se* was relatively meaningless for many historically disadvantaged members, as they did not have the infrastructural means to route water from its source or storage to the required point-of-use. The example at the outset of this section, regarding willingness to participate in other forums with a direct tangible benefit, implies that the motivation of historically disadvantaged actors to participate in the KatRWUA was negatively affected by its inability to deliver obvious tangible benefits due to this statutory constraint on the role of decentralised water-management institutions. Hence, at the development stage of the Kat River catchment, the process of allocation was of most relevance to those residents for whom basic infrastructural needs were already in place. SANWA therefore contains a paradox, as it deters the motivation of historically disadvantaged to participate in water-resource management processes through constraints on institutional functions, whilst simultaneously mandates their representation.

In contrast, the KuisebBMC did not form around a specific issue or objective but arose from legislation encompassing multiple and loosely defined functions (section 5.3.3). Furthermore, the ELAK project focussed primarily on relational, rather than technical, objectives, in which the former were conceived as a precursor for realising the latter. Consequently, the KuisebBMC forum was not presented initially, as a 'space' where the posited outcome(s) included decision making or action that would necessarily impact on residents' livelihoods, as was the case in the KatRWUA. This lack of specific function may have had two contradictory effects on their stakeholders' motivation to participate. On the one hand, the creation of a 'safe' space and lack of preclusion issues for tackling at the outset (which is identified as a disincentive to participation in the KatRWUA example above), may have led to an increased likelihood of multi-stakeholder participation. On the other hand, a lack of clear objectives may have reduced stakeholder motivation on the basis that participation is a 'waste of time' (e.g. Warner, 2006). Notwithstanding other differences between the physical and social contexts of the KatRWUA and KuisebBMC, the higher degree of 'multi-stakeholder' participation on the KuisebBMC implies that Warner's recommendation of clear process aims is not appropriate to all situations.

Interviewees identified further significant disincentives to participation, which had resulted in non-participation by relevant stakeholders in the formal water-management institutions and their wider activities. Common to both case studies were feelings of mistrust amongst wider stakeholders, towards the KatRWUA and KuisebBMC. For example, a KuisebBMC participant asserted that, "some [farmers] will just say that this [KuisebBMC] is another way for the government to do certain things and some, and so no they will not want to come to these things", whilst a KatRWUA member asserted that many small-scale farmers of the Upper Kat are scared that they will have to start paying for water if they participate. This factor of mistrust was strongly linked to perceptions of the KuisebBMC and KatRWUA as government-aligned 'enforcement' institutions, which is related to their history. For example, governmental water-management agencies in Southern Africa have traditionally behaved in a strong top-down, authoritarian manner (section 4.7.1) with enforcement and punishment capacity (section 2.2). Furthermore, whereas certain water-related practices were previously deemed acceptable, or were overlooked by authorities, under the new ethos of national legislation and policy some stakeholders were viewed to be engaging in 'wrong' behaviour according to principles of integrated water-resource management and/or national political objectives. Historically, many black Southern Africans did not pay for water use for the reasons explained in section 4.2.2, such that they were concerned about being forced to pay for water use in the wake of the national policies of cost-recovery. This fear was likely to have been compounded by the history of the KatRWUA as an Irrigation Board, which charged members for water use, meaning that emerging and small-scale farmers may have similarly associated the KatRWUA with water payment. Although securing payment *is* one objective of water-registration, water charges were extremely low for historically disadvantaged members, the implication of which is discussed in section 8.4. A similar disincentive for the involvement of commercial farmers in the KuisebBMC was that they had built dams exceeding permitted capacities in the past (KuisebBMC member, 2007). In this way, residents within both catchments were unwilling to engage with institutions, which they feared would threaten their activities, so they consequently avoided engagement with perceived 'authorities', in order to avoid being 'caught out'.

This interpretation supports observations indicating that low bridging social capital existed between social groups within the case-study catchments. Furthermore, these observations indicated that participation and wider cooperation could not be enforced, as the 'misbehaving' stakeholders (in terms of behaviour that is contrary to national legislation and/or integrated water-resource management objectives of collective interest) simply opted not to participate. In light of the conversation with a high-level DWA official (in section 4.7.7), who envisaged the basin-management committees as the 'eyes and ears' of catchments for reporting infringements to DWA, one could thus argue that the aforementioned stakeholders were right to be suspicious of engaging with the water-management institutions. More significantly however, the role

envisaged by top-down authorities for participatory processes as a mechanism of behavioural enforcement and as a means of peacefully negotiating a redistribution of water rights may be fundamentally flawed, due to the implicit assumption that all stakeholders will be willing to participate in such processes in the first place compared to the observations in this chapter that they do not. The interpretation therefore further implies that, if the decentralised institutions fail to change the behaviour of catchment residents through social and relational mechanisms, then they may need to acquire powers of enforcement, and/or be able to rely on higher-level authorities to enforce change.

Returning to the theme of motivation; as Jiggins (2002) observes, a crisis, or perception thereof, helps to stimulate participation in a social learning process. This concept was also interpreted as relevant to both case studies from primary data sources. For instance, a KuisebBMC member believed that the lack of a perception of an imminent threat amongst wider Kuiseb River stakeholders accounted for the lack of wider interest in their stakeholder forum:

> ...and the main problem is, OK so it looks like we are in the middle of the desert, but water is not actually a big problem in that it's coming out of the taps. The people, they know about the plans for the desalinisation and all that, but it's in the future. For now, its not a problem so they are not really interested to participate in these things. Only when we put the water rates up or something and then they will complain that they were never told or invited to participate.

Similarly, when a MoA official implied that the KatRWUA had not asked a group of farmers to participate in the KatRWUA process, its members recalled that the group had in fact been invited to participate at the outset, but that they had declined because "they didn't realise the importance back then". Since the farmers in question had recently obtained funding for the necessary water-supply infrastructure, they had more recently expressed an interest in the allocation process. These examples thereby support findings that a direct threat to economic wellbeing can motivate participation in processes of relevance.

The data also indicated that stakeholder motivation to participate in the KatRWUA was low because of mistaken perceptions of the institution. A small-scale farmer asserted that, "they [other small-scale farmers] think that the KatRWUA is only for the citrus people and those guys down there [commercial farmers]". For this reason, he requested that a large-scale or emerging farmer KatRWUA member attended a small-scale farmers' meeting, in order to clarify otherwise. However, his request was not responded to. This unwillingness to conduct outreach work was unlikely to have stemmed from a deliberate and malicious intent to exclude historically disadvantaged members on the part of large-scale representatives, but as a consequence of high time pressures associated with their own livelihoods, as well as feelings that it was not their responsibility to conduct such outreach. According to this interpretation, the

required outreach could not practically have been the responsibility of the historically advantaged members due to such time pressures, whilst the lack of financial resources of the KatRWUA (section 8.4) prevented it from employing staff who could conduct such activities on their behalf. Many village interviewees were unaware of the KatRWUA, let alone its role, whilst the DWAF official also observed that, "other water users in the Kat do not know that there is a structure called KRVWUA" [sic]. Ultimately however, the combination of refusal and/or inability to proactively reach out to historically disadvantaged water-users is likely to negatively impact on institutional sustainability because organisations without the 'appropriate representation' are unlikely to be recognised as legitimate by the current governments of Southern Africa, especially in light of the Water Acts' emphases on representativeness.

'Disbelief' amongst stakeholders was also thought to play a part in stakeholder disinclination to participate in the case-study processes, as the Kat River catchment is often described in the literature as the 'valley of broken promises', whilst a KuisebBMC member observed that:

> There's always this fear that if you have a project in which you rely on voluntary inputs of people, that it runs for as long as there is a project supporting it, and external people organising meetings, and there is financial support for the meetings and that type of thing, and then when that stops often the thing collapse [sic].

Such statements attest to the plethora of externally driven research and development projects and initiatives that have been carried out in the respective catchments and, more broadly, countries, as the socio-economic status of Southern Africa as a developing region means it is subject to the influx of development 'machinery', e.g. state, donor, NGO and research organizations (Swatuk, 2005a). Some of these initiatives have not amounted to change and/or benefits for those involved. Expectations of similar processes and projects may therefore have been correspondingly low and even hostile amongst wider stakeholders of the Kat and Kuiseb River catchments, thereby reducing motivation to participate. Moreover, intervention by 'external' agencies is frequently critiqued in terms of its ability to yield tangible and lasting results once such actors have withdrawn (Neba, 2009). According to these insights, stakeholder motivation to participate in the KatRWUA and KuisebBMC may have been negatively affected by their association with 'external' implementing agencies. Overall, this section demonstrates that stakeholder motivation to participate in the social learning processes varied and was influenced by: the role and activities of the forums; economic and time-related considerations; and the socio-economic and physical contexts of the catchments.

5.6) Chapter conclusion

In the first part of this chapter, an exploration of the historical development of the KatRWUA and the KuisebBMC illustrated how the changes in global perspectives on best practice in water-resource management (chapter 2) drove operational changes at more localised levels of water management via national Water Acts (section 4.7). A further driver of change in the case-study contexts was due to the involvement of the implementing and/or facilitating institutions of RU and DRFN, who stimulated the transformation and formation of the KatRWUA and KuisebBMC respectively (sections 5.2. and 5.3). Their involvement and interpretation of the global discourse meant that additional agendas and objectives were imbued in the institutional processes; hence the envisaged roles and activities of the KatRWUA and the KuisebBMC differed significantly. The KuisebBMC was permitted a comparatively large range of potential functions, whilst the KatRWUA was limited to the specific activity of water allocation. This difference between their proposed functions, and the issues that they addressed, was later considered to contribute to differences in stakeholder participation (section 5.5.5). Section 5.4 also revealed how implementing and/or facilitating agencies played a significant role in bringing disparate social groups together through the multi-stakeholder processes, as a result of their perceived neutrality amongst the majority of stakeholders. This interpretation illustrates how bridging social capital, at least, can be constructed via managed social learning processes. The emergence of other elements of social capital (section 2.5.5) is highlighted in chapter 6.

In the latter half of the chapter, an analysis of the actors involved in social learning processes of the KatRWUA and KuisebBMC revealed that 'full' multi-stakeholder participation – according to concepts promoted by the integrated water-resource management discourse – was not realised within either of the case studies (section 5.5). Of particular significance was that tensions had arisen between the traditional water-management authorities of state agencies and the decentralised water-management institutions, which was attributed to the proposed shift in the balance of power under integrated water-resource management and social learning ideals of democratic decision making and management (section 5.5.4). However, a significant difference between the KatRWUA and the KuisebBMC was the manifestation of this tension on the part of state water-management institution representation at the decentralised forum, with the representative of the Namibian DWA appearing significantly more supportive and positive towards the process than his South African counterpart. The insights gained from this chapter, regarding institutional roles and activities, stakeholder participation, and the nature of the catchments' issues, continue to inform analysis of social learning processes and processes in the following chapters. Having analysed the proposed roles, functions and activities of the social learning processes under study, according to policy and implementing-agent visions, the next chapter moves on to explore and assess the processes of social learning within the institutional settings of the KatRWUA and the KuisebBMC.

Chapter 6

Collective Learning and Interaction: Connecting Policy and Practice

6.1) Introduction

Having described the nature of the issues and activities with which the KatRWUA and the KuisebBMC are engaged, this chapter moves on to explore and analyse the corresponding processes and outcomes of social learning. In chapter 2, social learning was conceptualised as a process of collective and communicative learning surrounding relational practices, which then provides a basis for future concerted collective action; a behavioural outcome. The inter-related processes that contribute to this outcome include (summarised from Pahl-Wostl, 2002; Craps & Maurel, 2003; SLIM, 2004a-f; Keen *et al.*, 2005; Muro & Jeffrey, 2006; Collins *et al.*, 2006): information exchange and knowledge construction; interaction with other stakeholders and decision makers; and learning and cognitive change. As the KatRWUA and the KuisebBMC were further conceived as forums which incorporate and facilitate these processes; their practical enactment within the case studies is explored within this chapter. As these processes operate in parallel extensive cross-referencing within the chapter is necessitated.

Previous chapters have increasingly noted and analysed the emergence of asymmetrical relations between the actors involved in the case-study social learning processes. The concepts of power that were identified and explored in section 2.6 are therefore drawn upon significantly, in order to analyse the elements of social learning that are investigated within this chapter.

6.2) Sharing information and constructing knowledge

Brown & Pitcher (2005) assert that the ability of a social learning forum to construct 'neutral' knowledge is an important determinant of 'successful' outcomes. Craps & Maurel (2003) also identify the use of information and decision-support tools as a key element of the social learning process. These two theoretical pointers are used to analyse the processes of information exchange and knowledge construction within the case-study social learning processes.

6.2.1) Privileging quantitative and expert information and knowledge

As already observed in section 5.2.3, specialist knowledge is required for the collection of the majority of information required for the KatRWUA's purpose of allocating water amongst catchment-based stakeholders, due to the scientific and technical nature of ascertaining the ecological requirements and hydrological constraints of the resource. In this way, the quantification of the water-resource yield and usage is necessitated by the legislation, thereby

privileging scientific and expert knowledge within the water-management process. Water management in both South Africa and Namibia is therefore considered to have changed little from the old 'command and control' management approach (section 4.7.1), in which it is assumed that water resources can be accurately predicted, assessed, controlled and distributed. The main difference between the 'old' and 'new' approaches is that recent policies promote the participation of *all* water-users in the process of deciding who should use and access water. The process by which the participants influence or enact the 'command and control' of the resources is analysed in subsequent chapters.

Establishing the human demand for water in the Kat catchment (required for the catchment-management plan) invoked a 'participatory' element, as it envisaged that the KatRWUA participants would solicit the water demands of their wider stakeholder group. However, due to the lack of multi-stakeholder participation in the KatRWUA, aside from agricultural water-users (section 5.2.2), the task of ascertaining future water demand of wider stakeholders fell mainly to RU researchers. As well as interviewing representatives of wider stakeholders directly, RU researchers organised a public 'catchment visioning' workshop on behalf of the KatRWUA, in order to ascertain the development vision and associated demand for water of the wider catchment. It is unlikely that this information would have been obtained without the intervention of researchers, indicating the significant driving role played by RU in terms of the KatRWUA's progress and adherence to mandatory procedures.

Furthermore, the ability of the participating agricultural water-users to obtain such information differed significantly. For example, the large population of small-scale and communal farmers, and the lack of resources of historically disadvantaged individuals, restricted the ability of their KatRWUA representatives to ascertain water requirements of the wider sector. The collection of information on water use by historically disadvantaged participants was compounded by the backdrop of in-fighting amongst ex-Ciskei communities and individuals (sections 4.2.3 and 8.3.1), such that the low social capital had resulted in secrecy surrounding potential projects and activities that would require water in future. In addition, the high level of failure of development projects in the catchment and uncertainty over land tenure also made distinguishing between 'pipe dreams' and likely actual water demand difficult. These social constraints hindered the water-management process, as it was earlier observed to be contingent on the numerically accurate determination of water usage. In contrast, both scheduled and unscheduled commercial farmers were more easily able to identify the future water-use requirements of their stakeholders because of their: access to advanced water-supply technology; history of receiving and paying for water in volumetric amounts; low populations; and access to communication infrastructure (chapter 4). In this way, the 'concerted action' (information collection) required of KatRWUA members by DWAF favoured historically advantaged participants. Moreover, their higher

ability to ascertain quantitative determinations of water use is thought to increase their ability to influence water-allocation decision making (see sections 7.2.3 and 7.2.4).

Notwithstanding these limitations, information on water use and demand was collated by RU researchers and incorporated into negotiation-support activities and tools, before being [re]presented to the KatRWUA. In particular, such information was incorporated into the KatAWARE model (introduced in section 5.2.3), which although ostensibly envisaged as a "negotiation-support tool" (Farolfi & Bonte, 2006: iii), was interpreted as being used for a decision making purpose because yield-analysis determinations made by consultants under the KatRVP had increased the amount of 'allocatable' water. The consequent increase in the available resource rendered the undertakings of the KatRWUA as much a process of decision making regarding how to allocate the 'surplus' water, as a negotiation process over current allocation.

Farolfi & Bonte (2006: 4) imply that within the KatAWARE process, knowledge construction is collective through their assertion that "an iterative process of modelling and discussion" produces "a common and validated representation of the reality for local stakeholders participating in the *co-construction* of the model". However, the aforementioned collection of information by researchers, followed by its subsequent integration into the KatAWARE model, implies that knowledge was *principally* constructed by experts, which KatRWUA members were then expected to use for negotiation and decision making. The boundaries of such knowledge were determined by the objectives of the KatRVP and the inherent limitations of numerical models to represent a complex socio-ecological 'reality' (e.g. Epstein & Axtell, 1996; Bar-Yam, 1997). How these boundaries constrained subsequent decision making is discussed in section 7.2.3. Thus, along with the technical nature of the data involved in water management at the onset of this section, processes of knowledge construction inherently privileged expert and quantitative assessments of 'reality' as bases for decision making, thereby, at the same time, reinforcing the validity of associated ontological perspectives. Given that understandings and perspectives related to water resources are considered to vary with scale and water-user type (section 2.2), the privileging of ontological perspectives and higher management-level priorities in this case implies that social learning involved the realignment of pre-existing perspectives to those which are most appropriate for meeting national-level water-management objectives, which had in turn been heavily influenced by global discourses on water management (sections 2.5.4 and 4.7.6). This interpretation supports Andrew & Robottom (2005: 63), who assert that the prevailing view of 'appropriate knowledge' "largely reflects the values and interests of people and organisations in positions of power".

Differentials in power and interests between RU researchers also resulted in some knowledge and associated perspectives being privileged over others within the KatRVP. For instance, the domination of the technical process associated with the construction and use of the KatAWARE model is implied through a researchers' assertion that:

> For me it's more important that people ask the right questions. But I feel that at the moment all this information is just confusing people and leaves them feeling frustrated. (...) But this [workshop with KatRWUA members] was so focussed on the model [KatAWARE] and it needs to be more about getting people to think about what information they can get from it and what they can't.

Another researcher agreed, implicitly acknowledging that the model had taken too central a place in the process, over and above the objectives of the KatRWUA itself:

> People need to get into roles. Yesterday [workshop with KRWUA members] was too much about the model which should be put in the background. There was no chance to discuss. The model is important but it should not be the key thing.

The centrality of the KatAWARE model to the KatRWUA process had arisen from the combination of power differentials between individual researchers, between researchers and funding bodies, and between researchers and participants. The implications of this outcome are discussed further in section 7.2, where it is considered to have a detrimental impact on the social learning process in terms of social goals of equity and empowerment.

6.2.2) Incorporating 'alternative' knowledge

Despite the top-down nature of the KatRWUA process presented thus far, both informal conversations and interpretations of research histories (e.g. Motteux *et al.*, 1999; Motteux, 2003) revealed that many RU researchers involved in the KatRVP were deeply committed to the principles of participatory processes and were aware of discourses surrounding the plurality of knowledge. This outlook was reflected in the decision of the research group to incorporate research findings pertaining to the spiritual and cultural needs of the Kat River and riparian ecology into the mandatory report on ecological goods and services, even though it was simultaneously recognised that such considerations are not specifically required by DWAF. Two further interpretations for the incorporation of such data include that: the local desire to preserve culturally important flora and fauna supports RU researchers' objectives of environmental protection; and this desire implicitly requires that an amount of water be left in the Kat River, thereby meeting DWAF's mandatory requirement of environmental water, upon whose approval the project 'success' depends. Thus on this occasion, the synergy of local knowledge with the agenda of facilitators meant that local knowledge was incorporated into the 'collective' knowledge that was intended for use by higher level decision-makers, compared

with the rejection of mismatching knowledge (see the example in section 5.4). The previous two paragraphs therefore add further support to the assertion in section 5.4, that the desires and motivations of RU researchers influence the social learning process, thereby also reinforcing the conceptualisation that knowledge transfer between lower and higher levels of water management is also subject to the intervention and bias of the implementing agency. In this way, the implementers and/or facilitators of managed social learning processes act as 'gatekeepers', rather than simply filters, of information exchange and knowledge availability.

Yet despite the above attempt to incorporate 'alternative' information and knowledge into the decision-making process of the KatRWUA, the scope for researchers to do so was limited by: the set of highly defined and predetermined objectives of the KatRWUA (section 5.2.3); the top-down bureaucracy and guidelines of DWAF (section 8.4); and ultimately by the strong normative objectives of integrated water-resource management that are imbued in contemporary water-management processes. As these higher-level discourses are associated with a specific ontological perspective of water resources and social-biophysical system interconnectivity (chapter 2), it is interpreted that the information made available within the KatRWUA forums was selected to foster this ontological perspective amongst participants, in order to ultimately trigger decision making in accordance with the requirements of DWAF and influential concepts of integrated water-resource management. Information exchange and knowledge construction as collective, 'bottom-up' processes were therefore highly restricted within the KatRWUA. In addition, despite attempts to incorporate alternative knowledge by RU researchers, participants deferred to scientific knowledge themselves (section 6.2.4), supporting Andrew & Robottom's (2005: 73) assertion that, "the insidious nature of the dominant discourses in society is sometimes difficult to recognise and even more difficult to ensure that all types of knowledge and points of view are adequately represented".

In contrast, KuisebBMC members theoretically had more scope for collectively constructing knowledge independently, partly because the KuisebBMC operated without the intervention of an implementing or facilitating agency at the time of this research, and partly because a key fixed aspect of its meeting agendas involved stakeholder feedback sessions (section 5.3.3). Nevertheless, data analysis indicated that a similar realignment of participants' knowledge had occurred as a result of information promoted within the historical ELAK project. For example, in direct contrast to the pre-ELAK perspective (Amakali, 2005), it was generally agreed by KuisebBMC participants that commercial farmers were not to blame for deltaic groundwater levels having decreased over recent years. Instead, primary responsibility was ascribed by the participants, with the exception of one stakeholder group (explained in section 6.4), to climate change. The acceptance of this new 'knowledge' is interpreted as having been related to the observation that such understanding conveniently did not then invoke specific concerted action

on the part of individual stakeholders; as action to alleviate climate change is widely considered to require higher level intervention, and/or more widespread behaviour change than that of the catchment-based actors alone.

6.2.3) Linking knowledge and perspectives

The following example from the KuisebBMC illustrates that the process of knowledge construction was also influenced by the pre-existing predominance of opinion, where the majority *perspective* becomes equated to collective *knowledge*. For example, despite one member stating that most of his wider stakeholder group did not want to pay for water because they believed that they had the right to free water and that other actors were stealing it (see section 6.4), this information and associated understanding was categorically rejected by other participants, one of whom asserted that:

> The perception overall in the country [Namibia], not specifically only to the basin, is that water is a given basic from God, 'it rains and you guys are selling us water', that's the perception that needs to be cleared. It needs to be clarified to people all over the country especially in the rural areas, where people are not really used to paying for water. In the olden days, it was limited water as it were, people were not made to pay for it for various reasons, probably they did not have the means to pay for it. But these days one has to pay for water. That is how it is, but as I say, not the water but the services.

This quote highlights how the dominant *pre-existing* position of KuisebBMC members on this issue, and the pervasive normative understanding of the dominant discourse on water management, prevented the *collective* construction of a single outlook because the 'correct' knowledge, that water must be paid for, had already been accepted as fact by the majority of participants. Rather than reflect on whether the 'dissenting' stakeholder representative (on behalf of a wider group of actors) had a valid perspective, the forum maintained that payment for water services was the correct course of action. Consequently, the representative of the non-compliant stakeholder group came around to the opinion that such behaviour was correct and/or was under pressure to ensure compliance, as interpreted from his subsequent attempts to persuade his stakeholder group to comply with water-payment procedures. It is plausible that the resultant divergence between his own and his wider group's perspective on the issue of water payment may have played a part in his subsequent non-participation in the KuisebBMC because, when combined with the reputation for in-fighting amongst the community that he represents (section 4.2.3), such divergence provided an ideal opportunity for his rivals to engage in 'character assassination' by assuming the more agreeable stance of non-payment, as interpreted from extracts of KuisebBMC minutes:

> The problem regarding payment for water from the pipeline has not yet been resolved and large arrears have once again accumulated. In seems as if some members of the

> community are influencing the community not to pay for this water. Concern was also expressed on the leadership situation in the Topnaar community (KuisebBMC minutes: November, 2004);
>
> There seems as if there is little commitment from the community's leaders to the KBMC. [Topnaar representative] suggested that he might have to stand down from the Committee at some point in the future if he does not get the support from the community (KuisebBMC minutes: September, 2005).

These examples suggest that traditional authorities used the divergence of perspective caused by the representatives' alignment with the other KuisebBMC members to discredit him within the community, thus illustrating how participatory processes can be distorted by, and must therefore take into account, tensions within existing power structures and hierarchies of social 'groups'.

6.2.4) The relevance and types of information

Another consideration, introduced in sections 4.4.2 and 4.6.1, which is pertinent to the theme of information exchange and knowledge construction is the manner by which 'relevant' information, for invoking an understanding or perspective, is presented to a group of diverse social actors. Although careful consideration was given by RU researchers to making the KatAWARE model and its outputs as 'user-friendly' as possible, the volumetric data regarding water-use demand provided by KatRWUA members was nevertheless [re]presented back to participants in a more complex and technical format in the GIS-based KatAWARE model. An illustration of the complex output created by the KatAWARE model is provided in appendix 8. This observation is important because the following analysis reveals that information presented in this format was understood better by historically advantaged participants, therefore allowing them to use it more effectively to influence decision making for their own purposes.

As alluded to above, a lack of understanding of the KatAWARE model – both in terms of its purpose and its operation – was observed on the part of historically disadvantaged participants. For example, despite reflecting that they had 'learned a lot' from the KatAWARE model, few historically disadvantaged respondents were then able to specify clearly what they had learned in follow-up questions and instead provided vague and general answers. Even though it was difficult to follow up such answers without making the interviewee appear uncomfortable, sensitive attempts were made. For instance:

> [Interviewer] There were two types of workshop, the model and the RPG [the role-playing game that is part of the Companion Modelling approach]. So I'd like to ask you about these now. So what were they about and what did you get out of them?
> [Respondent] The workshops both taught me a lot and how to use water wisely. Also not only to think about ourselves but also other people.
> [I] How did they teach you to use water wisely?

[R] They told me that we should not pollute water and also how to care for water.

The response in this case highlights a mismatch between the information contained within, and purpose of, the KatAWARE model as detailed in this section and 5.2.3, which in turn suggests that the interviewee lacked understanding of the model's purpose. Other interviews further indicated that several historically disadvantaged participants did not understand the KatAWARE model, as they alluded to learning or outcomes that did not match the purpose, information or concepts encompassed by the model. For instance a later interview extract indicates the belief of a historically disadvantaged interviewee that the KatAWARE model would result in improved water infrastructure, whilst field notes record an RU researcher's reflection that:

> For example, [Mr X] has been present at all parts of the KatAWARE and he was there yesterday. But the question that he asked, made it clear that he did not understand. He didn't realise that we were using the model for defining strategies, he thought that we were still feeding the model.

These quotes indicate that several KatRWUA members were not only largely unable to differentiate between individual research activities, but also attest to the methodological difficulty of ascertaining human understanding and perspectives. For example, the interviewee in the first example, which was used to demonstrate a limited understanding of the KatAWARE model, nonetheless asserted at a workshop that they were having no problem understanding the proceedings, in spite of personal and other researcher's observations that they did not appear to. Such observations justify the triangulation approach adopted by this research (section 3.5.1). The reason that the lack of understanding and confusion regarding the KatAWARE model was more prevalent amongst historically disadvantaged members of the KatRWUA is ascribed to the IT format of the model and the predominance of accompanying explanations in English, which are both associated with higher levels of education in Southern Africa for historic reasons (section 4.4). Conversely, the historically advantaged members of the KatRWUA were able to understand the purpose of the model more clearly, as illustrated by their increased ability to differentiate between both the different aspects and associated events of the entire KatRVP, and between elements of the Companion Modelling approach (e.g. between the GIS model and the accompanying role-playing game), as well as the increased salience of their answers to the specific questions asked.

In particular, historically disadvantaged KatRWUA members revealed a lack of understanding that the KatAWARE model is a representation of reality, rather than a reality *per se*. For instance:

> The model is very useful in a sense that initially we did not know how much water is released from the dam and how much water is flowing out of the catchment and now that the model is here we can know how much water is getting out of the catchment.

An important consequence of the widespread lack of comprehension amongst historically disadvantaged KatRWUA members regarding the objectives of the KatAWARE model was that several of them therefore had unrealistic expectations of future outcomes:

> [Interviewer] Do you think the model addresses your vision, your needs in the future, is that represented in the model?
> [Respondent] My hope is with the model, I think the model is better than writing letters and applications and so on because if we use the model and we put all what we want into the model we can see the outputs and we can see the consequences and that is what I am saying, *my hope is in the model* [emphasis added].
> (...)
> [I] Do you feel your participation and contribution to the model has been valued?
> [R] Some of the issues that I come up with I have got little support from the group but I still sustain that the pipes from the dam are the best rather than using electricity and diesel and diesel is what pollutes the dam.

On several previous occasions, the interviewee had stated his desire to see the construction of pipes from the water source to the community fields. Due to his incomprehension of the model's purpose, the extract above reveals his belief that if he could get such pipes represented in the model, then this desire would come to fruition. Given that this outcome is unlikely to be realised, or at least not as a direct result of the existence of the KatAWARE model, this misunderstanding may contribute to the mistrust and scepticism of future research and development activities due to its perceived contribution to yet another 'broken promise' (section 5.6.2). More importantly, despite acknowledging that "it is very difficult to be critical of something that you have just known", the interview extract above nonetheless highlights how the interviewee privileges the KatAWARE model *because of* this lack of understanding.

Conversely, the enhanced formal education of historically advantaged participants enabled their clearer understanding of the model and recognition that the model outputs validated and supported their dominant position and capitalist worldview, which is discussed further in section 7.2.3. Consequently, such actors promoted the use of the KatAWARE model as a decision-support tool. For example, an influential KatRWUA member was noticeably outspoken at meetings regarding his favourable opinion of the KatAWARE model because:

> We were dealing with something that wasn't known and the reserves etc. and now we have a good idea about the consequences of different decisions. It gave me a lot of confidence that we can make a better decision. Before it was done by the department, but just by throwing balls in the air...now it is more sophisticated.

Notwithstanding that the assertion that 'throwing balls in the air' is a metaphor and the sentiment may also have been influenced by an underlying mistrust of government agencies and/or their data, the quote also reveals the interviewee's belief that the model is more 'sophisticated' because it is scientific and quantitative: an ethos that was reinforced by an 'expert' researcher at meetings and workshops:

> Through Companion Modelling, they [the KatRWUA] are now in a position to write down and define some priorities – quantitatively and concretely which they were not able to do before, which is what DWAF wants (Field notes, 2006).

Similarly, in response to observations that a quick, low-cost exercise with building blocks had produced very similar outcomes to that of the time-consuming and expensive KatAWARE model, albeit in proportional terms, the same researcher asserted that "yes, the visions are similar but they [the building blocks] are just qualitative expressions and are not really specific". These statements demonstratively assigned high credibility to quantitative and numerical information sources, thereby publicly endorsing the notion that qualitative and 'non-scientific' information is less valid [for decision making]. As these assertions were made by dominant participants and 'experts', it is unsurprising that those participants who do not understand the purpose and function of the KatAWARE model nevertheless assert that it is useful to them for fear of appearing 'stupid'.

Within the KuisebBMC, the predominance of scientific data and information was explicitly identified as a key concern by several participants, one of whom asserted that:

> [Interviewer] Were things also too technical at the beginning of the KuisebBMC meetings?
> [Respondent] Yes, yes they were. Even they still are, that's why you find that the people like, well I better not say this, but the people like the Topnaars, they feel these meetings are too of a level, that they are too technical so their input, probably they feel that their input is will not be taken, because if you look at these meetings you will have a lot of expertise talking in their technical languages, (...) they need a different language, not a different language in terms of English but a different level of understanding and a different level of discussion. Some of those people will not understand about the water table and such things. For the farmers you just have to state your language in plain English. By saying the saline, the saltwater will get into this, but now by putting all those graphs there, the depression, the cone of depression or those things, they will not understand what you mean. Even for me it is difficult.

Observations at both KatRWUA and KuisebBMC meetings noted the use of technical and scientific terminology and jargon, including: saline intrusion, groundwater recharge, sustainable yield, ecological reserve, integrated water-resource management and aquifers. Such terminology can be confusing, off-putting, and marginalising for stakeholders unfamiliar with scientific

terminology, as expressed by another institutional KuisebBMC member, who observed how the language affected their participation at KuisebBMC meetings:

> Sometimes it's getting more, too much scientific, too much figures and I'm not that water expert [sic] so these graphs for one are very difficult, sometimes they try to explain you know but for a community member who is representing the community it will be a difficult process.

The findings support the observations of Del Tufo & Gaster (2002) and Percy-Smith (2006), that the 'appropriateness' of the language type that is used within participatory forums can have a significant impact on stakeholder participation.

6.3) Learning about water and each other

According to the conceptual framework of social learning in chapter 2, the increased access to information, knowledge and other stakeholders engendered by interactive learning processes produces cognitive change on the part of participants, which is assumed to subsequently result in behavioural change. This section therefore explores the evidence for cognitive change amongst KatRWUA and KuisebBMC members before moving on to explore the behavioural outcomes associated with the social learning processes of the KatRWUA and KuisebBMC in the next chapter. Whilst learning is sometimes considered to be synonymous with cognitive change (e.g. Freedheim, 2003), Weston (1999) observes that cognitive change may also arise from shifts in values without simultaneously incurring learning. Ramsden (1992) therefore divides learning further into two conceptual types: the 'simpler' acquisition of external knowledge by the learner, and the more 'complex' internal transition within a learner that involves a change in their perception, belief and/or understanding. The next section analyses the nature of KatRWUA and KuisebBMC participants' learning using these definitions. Due to constraints on the time of KuisebBMC and KatRWUA members (section 3.5.1), cognitive change and learning were largely interpreted from informal conversations, interviews, questionnaires and observations that yield insight into to participants' cognitive processes and own interpretations of learning, rather than assessed via formal psychometric tests, which only assess learning according to pre-defined categories and definitions. Under the constructivist perspective of political ecology, the concept of learning may be socially and/or culturally defined. For this reason, interview questions were deliberately open-ended in order to allow responses to incorporate the interviewees own constructs of learning.

6.3.1) Acquiring information and getting to know each other

When participants were asked what they had learned after a KatRVP-organised event in the Kat River catchment, a selection of responses included: "water must be paid for"; "we can all work

together"; and "about the river and how we must leave some water there so that the environment does not degrade". In these quotes, participants attest to the acquisition of new knowledge or facts, which is indicative of Ramsden's (1992) 'basic' type of learning. However, the match between such responses and the aims of the capacity-building activities of RU indicate that they also represent answers that interviewees believed that researchers wanted to hear, due to the issues of positionality and power relations that were discussed in section 3.7.1. In table 6.1, similar articulations of learning by KuisebBMC participants' for the whole process are grouped into three main learning areas, after using the coding process described in section 3.6.

Table 6.1. Types of stakeholder learning identified by KuisebBMC members

'What is the most important thing that you have learned through participating in the KuisebBMC?'	**Area of learning**
• Communication • Coordination of different stakeholders is important • Communication, coordination, cooperation • Cross-sectoral and multi-cultural information exchange is important • Information sharing	The need for multi-stakeholder collaboration on water-resource management
• Interest of stakeholders in water management is real • There are many uses and users of water • Getting to know the real issues, constraints and needs of the other stakeholders • The challenges facing each stakeholder in securing water for daily use	The choices, challenges and realities of other stakeholders re: water use
• Improved awareness of Kuiseb basin as a unit of management • There is very little water and so it is a vulnerable environment • The sensitivity of the natural ecosystem	'Natural' processes (physical and ecological)

The learning themes identified by KuisebBMC participants in table 6.1 include: the different uses and users of water-resources, the need for management on a multi-stakeholder catchment-wide basis, and the importance of water for the natural environment. As with the 'learning' of KatRWUA members, such themes exhibit strong parallels with the previous capacity-building activities of the ELAK project (section 5.3.3). The significant match between these learning themes and those that were taught within the capacity-building activities of RU and DRFN (section 5.4) suggest that managed social learning is akin to a formal education process, as conceptualised in section 5.2.3. Collectively, these 'learned' topics also reveal a greater understanding of the complexity of water management on the part of individual, single-sector participants, an understanding that is considered necessary for enacting integrated water-resource management (sections 2.4).

Nevertheless, due to the inherent diversity of individuals involved in the social learning processes, different aspects of learning were identified and prioritised by different participants. Although all KatRWUA and KuisebBMC members confirmed that learning had taken place as a result of their participation in the respective processes, there was significant variation amongst

responses depended on stakeholder type. For livelihood-based stakeholders of the KuisebBMC, access to scientific information was highlighted as a key learning experience; "the water tables of the basin, how are they, is the water table decreasing or is it level, and if the river doesn't flow from the upper basin, are we still getting water downwards". Conversely, several institutional participants, many of whom already have access to general technical and scientific data, identified the access to localised perspectives and knowledge as a more significant learning opportunity. For example, one observed that, "it is good to know what is happening, how the other people are using water and what their issues are, especially, you know, from the farmers and the land people", whilst another learned most, "when agricultural people speak about the field carrying capacity and that type of thing because I'm not from that sector and so I find that interesting in general". Differences in the nature of learning were also observed amongst KatRWUA members: whilst historically disadvantaged participants mainly cited the provision of knowledge and expertise by RU and DWAF within KatRWUA fora as a major source of learning, large-scale farmers indicated that "learning to interact with different people" had constituted a greater learning experience. This experience is likely to be due to the latter group's enhanced level of pre-KatRVP exposure to scientific information and perspectives for the reasons explained in section 4.4.2, such that the availability of factual or scientific information via the KatRWUA did not offer such a significant learning experience in this regard, compared with actors who had historically been denied access to such information. Only one respondent from the case-study areas asserted that they had not learned anything from their participation, due to the predominance of scientific and technical information that was described in the previous section:

> I don't really learn all that much because I'm not, well they go into these scientific sides (...) it gets down to the scientific stuff then that's beyond me.

These examples highlight how differences in individual learning arose from the same shared experience, which account for later differences in the individual cognitive changes that arose from participation in social learning processes.

6.3.2) Changing understanding and perspectives

As outlined in the introduction to this section, cognitive change is also thought to cover a second type of learning, involving a change in understanding or perspective which is illustrated by the assertion of an institutional KuisebBMC member that:

> You sit in your field and then suddenly other people are now present, like the presentation that Mr X make for us on how the dynamics work, I enjoyed his talk a lot because suddenly I realise how it works, so to me that is important, to realise how the bigger system works.

The quote reveals that a different understanding of the system had been reached via access to new information within the KuisebBMC forum, which was reinforced by a livelihood-based KuisebBMC members' assertion that, "it [KuisebBMC forum] builds up the bigger picture and makes one realise just how interconnected the whole thing [catchment] is". Thus, as well as attesting to cognitive change on the part of the respondents, the quote also highlights how the two learning types identified by Ramsden (1992) are interlinked, as the acquisition of information – first type – was then processed cognitively, leading to the second type of learning involving a change in the learner's understanding and worldview. Further quotes illustrate that cognitive change regarding the nature of the water 'system' has occurred on the part of participants. For example, a commercial farmer from the Kat River catchment observed that, "I had very naïve views on the water system and learned how involved/intricate a system it actually is", whilst a KuisebBMC member similarly reflected that:

> I think that I never realised that it is such a big system and that there are so many factors involved, and these factors need to be compared and combined, and at the end of day make a decision to give guidelines and to give all those things. There are certain things that I always thought 'oh why and what does that matter' but eventually it does matter. The little things also matter, as [Mr X] said, that little Tok tokkie [type of endemic beetle] on the ground, it also matters so I got quite a broader perspective of the system now in a whole [sic].

These examples attest to cognitive change on the part of participants towards a more integrated and inter-connected socio-ecological system. Quotes from both KatRWUA and KuisebBMC members indicated that their conceptualisation of the water 'system' had become synonymous with the boundaries of the hydrological catchment, as exemplified by a KuisebBMC interviewee: "now there is improved awareness of Kuiseb basin as a unit of management". This adoption of the hydrological notion of the catchment as a unit of management and interconnection matches the requirement of integrated water resource management (section 2.4), and an objective of capacity-building activities (section 5.4). Learning about the realities of other stakeholders also produced cognitive change amongst participants regarding an increased acceptance that other perspectives are valid and, therefore, that alternative behaviour is rational even if it not necessarily 'correct' from personal perspectives. For example, a KuisebBMC member observed that:

> You see a lot of interesting people, you can see a lot of values, you get a lot of insight into information and data, and places that I would not have seen otherwise. And it helps for the mutual understanding of why things are as they are, and learning why things are done, and why one support certain actions more [sic].

Amongst the KatRWUA, the improved access to other stakeholders has resulted in cognitive change on the part of previously advantaged stakeholders, regarding the right of historically disadvantaged actors to access water resources:

> Ourselves, we must understand that the domestic need water for the houses, we don't want people getting bucket water from the river, we want people with good health and in-dwelling taps, we support that. Maybe in the beginning people may say that we [the large-scale farmers] do not care about their businesses but we are over that now that we find each other.

These cognitive shifts towards the validity of plural, multi-stakeholder perspectives and increased understanding of other stakeholders are directly linked to relational outcomes in section 6.4, and to the decision making process of the KatRWUA in section 7.2. Overall, implicit in the quotes provided in this section, as well as the expressions of learning provided in table 6.1, are a set of cognitive changes that have variably occurred on the part of participants, including that:

- Other sectoral/social groups' perspectives are valid, relevant and consequential to the management of the catchment's resources;
- Behaviour and decision making by social actors are contextual. They therefore vary between different actors, which are nonetheless all accepted as 'rational'; and
- Individuals and social groups are part of a wider socio-ecological system and are linked via inter-dependencies within the hydrological catchment.

These cognitive changes imply that conflict may be reduced and future conflict mitigated, and also that behaviour in the collective interest may be more likely. However, a salient observation is that the posited cognitive changes of participants are relatively general in nature. Further analysis of whether and how these posited cognitive changes translate into decision making and action is therefore provided in sections 7.2 and 7.3.

Table 6.2 indicates that such outcomes were produced in two ways: via access to information and knowledge, as discussed above, and via interaction with other stakeholders, which is discussed in the next section.

Table 6.2. Interview extracts highlighting the reasons for cognitive change and improved inter-stakeholder relations

No.	Quote	Explanation
1	"We see them less as a threat, these people who are demanding water. Because we can look at what they want and quantify it (...) so the relationship is much better now" (large-scale farmer).	Improved access to factual [scientific] information
2	"At least they are not complaining now if there's no water or blaming the others, they understand that it's just because there is no flood and once in every four years the river will flood and then it will recharge the aquifer and so they understand better what is happening" (institutional KuisebBMC member).	
3	"Yes I can say there was a change in terms of interaction and how I really viewed some stakeholders, for example Mr X in the beginning, I felt that Mr X, his discussions and negotiations was self-centred, he wanted to serve his own interests and he wanted to make sure that his area gets it all but at a later stage as we meet often I've tried to understand where he comes from. And I also saw that he is thinking about the catchment as a whole...through the negotiations and discussions I am trying to understand where he stands and I see that he is not thinking about himself only because otherwise people, for example if he was not treating the other areas well so communities might start rising up against him and that could affect his future generations" (HDI, KatRWUA).	Opportunity to experiences others' and their realities at first-hand
4	"The community, they were saying 'oh the white farmers, they are just keeping water there for themselves' but it's not really true. I was also thinking that they were keeping water up there but later when we go up and *I saw* 'oh that is not what is happening' and so KuisebBMC has bring the information together" and "when we were there seeing those dams, the community, we were all just laughing and saying that this is not what is stopping the water" (HDI, KuisebBMC).	

In the first two quotes of table 6.2, the large-scale and institutional representatives identify increased access to quantifiable and science-based information as having contributed most significantly to reducing tensions between stakeholders through its impartial and objective nature, as such information was able to negate the 'mistaken' perceptions of water users that had been responsible for pre-existing tensions. However, quotes 3 and 4 alongside the following analysis demonstrate that a different aspect of the learning process featured more strongly in changing the perceptions of some historically disadvantaged participants, and that the resultant lack of 'blaming others' may not be as extensive nor straightforward as implied by another participant in quote 2.

Through the KuisebBMC's practice of rotating the meeting venue amongst its stakeholders and incorporating site visits into meetings on many occasions, high levels of insight into each other's personal and/or professional lives were afforded. Participants were thus able to 'see for themselves' the water use and livelihoods of their counterparts. According to the dataset, this opportunity afforded by multi-stakeholder processes is of enhanced significance to historically disadvantaged participants. For example, in quote 4 of table 6.2 a Topnaar community member recalled that their *personal* observations of commercial farm dams were of particular significance in changing their perception of upstream commercial farmers. Quote 3 by a KatRWUA counterpart also demonstrates that the ability to experience *personally* the other stakeholders 'in action', making decisions in this case, played a critical role in shaping their

subsequent attitudes towards other participants. Thus, despite an earlier observation that historically disadvantaged participants were more likely to acknowledge that acquisitional learning had occurred through the increased access to scientific and factual information, these examples suggest that personal observation and experience play a more significant role in terms of producing subsequent cognitive change on the part of historically disadvantaged participants than access to secondary data. This interpretation is significant because it supports a 'learning by doing' approach for realising cognitive change, whilst simultaneously calling into question the assumption that cognitive and, therefore, behavioural change will apply on a wider basis, as social learning processes necessarily rely on stakeholder representation rather than the participation of an entire society. This contradiction is returned to in section 8.6.2.

The previous examples are indicative of the complex process by which information availability leads to cognitive change. This finding is reinforced by the observation that, despite the post-ELAK acknowledgement amongst the Topnaar community that commercial farmers are not responsible for decreasing water levels, in contrast with the other stakeholders, the 'blame' within the community had shifted to NamWater rather than the notion of climate change[17], as interpreted from a KuisebBMC member's observation that, "for the people in the lower Kuiseb there is a perception that NamWater is stealing their water because they have lived there for a long time" (KuisebBMC member). Although a NamWater geohydrologist presented graphs and figures at a BMC meeting, which refuted this assertion based on a lack of correlation between abstraction rates and average groundwater levels, a combination of reasons explain why such 'evidence' has not repudiated this perception of the wider Topnaar community, including:

- In comparison with the former example of perception change toward commercial farmers, the physical nature of groundwater storage means that 'seeing for oneself' is impossible. Trust in scientific information therefore plays a key role in the perceived legitimacy and, accordingly, the acceptance of knowledge derived from it. Given that in this case, groundwater data are largely collected, interpreted and owned by the agencies who abstract the water and/or authorize its abstraction, it is unlikely to be trusted by stakeholders who perceive themselves to be a victim of such activities;
- Comprehension of information is also assumed to be a pre-requisite to accepting a perspective that rests upon it. Groundwater data are generally represented numerically and graphically. Based on the observations of several participants, that engaging with the scientific discourse surrounding water presented a challenge (section 6.2), it is assumed that understanding of groundwater data is limited, especially amongst historically disadvantaged

[17] It is not the intention of this thesis to enter into the debate on climate change, suffice to acknowledge that, despite a predominant acceptance of 'climate change', there is an ongoing deliberation regarding its existence, origins and nature (For a comprehensive overview, see Dessler & Parson, 2006).

participants. On this basis, it is also assumed that the widespread acceptance of perspectives derived from such information may be constrained;

- The ELAK project allowed many more Topnaar community members to participate in the process than does the representational structure of the KuisebBMC. The resultant reduced level of community representation means that information disseminated within the KuisebBMC forum is assumed to be less probable of reaching such a large proportion of the community and, therefore, to result in the widespread change of perceptions;
- Uncertainty and conflict exists amongst professional and scientific opinions. Whilst some research links decreased groundwater levels to over-abstraction of the aquifer for mining and industrial purposes, other reports propose a range of causal factors, which variably include: increased sand deposition, decreased flooding and climate change (Shilomboleni, 1998; Widlock, 2000; Ito, 2005); and
- The assignment of blame to a human entity, rather than the climate, increases the likelihood of securing financial compensation. As already revealed in this section, the Topnaar community's water bill has been paid in the past by WBM. Whilst this previous undertaking can be interpreted as a charitable act to assist impoverished social actors, it is also likely to stem from an implicit acknowledgement that water taken from the Kuiseb aquifer is used to supply the municipality and industry of Walvis Bay at the expense of the Topnaar community. According to this interpretation, if the Topnaar community was to accept that the climate or their own water-related behaviour are to blame for their plight, then financial assistance from other stakeholders might be less forthcoming.

The points above underscore the complexity of cognitive change, which is affected by: information availability, information type, trustworthiness and 'legitimacy' of information, social networks, and motivation to change understanding. The latter two topics are returned to in chapter 8, where they are shown to constrain the ability of social learning processes to enact socially and environmentally sustainable behaviour.

Above all, the cognitive changes that were identified from KatRWUA and KuisebBMC members' responses directly matched the various elements of the global discourse of integrated water-resource management (section 2.4). This observation is explained by the nature of the capacity-building activities of ELAK and RU, which were demonstrated to match the ontological perspectives of the global discourse (sections 5.2.3 and 5.4). Social learning in the case studies is therefore considered to involve the concerted realignment of localised perspectives to those of higher levels of water-management via information provision and targeted capacity-building activities, which in turn reveals power differentials between the social actors involved. Furthermore, as cognition was linked to behavioural outcomes under concepts of social learning (section 2.5); this interpretation renders managed social learning a

coercive process, which is ultimately designed to engender the desired behaviour of a normative global discourse by localised social actors via the instillation of 'appropriate' cognition. This interpretation supports the assertions of Twyman (1998) and Swatuk (2005a) that 'participatory' processes, e.g. facilitated social learning, are used as a means for realising 'appropriate' natural-resource management *through* the management of people.

6.4) Interacting with others

Through their exposure of representatives of stakeholder groups to those of others from different socio-economic, professional and cultural backgrounds; social learning processes are thought to lead to improved inter-stakeholder relations (Schusler *et al.*, 2003; Mostert *et al.*, 2007; Muro & Jeffrey, 2008). From a starting point of tension-filled inter-stakeholder relations and low social capital within both catchments prior to the adoption of participatory approaches (chapter 4), this section analyses the interactions and the relational changes amongst KatRWUA and KuisebBMC members over the course of the respective processes. All KatRWUA and KuisebBMC members identified *generally* improved inter-stakeholder relations, as an outcome of the respective processes. A KuisebBMC member reflected that, "now everyone is honest and they do not sit at the meetings looking like that [interviewee screws up face to indicate mistrust and/or dislike] at the next person". Similarly, a large-scale farmer of the KatRWUA observed that, due to the KatRWUA, "there's less animosity with people" vis-à-vis "at the beginning of the [KatRWUA] meetings people were sort of sceptical to one another". However, further observations necessitate that such general statements are subject to further critical analysis.

6.4.1) Changing stakeholder relations

It is not only the relations between water users that became increasingly positive and cordial, but also those between catchment-based water users and government-agency representatives, as noted by both KatRVP researchers and KatRWUA members: "there is increasing friendliness and tolerance towards each other, [DWAF official] is more friendly and relaxed than at the start" (researcher), and "[DWAF official] irritated a lot of people coming and telling us we had wasted our time...but in the last meeting he had changed quite a bit, for the better, he is not criticising us that much" (KatRWUA member). Despite some KatRWUA members retaining negative attitudes towards DWAF, most historically disadvantaged members had a positive attitude towards the participation of the DWAF representative. For instance, one such member asserted that, "the best thing that ever happened is the involvement of DWAF so when they came we were happy". From a *relative* perspective of their historical marginalisation from governance structures and the problems associated with homeland governance (see chapter 4), it is plausible that historically disadvantaged KatRWUA members had lower expectations of

government officials when compared with white South Africans who were previously accustomed to a higher level of service provision and receptiveness on the part of official authorities towards their ethnic group. Furthermore, historically disadvantaged participants were less likely to be aware of the difficulties encountered by RU in securing DWAF participation due to linguistic differences between historically disadvantaged KatRWUA members and most RU researchers. In contrast, a commercial farmer of the Kat River catchment indicated in conversation that he was well aware of the problems faced by RU in getting DWAF to attend meetings, despite not even being a member of the KatRWUA.

As implied above, and using insights derived from chapter 4, racial identity is interpreted to be relevant to the explanation of inter-stakeholder relations in the Southern African context. This assertion is further illustrated by a KuisebBMC member who asserted that:

> There are still underlying issues to do with who we are. You have seen that more than half of us are white (...). In Namibia it is something that we have to be aware of, I would like to see the day that it doesn't matter. What I am saying is that the racial awareness is there, it is not a problem but it is there.

Although racial identity is not considered to have constituted a significant issue in the KuisebBMC context, whose function did not encompass decision making that could have negatively impacted on stakeholders' livelihoods, data indicate that racial identity was of enhanced significance in the KatRWUA case study due to the specific aim of SANWA and the KatRVP to redress historical 'imbalances' and achieve social equity (chapter 4). The DWAF representative's identity as a black and, therefore, historically disadvantaged, South African, meant that his vision of 'equity' for water use and understanding of a participatory process was unlikely to have matched the situation in the Kat River catchment, where the commercial farming sector remained the biggest water user (section 3.4.4) and a white commercial farmer dominated the KatRWUA proceedings (section 7.3.3). This assertion is interpreted from quotes extracted from an interview with the DWAF representative:

> All the commercial water users are influential, that is why some of them do not value meeting attendance. Simply because they have everything they want. So instead of attending meeting, they rather sit back and do some work in their farms.

Although the attendance of *one* commercial farmer declined, observation notes attest that the attendance of non-commercial KatRWUA members also declined, albeit variably in terms of individuals. This quote is therefore interpreted to be illustrative of how antagonisms between racial groups affect relations and attitudes towards each other because it does not correspond to the observable 'truth'. Furthermore, a corresponding enmity towards the DWAF official on the part of commercial farmers is illustrated by the next quote:

> He [DWAF official] irritated a lot of people coming and telling us we had wasted our time, especially you guys [RU] when you have been working your arses off. And he cannot get his point across but in the last meeting he had changed quite a bit, for the better, he is not criticising us that much... and I say us it is not us... it is them [RU] that have done all the work. I did not enjoy the way he just took over the Chairman's seat. He just kicked out [KatRWUA Chair] and took his place.

It is also likely that pre-existing tensions between commercial farmers and DWAF, as an institution as a whole, played a part in these hostilities. For example, one unscheduled commercial farmer described having struggled for several years to get a definitive answer from DWAF regarding their legal water-use status, such that their past experience is thought to have contributed to ongoing negative perceptions. The subtext of SANWA is also interpreted to have influenced negative attitudes towards DWAF on the part of scheduled commercial farmers', as their previous power of decision making and control via the KatRIB had effectively been revoked by the requirement of SANWA that decentralised water-management institutions, and their activities, be subject to DWAF approval (section 4.7).

The misunderstanding of some historically disadvantaged participants regarding the purpose of KatAWARE, as a model of a future reality rather than for scenario-testing (section 6.2.4), had a temporary detrimental relational impact between large-scale and small-scale water users. For example, one large-scale farmer reflected that:

> When I said I wanted to see scenario five then people really thought I wanted it rather than I wanted to see what the stresses would be when I saw it...People think you are in favour of that, they were sort of trying to pre-empt it. I saw that in the executive meeting – I tried to explain listen guys people were focused on those scenarios I tried to explain that they are a tool for negotiations, it is not deciding things now. People when they see that they think they are all in negotiations they do not realise that they are looking at things. So this is very worrying to me (...) People are taking it as the truth and actually I was just choosing one to see what would happen.

Fortunately research evaluation interviews brought this misunderstanding to the attention of researchers, who were then able to reaffirm the purpose of the KatAWARE model and associated meetings, thereby de-fusing the associated tensions. This example highlights both the drawback of using complicated information and the importance of evaluation and facilitation processes, which prevented the derailing of the social learning process in this instance.

Further analysis also revealed that the degree and nature of attitude change towards stakeholders depends on a stakeholder's participation in the process. For example, questionnaires given out before and after a KatRVP workshop involving the wider public reveal that a positive shift in attitude towards other *attending* stakeholders was observed, whilst conversely, attitudes towards those stakeholders who were absent (e.g. government tourism and conservation agencies) either

remained the same or shifted to negative. In figure 6.1, KuisebBMC members' responses attest to a similar polarisation of attitudes towards other stakeholders over the course of the Committee's history, which also correlates with stakeholder attendance levels. The data presented in figure 6.1(a) were sourced from the KuisebBMC minutes, whilst the bar charts in 6.1(b) and 6.1(c) draw on the questionnaires referred to in section 3.5.3. Stakeholder attitudes relating to other stakeholder groups prior to participation in the KuisebBMC were therefore ascertained retrospectively, possibly leading to inaccuracies in participant's recollections. However, given the relatively short time frame between the inception of the KuisebBMC and this research, such inaccuracies are considered to be minimal. In figure 6.1(c), many of the original ambiguous attitudes towards other stakeholders that are displayed in figure 6.1(b) have changed to a positive attitude, with several stakeholders losing the pre-existing negative attitudes towards them entirely. Social groups that retained, or show increased, ambiguous or negative attitudes towards them, are those which: had a generally high negative public image (e.g. NamWater); declined to participate (e.g. MET, Khomas Regional Council); or whose participation was irregular (e.g. Topnaar community, Erongo Regional Council). These observations indicate that face-to-face interaction is a key element of relational improvements, and, therefore, a mechanism by which social capital is built.

The commercial farming sector has especially benefited from the KuisebBMC process in terms of acquiring a more favorable perception by other stakeholders. In addition to the site visits to commercial farms that were made during the ELAK project by participants (section 5.3.1), this outcome is largely ascribed to a report by Angula *et al.*, (date unknown), which was provided to the KuisebBMC forum. The report concluded that the impact of commercial farm dams is negligible and was subsequently identified by several participants as being directly responsible for reducing the previously widespread negative perception of the commercial farming community. This example not only supports assertions regarding the privileging of scientific information (section 6.2.1), but also illustrates how relational outcomes are linked to both improved access to factual information and the creation of experiences that allow individuals to obtain personal, observation-based 'evidence'. The difference between these two causes of perception change is highlighted because they are linked to different types of stakeholders later in this section, as well as to different outcomes in section 7.4.

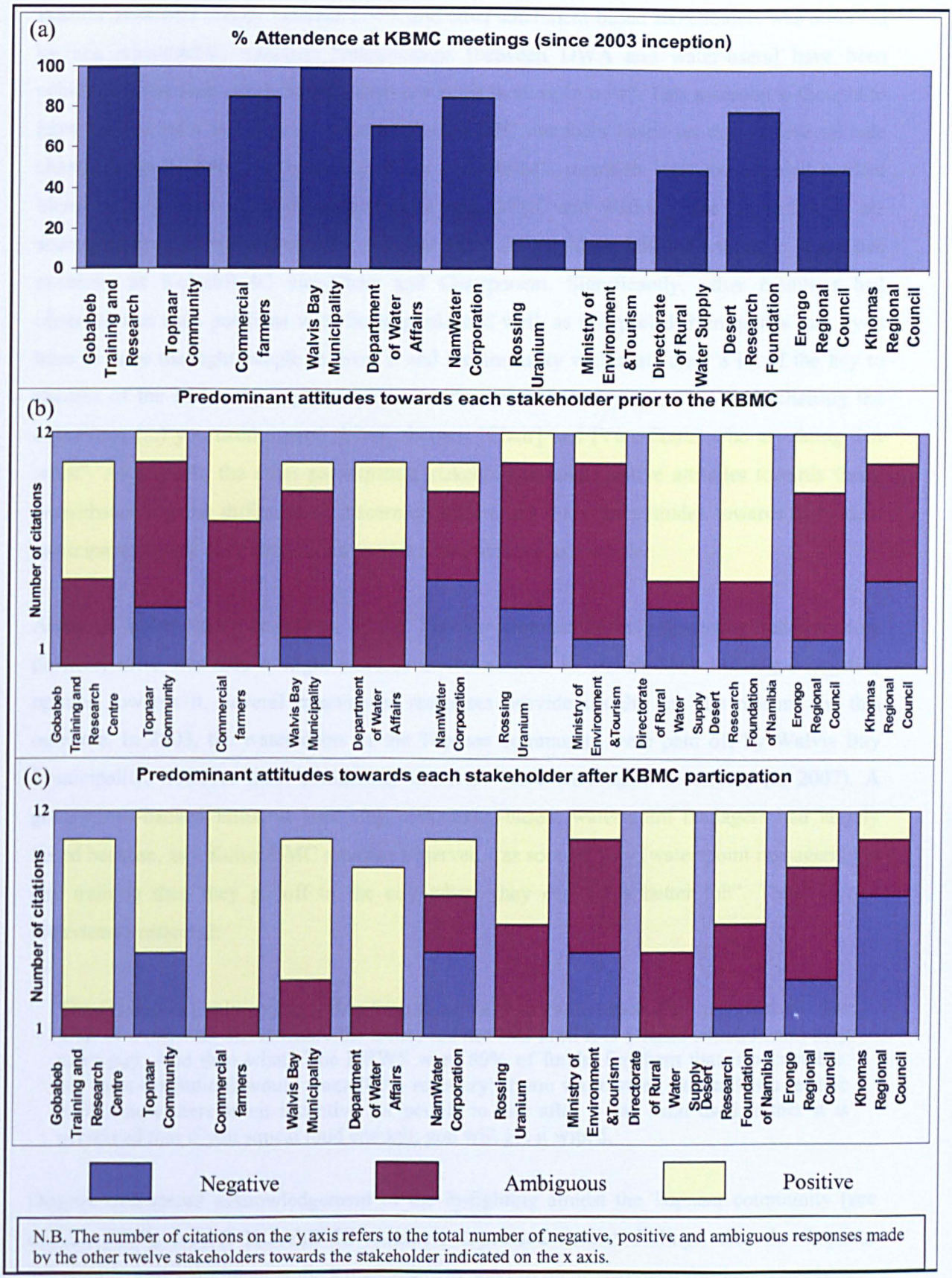

Figure 6.1. Graphs showing the KuisebBMC members attendance record (a), and the change in attitudes towards other stakeholders from the outset of the process to the time of this research in graphs (b) and (c).

Positive relational change between DWA and other catchment-based stakeholders was observed by one KuisebBMC member; "relationships [between DWA and water-users] have been nebulous in the past...these relationships are much more open now". This assertion is thought to have applied on a wider basis amongst KuisebBMC members based on the positive attitude change towards DWA in figure 6.1. Other KuisebBMC members who experienced marked increases in positive attitudes towards them were GTRC and WBM. These latter changes are accounted for by the prominent roles that such stakeholders fulfilled via their respective positions as KuisebBMC vice-Chair and Chairperson. Significantly, other members had observed that such positions were being performed well, as interpreted from quotes that, "you have to have the right people to drive it and we are lucky with that" and "a lot of the key to success of the BMC, for any committee for that matter, is, depends on who is chairing the committee (...) you need a good driver, the pair [Chair] and [Vice-Chair] who are doing that work". As a result, the other participating stakeholders held positive attitudes towards them, notwithstanding the difficulty of discerning differences between attitudes towards individual participants versus their institutions or wider communities as a whole.

Although stakeholder perceptions of the Topnaar community have generally become more positive, there was also a slight increase in the number of stakeholders holding a negative opinion towards it. Several interviewee responses provide insight into the reasons for this outcome. In 2003, the water debts of the Topnaar community were paid off by Walvis Bay Municipality, however most community members were once again in arrears (in 2007). A government-backed initiative involving community-based, water-point managers had largely failed because, as a KuisebBMC member observed, "as soon as they [water-point managers] get any training then they go off to the city where they can get a better job". Thus, as one interviewee reflected:

> They [Topnaar] only appeal if they run out of water or cannot meet their payment. So it is a bit of a one-way street where the issues are not told until it is a crisis situation and they can't pay. And then what? The DRWS want 80% of funds, for them that is acceptable, but most institutions would want 100% recovery; if you want water, pay and you receive it. But now there is no incentive for people to pay after it has been used, rather it is perceived that if you squeal loud enough, you will get it wiped.

Despite widespread acknowledgement of the in-fighting amidst the Topnaar community (see section 4.2.3), several KuisebBMC members expressed similar feelings, that the Topnaar community *only* participate in the KuisebBMC in order to secure payment for their water bills:

> They've got no interest there so why attend. They don't want to pay for the water, that's their issue and we [the KuisebBMC] are not going to pay it for them (KuisebBMC member).

In contrast, due to the information-sharing nature of the KuisebBMC, the majority of participants were motivated to attend for more altruistic and subtle reasons (section 5.5.5). The above perception of the Topnaar community, as only participating in the KuisebBMC out of self-interest, may therefore provide one explanation for negative attitudes towards it. For instance, one KuisebBMC member reflected that, "the social side is very difficult because my reading of the Topnaars is that they won't do anything for themselves, you've got to do it for them, and that's where it all goes wrong". These observations indicate that a perpetuation of negative perceptions, as well as improved relations, can also arise from multi-stakeholder processes, whilst also attesting to the commonplace stereotyping of the entire Topnaar community through the interviewees' frequent use of the word 'they' when referring to a group that is nonetheless comprised of individuals. This observation and further informal interview data suggest that the negative perceptions in this example were compounded by pre-existing stereotypes of other participants, which Kersten & Ison (1998) identify as a constraint to the improvement of relational outcomes via dialogue-based approaches, such as social learning. That the KuisebBMC process reinforced or invoked negative attitudes towards other members contrasts with much of the social learning literature, which often justifies the approach on its ability to yield improved relations (section 2.5.5). Notwithstanding the explainable exceptions within this section, inter-stakeholder relations amongst KatRWUA and KuisebBMC members nevertheless generally improved for the reasons highlighted in table 6.2 of the previous section: improved access to information and improved access to each other.

6.4.2) Power relations: domination and disempowerment within social learning processes

Examples regarding the privileging of scientific and quantitative information within the KatRWUA and KuisebBMC forums (section 6.2) indicated that power differentials existed between their participants. This domination of both the KatRWUA and the KuisebBMC forums by a limited number of historically advantaged and/or institutional members was observed both personally and by participants. For instance, in reflection of a KatAWARE workshop, a researcher observed that:

> I thought that it would've been interesting given that there were not many large-scale farmers there so other people would have a chance to talk. But maybe it's just because [Mr Z] is such a powerful figure that really the others didn't get chance to interact with the [KatAWARE] model. But actually we didn't look at any other scenarios, just the one that [Mr Z] wanted.

My own comment on the workshop similarly noted that:

> [Researcher 1] asked people if they had any questions on the scenario and the first person to ask was Mr Z [same KatRWUA member as in the above quote] who asked a technical

> question. His question generated a debate between [researcher 1] and [researcher 2], which is fine, but then by the time [the query] was resolved and [the researchers] had debated between themselves, [researcher 1] then went straight back to explaining the screen. And the other participants who had been edging to ask had not been able to get their questions in.

A similar dominance was observed amidst the KuisebBMC, with a member asserting that:

> There are persons [sic] that are more influential but that has to do with personalities not because of the institutions that they represent. That is how it is. (...) I feel that the meetings are dominated by two or three people.

The revelation that 'powerful' actors promoted the use and format of information and knowledge to facilitate their domination of the proceedings supports Foucault's power-knowledge conceptualisation (section 2.6). Although innate individual differences in personality type are likely to have affected individual levels of participation, such differences may have had specific implications when analysed with an awareness of the Southern African historical context, as psychologists believe that self-confidence and public-speaking skills are also developed through personal experience (e.g. Westen, 1999). Under this logic, historically advantaged members are assumed to have had greater self-confidence within the public forum and/or a greater sense of entitlement that their understanding and perspectives were valid and 'correct'. Historical advantages are thus thought to pervade more recent social processes to the same actors continued advantage. Overall, the data suggests that the domination of the KatRWUA and the KuisebBMC by historically advantaged actors was caused by the combination of: the provision of technical and/or numerate information for use by KatRWUA and KuisebBMC forums; holding meetings in English; differences in personality type; history; and social inequality. How these factors also affect participation is discussed in section 8.2.

6.5) Chapter conclusion

Section 6.2 revealed that information exchange was strongly linked to educational capacity-building activities, with information exchange and knowledge construction conceived as having been (KuisebBMC), or in the process of being (KatRWUA), controlled significantly by external agencies. This process involved external actors making decisions on the nature of relevant information to the issues at hand, on behalf of catchment-based stakeholders. As the 'issues' and 'problems' of the Kat and Kuiseb River catchments had been identified and selected for action according to global discourses on water resources and management (sections 5.2.2 and 5.3.2), the information and tools provided by implementing agencies within KatRWUA and KuisebBMC forums largely encompassed analogous ontological perspectives and knowledge. Consequently, the purported learning of KatRWUA and KuisebBMC members showed a strong match with the goals of the capacity-building activities of implementing institutions (section

6.3). Their assertions of learning also suggested that cognitive changes in understandings of KatRWUA and KuisebBMC members had shifted towards a more complex ontology of inter-connected social and biophysical processes, alongside the increasing recognition that the perspectives of other water-users were valid and rational.

However, within both of the case-study social learning processes, the dominance of historically advantaged and/or institutional members was a significant feature of inter-stakeholder relations (section 6.4.2). Whilst individual personality was thought to have played a role, such domination was also made possible by the reinforcement of historically advantaged perspectives through capacity-building activities and decision-support tools, the privileging of scientific and quantitative information within the KatRWUA and KuisebBMC forums, and/or the adoption of the majority opinion within the forums (section 6.2). Consequently, there was no evidence that the views of the historically advantaged and 'powerful' participants had changed regarding relevant issues, e.g. water payment; instead, the perspectives of the historically disadvantaged participants were interpreted to have realigned with them over the duration of social learning processes. The impact of this domination of case-study proceedings by historically advantaged actors on decision making and action are addressed in chapter 7.

This chapter highlights how the application of a social learning approach to the context of water-resource management rendered its practical implementation problematic, as the scientific rationale for catchment-based water management produced situations that contravened the ideals of national legislation, development objectives and social research, of equitable participation. Throughout the chapter, a series of inherent contradictions and tensions generated by this amalgamation of theories have been revealed: between individual representation and wider social learning and interaction; between the normative ideals of social and environmental equity of integrated water resource management and social learning, versus individual and economic interests; and between the shorter-term political goals and public desire for economic development that predominate at the localised level, and the longer-term social and environmental goals that are desired by the global discourse, which is influenced by a physical science-based perspective (section 2.4).

Chapter 7

Managing Water, Making Decisions and Taking Action: Putting Policy into Practice

7.1) Introduction

In the previous chapter, the component processes of social learning, of information exchange, interaction and learning, were presented and discussed. Under the conceptual framework of managed social learning, the play out of such processes has a bearing on their overall outcomes. This chapter therefore moves on to consider the outcomes and effects of the KatRWUA and KuisebBMC, in terms of their decision making and 'action-oriented' outcomes.

Throughout subsequent analysis sections, narratives from the dataset are compared against theoretical insights derived from the relevant literature provided in chapter 2. In particular, social learning within the context of integrated water-resource management is envisaged to lead to concerted action in the collective interests of society and the biophysical environment (section 2.5.4). Furthermore, the political ecology framework of this research necessitates a critical analysis of how, and whose, objectives and concerns are realised by any outcomes or lack thereof (section 2.2). Ultimately therefore, the examples within this chapter provide a basis for the overall critique of social learning, as a process by which collective 'learning' ultimately leads to concerted action and behavioural change, that is provided in chapter 9.

7.2) Making decisions

Social learning in the context of natural resource management is fundamentally linked to the participation literature (see section 2.5.3). Within this discourse, improved equity is assumed to occur via the increased access of stakeholders, especially by previously marginalised social groups, to decision-makers and higher 'authorities', and/or via the devolution of decision making powers to the multi-stakeholder forum, platform or institution. Social learning approaches assume that decision making will be rendered more equitable due to the balance of interests that this multi-stakeholder participation incorporates and individual social actors becoming 'less selfish' (e.g. Koelen & Das, 2002; Schusler *et al.*, 2003). The decision making processes of the case-study contexts are analysed according to these theoretical insights.

7.2.1) Allocating water amongst Kat River water-users

In section 5.5.5, a variety of explicit and implicit reasons were revealed to motivate participation in the KatRWUA and KuisebBMC; these motivations became further apparent through the decision making process of the KatRWUA, which involved the allocation water amongst the water-users of the Kat River catchment (section 5.2.3). At the main catchment vision workshop (section 6.2.1) to which all wider catchment residents were invited[18], participants in groups delineated by geographical area were required to proportionally allocate water amongst environmental, social and economic categories. The results of this activity are shown in table 7.1.

Table 7.1. Water allocations by groups of participants carrying out a percentage-based water-allocation activity at the catchment vision workshop

	Water allocation (percentage)			
	Citrus	Vegetable	Social	Environment
Upper Kat	25	35	15	25
Middle Kat	35	15	20	30
Lower Kat	40	20	15	25

My observation notes from facilitating this activity record that suggestions for allocation varied according to the interests and desires of the proponent. For example, a larger proportion of water was allocated to vegetable farming by the group that mainly consisted of Upper Kat subsistence farmers, whilst women and domestic water-users within my group more prominently afforded water to social development projects (e.g. schools, hospitals). A commercial farmer wanted to see an improved water-supply system, in the form of canals routing water directly from the dam to farms. When, as the group facilitator, I observed that the river may then simply become a sewer for dumping wastewater, he just shrugged his shoulders and said, "yes, but then actually we wouldn't need to depend on the river if everyone had a clean supply". Another commercial farmer referred to water going into the Fish River, i.e. that leaving the Kat River, as 'wasted' water. These latter examples underscore the objective of commercial farming regarding water resources, as being that of gaining the maximum economic returns from water, whilst the former examples attest to the overwhelming desire of historically disadvantaged catchment residents for socio-economic development.

Decision making is also interpreted to have been further influenced by historical precedence and 'tradition', as the proportional allocations to economic sectors made by the workshop sub-

[18] Invitation to *all* residents is in the notional sense, as it is recognised that not all residents would have been aware of the workshop despite the diverse communication strategy that was planned and conducted by RU researchers.

groups broadly reflect the existing dominant livelihoods of each sub-area (table 6.3). For instance, during the allocation exercise at the catchment vision workshop of the KatRWUA, despite encouraging my group "to dream, to think about what you would want for the area if you could say anything" (Field notes, August 2006), participants' economic visions were largely consistent with existing [economic] 'successes'. Significantly, the proposals of both individuals and groups also correlated with the predominant economic successes of the catchment's sub areas, e.g. citrus farms in the Lower and Middle Kat and the Katberg Hotel in the Upper Kat. This observation therefore also indicates that economic considerations and perceptions of tangible benefits played a central role in livelihoods-related decision making of catchment actors.

7.2.2) Steering water allocation decision making towards desirable outcomes

In addition to the allocation of water to meet socio-economic development desires, all groups also allocated water to the environment. However, this outcome is strongly linked to legislative constraints, top-down intervention and to the immediate context of the workshop. For example, during a presentation at the vision workshop, in response to a participant's question about what would happen if somebody wanted an F class of river (the lowest ecological category of the South African scale), the presenter's [a researcher] response was: "DWAF won't allow that, you can't choose anything below a D class of river". Legislative requirements also influenced the initial framing of the activity when participants were told that they had to allow 15% of water for the 'environment' category, in order to meet the basic ecological reserve value. In the event, all the groups can be seen in table 6.3 to have added to this mandatory ecological reserve, which is represented by the 'environment' category in the table's column headings. Nonetheless, this should be analysed within the wider context of research activities in the catchment. For example, although a secondary analysis of Fox's (2006) interviews as well as my observations at KatRCF meetings attested to an awareness of the environmental need for water and an appreciation of environmental goods and services amongst Kat River catchment residents, these insights were frequently obtained by soliciting such information specifically, rather than asking residents to consider, or to rank such value, alongside other desires and visions (e.g. more schools, factories, clinics). This observation is significant in light of how the data were then used by RU researchers at a workshop prior to the main catchment vision workshop. The purpose of the 'pre-workshop' was to develop a vision with the KatRCF, as it was ostensibly envisaged by researchers that its participants would subsequently have been capacitated to more articulately represent the KatRCF at the wider stakeholder vision workshop (CRG, 2006). At this workshop, the insights derived from Fox's (2006) interviews on ecological goods and services were used to impress on KatRCF members the need for environmental allocations of water, in order to ensure the survival of the culturally important species that Xhosa-speaking

participants had identified as important to their traditional livelihoods. Representatives on for the wider KatRCF membership were then chosen to attend the main catchment vision workshop, at which the water-allocation activity then followed presentations on the principles and purpose of the ecological reserve. One could therefore argue that participants had been 'primed' by RU prior to the decision making process, in order to ensure that environmental considerations were factored into decision making.

Furthermore, as the interviews and activities above were largely conducted amongst communities with high previous links to RU researchers and the KatRCF, which was formed by an RU research student as an environmental action group (section 5.2.1), participants were more likely to have had: a higher pre-existing environmental sympathy; an awareness of the environmental slant of RU researchers' due to previous RU-led environmental initiatives; and/or a strong motivation to provide an 'agreeable' answer due to the socio-economic motivations associated with past RU activities within the Kat River catchment (section 5.5.5). As a consequence, the environmental allocation of water generated by the vision workshop may have been over-stated compared to the desires of a more 'representative' section of the catchment's population. The strengthening of the environmental perspective as a result of facilitation by RU is thought to have arisen for two reasons: the environmental sympathies of many RU researchers (section 5.4); and their knowledge that DWAF was unlikely to approve a vision that did not include a commitment to the ecological right to water, which again underscores the legislative constraints on decision making. The first reason demonstrates how a significant degree of power was conferred on the facilitator, ultimately allowing them to influence the 'collective' decision making process and thereby reinforcing the conceptualisation of RU as a selective 'filter' of knowledge and information (section 5.4). Above all, despite the presence of a range of catchment-based water-users in each group, the three scenarios for catchment development generated by the vision workshop exhibited high similarity. This outcome indicates how top-down constraints (e.g. mandatory environmental and holistic allocations) acted to steer decision making *at a general level* towards a conclusive normative ideal, reinforcing the conceptualisation of managed social learning, as an education rather than a learning process, and highlighting how power differentials between catchment-based water-users and external agencies influence water-related decision making processes.

7.2.3) Learning in practice and the use of information in decision making

Despite members' assertions of improved inter-stakeholder relations and receptiveness towards the validity of others' perceptions amongst KatRWUA members (section 6.4), underlying and unresolved tensions continued to affect the water allocation at the detailed level of volume-based allocation. In particular, the issue of legality of water use by unscheduled commercial

farmers remained unsolved. In spite of the high cost that had been incurred by the KatRVP in commissioning a legal report to address the issue, the resultant report did not address this uncertainty explicitly (see Johnson, 2005). This observation suggests that the procedure of the WRC, of paying for commissioned reports before they are subject to approval, is not only unwise but may also be detrimental to the social processes for which they are envisaged. The continued uncertainty impacted significantly on the decision making process, as it allowed scheduled commercial farmers to continue refusing water allocations to unscheduled farmers. During a KatAWARE model workshop, a scheduled farmer outwardly rejected the claims of unscheduled farmer based on a notion of 'fairness', as scheduled farmers had been constrained in terms of their irrigated hectarage through the irrigation scheme, whilst unscheduled farmers were able to continue expanding their operations, albeit at their own risk. From an economic competition perspective, the significant size and capacity of the unscheduled farms would make them significant business rivals to scheduled farmers if they are able to obtain the same assurance of water supply. The behaviour of the scheduled farmer within this decision making process was therefore interpreted as being in self-interest rather than principles of equity. This assertion is reinforced by an occasion when researchers presented a possible allocation scenario to the KatRWUA, which took into account the unscheduled farmers' water consumption requirement. The scheduled farmer was quick to interject, "but, as I understand it, it's the past disadvantaged ones who will get the water first". At this point he appeared to support allocations to historically disadvantaged water-users, which accounts for the subsequent assertion of a historically disadvantaged member that:

> Yes I can say there was a change in terms of interaction and how I really viewed some stakeholders, for example, [commercial farmer of the previous quote] in the beginning I felt that [his] discussions and negotiations was self-centred, he wanted to serve his own interests and he wanted to make sure that his area gets it all but at a later stage as we meet often I've tried to understand where he comes from (...) I am not thinking about himself only because other people, for example if he was not treating the other areas well so communities might start rising up against him and that could actually affect his future children and future generations [sic].

However, whilst the scheduled commercial farmer outwardly appeared 'altruistically' to support water allocation to historically disadvantaged users, his support becomes more 'self-centred' upon further analysis, as it was only offered at the point when RU researchers were proposing that the requirements of unscheduled farmers be factored into water entitlements. Thus another plausible interpretation is that, rather than unequivocally supporting historically disadvantaged farmers, he was covertly trying to reduce the amount of water available to unscheduled farmers, who would be a lower priority under the criteria that he was advocating. Furthermore, the scheduled commercial farmer of this example, alongside others, had recently embarked upon a development project involving citrus farming in the Upper Kat, for which they would receive a consultancy fee and an added supply for their citrus-export business in the longer term. With

such knowledge in mind, the commercial farmers' support for water allocation to historically disadvantaged farmers does not appear quite so lacking in self-interest, as both first appearances suggest and the historically disadvantaged participant quoted above appears to believe. Overall, the previous two examples reveal how the scheduled commercial farmer was able to use both the lack of definitive guidance on the part of DWAF and experts on the legality of unscheduled farmers, and the inclusion of legislative clauses regarding water allocation to historically disadvantaged social actors, to his ultimate advantage in the negotiation process through their provision of a rationale to continue excluding unscheduled farmers. In this way, the power and dominance of a single actor within the KatRWUA was shown to affect its decision making process significantly.

In order to engender 'optimal' decision making (in the collective and environmental interest) by the KatRWUA, the KatAWARE model simulated the cumulative impact of actors' decisions on the water stress of the sub-areas of the Kat River catchment. However, other variables of relevance to holistic decision making were not incorporated. For instance, the lack of water-quality data meant that the impact of different allocation scenarios on water quality, rather than availability, could not be ascertained. Although KatRWUA participants were theoretically free to seek, request and/or draw upon additional decision making criteria, their privileging of the model (section 6.2.4) is interpreted to have prevented this. The KatRWUA decision making process is therefore considered to be further constrained by the KatAWARE model, whose linking of water availability with economic profit inherently rendered economic considerations central to the decision making process. In contrast, environmental considerations were largely depicted as secondary within the model; relevant only when water scarcity impinged on economic productivity or the mandatory ecological reserve. In this way, the model's placement of economic considerations at the forefront of evaluation criteria endorses the perspective that economic considerations should constitute priority evaluation criteria for water allocation. This perspective synergises strongly with that of commercial farmers, as derived from their statements at the catchment vision workshop (section 7.2.1), accounting for earlier observations that a commercial farmer placed high value on the model and its outcomes (section 6.2.4). Conversely, the model did not encompass the desired reality of historically disadvantaged KatRWUA members in terms of water-supply infrastructure, such that, at the time of this research, their energies therefore continued to be focussed on rectifying this issue rather than using the model, as the commercial farmers did, to influence decision making (see following examples). The outputs of the KatAWARE model, of formal employment and profits to the catchment, also meant that the commercial farming sector was represented in a highly positive light. In this way, the KatAWARE model provided commercial farmers with credible 'evidence' that reinforced and justified their raison d'être and *modus operandi* within the water allocation process, as the output of formal-sector employment and profit generation by the citrus industry

comprises a direct and tangible financial benefit. Although KatAWARE showed the number and type of formal jobs created, these figures did not reflect *who* would benefit from the profit that such labour creates, nor the non-economic subtleties surrounding informal employment e.g. benefits to health, self-efficacy and/or female income. This observation may have swayed decision making further in their favour, in light of the pervasive desire for local employment amongst wider residents (section 8.6).

As alluded to in the previous paragraph, historically advantaged actors were also able to engage with the KatAWARE model selectively, in order to achieve their agendas, due to their higher comprehension of its purpose (section 6.2.4). For instance, despite having expressed considerable support for the KatAWARE model (section 6.2), when a proposed scenario restricted water availability to commercial farmers, the same commercial farmer (as in the previous example) asserted that "there could be a drought and all these figures will go out of the window" (Field notes, November, 2006). His statement is interpreted as an attempt to discredit the proposed scenario, which was unfavourable to him, in order to prevent other participants from subsequently selecting it. Thus, whilst revealing a high critical awareness of the limitations of scientific data, he nonetheless drew on such data *as and when* it suited his agenda, as interpreted in light of his earlier support for the KatAWARE model (section 6.2.4). An unscheduled commercial farmer similarly drew on the expert numerical estimations of the resource yield and favourable KatAWARE model scenarios, in order to back his cause:

> At least now we have been given the figures, 21 M cumecs so that is what we can work with. (...) Before everyone had their own ideas but now there is a new model that we are supposed to play with. So many cubes and so many hectares, so now we can work with figures.

The quantitative nature and technical format of information within the KatRWUA process also facilitated the domination of proceedings by historically advantaged participants. The participant observation notes provided below attest to the extent to which one such actor was able to manipulate the social learning process. Due to the concerns of some RU researchers, that the KatAWARE model only incorporated economic criteria, a list of potential decision making criteria was presented to the KatRWUA:

> [Researcher 1] We hope this shows you what really is the impact of development and are there other things that would better use water.
> [Commercial Farmer] It is like an EIA [environmental impact assessment] but without the figures. And not so expensive.
> [Researcher 2] Yes, sort of, but more qualitative. So do you think that it will be useful?
> [CF] So the question is should we plant anything because everything has a negative impact, whatever you do affects the environment!
> [R2] It's another way of looking at the impacts of scenarios rather than the KA [KatAWARE] model, but less quantifiable but more a complete picture.

[Commercial Farmer] We'll see what happens but maybe we will be able to use it...[appears ready to move on]
[R1] ...the idea was that it would help you assess the different options and be a set of criteria against which anyone could decide on what development would be good. The WUA needs to think, if someone is doing a brick-making factory does that impact you or can you ignore it?
[CF] What we really need is to know how much wealth is created per litre water used. But yes, also need to look at the social stuff. But we need to measure stuff in amounts for it to be useful, so what wealth comes from using such an amount of water.
[R2] So there is a need for that?
[CF] Yes, for negotiation, a need to put a price to it.
[R2 suggests a project on the economic returns of different enterprises in conjunction with Wageningen University]

The extract illustrates several points: the high level of dominance of one commercial farmer and his personal skill in manipulating the 'collective' process; the pressure from researchers to reinforce the holistic perspective; and, their susceptibility to being diverted from the task at hand by their own research orientated agendas and interests. Having already reinforced his own perspective within this dialogue, the commercial farmer also managed to set up a potential future source of evidence that would further strengthen the case for his modus operandi – with the complicity of a researcher. Although such complicity is interpreted as having been inadvertent, in light of the knowledge of the high level of desire to act in the interests of historically disadvantaged actors (sections 5.4 and 6.2.2), the result was that the commercial farmer successfully prevented alternative positions from being more thoroughly discussed. The facilitator of this meeting later reflected that, "I just can't seem to control him, he's too powerful, it'll just be business as usual once this thing [KatRVP] is over". This example therefore highlights the importance of skilled and independent facilitation, in order to negate power relations and associated attempts – both deliberate and inadvertent – to deviate from the process objectives, if elite capture of the process is to be avoided.

Furthermore, these examples highlight that, despite the cognitive change identified by stakeholders in section 6.3, that others have valid and rational demands on the resource, such change is restricted when applied practically to a situation where actors stand to gain or lose economically. For instance, an unscheduled commercial farmer asserted that, "farming is sustainable, we have been using the same water all this time and we are still here and there is still water available". This reflection markedly overlooked the inequity of farming activity within the catchment and failed to consider the cumulative impact on water-resource sustainability if all catchment actors were to have similar water requirements as himself. This hypocrisy and limit to the enactment of cognitive change is also implicit in a scheduled commercial farmer's observation that:

> We see them less as a threat, these people who are demanding water because we can look at what they want and quantify it. And they themselves have realised that we also want extra water, so we must come to some system that is fair so everyone gets a proportion.

Whilst attesting to the right of others to water, the interviewee here implicitly reveals his belief that it is "fair" for commercial farmers to receive a portion of any 'new' water that is deemed 'allocatable', as was likely if KatRVP calculations on the reserve were approved by DWAF. Given that commercial farmers already accounted for the vast majority of the catchment's water use (section 3.4.3), this assertion contradicts notions of 'fair' and 'equitable' in the social justice sense (section 2.4.1). Due to this significant discrepancy between water use of historically advantaged and historically disadvantaged participants, and the lack of significant change that has arisen through the participatory process, one researcher reflected that:

> DWAF is just going to go ahead and do their own thing anyway. So this whole thing is just giving people hope but then most of them aren't going to get what they want, except the people in the Upper Kat.

The quote implicitly supports Allan's (2005: 5) assertion that "water allocation is unavoidably a political process", as it implies that the overriding desired outcome of the state agency of DWAF will ultimately be enacted regardless. As South Africa's national government is keen to advance the socio-economic well-being of historically disadvantaged citizens, one can interpret that DWAF is under political pressure to align their objectives and activities with such goals. This interpretation in turn suggests that the underlying purpose of institutional reform from irrigation boards to water-user associations is to subtly, rather than directly and overtly, coerce historically-advantaged water-users into 'voluntarily' giving up some of their historic advantages through a process of interaction. However, both previous quotes of commercial farmers above imply that such a shift is unlikely to occur within the KatRWUA context.

7.2.4) Structural constraints on decision making

A key constraint on the decision making process of the KatRWUA is alluded to by an unscheduled commercial farmer:

> Well when people started looking at the whole river and not separating then it seemed like we [the unscheduled users] were being acknowledged. But maybe they felt that we were just playing a game and that in real life it wouldn't happen. I think that is a problem even to this day, yes we know how we all affect each other. But is that going to happen, will it change? We were seen as outsiders and we're not going to get in there. So it felt like we were part of the whole thing in the game but deep down thinking that it wouldn't change for us in reality. (...) And in the model the same, yes we were tolerated for the game but when it comes to the crunch it's the scheduled area first and then if you're lucky, maybe. But then maybe I was being negative.

In the interview extract, the farmer highlights the fundamental limitation to the 'decision making' process of the KatRWUA: it remained largely hypothetical. Even though the results of the negotiation process were intended to generate a water allocation scenario, this output ultimately constituted an 'option' for consideration by DWAF. In this way, the KatRWUA was disempowered as a forum where 'real' decision making could take place.

The KuisebBMC suffered similarly from a lack of decision making power, as illustrated by the following transcript from an interview with the DWA representative:

> [Interviewer] What do you see as being the main role or function of the KuisebBMC?
> [Respondent] At the moment it's just an interaction of people and the fact that things are discussed and explained at the moment that is it.
> [I] Do they have to make any decisions? Is it a decision making body?
> [R] At this stage not, but that they should be. OK, but decision making is a big thing. At the moment, in this country the Minister for Water decides on everything and the fact that the people who advise him decide. The BMC should in the end become the final advising actor on water matters in the Kuiseb and formally they will decide their advice to the Ministers, it will be the definitive input in 99% of the cases but they don't have that role at the moment.

For this reason, the KuisebBMC could not be drawn upon significantly within this section, except to reinforce the assertion of section 5.3.1, that the KuisebBMC was subject to top-down interference. Yet although an explicit decision making role was not envisaged for the KuisebBMC, an element of decision making nonetheless remained for the KuisebBMC members: deciding on specific action(s) to pursue, from the wide range of proposed functions and activities in both the NWRMA and their own constitution. The wide range of responses to questions about the current role and/or the future activity of the KuisebBMC indicate that there is a high degree of confusion amongst participants regarding its purpose. As one member observed: "we've drawn up a strategic plan and if you look at it, it's a nice plan but we're not following it, because people are maybe not understanding it". The interviewee went on to assert that, "ultimately we would have the Water Master plan which will tell us what to do the next five or ten things and then we work towards that", implying that KuisebBMC participants were waiting for external actors to provide a role rather than actively shaping it themselves. This interpretation is supported by a DWA member's observation that KuisebBMC members were expecting DWA to provide further guidance on their activity:

> [Interviewer] Not here but at another meeting, a participant said to me, 'this participation thing is getting us nowhere, why can't DWA just tell us what to do'. Do you agree with that?
> [Respondent] Well that sort of thing was also happening on Monday, when the Water Plan was being discussed and everybody looked at me. (...) There's two things that we can tell the people what to do. The one thing is that we can tell them how to run the BMC. And the other thing is what decisions are the best ones. Now the second one we can't do because it's against the principle and then you have a rubber stamping thing.

Yet although the official respondent appears to express a desire for the KuisebBMC to take responsibility for determining their own future in the quote above, another participant's recollection of an occurrence at the outset of the KuisebBMC process suggested that it was the past behaviour of DWA that had prevented such self-determination from happening:

> For example with the strategic plan, there was a big fight a few years ago, [Mr X] wanted to sort it out, the who, the when and the what so he said that everyone must do their bit. But DWA objected to non civil-servants ordering them around. We managed to sort it out and restore the relationship but since then the strategic plan has been left aside, it clouded the situation. So our enthusiasm was a bit dampened since then. Also some things are not clearly expressed in the Act and it is clear that there were different understandings, the people in [one institution] had different understandings to others.

This quote reveals how the tension between top-down control and bottom-up influence (section 5.5.4) was compounded by the ambiguity of the NWRMA that is highlighted in section 4.7.7.

According to the analysis above, neither the KatRWUA nor the KuisebBMC incorporated a process of devolution that is called for by the proponents of participatory approaches in section 2.4.2. Although the KatRWUA is nominally involved in decision making pertaining to water allocations within the catchment, analysis within this section has revealed that any 'decisions' or information must first be approved by DWAF and are strongly governed by the relevant policy and legislation that was analysed in chapter 4. Meanwhile, a Namibian DWA representative openly acknowledged that "the BMC approach is that people have some channel to influence the Minister's decisions but ultimately the Minister's decision is final, so if you don't like their decision then you must vote for someone else next time" (Field notes, September, 2007). The key difference between the case studies is that the KatRWUA was envisaged as a decision making entity by the KatRVP (section 5.2.3) and was, therefore, sold as such to its participants. In contrast, the KuisebBMC was promoted principally as an information-sharing and learning platform. The impact of this difference is discussed in terms of their overall outcomes in section 7.4. The interpretation that neither the KatRWUA nor the KuisebBMC were independent of state water-management authorities is of further relevance because, in contrast to the limited nature of actual decentralisation of authority, the implementers of the research and development projects from which the case studies arose envisaged a more proactive and authorative role for the KatRWUA and the KuisebBMC. The resultant mismatch between the envisaged roles and responsibilities of the KatRWUA and the KuisebBMC, between facilitators, authorities and participants is returned to in section 8.5. Nevertheless, in light of the revelation (section 7.2.3) that decision making within the KatRWUA was dominated by historically advantaged commercial farmers acting largely out of self-interest, this top-down constraint on decision making by DWAF can be considered

reasonable *if* the objectives of equity, and collective and ecological wellbeing, are to be achieved in the Kat River catchment. This observation highlights the inherent tension within a managed social learning approach: between allowing social process to play out 'naturally', versus the risk that, without concerted interference, the pre-determined objectives of social and environmental equity will be subverted by existing power structures. Above all, this interpretation underscores the highly normative context, within which managed social learning processes operate when applied to water-resource management.

Overall, the preceding sub-sections have revealed the incongruities between, and ambiguities of, the agendas and objectives of different water-management scales, which had created areas of conflict between stakeholders of the case-study processes. Furthermore, both decision making processes were dominated by a minority of historically advantaged and/or institutional actors, thereby revealing that historical power relations between participating social actors continued to affect recent social learning processes. The significance of these power imbalances is explored further in the following sections, in relation to the outcomes of social learning.

7.3) Taking action

The conceptual framework of managed social learning specifically expands on the participation discourse by placing social interaction within a context of learning and task-centred action, whilst a key theoretical underpinning is that learning, which is rendered explicit, is then translated into action via behaviour change. Although learning amongst KatRWUA and KuisebBMC participants (section 6.3) was linked to relational changes in section 6.4, the posited cognitive changes were revealed to be constrained in terms of their impact on livelihood-related decision making in section 7.2.3. This section moves on to explore if, and how, the behaviour outcomes of the KatRWUA and KuisebBMC members are linked to their learning, at an individual and/or collective level.

7.3.1) Institutional action

Previous sections attest that although several 'actions' had been realised by researchers and consultants involved in the KatRVP, such as the yield analysis, ecological reserve determination, legality of water use and water quality status (respectively: Mallory & Hughes, 2005; Louw & Koekemoer, 2006, Johnson, 2005; Muller, 2005), the KatRWUA members were still in the process of negotiating water-use scenarios at the time of this research. Thus, when asked about the outcomes of the KatRWUA, one member observed that "we actually have done nothing but we have carried on...we're still around and there is a lot of discussion and debate"

whilst another acknowledged that the KatRWUA still needs "put into practice what we have learned".

The majority of KuisebBMC participants expressed a similar sentiment to that of their KatRWUA counterparts above: that the KuisebBMC has not yet resulted in action-oriented outcomes. For example, when asked about the KuisebBMC's achievements, one member's response was:

> I'll have to think [laughs]... I think it's difficult to say what has been its biggest achievement so far, I think the biggest achievement will be this Water Master Plan, 'cause currently what we're doing is we've put a lot of systems and goodwill in place, I was just telling Mr X yesterday and Mr Y at lunchtime that so far the KuisebBMC was just being established so we put all the systems in place, we get together, we meet regularly, we have a policy, we have a plan, but we've not really gone over from putting things in place on the development side. I think the next phase will actually be putting things in place. So to be honest, up to now, we were just getting ourselves organized.

These reflections tie in with personal observations that neither the KatRWUA nor the KuisebBMC had realised conceptual goals of social learning, of concerted and/or collective action, at the respective times that the fieldwork for this research was undertaken.

7.3.2) Institutional change

Nonetheless, observations indicated that both institutions were situated within wider processes of change. The social transformation of the former irrigation board and the collection of the water-user information that were required by DWAF, in order for the KatRWUA to become a legitimate institution with responsibility for water allocation, had resulted in a time lag between the cessation of the activities of the KatRIB and the independent functioning of the KatRWUA as a water-allocation entity. This period of 'action' adjournment was beginning to frustrate some KatRWUA members, as revealed by the following interaction at a KatRWUA meeting:

> [Researcher] That process that you just described we need to get that written down and signed off by DWAF. So we just need to get some registration principles together. I am struggling to get negotiation principles, maybe [DWAF representative] you can help? I've been having problems getting hold of them. I spoke to someone who told me about them but no-one else seems to know what I mean.
> [DWAF] I think it is things like equitable access, socio-economic variables, the historically disadvantaged...
> [Researcher] ...maybe you could comment on this [hands DWAF a list of negotiation principles that RU have drawn up]
> [Commercial Farmer] Yes, and maybe you can sign it off for us and then we can move forward.

This extract from participant observation notes principally illustrates three things: a sense of frustration at the lack of progress and action on the part of the commercial farmer; the strong driving force of RU; and the bureaucracy involved in decentralised 'water management' in South Africa. Notwithstanding the observation that several participants expressed frustration at the slowness of the process, the manner by which the commercial farmer above proposes that the principles simply be "signed off", without really appearing concerned about what they contain, can be interpreted as an indication of tokenism, i.e. that they would anyway have little subsequent bearing on the negotiation process, and/or of resignation that such principles are anyway likely to feature 'predictable' content. Both interpretations are thought to be relevant: the latter because of the political changes in South Africa over the past decade, such that redressing 'past imbalances' and social inequity are key political concerns (section 4.5); whilst the former interpretation is supported by an RU researcher's observation (section 7.3.3), that once RU finishes facilitating the KatRWUA through the KatRVP then it will revert to "business as usual" on the part of the former KatRIB members.

Frustration over the lack of tangible action was observed in the KatRWUA to be highest on the part of those participants who were previously empowered to act (e.g. scheduled commercial farmers of the former KatRIB members) and those whose existing financial security rested on decisions being made (e.g. unscheduled commercial farmers). An unscheduled farmer reflected that: "there were lots of questions that we tried. We didn't realise that it would be such a big democratic process, we thought it would just be yay or nay". This quote not only attests to the time lag caused by the institutional transformation of the KatRWUA, but also supports the interpretation that unscheduled commercial farmers had used the new legislation and KatRVP as a process to serve their own agendas, rather than becoming more inclusive for social equity reasons (section 5.5.4). Observations that a scheduled commercial farmer was frustrated with RU researcher's continued pursuit of action research goals of instilling a holistic and equitable ethos also suggested that, from the outset, he had intended using the RU and the KatRVP to achieve his own agenda: interpreted as obtaining the information necessary to gauge his own future security (i.e. the yield and the reserve), and then to use such information to justify his position within the negotiation/decision making process (see section 7.2.3). These interpretations, which indicate that institutional change of the KatRWUA was being subverted by dominant actors and their agendas, are analysed further in subsequent sections.

7.3.3) Preventing change and delaying action within the KatRWUA

At a KatRWUA meeting, the commercial farmer of the previous example positioned himself to chair the meeting. When RU subsequently put forward a meeting agenda, he responded "but that is your agenda, not ours" thereby asserting his authority and regaining control of the KatRWUA

forum. Significantly, historically disadvantaged actors did not challenge the commercial farmer during this takeover of the meeting and formal assertion of his authority, which is probably linked to the low self-efficacy amongst many historically disadvantaged Southern Africans that is discussed further in section 8.2.3. Mindful of their imminent withdrawal from the process and, therefore, recognising that someone else would need to assume responsibility for driving the KatRWUA, RU researchers also overlooked this assertion of authority despite some expressing their discomfort that it signified a likelihood that the process would simply return to "business as usual" in future, i.e. the exclusion of historically disadvantaged individuals within formal catchment-based water management. This example not only highlights the bottom line of research and/or development initiatives, as RU researchers ultimately operated according to economic considerations and within time constraints, but further reinforces the assertion in the concluding paragraphs of section 7.2, that power differentials between social actors play a significant role in the explanation of social learning processes.

A lengthy extract from participant notes that were made at the same meeting reveals that commercial farmers (scheduled and unscheduled) understood, yet ultimately resisted, the role that DWAF required from them in terms of incorporating historically disadvantaged residents of the catchment into the formal water-management process. As the dialogue within the meeting was rapid and unrecorded, the sentences within this extract are highly paraphrased, as per the original notes. Some grammatical mistakes are caused by the direct quotation of non-native English-speakers. Nevertheless, the notes are not considered to have lost any of their original meaning such that they can be used for the purposes of this analysis:

> [DWAF] First need to find every registered user and sum up all volumes of water that are used. On the license application form it is important to apply for an accurate volume. So if there has been any changes then we need to look at those, for example if any of these are not correct [holds up a copy of registered users printed from DWAF database]
> [KatRWUA secretary] It would be easy to confirm that info, can just write to them all and ask if correct
> [DWAF] We need a list of all people in the Kat who are using water from the river.
> [Unscheduled commercial farmer] Whose responsibility is it to get that?
> [DWAF] The WUA
> [Scheduled commercial farmer] But we did all that, the people came with forms and we sent them all back. So everyone needs to be registered. I thought that had already been done.
> [DWAF] Some of it has, but really need to get everyone and those in the Upper Kat. for some of them you can put them as special cases and estimate how much water they use. But need to get everyone together and do this. I will come or I can arrange someone from DWAF to come, just tell me when and where and then you need to get everyone together
> [Scheduled commercial farmer] In the KatAWARE model there is a lot of info that I believe is accurate...
> [DWAF] Well I think it is just a tool, it is not really so realistic. For one thing, you can look at it but you need to also think how probable that will be. It does not look at that
> [Unscheduled commercial farmer] People must realise that ignorance of the law is not an excuse, we cannot make sure that everyone is following this, that is not our responsibility.

If they don't register water use then it is not DWAF or the WUA responsibility, we cannot make them
[RU researcher] A thing is that people are not used to it, so they are scared to put their name down because they never paid before so now they are worried that they will have to pay
[Small-scale farmer] The people from Upsher, the farmers, are having a meeting on 23rd November about irrigation, they would like to invite DWAF, the WUA and Rhodes.
[General agreement that it would be good for someone to go along]
[Unscheduled commercial farmer] You don't actually pay for water for the first 5 ha so maybe we need to make that clear to people but still they must register....
[Scheduled commercial farmer] I think that it is critical that we get the registration done.

Despite acknowledging that the lack of registration of Upper Kat water-users was delaying the KatRWUA process, the Chairperson (the scheduled commercial farmer in the above extract) did not then specify who would attend the proposed meeting nor ratify any attempt to organise an alternative event for obtaining the required information. Instead, he went on to expound further the merits of the KatAWARE model as a decision making tool, which created a digression from the proceedings, as it predictably triggered a debate with the DWAF official who had made it clear on several occasions that he did not think that the model was suitable for decision making by the KatRWUA. Thus, ultimately, a decision on who would attend the farmer's meeting and/or obtain the water-use information was never confirmed. This observation can be interpreted to constitute a deliberate stalling of the registration process, which is thought to have been in the interests of the scheduled commercial farmers because a delay in the issuance of new allocation licenses would permit their continued legal use of water without having to compromise on their own allocation for either unscheduled business rivals, emerging farmers and/or other social development activities.

Another occasion involving the dominant commercial farmer from the above example is interpreted as a further attempt to delay changes to the *status quo* of water allocation and to avoid compromises on water use by his sector. The global perspective of water resources, as finite and as a source of conflict, mean that negotiation and dialogue-based approaches to water management are increasingly promoted as water-management best practice (chapter 2). In line with this perspective, the 'action' of water allocation by the KatRWUA was preceded by a negotiation process. However, during the negotiation process, the commercial farmer challenged the perspective that the Kat River water resource was finite to the extent that potentially compromise was required on the part of the water-users. Field notes recorded that rather than accepting the yield value proposed by consultants, he instead proposed that the management strategy of the Kat River dam be changed to yield more water, despite acknowledging that such a strategy would decrease the assurance of supply as well as the capacity to meet the ecological reserve. In essence, he was attempting to increase the 'size of the pie', rather than accepting that the KatRWUA should operate within the proposed limits, which it is interpreted, would have posed a threat first and foremost to his own sector due to it being

the largest water-user of the catchment and a historically advantaged sector. This observation not only illustrates the economic priorities of the commercial farming ethos (also referred to on pervious occasions), but further demonstrates how the posited 'learning' discussed in section 6.3 was restricted in terms of an action outcome when related to a real-life situation rather than a hypothetical question. The limitation to objective facilitation by research-oriented actors was once again revealed during this example, by a researcher's response to the commercial farmer that determining the impact of an altered dam strategy could constitute a future research project. Thus, instead of remaining committed to the negotiation process at hand and reinforcing the need for compromise, the researcher inadvertently advanced the stalling tactic of the commercial farmer. This example, alongside others in previous sections, suggests that facilitation by research-oriented actors may be sub-optimal, if not detrimental, to managed social learning processes.

The examples of this section indicate that general acquisitional learning (section 6.3.1) does not necessarily translate into subsequent action-based outcomes, thereby further supporting the suggestion that interviewees may also have been answering questions in the manner that they thought researchers desired of them (section 6.3.1). The former assertion is supported by the limited affirmative responses of KatRWUA members to questions about how their learning within the process had changed their subsequent actions. Aside from answers pertaining to differences in the way that they treated or related to others and those relating to personal development (following section), KatRWUA members were unable to link their posited learning to specific individual behavioural outcomes, with two exceptions. These exceptions are discussed further in section 8.6.2 because, paradoxically, they both resulted in individual-level outcomes that are considered to have challenged the managed social learning process. One exception particularly highlighted how the practical enactment of the widely posited learning "to think about others" (section 6.3) was hindered by alternative influences on behaviour, especially economic influences in the KatRWUA case study (section 8.6). Thus, in addition to examples from the decision making process in section 7.2, these findings challenge social learning theory on the basis that factors *other* than learning are responsible for eliciting behaviour change.

7.3.4) Translating learning into action within the KuisebBMC

In line with the interpretation in section 7.3.1, a KuisebBMC member reflected that, "we haven't really achieved that much so far in my opinion, I don't think we have, we've talked a lot, a lot of good ideas have come up but it's never actually been put into progress". Another member concurred stating that, "as far as the formal meetings and the system is involved it could stop at any time and no gain for the people in my opinion". At an individual level, few

respondents were able to specifically identify behavioural changes that had directly resulted from the learning that they had previously attested to (section 6.3). For instance, one KuisebBMC member observed that:

> To get the bigger picture, that's definitely improved my personal view on the system. And one tries to get that out on the field but ja, it's difficult. I mean at the end of the day, we just have to survive and do what we can (...) I don't think that the actions in the Kuiseb have changed at all, not in the commercial farming sector...

However, this quote overlooked the behavioural changes that *had* occurred amongst the commercial farming population of the Upper Kuiseb catchment over recent years, where many commercial farms had embarked on tourism-based livelihoods (Commercial farmer, pers. comm. 2007; Henschel, 2006). These data indicate that behaviour change amongst stakeholders had occurred, just not as a result of the KuisebBMC. A KuisebBMC member also made a similar observation:

> I know that the mine have started recycling water more effectively and using water more effectively and so on to bring down water consumption and so on. But that is not because of my being in the committee but that is a general result because the pressure is there and the people are becoming more environmentally conscious, I think that people [in the Kuiseb catchment] are now more environmentally aware and that they may affect others people also.

The quote illustrates several points that are salient to this research: that behaviour and cognitive changes amongst wider catchment actors have occurred and/or are happening, albeit not necessarily due to the presence of a formal social learning process; that changing patterns of behaviour and perceptions, which have been 'organically' learned in a real-life context, is difficult; and that definitively linking observed change and outcomes with the social learning process under study is difficult. The first two points are explored further in chapter 8, whilst the latter further justifies the interpretivist perspective of this research (see chapter 3).

Overall, whilst both the KatRWUA and the KuisebBMC had made progress in terms of putting the relational and administrative structures in place; at the time of this research, neither had resulted in concerted collective action towards the broader social and/or environmental change that is called for by proponents of the approach in chapter 2. The lack of action to date meant that there had been little opportunity for group-level reflection on collective action. Thus, the final reflection aspect of Kolb's learning cycle cannot be addressed by this research (see conceptual framework in section 2.6). Within this section, the KuisebBMC was interpreted as having lacked an impetus for action due to the stand-off between DWA and other participants over responsibility for 'driving' the process, whilst the KatRWUA was being prevented from further action by the conflict between the objectives of DWAF, to redress inequity, and that of

historically advantaged commercial farmers, to perpetuate the *status quo* in their [economic] self-interest. Further reasons for the lack of concerted collective action in the social and environmental interest, by the KatRWUA and KuisebBMC, are discussed in chapter 8.

7.4) Social learning outcomes

Nonetheless, a range of tangible and intangible outcomes were identified from the case studies, which variably constituted social behaviour change and/or the *potential* for such change in the future, as discussed within this section.

7.4.1) Individual-level benefits

Section 5.4 revealed that both the KatRVP and ELAK projects involved capacity-building objectives of increasing stakeholders' capacity to participate in natural-resource management activities. As these objectives incorporated a specific emphasis on working with Topnaar and historically-disadvantaged communities within the Kuiseb and Kat River catchments respectively, observations of personal development amongst such participants were unsurprising. For example KuisebBMC minutes (February, 2003) record that, "[Mr X] noted that the fact that he can stand up there in front of the stakeholders and present, this shows an immense achievement amongst the Topnaars". Whilst his statement overstates the positive outcome of capacity-building, which applies to himself rather than the entire community, it nonetheless attests to the personal acquisition of social skills and, therefore, *potentially* also applies to other Topnaar community members who participated in the ELAK project. Similarly, the employment status of most historically disadvantaged KatRWUA members improved over the duration of the KatRVP (see section 8.2.1), almost all of whom secured formal employment in an area of otherwise extremely high unemployment (section 3.4.3) over the duration of the process. In reference to a historically disadvantaged KatRWUA member, a long-standing RU researcher observed that:

> His confidence has really grown since I first knew him. And he is very clear that he wants to stay in the community. So the [KatRCF] hasn't really benefited but [his community] has. Really it's the only community that is doing things by itself and it's mostly because of him.

My translator, who was a friend of many historically disadvantaged participants (section 3.5.2), agreed: "yeah, just look at them all: Mr X, Mr Y, Mr Z [historically disadvantaged KatRWUA members], they all have good jobs now". Although directly beneficial to individuals, such outcomes have a potentially detrimental impact on the overall sustainability of the social learning processes of the KatRWUA and the KuisebBMC, because, as already explained in previous sections, the participation of historically disadvantaged members subsequently

declined as a result of their improved employment status. However, under different criteria of benefit and outcomes, such as social equity, these individual-level changes can be considered positive, even at a wider social level if the individual uses new skills and networks gained through the process to assist with and/or facilitate wider social development. The latter outcomes are illustrated by the previous indented quote and by the KatRWUA member that the quote refers to, who personally linked his personal development from KatRWUA membership to his subsequent role of supervising agricultural development projects within Upper Kat communities. Although such outcomes do not constitute a direct and immediate benefit to society and the biophysical domain at the entire catchment scale, they potentially have significant benefits for the wider socio-economic amelioration of historically disadvantaged communities, which in turn may have two contrary outcomes for the biophysical system. On the one hand, socio-economic improvement may result in decreased biophysical degradation, as social actors are increasingly able to financially support environmental protection measures and to afford higher priority to environmental quality. However, on the other hand, a rise in socio-economic levels generally leads to increased water use, which would increase stress on biophysical systems if the additional demand of the catchment is met from the in situ resource.

However, the degree to which the individual development above benefits wider social actors within the catchment ultimately depends on the personality of individuals. Notwithstanding the power struggles within the Topnaar community, the cessation of the former KuisebBMC representatives' participation was likely to have been linked to another interviewee's observation that "he [former Topnaar KuisebBMC member] has also been kicked off the conservancy, he just wanted the money (...) there is a big feeling amongst those of us who have worked with him that he is just in it for himself". Similarly, a historically disadvantaged KatRWUA member continued to attend meetings, yet his lack of contribution and/or subsequent action suggested that he only participated due to the potential individual opportunities through its association with RU (section 5.5.5), as it was known that he had personally benefited from such opportunities in the past. These examples demonstrate how differences in personality affected the 'scaling up' of benefits and/or learning from formal social learning processes to wider social levels. Further impacts of individual personality on the social learning processes are explored in the following chapter.

7.4.2) Community-level benefits

Whilst not necessarily constituting 'concerted collective action' on the part of the group, limited tangible outcomes of the social learning processes applied beyond the individual level. For example, the Topnaar community struggled to pay their water bills, which was raised within the KuisebBMC forum. As a result, "Walvis Bay was able to help, through the industry"

(KuisebBMC member). Although the action 'failed' as a sustainable, long-term solution (most communities have now returned to the same situation), it nonetheless constituted a tangible outcome that arose directly from the KuisebBMC process. More important from a social learning perspective was that KuisebBMC members learned from this action, as an extract from a later discussion on the 'problem' of non-payment attests:

> The last way did not work. I think that it is important that a solution is found but that the community must be part of it and undertake to sort something for themselves so that it is more sustainable in the future (Field notes, September, 2007)

In the ensuing discussion a new approach was agreed upon: the relevant authorities, DRWS and NamWater, would initiate a dialogue with the Topnaar community, in order to collectively resolve non-payment for water services. In this way, the KuisebBMC met one of their identified constitutional functions: to "identify and resolve water-related conflict within the basin" (section 4.7.7). Significantly, this function does not require 'action' on the part of the KuisebBMC, but invokes a co-ordination role of stimulating action on the part of other agents or entities. This successful enactment of a KuisebBMC function nevertheless implicitly illustrates how a social learning approach may be constrained in the context of water management, as the action-based activities of water resource management already fell under the remit of institutions pre-existing NWRMA. This notion, that institutional overlap has resulted from new water-management ideology and legislation, is discussed further in section 8.5.

7.4.3) Increased transparency and openness of official decision-making processes

Returning to the theme of social learning outcomes; another outcome of the KuisebBMC was that the decision making process was considered by livelihoods-based stakeholders to have increased in transparency as a result of the participatory forums. A KuisebBMC member reflected that, "it [KuisebBMC] makes the allocations and the decisions and so on more open and transparent, now people can see where the decisions are coming from instead of just them [DWA] just telling people what to do". The quote attests to the continuation of decision making at higher levels of authority. Another member concurred, reflecting:

> I also like that we share information very openly. For example, yesterday we talked about the licenses. Before in the past it was very difficult for anyone outside government to know about how the licenses were issued let alone dare to ask why. Now at least we can discuss those things in the open. So less is hidden now.

The increased openness is directly linked to the positive relational outcomes of section 6.4 by a KuisebBMC member, whose response to the question, 'do you think that there have been improvements for anyone in the basin because of the KuisebBMC?' was "not in the material

sense but I think that the atmosphere in the Kuiseb has gone a bit more relaxed (...) because people realise that there is not somebody else who is going to take away all their water". This increase in openness and transparency is of high significance in the Southern African context, where, historically, only an elite sector of the population – determined by racial origin and/or water-use sector – was able to access decision-makers [of water-allocation]. Hence the access to decision-makers and their rationales for decision making, which were facilitated by the participatory KuisebBMC contributed to an increased feeling amongst catchment-based water users that decisions are 'fair' and rational. For instance, one member reflected that:

> Before this thing [the KuisebBMC] I was just saying even me myself, that this municipality of Walvis Bay and NamWater, they are just extracting and for what I don't know, not considering the other people. So through this one [the KuisebBMC] we are now understanding each other and I see that, erm, the water, it's not the end, its just the circumstances, their businesses have to be run so they need water for the industry and so on. So now when people are saying that in the [Topnaar] community, I am saying 'no, they are taking water for things, it's not just taking but it's for some goals and what' [sic].

Thus, whilst the KuisebBMC member still holds other water-users as responsible for declining water levels, his new awareness of the rationale of their water use and the bigger picture meant that it was subsequently more *acceptable* to him that water allocation involves trade-offs. This assertion is likely to have contributed to the positive relational outcomes outlined in section 6.4.1, and matches that of another livelihoods-based stakeholder, who observed that:

> It helps for the mutual understanding of why things are as they are, and why things are done, and why we support certain actions more (...) understanding the needs of the other people like the Topnaars and the end users at Walvis Bay helps to convey that message to the farmers upstream so it makes the decisions that are made more acceptable.

These examples thereby also intimate that openness on the part of decision-makers means that, even their 'disagreeable' decisions are more likely to be accepted if stakeholders can access and understand the rationale behind them. The context of the authoritarian history of Southern Africa is also relevant, as control of resources and access to related decision making has historically been the preserve of a privileged few. Thus, the novelty and intrinsic significance of being given a voice and/or being informed by 'official' institutions cannot be underestimated, as alluded to by a KuisebBMC participant:

> Especially for the farmers, they had no voice at another level. The commercial farmers were being accused of withholding all the water etc. and they are largely white landowners so their concerns were not seen. The local communities, they now also have an outlet for their plight and issues besides the water point committees so they can also make their issues known.

However, it is important to note here that the *opportunity* that is provided by social learning forums, for catchment-based stakeholders to access higher level decision-makers and to voice

their concerns, may remain just that in light of constraints on participation that have been highlighted in this chapter and are discussed further in chapter 8, as well as the non participation that was identified in sections 5.5.3 and 5.5.5.

7.4.4) Institutional accountability and public advocacy

Another positive aspect of the KuisebBMC was the opportunity it provided for the clarification of institutional functions and responsibilities, as revealed by the assertion of an institutional member:

> They [other stakeholders] realise that we have that information because many don't know that they can come to us and ask us to collect some information and I think that they were not aware that that was our function. Like this year for example, we have started giving flood warning, which is a core function of hydrology but people didn't realise that we could, and indeed should, do that for them.

This clarification of institutional responsibilities via the multi-stakeholder forum may ultimately contribute to institutional accountability, as the other stakeholders became aware of the services that institutions should provide. That other stakeholders recognised this opportunity was underscored by another KuisebBMC member's observation that, "with DWA, now they are expected to provide information rather than just if they want to". This accountability also applied to service providers. For example, field notes record an occasion when a KuisebBMC participant had called for a [water-supply] institution to improve their infrastructure maintenance. The institutional representative had subsequently raised the issue at an internal meeting, upon which he reflected that:

> We talked about it a lot, actually I brought it up at a couple of meetings, and the guy over there from the technical side in Walvis, he wants to do something but he can't because they are not giving him any money for maintenance. So yes, we discussed it there a lot but as far as I know there is nothing that he can do.

Despite not resulting in a positive outcome on this occasion, the example nevertheless attests to the improved access of water users and public stakeholders to empowered 'actors' via the KuisebBMC forum.

In these ways, the connection between decision makers, service providers and water users of the Kuiseb River catchment created a positive feeling amongst the participants, that decision making would take into account their concerns in future. That such an outcome is likely to be realised was reinforced by a DWA representatives' reflection that, through their participation in the KuisebBMC they had learned that: "I have to keep other stakeholders in mind when it comes to decision making in the Kuiseb and how my decisions will affect them". This outcome

is particularly salient to the Kuiseb River catchment, where livelihoods-oriented stakeholders were keenly aware that mining interests in the vicinity threaten their own access to water:

> I think that fact that the mines are existing and that will still be created, it's a burning issue for all Namibians I should say, especially people in the catchment and the farmers are very concerned. So it's good for us to know what's going on there because everything boils down to water consumption and that's water that we don't have.

One KuisebBMC participant indicated that he felt that the presence of the KuisebBMC had already influenced water use by the mines:

> I'm not exactly sure because I'm not on all the meetings that Walvis Bay and the mines are on but the water consumption that I've heard has been drastically reduced by the [mine] specifically, I'm not sure if that is a result of the KuisebBMC but I think that it contributed to the mine doing that.

This research found no support to back up the interviewee's suggestion that the presence of the KuisebBMC had triggered reduced water use by the mine. According to a mine employee, the reduction had occurred due to a combination of the growing ethos of corporate social responsibility and the refusal by DWA to increase the mine's water supply in future. This example therefore suggests that behaviour change results from top-down enforcement and economic considerations. These factors are returned to in the next chapter. Nonetheless, the presence of the KuisebBMC is likely to constitute a deterrent effect to future demands on the catchment's water resources especially if their authority is increased in future, as envisaged by a DWA official:

> The BMC should in the end become the final advising actor on water matters in the Kuiseb and formally they will decide what their advice to the Ministers will be the definitive input in 99% of the cases...but they don't have that role at the moment.

7.4.5) Networking

The increased institutional clarification and the networking opportunity provided by the KuisebBMC translated into the further benefit of improved social capital, as illustrated by a KuisebBMC member, who observed that, "I see the whole aspect of networking you know, if I need that information and I know who to call up, that platform [the KuisebBMC] created that access to information". The interviewee then went on to recall a specific occasion when he had required information for his professional context, which he was then able to source quickly via a KuisebBMC colleague in the relevant institution, concluding that "so what I want to say is that the networking is continuing, here and after the meetings, not just limited to the meetings but also outside so that is good". The networking benefits of connections between water users, service providers and decision makers within social learning processes are mainly relevant to

the KuisebBMC, as the KatRWUA had been unsuccessful in getting the municipality (main water-supply and sanitation service providers in the Kat River catchment) to participate.

The KuisebBMC forum also yielded a further intangible outcome. For instance, the information-sharing format of the KuisebBMC meant that the scope for the loss of information was reduced, as observed by a member who stated that:

> Some people are leaving, they are going on pensions and lots of data that were captured would be lost if one wouldn't have shared it in these sort of forums (...) I've been working in my job now for twenty years, twenty-one years and I know most or almost everybody up there in the farms, especially in my area...So the upper catchment and the middle Kuiseb is under my jurisdiction, its part of my extension area. So I've got quite a good knowledge of the topography and obviously the people and the animals there.

Ultimately, this process of information sharing, which relates to the increased trust and networks amongst participants, means that water-related decision making may be more optimal in future, as decision makers are able to access, and therefore draw on, wider tacit knowledge.

7.4.6) Summarising past outcomes and looking to the future

Overall, this section has identified a range of positive outcomes associated with the social learning processes, albeit mainly but not exclusively in the KuisebBMC case study, including: individual personal development, which may be linked to wider social development depending on individual personality; increased access to decision makers and service providers; increased openness, transparency and accountability; and the construction of social capital and networking opportunities. These findings largely explain why most KuisebBMC participants did not regret or resent their participation to date, in spite of the lack of 'action' observed in section 7.3. However, the intangibility of many of these positive outcomes in terms of material benefit is likely to have contributed to the lack of more widespread participation and interest in the KuisebBMC and the KatRWUA (section 5.5.3). The stakes involved in the KatRWUA decision-making process and the personal development of its historically disadvantaged members (section 7.4.1) meant that most of its members also expressed a lack of regret regarding their participation at the time that interviews were carried out.

However, although little concerted institutional and individual action had been realised at the time of the field-based research activities, it is acknowledged that both social learning processes remained 'unfinished' and ongoing. As such, further learning and outcomes may yet occur and emerge. Given the analyses of the two case-study processes hitherto, it is anticipated that the KuisebBMC process in particular may engender further action in future, as highlighted by a KuisebBMC member:

> I think that we are not at the stage where we can say that we are managing now but I am quite happy that we have reached the stage where we have created an understanding of that in future we will manage better together.

The outlook for the KatRWUA was somewhat different, where historically advantaged actors were engaged in a power struggle with DWAF over resource control and decision making following the promulgation of SANWA, which had reduced the historical power of the KatRWUA compared with the former KatRIB. Furthermore, many KatRWUA meetings were observed to be dominated by the struggle between scheduled and unscheduled commercial farmers over the right to water of the latter. Unsurprisingly, several historically disadvantaged members expressed their concerns about the future of the KatRWUA process following the imminent withdrawal of RU, as illustrated by the following interview extract:

> My main concern is that of getting knowledge about these things because definitely Rhodes has been giving a lot of support in terms of trying to bring everyone on the same level on what is going on and I don't foresee DWAF doing that and the workshops that you have done are not yet enough...so when you [RU] withdraw there will be that gap of knowledge.

Another historically disadvantaged KatRWUA member agreed: "I think it will be chaos when Rhodes withdraws, I do not see a future without Rhodes, there will be no transport or translation" (Field notes, October, 2006). These statements not only attest to the significant role of RU in having driven the process thus far, but also highlight strong uncertainty about the future of the process. Of high significance was that, shortly after the fieldwork for this research ended, the irresolution of the legality of water-use by unscheduled commercial farmers resulted in their initiation of legal proceedings, in order to secure access to water rather than relying on the outcomes of the negotiation process within the KatRWUA (Burt, pers. comm., 2007). This resort to legal processes signifies a failure of a social learning process as a means for resolving conflict over natural resources. At this juncture, an overall assessment of the 'success' of social learning processes is not provided; it is carried out in chapter 9, after further data relating to the constraints and challenges to social learning within the case studies are presented and analysed in the following chapter.

7.5) Chapter conclusion

Under the conceptual framework of section 2.5.3, managed social learning processes are widely held to result in outcomes such as relational changes, concerted action and common understanding; from which sustainable societal behaviour arises in turn (e.g. Roling, 2002; Keen *et al.*, 2005). Overall, this managed concept of social learning strongly rests on the principle that how people think has a controlling effect on how they act. Yet examples within section 7.2

revealed a key limitation to the purported cognitive changes of section 6.3 when applied to 'real' scenarios: the limited willingness of powerful stakeholders to abandon their own interests. To an extent, these historical 'winners' must relinquish their advantages and power for the goals of social equity and environmental sustainability to be realised by a social learning approach, as although state water authorities must approve revised allocations, they had no specific legislative power to force reallocation of existing allocations. The research finding, that these outcomes did not arise, supports research questioning the assumption that participants engaged in social learning processes change their views or abandon their interests in favour of the group (e.g. Koelen & Das, 2002; Mitchell, 2005; Muro & Jeffrey, 2008).

In contrast, the reinforcement of power relations through information-provision and knowledge-construction activities challenged the ultimate goal of managed social learning as a stimulant for social change, as the information and decision-support tools provided to the KatRWUA conversely facilitated the perpetuation of the *status quo*. Such an outcome does not align well with either: the social equity goals envisaged by SANWA or national government; the triple bottom line ideology, in which social, environmental and economic requirements are nominally considered equal, or; the concept of managed social learning, as a means by which behaviour change is realised.

This chapter also highlighted the difficulty of translating ambiguous international and national policy into practical outcomes due to the multiple actors and, therefore, interpretations involved in their enactment. This interpretation in turn supports a broad humanist perspective, in which social actors are not conceived as neutral actants, who mechanically enact policy, but who play an "active and creative role" in shaping policy enactment, whether consciously or unconsciously, due to their needs, intentions and self-belief (Denhardt *et al.*, 2001: 95). As is further discussed in the following chapter, the increased ability of dominant actors to engage with knowledge further increased their ability to pursue their own agendas within the process and, ultimately, to steer the process towards outcomes in their own interests.

Overall, despite the revelation that interaction and learning have fostered some positive relational outcomes (sections 6.4) and less-tangible benefits (section 7.4) amongst the case-study contexts, analysis of the dataset also exposed a lack of resultant concerted action and consequential behavioural outcomes. Notwithstanding that both processes had only operated for a few years, this overall finding suggests that additional factors influence social behaviour and intersect with the ability of the case-study institutions to act upon new information, knowledge and learning. The following chapter moves on to explore these factors through a continued analysis of the case studies.

Chapter 8

Preventing the Play-out of a Process: the Problems and Predicaments of Social Learning

8.1) Introduction

The previous chapter demonstrated that structural factors, including the constraints imposed by the relevant national legislation and water-sector institutional arrangements, had led to a pervasive lack of action-oriented outcomes by the KatRWUA and the KuisebBMC. Although the lack of action did not prevent the realisation of component processes and relational outcomes (chapter 6), the access to information and the learning had not necessarily lead to action by the case-study institutions, nor behavioural change amongst their wider catchments. As widespread behavioural change in the collective social and environmental interest is envisaged to be the ultimate desired outcome of managed social learning processes (section 2.5.3), this finding suggests that over-riding motivations and/or further constraints prevented these envisaged outcomes. This chapter therefore sets out to explore the factors that hindered the social learning processes in this regard.

The chapter draws its analytical focus from the relevant theoretical literature, in particular the work of Craps & Maurel (2003), Ison & Watson (2007), and Muro & Jeffrey (2008), which are based on their observations and analyses of social learning processes. Analysis in this chapter also draws strongly on the insights derived from the political ecology framework (section 2.2), which call for an exploration of how power differentials between actors and structural constraints upon human agency intersect with the social learning processes of interaction, learning, and action. In the first half of the chapter, the themes of participation and representation are returned to, because chapter 5 highlighted several discrepancies between their notional ideals and how they played out within the case studies. Then, in the second half of the chapter, issues of power, resources and social capital constraints are explored further through an analysis of institutional capacity and the wider socio-economic context, as previous analyses have implied that these themes prevented the play-out of social learning processes in the manner envisaged by the theoretical literature.

8.2) Explaining multi-stakeholder participation

Several previous sections have highlighted differences in stakeholder participation, both between stakeholders identified as relevant by the integrated water resource management discourse and those who attend KatRWUA and KuisebBMC forums, and between individual participation 'levels' of KatRWUA and KuisebBMC members. Within this section, information

from interviews and conversations, participant observation and literature analysis, is drawn upon to reveal the factors that explain these differences.

8.2.1) The 'burden' of participation

Participation in social learning processes incurs time and/or resource costs to participants (Mushauri & Plumm, 2005). Stakeholder type therefore plays a role in explaining differences in participation because, whilst institutional representatives had the financial costs incurred by their attendance covered by their institutions, livelihoods-oriented representatives had to bear their own transport costs or have them covered by other actors, which may thereby have placed them under a sense of obligation towards their 'benefactor'. The burden to livelihoods-oriented participants was offset in both case studies, as RU arranged transport for historically disadvantaged KatRWUA members, whilst the KuisebBMC reimbursed the transportation cost of commercial farmers and arranged transport for the Topnaar representative. Although such practices enhanced the potential for multi-stakeholder participation over 'project' durations, they have an implication for the longer-term viability of social learning processes, as implied by a RU researcher who observed that, "the quickest way to kill participation would be to stop providing free lunch and transport!" This quote illustrates the dilemma facing facilitating actors and independent participatory institutions, as a lack of participation on the part of historically-disadvantaged actors would have rendered the participatory process 'illegitimate' from the perspectives of the integrated water-resource management discourse and national legislation. RU, as implementing agency, and the independent KuisebBMC were therefore motivated to remove the fundamental barriers and disincentives to stakeholder participation, as above, in order to ensure that the forums achieved 'success' in terms of representation. Facilitation by RU is therefore influential in explaining the high percentage of historically disadvantaged individuals on the KatRWUA (section 5.5.5).

Whilst institutional and corporate stakeholders had their travel and participation time covered by salaried working hours, the time burden of participation equated to an additional financial cost to livelihoods-oriented representatives through a loss of working hours and, therefore, earnings:

> It take up some time and it take up valuable time which you need to spend there and you've actually got a loss of income direct. Not if I work for [municipality] then [municipality] lost the income, I personally lost the income, I personally need to spend some money to get to the meetings. Not my organisation, I personally [sic]. (KuisebBMC member)

Notwithstanding the high significance to livelihoods of the function of the KatRWUA (section 5.5.3), this observation explains why 'participatory' forums are often observed to be dominated by stakeholders with strong vested interests (e.g. van den Hove, 2006; Videira *et al.*, 2008), as

the motivation to attend outweighs the economic burden. Ironically, the problem of the time-cost burden was raised by a historically advantaged KatRWUA member, whilst simultaneously acknowledging the dilemma of using financial incentives to meet participation, rather than water-resource management, objectives:

> The guys like [X], who don't have a stable job, they should pay him for his time at these meetings, my company pays for me but they are here in their own time so they should be compensated for it. But then some people might just pitch up at the meetings just for the money. If we paid everyone 100 bucks for coming to KA [KatAWARE] we'd be packed.

The predicament of the above quote is at the root of participatory processes, especially in the developing country contexts of South Africa and Namibia, where high socio-economic inequality means that participatory processes risk reinforcing existing inequalities, yet the provision of incentives poses a challenge to social learning based on the interpretation that such incentives encourage the participation for 'selfish' reasons. For instance, some historically disadvantaged actors participating in the KatRWUA and KuisebBMC processes were observed to be motivated by perceptions of economic and personal reward; they subsequently neither acted on behalf of their wider community, nor were willing to relinquish their positions due to perceived and potential opportunities for personal gain (section 5.5.5). Similarly, the opportunity to influence decision making, in order to maintain their advantageous situation, drove the involvement of historically advantaged KatRWUA members. Thus, although the assumption of 'rational man' sits uncomfortably with the humanist perspective of humans as 'social, cooperative and altruistic' (Agnew *et al.*, 1996; Gregory, 2000; Tuan, 2005), upon which social learning approaches are premised; these findings suggest that the theoretical non-recognition of selfish, economically-driven behaviour is not applicable to all contexts, as it largely prevented the ultimate goal of social learning, of collective behaviour in the wider societal interest, from being achieved.

Whilst the proposed integrated approach of recent Water Acts fundamentally requires the participation of historically 'non-relevant' social actors, time pressures constrained their more active participation as observed by several institutional KuisebBMC members. For example, one member noted that:

> There's so many other work to do, our financial year ended last week which the budget must be finished and immediately after you have to do the Kuiseb as well. And then you have family business and staff problems and all that. So at the moment I am only putting one percent of my time to the Kuiseb, and it shouldn't be like that but what can I do?

Another member concurred, reflecting that: "I have my line function duties to perform and if there is a workshop or a meeting or a regional visit that I need to make, definitely the first to take off the list will be the Kuiseb meeting". These quotes illustrate how institutions defined as

relevant through the integrated approach have since been expected to take on additional responsibilities, whilst retaining institutional duties that had remained unchanged. This finding may explain why local authority representation on the KatRWUA and the KuisebBMC was lacking (section 5.5.3), as local authorities in South Africa and Namibia are often considered to lack financial resources and to be over-stretched in terms of human capacity (e.g. DWAF, 2001; Buhlungu, 2008). Additionally, even where these resources existed, institutions may have been unwilling to participate due to alternative priorities and/or resentment towards the top-down imposition of further duties, without corresponding resources to mitigate the additional time and cost burden of their participation. Related to this issue of time pressure on participants was that the trend for integrated approaches and wider stakeholder participation was not limited to the water sector in both nations. Other sectors, such as forestry management, integrated development plans (IDPs), and agricultural and infrastructural development projects, also demanded wider stakeholder input or participation. This more general trend may have detrimentally affected stakeholder willingness and ability to commit to the participatory water-management processes of the KatRWUA and the KuisebBMC.

Of further relevance to this analysis of participation was the employment status of representatives. At the outset of the KatRWUA process, the employment status of its members tended towards the extremes of a notional employment 'spectrum' – from unemployed to top management (including self-employed). As the end categories were less answerable to a higher echelon of management, they did not restrict individual ability to attend the KatRWUA meetings that mainly fell within conventional working hours. Although KatRWUA meetings were arranged in consultation with participants, several factors meant that they were usually undertaken between 9am-5pm, including an allowance of time for RU facilitators to travel to/from Grahamstown, and time for catchment-based participants to travel to/from the meeting venue from the different areas of the catchment, especially considering the prevailing unwillingness of South Africans to travel during hours of darkness[19]. Whilst the day-time scheduling of meetings was generally acceptable to participants initially, it became problematic due to the changing employment status of historically disadvantaged participants, many of whom secured formal employment over the course of the KatRVP (section 7.4.1). Their participation in the KatRWUA subsequently decreased, implying that, in conjunction with the timing of social learning forums, the employment type of representatives had an impact on participation. A further complication was that amongst members of both case-study institutions, the suitability of meeting timing was observed to be acutely different between livelihoods-oriented and institutional participants, for instance when a farmer (livelihoods-oriented) proposed holding evening meetings, an institutional member responded that such timing would

[19] Many South Africans are disinclined to drive at night, due to the higher incidence of violence and hijackings and the increased risk of accidents caused by nocturnal wild animals.

prevent their attendance. This finding creates a challenge for multi-stakeholder social learning processes due to the difficulty involved in establishing a schedule that is able to make allowance for the inherent diversity of stakeholders' livelihoods and their associated routines.

Observed differences in access to resources and services were also of relevance to participation for several reasons. First, the KatRWUA and the KuisebBMC sent out their agendas by email prior to meetings, which a KuisebBMC member acknowledged as disadvantageous:

> You know the other thing is that sometimes the Chairperson is sending things through email which is when the next meeting and I don't know when is the next meeting and what. Even we try saying at our regional level that we need Internet but they are saying that our budget constraints are not possible. I mean sometimes I go to the Chairpersons office which is OK for me, but for the community [Topnaar] person it will be difficult.

Roughly two thirds of the KatRWUA members, all of whom were historically disadvantaged members lacked internet access. In comparison, only two members of the eleven-member KuisebBMC lacked internet access: the livelihoods-oriented representatives. In light of these discrepancies, the use of email to send out agendas and minutes essentially disempowered the members who did not have such access, as they were unable to influence the meeting content, or to prepare information and/or ideas related to agenda points, in advance. At a wider level, this use of email as a communication method highlights a logistical problem for multi-stakeholder approaches in developing country contexts, where there may also be a lack of alternative reliable and rapid communication mechanisms. For example, whilst RU researchers also telephoned KatRWUA members to notify of workshops and meetings, this practice not only incurred an additional time/cost burden, which a self-sufficient organisation may not subsequently be able to uphold, but also raised the comparable issue of inequities in participants' access to telecommunication infrastructure. Thus, the logistical dimension of managed social learning processes is especially problematic when applied to social contexts with high intra-societal disparities in access to basic services. In contrast, access to telecommunication services are commonplace amongst citizens of more economically developed countries, where such approaches originated.

Overall, this section has revealed how the incurrence of financial costs to participants or their institutions affected participation in the case-study social learning processes. The improved access of historically advantaged stakeholders to basic services, and financial and logistical resources, enabled their participation compared with historically-disadvantaged members. Formal institutions also had greater access to participation-enabling resources. Hence, if the objectives of representation of integrated water-resource management and social equity goals of national legislation are to be realised via participatory management approaches, then these research findings indicate that a pertinent issue is *who* should bear the associated financial costs,

in particular those incurred by previously disenfranchised social members. This issue has particular relevance for the application of social learning approaches to countries that experience high levels of socio-economic poverty and/or inequality, especially as section 2.6 demonstrated that the impetus for such approaches is unlikely to have originated within their national contexts. Therefore, an underlying implication of this section is that policies and practices have been foisted upon nations that are inadequately financially-equipped to enact them.

8.2.2) The language of learning

The language used at KatRWUA and KuisebBMC forums, both in relation to the *lingua franca* of the catchment and in terms of its style, was observed to influence participation. Despite the predominance of Xhosa as the first language of the Kat River catchment population, the dominant language of KatRWUA meetings was English. Whilst a translator was normally present, observation notes recorded that the dialogue often moved on quickly, thereby only allowing for the partial translation of proceedings into Xhosa, as reflected by a participants' comment that, "I think it would be easier if [translator] had more time after translating so that we can think about the questions". This comment implies that the translator was simply present to report the decisions of the other participants to the Xhosa speakers. Although this interpretation contradicts the inclusive intentions of RU facilitators and their purpose of funding a translation service, it reveals that time restrictions nonetheless restricted the scope for more active participation of Xhosa-speaking participants. Despite this finding, many Xhosa-speaking KatRWUA participants valued the translation service highly, as expressed through the concerns of several interviewees that it would no longer be available once the KatRVP terminated, as even limited translation allowed more awareness of proceedings and increased scope for input than none at all. This interpretation is informed by a relative perspective, based on an awareness of the non-white exclusion from decision making processes under the previous Apartheid government (chapter 4). The willingness of KatRWUA participants to operate in a bilingual environment was therefore highly relevant to the South African context, as it symbolised a change in the history of power relations; previously, the enforced imposition of Afrikaans on indigenous South Africans simultaneously reinforced historic power relations and controlled information accessibility through linguistic barriers. However, from an English speaker's perspective, the incurrence of an additional time burden for translation was a source of frustration:

> It is very time consuming but the one thing that makes the meetings longer is that it is translated into Xhosa so if it was only in Xhosa or in English then it would be a lot quicker. I think [translator] has to sometimes memorise a full half an hour of speech and so this is taking time.

This time pressure invoked by translation, which was also raised by other English-speaking participants, is relevant to the overall sustainability of the forum, as it increases the likelihood of 'frustrated' participants withdrawing from the process. The quote further suggests that, although the resultant marginalisation of Xhosa-speakers may not have been deliberate, if the English-speaking participants had *really* wanted more active participation from them, then they would have modified the approach. However, this interpretation also assumes that linguistic barriers were the only constraint to more active participation on the part of most Xhosa-speaking participants, which is challenged by observations regarding self-efficacy in section 8.2.3.

A final dimension to the use of English within the case-study social learning forums relates to the observation that, although the mother-tongue of commercial farmers was either English or Afrikaans, their representatives on the KatRWUA revealed a degree of understanding of Xhosa, which is attributed to their position as employers in an area where the majority of the workforce was Xhosa speaking. The need for undertaking KatRWUA meetings in English therefore stemmed mainly from the facilitation by RU researchers, who were predominantly English speaking, and the DWAF official, who was not from the Xhosa ethnic group. This observation illustrates how the linguistic complexity of Southern Africa, caused by a plurality of cultures and the historical linguistic primacy of English and Afrikaans within the education system, challenged the social learning process, as well as rendering it more amenable to historically advantaged institutional participants. Thus, in light of the *majority* understanding of Xhosa within the Kat River catchment, the subtext of this observation implies that the needs of state authorities and researchers to participate and communicate their information and ideals were more important than those of catchment-based actors, which in turn further indicates the privileging of knowledge and perspective within, and the top-down nature of, the case-study learning process.

Most Namibians with a formal education and/or European background are fluent in English due to its dominance in official and educational settings (chapter 4) so the predominance of English at KuisebBMC meetings was less likely to have significantly prevented the active participation of its member representatives, as most fell into one or both of these categories with the exception of the Topnaar representative(s). Nonetheless, the level of individual comfort afforded by the use of the English medium favoured historically advantaged actors in both cases. Of higher significance in the KuisebBMC case was the 'appropriateness' of the type of language used, as reflected by an institutional member:

> [Interviewer] Were things also technical at the beginning of the KuisebBMC meetings?
> [Interviewee] Yes, yes they were. Even they still are, that's why you find that the people like, well I better not say this, but the people like the Topnaars, they feel these meetings

> are too of a level, that they are too technical so their input, probably they feel that their input is will not be taken, because if you look at these meetings you will have a lot of expertise talking in their technical languages, you have NamWater, you have Water Affairs, you have other institutions, you have Gobabeb and the scientists and you know, you'll feel that there are a group of people – a certain class of people – that will understand each other, but probably who are not taking note when other people are talking when whatever is being discussed. And they need a different language, not a different language in terms of English but a different level of understanding and a different level of discussion. Some of those people will not understand about the water table and such things. For the farmers you just have to state your language in plain English. By saying the saline, the saltwater will get into this, but now by putting all those graphs there, the depression, the cone of depression or those things, they will not understand what you mean. Even for me it is difficult.

Observation notes from both case-study meetings recorded the extensive use of technical and scientific terms and water-management jargon, variably including: saline intrusion, groundwater recharge, sustainable yield, ecological reserve, integrated water-resource management, and aquifer. Such terminology is interpreted from interviews with KuisebBMC and KatRWUA members as having been variably confusing, off-putting, and marginalising for stakeholders, especially historically disadvantaged participants. For example, a KuisebBMC member reflected that:

> Sometimes it's getting more, too much scientific, too much figures and I'm not that water expert so these graphs for one are very difficult, sometimes they try to explain you know but for a community member who is representing the [Topnaar] community, it will be a difficult process...[sic]

For the reasons outlined in chapter 4, many non-white residents of the Kat River and Kuiseb River catchments had received a limited or non-existent formal education. As a result, the use of scientific language and associated concepts are thought to constitute another explanatory factor for the more prevalent passive participation of historically disadvantaged actors in the KatRWUA and the KuisebBMC. These findings overall support those of Del Tufo & Gaster (2002) and Percy-Smith (2006), who observe that language type affects participation in public participation processes, and also Thompson's (2005: 3) assertion that "participants in formal processes must either become proficient in the language of the scientific policy discourse or remain silent". The findings implicitly attest to the power differentials between social actors, which therefore become imbued within processes of social learning.

Although capacity-building initiatives by RU and DRFN attempted to respond to this challenge, difficulties nevertheless arose from the legacy of Apartheid-related educational and socio-economic disparities of 'multi-stakeholder' social groups in the South African and Namibian contexts. For example, whilst the quote below attests that capacity building and outreach have had a positive impact on improved ability to participate in multi-stakeholder forums; this impact paradoxically impacted negatively on their future sustainability because such activities meant

that the participants' knowledge and understanding deviated from those of their wider stakeholder group. For instance, a KuisebBMC member reflected that:

> Because, ok, we are already following the process long time so we are following what is saying, the basics, but it's maybe some years behind if someone representing the others to come along, because you know sometimes they are scientific and those diagram [sic] are difficult to understand.

In this quote, the interviewee attests to how the learning of participants that had been fostered by capacity-building activities and interaction may ultimately present a future challenge, as successive incoming representatives would not initially have the same understanding as existing members. One consequence is that an incomers' motivation to continue participating may be negatively affected. This interpretation raises a dilemma for existing members in terms of balancing the need to 'backtrack', in order to avoid losing new members, with the detrimental effect that repetition has on existing members according to the reflection of a KuisebBMC member that, "I don't like it when we get new people and we have to start all over again". Although membership of the KatRWUA and KuisebBMC has remained largely unchanged since their establishment, this potential source of discord is likely to constitute a significant challenge in their futures.

8.2.3) Individual personality and participation

The domination of social learning forums by a limited number of participants was linked to personality by a KuisebBMC member:

> There are persons that are more influential but that has to do with personalities not because of the institutions that they represent (...) the meetings are dominated by two or three people.

Features of individual personality, such as self-efficacy and extrovert/introvert personality type, are thought to affect individual participation within participatory forums because social learning is based on a social interaction process, which inevitably involves an element of public speaking. As observed by a KuisebBMC member, "some people just don't want to express themselves in a big group but if you put them in smaller groups, say local groups, you get more input from them". Yet whilst some personality differences are innate, such differences must also be interpreted in their Southern African context, as psychologists believe that self-efficacy and public speaking skills are developed through personal experience (e.g. Westen, 1999). According to this logic, it is assumed that historically advantaged actors have greater self-confidence and, are therefore more likely to participate actively within the setting of a public forum, as was borne out by findings of this research (chapter 6). Furthermore, due to their

historically advantaged education and social status, historically advantaged actors were considered more likely to have had a greater sense of entitlement that their understanding and perspectives are valid and 'correct' when compared with historically disadvantaged social actors.

Such differences are considered to have affected individual propensity for action to the detriment of historically disadvantaged actors, as interpreted from one such member's observation that, "we can't seem to be able to do these things for ourselves"; the widespread concern amongst historically disadvantaged members that RU would be decreasing their involvement (see examples in 7.4.6); and Motteux's (2001: 15) observation that a history of "being crushed" means that historically disadvantaged actors have "very low self-esteem". It is important to highlight that historically disadvantaged social actors were not a single entity and diverse personalities meant that differences in self-efficacy amongst them were observed. Moreover, positive changes in self-efficacy amongst historically disadvantaged representatives had been generated by their participation in the KatRWUA and KuisbBMC (section 7.4.1). Nevertheless, in light of previous observations attesting to the greater ability of historically advantaged KatRWUA and KuisbBMC members to participate in, and manipulate, the institutional proceedings, it is interpreted that such differentials had played a significant role in determining their outcomes and, therefore indirectly, so had national history.

Individual personality also impacted on stakeholder relations, as demonstrated by a KuisebBMC member's reflection that:

> [Relationships] are not always good between people but at the KuisebBMC meetings it seems that everyone is nice and respectful and that is good for the whole thing (...) but a lot depends on the people involved, for example it is sometimes just the one personality that makes things difficult and then what. Certain characters can make things very difficult and then there is the problem for everyone.

The ability of participants to put aside external and or pre-existing differences and inter-institutional tensions within the context of the KuisebBMC explained the success of the KuisebBMC compared with another basin-management committee, which, according to the KuisebBMC member, was "having problems with a difficult individual". Notwithstanding the historical reasons pertaining to the particular context, section 5.1.3 also implicitly highlighted that personality attributes affected the subsequent social learning process, as the obstinate, hostile personality of one representative had a detrimental impact on both the ability of the KatRWUA to pursue action, and on stakeholder participation and relations, which in turn is thought to reduce the potential for concerted collective action. Analysis of relational changes in section 6.4.1 also supports an interpretation that individual representatives can either tarnish or enhance the reputation of a whole institution or social group by virtue of their personality and/or

behaviour within the social learning forum. These examples therefore demonstrate that individual personality has a significant impact on both the action and relational outcomes of social learning processes.

8.2.4) Participation and social learning in an unequal setting

Overall, the hindrances to participation that have been highlighted within this section combine with those of apathy and disinclination (section 5.5.5), to explain why multi-stakeholder participation in the KatRWUA and KuisebBMC have not been achieved hitherto. This lack of multi-stakeholder participation contributed to the overall lack of direct action-based outcomes of the social learning processes in two ways: first, an inability to influence actors who were empowered to perform action-oriented roles; and secondly, by preventing the input of actors whose function impacted on the social learning process. For instance, the absence of planning authorities in both case studies meant that coordination and water allocation roles were hampered by the lack of input from authorities whose decisions had significant impacts on water use of the catchments. In this way, the lack of multi-stakeholder 'buy-in' to, and/or ability to participate in, social learning processes constituted a fundamental obstacle to social learning approaches when applied in the broader context of integrated water-resource management, as one aspect of the integration concept (section 2.4.3) requires coordination across these sectors.

Furthermore, examples from both case studies revealed that the initial attendance and subsequent participation of historically-advantaged and institutional actors at social learning forums were facilitated by factors including resource availability, individual personality, and the use of science-based information and language within social learning processes. Such factors allowed the case-study processes to be dominated by historically advantaged members. The comparable lack of participation by historically disadvantaged members vis-à-vis the pervasive dominance of historically advantaged members meant that the KatRWUA and KuisebBMC do not therefore meet the ideals of representivity of South African and Namibian legislation, nor their governments' political goals of reducing societal inequality. As a result, the KatRWUA suffered especially from a lack of institutional 'legitimacy' in the eyes of the state agency, DWAF, as interpreted from: the DWAF representative's hostility towards the process (see table 5.3) and the comment of a KatRWUA member that, "[DWAF representative] sees too many white faces" (quoted in Burt, 2006: 1). A lack of legitimacy also applied to the KatRWUA and the KuisebBMC amongst wider stakeholders of the respective catchments due to differences between the perspectives and world views of their members and those of wider catchment-based stakeholders (section 8.6.1). Fundamentally, differences in participation also had implications for stakeholder representation.

8.3) Examining stakeholder representation

The concept of stakeholder representation is expanded on within this section, as it is assumed by the conceptual framework of managed social learning that the participation of a limited number of individuals, representing a broader group of actors, can bring about wider social behaviour change in the humans and the biophysical interest (see assumption 2 in section 2.5.7). This visualisation not only implies that participating representatives interact with, and represent, their wider stakeholder group, but also that representatives pass back information from the social learning forum, which in turn triggers learning and behavioural change on the part of the wider group. In this way, managed social learning further assumes that participating representatives can influence the behaviour of the wider stakeholder group that they represent. How these assumptions play out amidst the case-study social learning processes, where stakeholders had been defined according to single variable socio-economic criteria are discussed below.

8.3.1) Stakeholders as 'homogenous entities'

The principle of representation fundamentally assumes that all members of an identified stakeholder group have the same issues or that, if intra-group issues vary, then the representative is able and willing to represent this diversity. However, researchers increasingly caution against viewing stakeholder groupings as homogenous and unified entities, because multiple identities within such groupings give rise to power structures and tensions, in addition to plural needs, desires and understandings (e.g. Cooke & Kothari, 2001; Westcoat & White, 2003; Rocheleau, 2008). Data from the case studies of this research support these findings. For example, primary and secondary data (e.g. Widlock, 2000; Burt & Vanderford, 2006; Rossing, 2008) attest to in-fighting both between and within indigenous communities of the Kat and Kuiseb River catchments. For this reason, in spite of the national preference for including traditional authorities in participatory processes as representatives of their wider ethnic group (section 4.2.3), RU explicitly did not invite traditional leaders to participate in the KatRWUA or the KatRCF due to their awareness of tensions between traditional leaders and surrounding communities, which had arisen after traditional leaders appropriated communal land purportedly belonging to the local community (Birkholz, pers. comm. 2006). Thus, whilst small-scale agricultural and domestic water-users participated in the social learning process, water users who may arguably have greater impact on the resource because of their access to greater land and wealth were excluded. The exclusion of traditional authorities further highlights the difficulty between meeting the objectives of water management from an ecological perspective, which inherently necessitates the inclusion of high-volume water-users, versus the social perspective, which seeks representation of water users according to statistical proportioning of stakeholders within a catchment rather than their volumetric use. The example further highlights how the facilitating role of RU influenced participatory outcomes (see also section 8.2.1).

In spite of similar divisions amongst the indigenous Topnaar, the approach taken by the KuisebBMC directly contrasted with that of the KatRWUA above. Prior to this research, intra-community divisions had led to the original Topnaar KuisebBMC member being disowned by the community's Traditional Authority and, hence, disallowed from representing the community at KuisebBMC meetings. According to the 'traditional' Topnaar Chief[20] (2007: pers. comm.), the original representative "was not reporting back to the community and was just looking after himself so he is no longer part of the traditional authority". It was difficult to ascertain the veracity of this assertion and justification, because despite comparable allegations about the representative by other interviewees, similar accusations were also levelled against the Chief. As a consequence, Topnaar representation at KuisebBMC meetings had largely ceased, disregarding the repositioning of another participant in order to create a semblance of representation (section 5.5.3). Yet, mindful of the need to be representative of all stakeholders, the KuisebBMC requested that the traditional Topnaar Chief 'elect' another representative. When asked if a new representative had been duly elected, a Topnaar community member replied, "I think the chief already has someone in line, I believe he will be at the next meeting". Thus, despite such action having been intended to secure the representation of the Topnaar community in its entirety, this example implies that only certain factions were, and will continue to be, actively represented on the KuisebBMC. Moreover, by approaching the Chief to select a new representative, the KuisebBMC further perpetuated his authority through the reinforcement of his 'right' to make unilateral decisions on behalf of the wider Topnaar community, which ultimately resulted in a continuation of pre-existing power relations. In this way, power imbalances amongst stakeholder groups hampered the social learning process as a mechanism for effecting social change and negating power imbalances amongst social actors (identified as a major broad objective of participatory approaches in section 2.4.1) because alternative community representatives did not have 'legitimacy' as a representative without the approval of pre-existing authorities. The example further highlights how the top-down imposition of a participatory approach with democratic ideals on a hierarchical socio-cultural context was challenged by 'powerful' local actors resisting such change out of self-interest, as was interpreted to have occurred within the KatRWUA in chapter 7. Therefore, this example also supports the assertion that the goals of managed social learning approaches fundamentally require that powerful actors relinquish power and its associated social and economic advantages (section 7.5). As both the South African and Namibian contexts were relatively hierarchical when compared with Western societies (chapter 4), whence such approaches originated, this

[20] Traditional is highlighted in this sentence due to assertions that the Topnaar chieftainship experienced colonial interference in its succession (Widlock, 2000; Barnard, 2002), thereby contributing to an ongoing dispute over the legitimacy of the current chieftainship within the Topnaar community.

finding further indicates that social learning approaches may not be appropriate to all contexts (also section 8.2.4).

The complexity of divisions within, and considerable population of, the indigenous small-scale farming 'community' of the Kat River catchment affected their representation. Whilst many divisions (e.g. according to kin, community and project alignment) split the larger small-scale agricultural community into a plethora of distinctive sub-groups, only three 'representatives' of small-scale farmers participated in the KatRVP process. Further observations suggested that the three representatives were unlikely to have been 'representative' of the wider majority of small-scale farmers of the Kat River catchment. In addition to the intra-community conflict described above, it is assumed that the limited resources of historically disadvantaged actors constrained their regular interaction with the entirety of the wider small-scale water-user group (sections 5.5.5 and 8.3.3). Furthermore, the historically disadvantaged KatRWUA members were mainly those who had had a previous connection to RU researchers and/or associated projects (section 5.5.5). That such representatives were unrepresentative of this wider community was also underscored by observations made at a community farmers' meeting, which noted that the small-scale KatRWUA representatives were strongly sidelined, downplayed their membership of the KatRWUA, and appeared embarrassed and unwilling to represent the KatRUWA when invited to do so. This occasion implied that wider small-scale farming interests within the catchment were more powerful and dominant, and is therefore also considered to be illustrative of lack of institutional legitimacy of the KatRWUA amongst other water-users of the catchment, a topic that is returned to in section 8.6.

Although the commercial farming community of the Kat River catchment also featured intra-group conflict (section 5.2.2), not only was their total group much smaller, but their division was relatively simplistic: between scheduled and unscheduled water-users. Such observations are significant because an important difference between the heterogeneity of commercial farmers compared with small-scale farmers was that *both* factions of commercial farmers and, therefore, their associated issues were represented within the social learning process versus the limited representation of small-scale agricultural sub-groups described above. Thus, despite concerted efforts by RU researchers to secure wider small-scale participation (section 5.5.1), the more accurate representation of the commercial farming community is thought to be another reason why the KatRWUA process was largely dominated by the interests and issues of the commercial farming sector (chapter 7), notwithstanding that this outcome was also influenced by the activities and history of the KatRWUA, which have already been demonstrated to discourage and constrain wider interest and participation on the part of historically disadvantaged actors (section 5.5.5).

8.3.2) Managing identity and imposing boundaries: institutional representation by individuals

The previous section highlighted the inherent difficulty of individual representation of larger heterogenous groups. This section moves on to discuss and explain the complexities that arise from individual representation of institutions, as the data indicates that they also contributed to the lack of action-based outcomes of the KuisebBMC and the KatRWUA. The level of personal authority of institutional representatives especially affected their ability to enact recommendations suggested, and to provide the information required, by the other institutional members. In the following example, the perceived lack of authority of an institutional representative had negative relational consequences, and underscores the assertion that perceptions of entire institutions arise from individual representation (section 6.4). When KuisebBMC member Mr A demanded a response from institutional KuisebBMC member Mr Mr B at a KuisebBMC meeting, Mr B was forced to say, "I am not high enough, I am sorry but I can't answer that now, it's not my decision to make". Their subsequent reflections on this event revealed that:

Mr A subsequently had a negative perception of Mr B's institution due to his perception that it lacked 'commitment' to the process:

> The responsible people should be there and turn up, not just, the responsible people should turn up from government, you don't want people there who are just lackeys. We want more responsible people there (...) I don't know what his [Mr B's] position is, why he's in on the meetings, but [the institution] should have somebody else there because they run the things that need to get done, someone who is responsible who can get things done [sic]

Furthermore, Mr B felt disempowered and was caught between the goals and internal hierarchy of the institution that he formally represents and personal empathy with the stakeholder:

> Actually I was raising this issue that Mr A talked about in a [internal institutional] meeting the other day, it created lots of discussion! But the problem is our Chairman, he won't authorise any more funds so although we want to do things, we cannot because the money is not there. And then it's difficult for me because I understand why they [other KuisebBMC members] are annoyed, it's frustrating. I want to help and I have a sympathy with them there but there's nothing I can do. And anyway it's not my side of things so the other ones will get annoyed with me thinking that I am trying to tell them how to do their job [sic].

The example above highlights how members of a defined social learning 'community' were subject to differing "psychological boundaries" (Hirschhorn, 1990), which were related to personal and institutional identities. Ultimately, the above event was a source of stress for the institutional representative who later reflected on feeling "pulled apart" by the conflict between his official institutional boundary and his own ethos of wanting to further both the relational

progress of the social learning process by taking subsequent action. Thus, whilst this thesis has addressed institutional and individual aspects of participation separately for ease of analysis and reading, it is acknowledged that these identities are highly interrelated for the fundamental reason that institutions are comprised of individuals. This example thereby underscores the centrality to the analysis of social learning processes and/or their outcomes of individual authority within institutions, and of the personality of institutional representatives (also section 8.2.3).

Another example reveals how representation by individuals was further complicated by internal institutional structures and politics. As an institutional KuisebBMC member observed:

> There should be other representatives from [his institution] especially from water supply and they must be able to answer those questions. We are the technical side and we can scientifically assess the water that is available but we cannot talk about how that it getting to the customer for example.

This point is also salient to the KatRWUA case study, where, DWAF had been primarily responsible for the national policy, legislation and guidelines pertaining to water resources and their use. That the regional DWAF representative on the KatRWUA was subsequently unable to provide definitive answers regarding the legality of water-use, despite being the formal representative of the national authority on water-resource management, made him appear incompetent and ineffective, which frustrated catchment-based water-users. The DWAF representative's lack of authority is therefore interpreted to have contributed to the negative perceptions of DWAF and relational outcomes identified in section 6.4, notwithstanding the pre-existing subtleties imbued in these perceptions and relations (section 5.5.4). Thus, in the examples provided in this section, institutional representation was affected by both the representative's level of authority within the institution, and their location within the institution's internal structure.

8.3.3) Disseminating learning, diffusing knowledge and dispersing information

The limited resource availability of the representatives on the case-study social learning processes not only impacted negatively on their participation (sections 8.2), but also hindered representation through the constraints on communication between representatives and their wider stakeholders. As a KuisebBMC member observed, "there is no money, how do you spread information without money?" The spread of information, learning and perspectives arising from the social learning forums is therefore also thought to have been constrained. In light of examples in previous chapters, which demonstrated extensively how the majority of social actors who were privileged under the previous apartheid regime had retained enhanced

access to financial and telecommunication resources, the representation of historically advantaged stakeholders is thought to have been comparatively restricted. The advantage of physical and financial resources for stakeholder representation was recognised by a commercial farmer who asserted that, "the lower Kat is pretty well represented, we don't have a lot of communal land and small farmers that are difficult to get hold of". The logistical difficulties presented by the larger physical catchment meant that communication amongst livelihoods-oriented stakeholder was of further difficulty in the Kuiseb River catchment, even amongst historically advantaged actors. For example, the commercial farming representative asserted:

> Communication stays a problem, it is impossible to reach all the guys, we are very spread out, we work through the Agricultural Union and their system to get information out but it is limited yes. It is absolutely limited and maybe not enough information go out at this stage, to the guy on the ground, they don't get all the information (...) to get the big bulk of people it is impossible (...) the main thing I will say is money...I must somewhere stop to spend my personal money so money is an issue.

In this way, livelihoods-oriented representatives not only incurred a personal financial cost through their participation (8.2.1) but were also expected to bear the financial burden for wider communication with their stakeholder groups. Furthermore, the associated costs were likely to be higher than those incurred by institutional representatives whose stakeholders were generally limited to a single spatial location. For this reason, the interviewee went on to state that they felt disadvantaged by participatory processes, compared with institutional participants:

> The bigger institutions are definitely more powerful for the main reason that the institutions are compact, whereas the farms is spread all over the whole community and there is only one representative there which makes it impossible to get these guys together [sic].

Social networks also affected stakeholder representation in terms of feeding back information and communicating learning to wider stakeholder groups. Despite the conflict between scheduled and unscheduled commercial farmers in the Kat River catchment, interviews and observations indicated that a strong social network based on professional and cultural identity existed amongst commercial farmers of both catchments. This network, which was facilitated by favourable financial, transport and communication resources compared with historically disadvantaged stakeholders, permitted widespread information dispersal within commercial farming communities. For example an agricultural extension worker in the Upper Kuiseb observed that, "even though there are some [commercial] farmers who keep themselves to themselves, somehow they find out what is happening and then when they see me they will ask me about those things that they have been hearing". Thus, in spite of the existence of divisions within the commercial-farming community, strong social networks allowed the wider stakeholder group to be informed about social learning proceedings. It is interpreted that such

widespread information dissemination is not achieved by the small-scale and communal farming representatives of the KatRWUA or the KuisebBMC because of the prevalence of in-fighting within such communities (section 4.2.3), their relative lack of communication infrastructure and financial resources (8.2.1), and the relatively high population of communal farmers compared with minority white commercial farmers of the Kat River catchment. Similarly, both the financial burden of representation on historically disadvantaged small-scale farmers, and the lower level of social capital amongst them (section 8.3.1), are therefore thought to limit the ability of their KatRWUA representatives to fulfil the responsibility expected of them by the KatRVP, of "ensuring that all potential stakeholders in the catchment are identified and kept informed on the project's progress and included in any decisions to be made concerning the outcomes of the project" (Rowntree & Birkholz, 2004: 8). Although interviews and focus groups were only carried out in two villages, in conjunction with a DWAF official's observation that "it is funny that other water users in the Kat do not know that there is a structure called KatRWUA", it can be interpreted that few respondents were aware of the KatRWUA and its function. Similarly, a KuisebBMC member observed that, "at the moment there are still many people [in the catchment] who are not knowing what it is that we [KuisebBMC] are doing and talking about" [sic] and another that:

> I'm sure there are a lot of guys that still don't know there is a basin committee. They don't know we are existing, I'm sure about that. And other guys they will say that 'I thought that thing had run dead long time ago' because the information doesn't get there.

Overall, these last two sections have revealed how both participation and representation by historically disadvantaged actors were hindered by the interrelated factors of power relations, resource availability, social capital, historical contingency and individual personality. In particular, financial resources limited the overall functioning of social learning processes, through their constraints on the participation and representation of stakeholders. These factors have contributed variably to the observed mismatch between the case studies and the ideals of equal and multi-stakeholder participation of both integrated water-resource management and social learning (chapter 2), as well as the lack of action on the part of the social learning forums (section 6.6). Although the South African and Namibian Water Acts theoretically empower historically disadvantaged actors through clauses on representation (see sections 4.5.1), institutional constraints imposed by the same Acts paradoxically restricted their participation through more subtle influences on motivation (section 5.5.5) and omissions, such as the lack of financial support (section 8.2.1). The achievement of truly inclusive participation and representation across multi-ethnic and socio-economic boundaries was therefore unrealised by the case-study institutions, in which women, indigenous peoples and non-agricultural water-users were variably excluded from the formal water-management processes for the reasons provided in this section. The resultant perpetuation of existing power structures within the

'participatory' case-studies supports the findings of Faysse (2004) and Waalewijn *et al.* (2005), who conclude that historically disadvantaged actors largely remain marginalised in spite of policy changes designed to render Southern African water-management institutions and processes more equitable.

8.4) Institutional capacity, legitimacy and social learning

A fundamental constraint to concerted action was that neither the KuisebBMC nor the KatRWUA had an independent funding source. The original EU funding for the ELAK project did not extend to the KuisebBMC because, according to a KuisebBMC member, such assistance was only available for start-up projects. Subsequent attempts by the KuisebBMC to secure funding via NamWater levies on water users within the Kuiseb catchment failed because it was deemed untenable by NamWater management that heavily populated basins would have necessarily had to cross-subsidise those with low populations (NamWater official, pers. comm., 2008). Thus, as a KuisebBMC member reflected, "the main problem is money, we don't have any and we have spent the last two years trying to get it but we have been unsuccessful so far". The rotation of venue amongst its members meant that the financial costs of meeting had been distributed and minimised hitherto. Furthermore, with the exception of the commercial farming representative, members rarely bore the associated meeting costs personally due to the majority institutional membership of the KuisebBMC. Nevertheless, beyond basic meeting, further action was constrained. For instance, when a DRFN member outlined a potential public outreach strategy, a KuisebBMC member pointed out that it was a great strategy but that the KuisebBMC did not have the necessary funds. Their lack of financial resources therefore impacted negatively on the ability of the KuisebBMC to secure institutional legitimacy amongst the wider public, as, according to a member, it meant that, "people don't see any benefit, even if the BMC does something, usually the people don't know that that was the reason something happened".

Furthermore, out of the wide range of applicable legislative and constitutional roles for the KuisebBMC (section 5.3.3), most require financial resources for their enactment, over and above the costs of merely meeting. Although the DWA was unwilling to provide indiscriminate funding to the KuisebBMC, its representative pointed out on several occasions that the DWA would consider funding specific projects and/or activities by the KuisebBMC, subject to a formal tendering process. This observation suggests that the lack of clarity of institutional function due to legislative and constitutional uncertainty, ambiguity and wide-ranging scope (section 4.7.7), is of higher relevance in terms of explaining the lack of action by the KiusebBMC than a lack of financial resources *per se*. Nonetheless, the formal tendering process would not only have required KuisebBMC members' *decisions* on action, which was observed to have been unforthcoming due to issues surrounding the transfer of power (section 7.2), but

also, inevitably, their *time and input* to compile proposals and tenders for action. The observation that no action had been taken by the KuisebBMC in the face of funding availability, can thus be linked to economic constraints because many members identified time and economic constraints as a limitation to their more active participation (section 8.2.1).

At the time of this research, the KatRWUA received limited financial assistance from DWAF, such that many of its operational activities were funded through the KatRVP. Whilst SANWA notionally permitted water-user associations to levy fees on water-users within their jurisdictions, government water tariffs restricted charges to historically disadvantaged social water users to the extremely low rate of 0.78c per cubic metre of water (Field notes, November, 2006), in order to comply with national political goals of social equity. This constraint restricted the ability of the KatRWUA to generate income, with the implication that the financial self-sufficiency of water-user associations depends on them having enough 'high tariff' water-users within their catchment or, an alternative external funding source e.g. research or NGO monies or government subsidies. However, as already illustrated throughout chapters 5 and 6, such funding did not come without attached conditions and agendas, the detrimental impacts of which are discussed in section 8.5. The prevention of the financial viability of the KatRWUA by top-down constraints and political goals paradoxically reduced its ability to secure the participation of historically disadvantaged actors that such actors and goals desired, as it prevented the KatRWUA from carrying out activities in their interest. For example, one KatRWUA member reflected that, "most of the guys up there [in the upper Kat] still feel that it represents the commercial citrus farmers and it's not doing anything to help them". In this way, the limited financial resources of both institutions affected their legitimacy amongst catchment-based water users, as they were unable to demonstrate their utility via tangible action-oriented outcomes, or to carry out wider public outreach and education activities.

South African researchers, who had been involved in participatory water-management processes since the ratification of SANWA, observed that few water-user associations had been able to form independently without external assistance from academic, NGO or government institutions. Personal observations further indicated that such assistance was not only necessary from a financial perspective, but also due to the complex, bureaucratic and, therefore, time consuming process of establishing a water-user association, to which a plethora of lengthy guidelines pertained (e.g. DWAF, 2004; DWAF, undated). Further bureaucracy surrounding the establishment of a water-user association involves the production of documentation, including a constitution, strategic plan, business plan, and annual reports. When the KatRWUA presented their annual report to the DWAF official, it was initially rejected because it was not in the 'right' format (Field notes, October, 2006). Only *after* this attempt did the DWAF representative provide the KatRWUA with specific guidance on the required format, in order

that it would be 'acceptable'. The excessive bureaucracy had a detrimental impact, as interviews and secondary data analysis revealed that the time delays incurred by it negatively affected stakeholder motivation to participate, thereby also hampering the posited goals of widespread participation in SANWA through the 'filtering out' of stakeholders without strong vested interests and agendas.

Furthermore, from these observations, it is interpreted that adherence to official requirements and procedures inherently required skills of literacy, access to IT facilities, time (for reading guidelines and completing documents), and experience of conducting such activities. Such formalities are therefore also interpreted to have impeded social learning within the water-management context, as, in reality, only some members of any given social group can meet the criteria above. In the South African context, the necessary skills and experience were more likely, but not exclusively, to be found amongst historically advantaged actors in light of observations in chapter 4. Yet as already discussed extensively in chapter 6, such actors were also those with strong vested interests that were being threatened by the national realignment of allocation priorities and the opening up of the allocation process to previously disenfranchised social groups. It is therefore interpreted as having been in their interests *not* to volunteer to carry out such tasks thereby delaying the process, as it was ultimately likely to benefit others rather than themselves. Even if historically advantaged actors were to have volunteered to complete these tasks, such action would have likely reinforced external perceptions that the process was driven and dominated by the historically advantaged, in turn further compromising the legitimacy of the institution and the process (as above). This observation reveals a 'Catch 22' situation for institutions with diverse membership in contexts of high social inequity, as the actors 'capable' of carrying out the mandatory requirements were those who reduced the legitimacy of the institution on the grounds of the political goals of representivity and 'redressing the balance'. Ultimately, RU researchers assisted with bureaucratic requirements, e.g. the constitution and the catchment-management plan, so that the KatRWUA could progress to an operational institution. Yet whilst their intervention ensured that the official requirements were met, it further allowed their ideology, agendas and visions for action to become suffused within the process (also section 5.4).

It is recognised that DWAF is a large public institution with human and technical resource constraints (Karodia, 1998). According to one interviewee, "they [DWAF staff] are terrified of making a decision in case they make a mistake and then someone will put the blame on them, the blame culture there is terrible". Whilst the internal institutional operation of DWAF was not the focus of this research, conversations with water-management practitioners suggested that these factors, along with the internal system of centralised decision making, were responsible for an apparent inefficiency of employees at lower management levels, which had a subsequent

detrimental impact on stakeholder relations (section 8.3.2). Nevertheless, the examples above demonstrate that excessive bureaucracy hinder the social learning process of the KatRWUA through detrimental impacts on stakeholder motivation to participate and the reinforcement of power relations through its necessitation of skills and/or external assistance. These findings also support Osborne & Plastrik (1998), who observe that although bureaucracy is designed to prevent mismanagement and deliver a unified service, it simultaneously stifles action towards policy goals and objectives. Overall, this section has revealed that in both case studies, bureaucracy and the lack of independent financial resources negatively affected institutional ability to carry out action, which in turn had negative implications for participation and institutional legitimacy. In particular, the highlighted contradiction between institutional members' capacity for action and national socio-political objectives suggests that the tender process required for Namibian basin-management committees to obtain funding, and the bureaucracy of institutional reform in South Africa, are not appropriate for institutions comprised of voluntary membership and diverse stakeholders. The lack of independent finances also reduced the institutions' ability to set their own agendas and objectives, such that the lack of concerted action may also have been compounded by differences in institutional visions of their funders, implementers, and members.

8.5) Multiple and uncertain visions of institutional function

Both social learning and the discourse of integrated water-resource management invoke the notion of action by multi-stakeholder interaction processes. However, as the NWRMA incorporated significant flexibility and ambiguity for the function of basin-management committees (section 4.7.7), a variety of roles for the KuisebBMC were envisaged by its participants, as shown in table 8.1. Within the table, interviewees are clustered into groups and, for institutions that were internally split into technical and supply divisions, responses by representatives from both divisions are combined within a single group; in order to protect individual anonymity. Furthermore, the following quote, which is typical of other responses, illustrates that KuisebBMC members remained uncertain of the KuisebBMC's function and, as a consequence, were awaiting direction from higher level actors:

> The next step really will be when we have this Master Plan, and from that a lot of things will flow out. It will tell us what we are doing and give us some direction.

Further guidance regarding the function of the KuisebBMC was usually expected to be provided by DWA or, as in the case above, by the forthcoming Master Plan, which was in the process of being contracted out to a consultant at the time that this research was being undertaken.

Table 8.1. Envisaged functions and implicit roles of the KuisebBMC

Stakeholder	Functions of the KuisebBMC	Implicit role(s)
Government Ministry	To feedback on licensing arrangements To provide DWA with information To prepare basin management plans To allow stakeholder interaction To prevent unlawful water-use through monitoring	Advisory Data provision Action Information exchange Enforcement
Institutional water-service providers	To allow institutional stakeholders to explain their roles to the public Coordinate basin activities To advise Water Affairs Discussion forum and information exchange To oversee and monitor catchment activities	Transparency & accountability Sustainable management (via coordination of activities) Information exchange Monitoring Oversight
NGO	To lobby other stakeholders for action To monitor the catchment activities To share information and advise government To raise awareness of local issues	Lobbying and advocacy Monitoring Data provision and advisory Information exchange
Livelihoods-based water-users	To share information amongst stakeholders To look at the basin from the bigger picture Power of recommendation on future development	Information exchange Oversight Advisory
Project Implementer	To monitor catchment activity and environmental state To share information amongst stakeholders To act on information collection in the wider interest of the catchment	Monitoring Information exchange Data collection Action (sustainable management)
Independent (e.g. researcher, consultant)	To share information To resolve issues amongst stakeholders To lobby for action by agencies and service-providers To make decisions e.g. on development in basin	Decision making Action (unspecified) Information exchange forum Advocacy
Funding agency	Basin planning (catchment-management plan) To carry out activities identified in the plan	Advisory Action

These differences and uncertainty are fundamentally ascribed to legislative and constitutional ambiguity (section 4.7.7), and are reflected in the following interview extract with an institutional representative and their manager:

> [Interviewer] It's a similar question, but what kinds of decisions do the KuisebBMC have to make?
> [Researcher 1] That's a difficult question.
> [I] You see, they say that the BMCs will have decision making responsibilities?
> [R1] So is it a bulldog without teeth, or is it a bulldog with teeth? And that is the question.
> [Researcher 2] Well the KiusebBMC is a special case. There is a lot of professional representation sitting on that committee so I think that they have the capability to make good decisions. They are in good positions and they have power to make decisions, which might not be the case for other basins.
> [R1] But can those decisions be binding because who are they actually representing? I mean a BMC, is that registered with government? Is that an extension of a government function? If it's not an extension of a government function, then they cannot tell anybody what to do, they can only provide information and provide a forum.
> [I] For example, do they have any powers of enforcement?
> [R1] I don't know, we don't know exactly.

> [R2] Personally I would have liked to see the BMCs as the way of exchanging information and to establish the needs of all the stakeholders. And then to leave the decisions to the professional people.
> [R1] You must bear in mind that we have the department of Water Affairs and everyone is basically supposed to report to the department of water affairs. And so if anything needs to be forced, it should come by the DWA and not the others.

As well as illustrating the ambiguity regarding institutional function, this extract also supports previous assertions that historically empowered decision makers were reluctant to relinquish authority (sections 5.5.4 and 7.5). As a consequence of the legislative uncertainty, participants envisaged different roles for the process according to their different agendas and motivation. For example, a KuisebBMC member, who reflected that personal interest and a networking opportunity had motivated his involvement, maintained that its information-sharing nature was sufficient:

> Do I hope that [the KuisebBMC becomes a decision making entity]? No I don't hope that. It is this information sharing that is a good thing and is making better for people. No, as long as the KuisebBMC stays as an advisory and as supportive to communities and information spreads, this is the type of things where the KuisebBMC could grow. At the moment there are still many people who are not knowing what it is that we are doing and talking about.

In this example, the social learning process, as one that triggers action is constrained by a participant who did not want to act, their justification: because it would require time and "we are all busy people and I think that one cannot be coming to the meetings more and more". This observation is also compounded by observations that many livelihoods-oriented stakeholders of the Kuiseb catchment did not perceive their current behaviour as 'wrong' and, therefore, saw no need to take further action (section 8.6.1).

The ambiguity surrounding the function of the KuisebBMC meant that participants interpreted it according to the interests of their stakeholder group. For example, an institutional representative reflected that the KuisebBMC allowed them to interact with the general public, stating that, "we get to hear the feeling or the thoughts of the people within basins, how do they feel and how they see us". This concern with public image is of particular relevance to the interviewee's institution, which had a largely negative image in the public domain according to printed media and informal conversations. Thus, the perceived connection to the general public afforded a "chance to explain" and "to clear some misunderstandings", which was highlighted as necessary because:

> You have all those perceptions from political representatives, community representatives, traditional leaders and some other organisations such as farmers and everybody. So the advantage is that messages will probably be communicated easier through them [basin-

management committees] than through media, which in most cases they probably don't understand because they also don't have chance to ask questions with that.

This perspective of the KuisebBMC as a mechanism for communicating with the wider public and yielding more widespread understanding is challenged by the findings of section 8.3, which revealed that communication between individual representatives and their wider stakeholder groups is limited. In another example, a KuisebBMC member observed that institutions concerned with collating and providing information now had a group of actors, which could use such information:

Our research efforts become interactive, such as [research project on groundwater recharge], on the one level it is an academic study but then this BMC can make it useful to other people.

These findings therefore support the assertion in section 5.5.5, that a forum with a loosely-defined agenda and/or purpose increases the likelihood of multi-stakeholder participation at the outset. However, such ambiguity may ultimately lead to detrimental relational outcomes. For instance, although such information can be used and acted upon, it does not necessarily follow it categorically will be. The related lack of action by the KuisebBMC in the face of such information provision had led to external frustration with the KuisebBMC, as illustrated by a member of its former implementing agency:

If they don't want to make any decisions, then what's the point? We are just wasting our time with them. They have to start making decisions otherwise all this information is useless.

These quotes not only underscore how the KuisebBMC had largely failed to realise action (section 6.6), but also reveal how the variable expectations of the social learning process ultimately resulted in relational tensions. The different expectations are related to varying interpretations of the global discourse of integrated water-resource management by different national-level actors. In particular, both the global discourse and managed social learning approaches invoke an action role for multi-stakeholder forums. However, this envisagement was problematic for the KuisebBMC because many action-based roles and responsibilities were already being enacted by other agencies, as implicitly reflected in the first interview extract of this section, and a member's assertion that:

So to be honest, up to now, we were just getting ourselves organised. So apart from many projects, what NamWater's doing, they are doing it, not the KuisebBMC doing it. Like the Omdel, like what they showed us yesterday, the development of alternative water resources in the Kuiseb, the KuisebBMC is not doing it, they [NamWater] are doing it. Same with the WADE project [groundwater research project], for me that has one of the biggest values to me personally, what they're doing in the river, but that was driven by DRFN and Gobabeb, it wasn't driven by the KuisebBMC.

For this reason, one interviewee reflected that, "it is still not quite clear to use what the role of the BMCs are (...) they came along with outside agendas". In light of the conceptualisation (section 2.5.4), these 'outside agendas' are interpreted to mean the global discourse of international actants, whose vision of action by participatory institutions necessitated the transfer of role(s) and responsibility from pre-existing centres of agency in the Namibian context. This process essentially involves a transfer in the balance of power, which was perceived negatively by an employee of a pre-existing water-management institution, who asserted that, "there is a concern that the professionals are having their authority taken away" and the similar sentiment expressed in the interview extract at the onset of this section. The resultant reluctance and resistance on the part of pre-existing decision-makers and authorities to the devolution of decision making authority is therefore considered to play a part in explaining the lack of action by the KuisebBMC.

In contrast, the history of the KatRWUA as an action-based institution meant that, under the legislation, power had shifted *from* a decentralised institution back to the higher authority of the state agency (section 5.5.4). Consequently, both previously empowered actors of the antecedent KatRIB and RU researchers had different visions of the KatRWUA than that of DWAF; researchers because of their interpretation of the global discourse of integrated water-resource management, which promotes decentralisation and/or devolution (section 2.4), and previous KatRIB members because they were used to 'real' authority. From the observations in chapter 6, it is interpreted that DWAF largely envisaged the KatRWUA as an organisation responsible for carrying out information-collection activities, upon which DWAF employees would subsequently make the appropriate decisions. This interpretation implies that localised actors must do the practical 'work' (e.g. securing participation, collecting information and monitoring) that is necessary for DWAF to make the subsequent decisions, despite a corresponding lack of financial and logistical resource provision from DWAF to the KatRWUA (section 8.4). However, as RU initially promoted the KatRWUA as a decision making forum (section 5.2.3), several KatRWUA members expressed their anticipation of a decision making capacity and function. For instance:

> We had to decide without having any information, okay we agree but we were not strict on those issues we just went to DWAF to see what the computer said to see if we do not stress the dam but to me the WUA [KatRWUA] must be capable of saying *we* cannot allow these kind of things, *we* cannot have development because of stress. *We* need those tools. The computer should be on the WUA side not on DWAF side so they can discuss those issues and come up with decisions but the WUA was obliged to go to DWAF rather than do it themselves. *We* should be able to say you can't expand because of A, B, C, or D. Because as far as I understand the WUA makes the decisions and is guided by DWAF they must be able to run the organisation themselves not consulting consulting [sic] all

the time and so we must have the model ourselves and be able to make it work. [Emphasis added]

The quote not only attests to the limited institutional empowerment (section 8.4), but also indicates that the resultant mismatch in the visions of KatRWUA members and RU researchers, and the DWAF representative, may have contributed to the relational tensions between them (section 5.5.4). Overall, according to interpretations in this section, lack of action on the part of the KuisebBMC was mainly due to the lack of a clearly-defined role. Although defined as such, in order to allow the approach to be applied to catchments with different physical and social contexts, this ambiguity had left the KuisebBMC with an 'identity crisis' that ultimately contributed to a lack of further action. In contrast, the KatRWUA was mainly constrained from pursuing a more action-oriented role by conflicting visions of 'desirable' outcomes between state water authorities and 'powerful' actors.

8.6) The wider social context and organic social learning

Whilst the managed social learning processes of the case studies took place within the specific communities of their 'institutional spaces', it was recognised by the conceptual framework of this research that such learning occurred within a wider social and physical context, aspects of which were presented and discussed in chapter 4. Throughout the previous analysis chapters, elements of these wider contexts have been highlighted to impact on the managed social learning process. These aspects are now returned to in the following two sub-sections.

8.6.1) Differences in perspective and knowledge

In section 4.7.4, it was highlighted that at the policy level, the definition of problems and the framing of water resources and issues have been heavily influenced by hydrological understandings and the ontological perspective of interconnected natural and social systems. Yet several observations regarding the knowledge of wider social actors in the case-study contexts reveal a mismatch with such understanding. For instance, interviews carried out with residents of an Upper Kat community and observations at catchment-based workshops indicated that understandings of the Kat River 'system' varied. In particular, many historically disadvantaged residents based their understandings on visual processes of connection rather than the 'invisible' infiltration and throughflow process of the hydrological cycle, with water pollution ascribed to visual sources, such as livestock drinking from the river, humans defecating and littering gullies connected to the river. Data also revealed the widespread belief that 'water held in the soil' (e.g. groundwater) was not connected to the Kat River. Thus, even though the understandings of the participants had changed in this regard (section 6.2), their limited representivity (section 8.3) and this wider mismatch with scientific understandings are

likely to have contributed to the lack of behavioural change within the case-study catchments hitherto. A sense of interconnection and interdependency is considered especially necessary for stimulating relevant stakeholders to participate in, and enact, catchment-wide, water-management initiatives (Mostert *et al*, 2007: 1). Yet further differences in concepts of interdependency were observed both within and between the actors of the case-study catchments. As highlighted in section 3.4.4, the ephemeral nature of the Kuiseb River starkly contrasted with the perennial Kat River. Thus, although upstream and downstream stakeholders of the Kuiseb River catchment drew on a single resource according to the hydrological concept, the use of surface water in the upper catchment compared with groundwater in the lower catchment meant a sense of interconnection between upstream and downstream users remained low, as observed by a commercial farmer of the Upper Kuiseb:

> We are used to doing our own thing. We get the water for ourselves at our own cost, we don't rely on anyone else. And really the water that we are keeping in the dams, it is not a lot, it is not affecting the others downstream anyway. And they are using the groundwater anyway. If we didn't store the water, most of it would evaporate anyway. (...) But it is difficult to find water, that's why you need a large farm so that there are some different places to get it, then if one is running dry there is always somewhere else. (...) So what can we do? Especially now, we know that the government will not help us and so we must just do what we can. But it is nice to know the 'bigger picture' and to know what else is happening.

This perspective of *insignificant* interconnection between upstream and downstream water users, which is likely to have been reinforced by the scientific study that was promoted within the KuisebBMC process (section 6.4.1), was used to justify making no changes to historical behaviour. Tradition was also identified to prevent such change by a commercial farmer from the Kuiseb River catchment:

> I don't think that the actions in the Kuiseb have changed at all, not in the commercial farming sector but I think that there's more awareness amongst certain farmers about certain things, about the water issues and so on, but that fact is that they will not easily change, and there's nothing really wrong about what they are doing. They are doing this for almost a hundred years now, this farming.

In contrast, empirical studies to ascertain whether the claims of the Topnaar community, that over-abstraction of the Kuiseb aquifer is to blame for decreasing groundwater levels, had not been conducted by DWA, despite widespread speculation that aquifer over-abstraction is responsible for the Topnaar community's plight. DWA's unwillingness to conduct similar empirical investigations into this aspect of interconnection may have been linked to political pressure for continued water allocation to mining and industrial interests, which provide high economic returns on water use. The understanding of the Topnaar community, that other actors were responsible for their plight therefore remained 'unproven' by science, which meant that it could be dismissed by formal processes and authorative actors as 'anecdotal evidence' or

'claims'. Thus, in addition to the privileging of scientific information, control over information availability by official institutions was also revealed to be influential in shaping the accepted knowledge pertaining to the resource being managed. This observation supports the findings of Adger *et al.* (2006) that state agencies mobilise information and resources, in order to reinforce their own views and/or authority; although this research did not ascertain whether such mobilisation was deliberate or inadvertent. Regardless of the reason, existing power relations were consequently reinforced, as stakeholders unable to 'back up' their perspectives scientifically were marginalised in the process. This interpretation also supports Garcia's (2001) assertion that Foucault's concept of power-knowledge (section 2.6) is embodied by the self-reproduction of a professional class of scientific experts.

Furthermore, the accepted knowledge amongst KuisebBMC members, that the Upper and Lower Kuiseb water resources are largely separate and that water scarcity is *primarily* climatically driven, is counterproductive to the achievement of objectives of social learning in the context of water-resource management (section 2.5.3) because an awareness of interdependency is a motivator of stakeholder interaction and concerted action (Pahl-Wostl, 2006). The issue framing process of the KuisebBMC reduced the motivation for livelihoods-oriented water users to change their behaviour, as interpreted from the previous quote. By highlighting the physical duality of the hydrological system in the manner discussed above, this framing of the resource also contributed to a lack of an overarching catchment-wide 'issue', or perception thereof, and, therefore, common identity amongst KuisebBMC stakeholders.

In contrast to commercial farmers of the Kuiseb River catchment, those of the Kat River catchment were located at the bottom end of the 'system', such that they were highly susceptible to upstream water use both in terms of quantity available to them and its quality. It is therefore interpreted that the initial willingness of both scheduled and unscheduled commercial farmers to include emerging water-users from the Upper Kat in the KatRWUA was not only due to legislative requirements (section 5.2.1), but also a realisation of their tenuous position with the physical catchment, meaning that the inclusion of historically disadvantaged water-users may benefit themselves in the longer term. In contrast, even though interviews and observations revealed that historically disadvantaged water users of the Upper and Middle Kat were aware of an interconnection between upstream and downstream water users, it rarely corresponded to the hydrological scale of the entire catchment. The interconnection between sectoral uses of water was also low amongst non-KatRWUA members. For example, at the catchment vision workshop, participants experienced difficulty linking aspects of their environmental, social and economic catchment visions. These examples suggest that a pervasive lack of identification with the catchment as a spatial unit and understanding of system interconnection may also have contributed to the lack of participation and wider interest in the institutional processes. The

widespread tendency to conceptualise the environment, society and economy as separate entities at the local scale contravenes the fundamental ontology of the global discourse and integrated water-resource management, of complex interlinked systems. This finding therefore has implications for the decentralisation of water-resource management, as it implies that decisions made at the local level may not necessarily be in accordance with the triple bottom line, but may be biased towards environmental, social or economic interests depending on majority and/or powerful preferences. This interpretation is further supported by the observations pertaining to the decision making process of the KatRWUA in section 7.2, in which powerful economic interests dominated the process, despite participants purportedly having learned about the multiple facets of water resources (section 6.3).

The propensity to accept information as 'knowledge' is also interpreted to have been affected by economic motivations. For example a small-scale farmer of the Kat River catchment asserted that, "I have noticed that there is more water and it is clearer now since 'Working for Water'[21]" (Field notes, October 2006) and that "the sacred pools are much deeper because of Landcare[22]". It is not the intention to critique the 'correctness' of these assertions, only to highlight that the interviewee was known to have friends and relatives who had benefited financially from the employment that these programmes provided. Thus, his willingness to accept such knowledge as fact, without critiquing whether other factors may have been responsible (e.g. more rainfall), is considered to have been influenced by socio-economic incentives to do so. Moreover, even though the related activities were identified as beneficial to land and water resources, observations of broken fences and a subsequent lack of action on the part of their participants and communities once the projects had finished, indicated that the economic incentives had played a central role in action. Notwithstanding the disincentive to improving 'communal' land, due to uncertainty and conflict surrounding land ownership (section 4.4.4), another social factor for explaining the lack of wider action and behavioural change is the propensity of volunteerism. As one Kat River catchment resident observed, "most people just want money so they don't care for the environment unless you are paying them". Another commented that, "people don't volunteer, they will just laugh at you, why would they do something for free? It is not the culture". Given that membership of both the KatRWUA and the KuisebBMC was 'voluntary', albeit less so for institutional participants (section 8.2.1), this feature of the Southern African context of the respective catchments is thought to have had an impact on the limited success of the KatRWUA and KuisebBMC in attracting the interest of wider community members. These observations thereby reveal that economic considerations influence both the behaviour and knowledge of social actors. Economic determinants of behaviour are discussed

[21] A government initiative dedicated to removing alien vegetation species in a linked environment-social development project

[22] Landcare (or Sinsonke) was a project run by the KatRCF, with assistance from RU researchers to secure funding (Rowntree, 2006), which aimed to restore eroded and gullied land to arable productivity.

further in the following section, which explores the reasons for the behavioural changes that were observed amongst social actors of the case-study catchments.

In a previous example pertaining to the KatRWUA, it was interpreted that the significant threat to commercial farming interests of the new legislation had driven their high level of interest and participation. Jiggins (2002) and Obama (2008) also observe that an immediate 'threat' or 'crisis', or perception thereof, assist in triggering public participation and related action. This notion of a threat is evident within the global conceptualisation of water resources (section 2.2). However, interviews with small-scale water-users of the Kat River catchment highlighted a general perception that 'enough' water was available for human and non-human water requirements. The lack of a direct threat to livelihoods also contributed to a difference between the global stance and that of wider stakeholders in the KuisebBMC case study, with one member ascribing the lack of wider stakeholder interest in the process to the lack of an imminent threat: "if you were to tell them, for example, that a mine is coming into the area then you will find that they will all want to come [to the KBMC stakeholder forum meeting]". This assertion is supported by the example in section 5.5.5, in which a KuisebBMC member reflected that no-one was worried yet because water was still coming out of the taps. Thus, whilst Tompkins & Adger (2004) posit that social learning increases adaptive capacity by building networks that are able to deal with crisis events, these observations paradoxically suggest that such crisis events may first be necessary to trigger a social learning process. Further constraints then restricted their vision of increased adaptive capacity. For example, the establishment of a contingency plan, which had been listed as an agenda item following the extreme flooding event of 2006, remained a standing item on the agenda at the time of this research in 2008 because the time constraints and other priorities of relevant actors prevented their necessary involvement (KuisebBMC member, 2007). Adaptive capacity to deal with a repeat event had therefore not increased due to the presence of the KuisebBMC. These observations suggest that the nature of a crisis may play a further role in motivation to participate in collective initiatives, as the imminent and constant threat to commercial farming interests in the Kat River catchment from another stakeholder group is interpreted to have provided a strong incentive for participation and 'action' (to defend interests) compared with the longer-term, uncertain threat of another destructive flood amongst Kuiseb River catchment stakeholders.

Enserink *et al.* (2007) cite Hofstede's (2001) characterisation of societies in terms of their 'long term orientation' (a propensity to think long term), as a determinant of the 'success' of social learning approaches. As social learning processes are ultimately conceived as medium to long term processes, requiring time for outcomes to be realised (Craps & Maurel, 2003), participants are thought to require an understanding of longer term processes and/or have their immediate basic needs met, in order that they are able to expend time participating in a process with longer

term objectives. Whilst the findings of section 8.2.1 indicate that the latter reason is likely to have constrained the ability of historically disadvantaged stakeholders to participate in longer term processes, several observations also indicate that the former awareness may be lacking. For example, a KatRVP member (quoted in Burt, 2006) reflected that:

> The disadvantaged communities may get more land then their demand for water will be more. At the moment I don't think anyone foresees this. I heard that the Lower Kat farmers are asking if they can buy the water that the upper Kat farmers are currently not using. The farmers in the Upper Kat have no problem at the moment, but when the opportunity comes for them to irrigate, they won't want to give up water...people may have agreed but don't understand the repercussions. These things need to be made clear and cleared up.

This observation contrasts with the capacity of historically advantaged commercial farmers to think and act in the longer-term interest, which is evident in the above example and according to their critique of the KatAWARE model that its timeframe of five years for citrus farming returns was too short and, therefore, 'unrealistic'. In this way, their synergy with the longer term timeframe of social learning processes placed them at an advantage compared with historically disadvantaged stakeholders, who were more likely to have been operating on shorter time scales of economic return through necessity.

Finally, although Pahl-Wostl (2006) and Craps & Maurel (2003) purport that managed social learning is a relevant approach for dealing with the multi-faceted nature of water resources, as it theoretically acknowledges differing perspectives, section 6.2 highlighted that the understandings of water resources amongst the KatRWUA and KuisebBMC participants had largely been homogenized through the privileging of scientific information and capacity-building activities. Furthermore, the 'correct' perspective on issues, such as water payment, had been normalized to that of the dominant and/or institutional actors, which in turn corresponded to that of the best practice principles of integrated water-resource management. Thus, rather than 'constructively dealing with differences', the managed social learning processes of the case studies instead attempted to convert 'problematic' perspectives. This process of imposing perspectives onto lower scales of water management not only contradicts the theoretical conceptualization of social learning, but ultimately benefitted the social actors whose perspectives were already aligned with those of 'best practice', who were therefore not required to modify their behaviour. The following quote highlights how a historically advantaged and dominant actor within the KatRWUA used such alignment to justify his observation that historically marginalised social actors can now be involved, but only *if* they play according to the old rules:

> There is a bone of contention with all the black guys that do not pay their rates and get away with it. If the government is willing to laugh the omen off that should be added up.

> We all believe in righting the wrongs but there is a strong feeling in the middle Kat and lower Kat that water is being poached (quoted in Burt, 2006: 1).

From these examples, the knowledge and perspectives of historically-advantaged actors are revealed to align more closely with internationally defined principles of best practice in water-management, whilst simultaneously contradicting the expectations and desires of locally based, historically disadvantaged social actors, who, for historical and political reasons believed that they were entitled to and/or deserving of free water supply (chapter 4). With limited exceptions, interviews and focus groups in two Kat River catchment villages attested to the widespread belief that residents should not have to pay for water, typically "because we are too poor". Thus, although the concept of social learning is nominally centred on a dialogue or tasks that encompass "relational qualities of reciprocity, enabling all relevant stakeholders to connect with a shared domain in a meaningful way" (Craps & Maurel, 2003: 61), this example indicates that scope for reciprocity between stakeholders was reduced when social learning was applied to contexts where power differentials combine with pre-existing normative ideals of 'best' practice, as in both case-study contexts of water-resource management.

As in the case of the Topnaar community of the Kuiseb River catchment (section 6.2.3), the framing of the issue of water payment within the KatRWUA also intersected with local power struggles to the ultimate detriment of the wider legitimacy of the KatRWUA. At a local farmer's meeting, small-scale KatRWUA representatives, RU researchers and the DWAF representative were observed to be sidelined by a committee made up of officials from the Department of Agriculture (DoA). Not only were the DoA representatives hostile and dismissive towards DWAF and RU, but they also misinformed attendees regarding water charges and the right to impound water. This occasion thus appeared to constitute a deliberate attempt to discredit DWAF, RU and especially the KatRWUA in front of the wider [communal] farming community, in particular, by drawing on the knowledge that the issue of water payment was a disincentive to alignment with an institution that promotes this ethos. Attendance at this meeting also underscored the differences in the types of information that participants of the formal social learning communities were exposed to within their wider livelihoods. For instance, the DoA conveners of the meeting promoted the application of fertilisers and chemicals to increase crop yield with no simultaneous disclosure of the negative aspects of fertiliser/pesticide application. A KatRVP employee therefore quipped, "if we were to talk about organic farming here, they would really throw us out!" In this way, the knowledge promoted within this different forum precluded environmental concerns, which was interpreted as an advertent exclusion in order to meet priority objectives of increasing the 'success' rate of small-scale agricultural initiatives. This example shows how the information available to participants of managed social learning processes in other aspects of their livelihoods may directly contradict the ethos of integrated water-resource management, as well as indicating that the KatRWUA had not secured

legitimacy at a wider level. Of particular significance was the revelation that the KatRWUA had not achieved integration across agencies responsible for land and water resources, as such integration is identified as a key concept of integrated water-resource management (section 2.4.3). Overall, this section revealed how wider socio-economic, political and historical contexts interfere with the play-out of social learning process according to theoretical ideals, as well as indicating that organic social learning may counteract the objectives of managed social learning.

8.6.2) Triggering behavioural change

This section returns to analyse further the two examples of behavioural change that were identified to have occurred as a direct result of the case-study social learning processes (section 6.6), in order to shed further insight into the determinants of behaviour change and concerted action. The first example involved a small-scale farmer of the KatRWUA:

> [Respondent] before the model [KatAWARE] I was not motivated in terms of planting but when I used the role playing game and saw that by planting cabbages over this much surface you get something and even farmers around the community are learning from me and planting cabbages because I am planting now.
> [Interviewer] So is that because you saw that you could make a profit through the game?
> [R] Yes, depending on surface because the more surface you plant the more profit you get and the less surface you plant the less profit you get.

This example of behavioural change, which was related to the KatAWARE model, contradicts the envisaged function of the KatRWUA as an entity for ascertaining human water use, and collectively allocating available water, within the catchment. Despite acknowledging earlier in the interview that, "another thing that I mentioned [learning] is we need to use water equally and think about other stakeholders upper, middle and lower farmers and should not forget about the domestic users", the behaviour change described above paradoxically used water in an independent manner that failed to take into account other users of water and the cumulative impact of their activities. Such behaviour is counter to the objective of integrated water-resource management, of reducing selfish and uncoordinated social behaviour, which are thought to have a detrimental cumulative impact on the biophysical domain by the global discourse (chapter 2). Additionally, as the stakeholder had consequently reduced their own participation in the KatRWUA without finding a replacement representative, the increased water use was not subsequently reported back to the KatRWUA, despite the KatRWUA supposedly being an authority for water use in the catchment and the protagonist of this example being a member of it. This example therefore supports several interpretations: that KatRWUA participants misinterpreted the KatAWARE model or used the information that it generated for a different purpose to that envisaged (also section 6.2.4); that the functioning of the KatRWUA, as an institution responsible for allocation of the water resource of the catchment, was hampered by

the inadequate representation of the water-users of the catchment; and that behavioural change results from factors additional to information access and learning – in this case economic motivation. Since planting more crops, the small-scale farmer asserted that, "even farmers around the community are learning from me and planting cabbages because I am planting now". This example revealed the primacy of economic considerations as a determinant of behaviour, as despite the KatAWARE model's incorporation of several variables; its economic output had motivated the small-scale farmer to act. This assertion is reinforced by observations that successful examples of economically rewarding behaviour within the catchment provided a desirable option for widespread future change (section 7.2). This example illustrates Bandura's original concept of social learning, where individuals observed, reflected upon, and then mimicked, another actor's behaviour. Consequently, the example also supports the second assumption of managed social learning provided in section 2.5.3, as the localised participant had learned within the context of a top-down process and subsequently acted a behaviour change, which in turn stimulated social actors around him to replicate his behaviour. The second example of behavioural change, which was reported by an emerging farmer of the KatRWUA, also attested to the importance of economic considerations in decision making:

> [Interviewer] Since you became a member, do you think your views on some of the big water issues have changed, such as water irrigation and water pollution?
> [Respondent] Yes they have changed, because if you are not part of that you will not know the importance of that and how you conserve water, it makes you aware when you come part of that, it is not there but you are moving there. I learned a lot to be part of that. When it comes to your new development you change your system, you change to a better system of irrigation; use less water but more efficiently. When we look at this when you use your drip, when you compare with your overhead sprayer and it is windy, the water is scattered everywhere but with the drip the water is where you want, you need to water where your roots are, where you tree is. But with the other irrigation system the water is blown everywhere.
> [I] Did you learn about that through the [KatRWUA]?
> [R] Yes of course, when we talk about things it gets to your brain. You end up putting efforts to move towards that.

Whilst the participant reflected that behavioural change (moving towards conserving water whilst irrigating) had arisen a result of his learning within the KatRWUA process, his reflection merits further critical analysis in light of further observations relating to this example. According to meeting minutes and personal observations, although the broad ethos of water conservation was promoted within the KatRWUA fora, the specifics of irrigation techniques were not. However, field notes recorded that the content of *break-time* conversations included this topic. On two occasions, a commercial farmer discussed irrigation techniques with the interviewee of the above example, implying that an informal social learning process had actually provided the impetus for this behavioural change, which had albeit unintentionally been created by the managed social learning process. This observation supports Rogers' (2003) observation that differentiating between formal and informal types of learning by spatial

demarcation is impracticable, and further supports the conceptual framework of this research, which recognises that both learning processes operate in parallel (section 2.8).

That behavioural change in the context of land-use practice and livelihoods is primarily underlain by economic considerations is demonstrated by several further examples from the data. A commercial farmer revealed that his switch from micro-jet to drip irrigation was essentially due to the increased efficiency of the drip system, such that more profit could be generated. Economic rationale also drove behaviour change amongst domestic water-users, with a villager describing how residents had increased their rainwater collection since pre-paid water meters were installed: "now everyone has the larger tanks because the water is expensive". Interviewees cited several reasons for livelihood changes amongst commercial farmers of the Kuiseb River catchment (section 7.3), including: the termination of government assistance for dam construction and maintenance such that water-procurement costs have increased; the socio-political climate of land-tenure has reduced willingness to pursue livelihoods based on longer term returns; climate change has increased uncertainty and risk of drought; and government fixing of meat prices has meant that commercial farming is less viable. Economic considerations related to higher level structures also affected KatRWUA members. For example, a commerical farmer revealed an awareness of the detrimental impact of commercial agriculture on the biophysical environment, yet moved on to say, "but what can we do?" These latter examples attest to the 'reality' of social experience in the broader context of a capitalist market economy, which necessitates that social actors pursue an economically-productive livelihood; commercial farming being one such livelihood.

The examples implicitly support the assertion that the perception of tangible benefits played a central role in explaining motivation to participate in change-oriented initiatives (section 5.5.5), whilst illustrating how organic social learning processes led to behavioural change on a wider level, albeit not in the manner envisaged by proponents of managed social learning. The first example not only indicated that *economic* success was a powerful motivation for, and therefore agent of, widespread behaviour change, but also that *personal* observation of a tangible positive outcome stimulated such change. These observations, that individual desire for material wealth was a major driver of behaviour change and that 'seeing was believing', have negative implications for the managed concept of social learning in the context of integrated water-resource management, as they indicate that the probability of individual representation triggering wider social learning depends on whether representatives can convey their 'formal' learning in a manner that is both visible and tangible economically. Yet this outcome fundamentally contradicts the ultimate objective of managed social learning, of engendering decision making and concerted action in the long term interests of 'society' and the natural environmental (section 2.5.4). Organic social learning can therefore be interpreted to challenge

managed social learning processes, especially in the wider context of poverty and unemployment in developing country contexts.

8.6.3) Expectations of others

A final salient factor relating to the wider social context was stakeholder expectations of other actors. As inherent in the original, organic concept of social learning (section 2.5.1), expectations of other actors is a primary determinant of individual behaviour (Hornick, 1990). Interview extracts revealed how expectations of other actors affected the behaviour of KatRWUA and KuisebBMC participants, as well as wider social actors within their respective catchments. In particular, if individuals are expected to refrain from individualistic behaviour in self-, rather than collective interest, they need to believe that others will behave accordingly (Bechtel & Azjen, 2001; Churchman, 2002). For example, a villager from a Kat River catchment community observed that, "even if we stop polluting the river here, then the others in [adjacent community] will, so it [pollution] is not our fault and anyways there is nowhere else to get water for the animals". A KuisebBMC member also justified not changing their water-related [use] behaviour on a relational basis: "anyway what we use is very little in comparison to them [the mines]". These examples reveal how structural constraints regarding behavioural choices, expectations of others and a lack of intra-societal trust constrain action and behaviour change in the collective interest.

A commercial farmers' belief that government agencies were willing to overlook payment for water by historically disadvantaged individuals (section 8.6.1), also attests to a lack of credibility in the enforcement capacity and/or willingness of relevant authorities to prevent 'deviant' behaviour, which is interpreted to impact on their own willingness to toe the line vis-à-vis expectations that others do not. This perception of the low enforcement capacity of authorities is likely to perpetuate a future lack of behavioural change, in terms of reducing stakeholders' water use in the collective interest, as conversations with some high-volume water-users indicated that they had no intention of complying with top-down restrictions on their use, as they held the perception that such actors did not have the capacity to enforce them. This example highlights further limitations to 'voluntary', rather than coercive, approaches for engendering the behavioural change that is deemed necessary by the concept of sustainability within the field of natural-resource management (chapter 2).

Stakeholder expectations of other agents' responsibilities further intersected with the concept of managed social learning, which is underlain by the notion of human agency (section 2.5.2). For example, interviews from the two Kat River communities highlighted that many residents believed that the municipality should be responsible for water provision and sanitation services.

Henschel *et al.* (1998: 45) observe a similar mindset of expectation amongst the indigenous Topnaar community of Namibia, where:

> People living along the lower Kuiseb River are in need of alternative water sources. However following years of Government dependency, they seem to have accepted their daily struggle with the existing system as a way of life: they walk long distances to hand-dug wells that require maintenance, while they wait patiently for a Government technician to arrive to fix a pump...they currently have limited funding and do not intend to invest this towards a new water scheme, a service provided by Government now and in the past.

Thus, although McIvor (2000) indicates that community ownership of a resource improves its management, this example demonstrates how communities and stakeholders may also reject ownership and management of a resource, in order that other actors are responsible for the work and, therefore, time and financial expenditure, that such ownership entails. This rejection is thought to have been influenced by the political histories of South Africa and Namibia, where respective incumbent governments had fostered a paternalistic ethos towards the majority population at the onset of their governance (section 4.2.2). Consequently, many Kat and Kuiseb River catchment residents considered service provision and natural-resource management to be the responsibility of government agencies and, furthermore, that such activities should not incur financial costs to them. Overall, this section has demonstrated that low trust and linkages between social groups in South African and Namibian societies constrained social action in the environmental, and therefore ultimately collective, interest.

8.7) Chapter conclusion

Participation and representation are key assumptions of the conceptual framework of social learning presented in chapter 2. Yet, in the first two sections of this chapter, critical analyses of participation and representation processes in the case-study institutions revealed that they did not play out simplistically or straightforwardly in practice. Challenges to such processes were mainly related to the socio-economic aspects of the catchments, which had in turn been influenced significantly by their apartheid histories and associated marginalization of majority populations. The lack of multi-stakeholder participation and representation prevented learning by participants within the KatRWUA and the KuisebBMC from impacting on wider social actors, therefore ultimately constraining social learning as a mechanism for engendering wider behavioural change. The greater capacity of historically advantaged actors to participate and represent their stakeholders in such processes also meant that they were more able to influence the processes, thereby maintaining a status quo that was in their favour.

The political ecology framework of analysis that has been drawn on throughout this chapter also revealed how institutional, economic and social capital constraints prevented the translation of learning and cognitive change (section 6.2) into decision making, concerted action or individual behaviour change in the collective and/or environmental interest. Social, political and historical factors converged to hinder the 'action' component of managed social learning from being executed by its participants, supporting observations that interlinked physical and social factors influence human behaviour (e.g. Cassidy, 1997; Bell, 2001). In particular, a pervasive desire for material wealth prevented decision making and concerted action in the collective and environmental interest. This finding was linked to the developing-country status of the case-study contexts and associated pressure for, and primacy of, economic development, which contrasts with the managed social learning approach that is strongly influenced by the ecological objectives of a global set of actors. Consequently, organic learning processes within the wider social context not only challenged institutional legitimacy, but also managed social learning as an agent of change, as observed by Johnson (2007). This finding thereby supports a structural determinist sociological perspective, in which social life resists change through the restriction of individuals acting against the 'flows of collectivism', e.g. structures, norms, beliefs and laws (Redclift & Benton, 1994; Castro, 2008). In this perspective, overcoming tradition is difficult and requires strong motivation, or externally imposed and/or enforced change.

Nonetheless, further examples attest that initial 'risk-takers' overcame social conformity and triggered the propagation of new behaviour (section 8.6.2). These examples conversely support the contrasting theories of human agency, which view individuals as self-conscious actors whose behaviour was influential over 'wider social experience' (Redclift & Woodgate, 2000). *However*, findings suggested that such change first had to synergise with a wider socially-defined value system. As revealed in section 8.6, the dominant value system of actors within the social learning processes, and the wider actors of their respective catchments, aligned with the capitalist and materialist value system that prevails at a worldwide scale. Overall, the contradictory examples within this chapter have revealed the agency-structure debate that is at the root of the social learning discourse, and which is returned to in the following chapter.

Chapter 9

A Personal Perspective of Social Learning: People, Power, Politics, Past and Precedence

9.1) Introduction

The final chapter draws on the findings of previous chapters to construct a personal perspective of managed social learning, which is influenced by the personal experience and worldviews of the researcher, and by the selection of political ecology as a theoretical framework for this research. The chapter commences with institutional synopses, in which the interpretations of the previous four analysis chapters are collated and synthesised. In particular, the synopses address the central questions listed in section 2.4.1, which were highlighted as being of high relevance for the analysis of social learning processes. The synopses provide the basis for the subsequent discussion, in which the research findings are related to the core themes of the political ecology framework: power, wider context and society-nature relations (section 2.3). Throughout the discussion, the research findings are compared against those of the wider literature, which specifically enables the attainment of objective 3 of this research, namely to assess the applicability of social learning approaches to integrated water-resource management.

The chapter moves on to focus on the wider theoretical implications of the research findings vis-à-vis the concepts and understandings of political ecology, integrated water-resource management and social learning that were presented and discussed in chapter 2. Consideration is given to the implications of deficiencies and limitations of the research methodology, in light of the research findings. In the final section of this chapter, the key research findings are summarised, the broader implications of this research are discussed, and areas of future research are considered. Above all, this chapter addresses the objectives of this research, which are to:

1. identify the inter-relationships between the various components of the managed social learning process, including:
    a. between the context and the collective learning and interaction process;
    b. between the learning and interaction process and its outcomes;
    c. between the outcomes and the context;
2. identify the factors that facilitate or hinder social learning;
3. assess the applicability of social learning as an approach to integrated water-resource management; and
4. further inform theoretical debate about participatory learning approaches.

9.2) Institutional synopses

9.2.1) The KatRWUA

The KatRWUA arose from the reform of the KatRIB, an agency which managed the Kat River water resource on behalf of the commercial farming sector. Its transformation was driven by national water-sector reform and subsequently facilitated by RU according to the principles of the integrated water-resource management discourse (section 5.2.1). The reformed KatRWUA included representation from a wider group of catchment-based water users, with the same purpose of allocation but also incorporating an ultimate function as a licensing entity. However, allocation options were constrained by national legislation, such as the mandatory human and ecological reserves (section 7.2). Fundamentally, the proposed allocations could not proceed without the approval of the higher echelon of authority, DWAF. Furthermore, DWAF retained responsibility for the operation of the Kat River dam, which had a twofold effect. First, it had a significant bearing on the resource yield and the ecological condition of the Kat River. Secondly, DWAF retained a practical mechanism for vetoing decisions made by the KatRWUA, as well as the power in principle under the terms of the relevant legislation. KatRWUA participants were essentially involved in bargaining for the water 'leftover' from mandatory requirements and pre-existing scheduled allocations. Nevertheless, the stakes remained high, especially for historically advantaged actors, for whom the failure to present a 'strong case' for their favourable allocations would have had detrimental economic implications (sections 5.5.5 and 7.2). This negotiation process was being overseen by DWAF and facilitated by RU, in order to ensure and engender compliance with wider social and political goals of addressing historical inequality. Thus, although the allocation process of the KatRWUA constituted a relational task encompassing the potential for reciprocity (Craps & Maurel, 2003) due to its inherent need for compromise and negotiation, in reality the activities of the KatRWUA were heavily subject to constraints imposed, and coercion, by external agencies. Despite such oversight and steering, chapters 6 and 7 revealed resistance to change by a minority of participants, who thereby subverted the realisation of theoretical 'appropriate' outcomes and processes.

9.2.2) The KuisebBMC

Despite arising from similar legislative reform, the function and roles of the KuisebBMC were significantly more wide-ranging and loosely-defined than the KatRWUA (section 5.3.3). Although intended to avoid the pitfalls of blueprinting, the lack of a clear function constrained action because, although national legislation *allowed* the KusiebBMC to take on a more active

water-management role within the catchment, it was not mandated and, furthermore, to do so required a positive decision to do so on the part of KusiebBMC members and DWA (section 7.3). This decision had not been taken, partly due to the relational tensions that had arisen from the ambiguity of policy and legislation regarding the locus of decision making responsibility and authority (section 4.7.7). In addition, some participants were content with the status of the KuisebBMC as an information sharing platform, as it had been under the forum's original development project (section 8.5). Thus, in practice, the KuisebBMC operated as a discussion-based, rather than a decision making, forum. In contrast to the KatRWUA, which evolved from an active task-based institution, the KuisebBMC arose out of an EU-funded, education-based environmental management project. The institutional landscape of Namibia, where many functions of water-management were already being carried out by pre-existing institutions, additionally created a lack of 'institutional space' for the KuisebBMC to adopt a task-oriented function (section 8.5). Despite its lack of concerted action and specific goals, the KuisebBMC nevertheless provided an effective arena for multi-way information exchange and interaction between stakeholder groups (section 7.4).

9.3) Constructing a political ecology of social learning

The institutional summaries above provide a basis for the following discussions on the major themes that have emerged from prior analysis. In particular, this section refers back to the political ecology analytical framework utilised by this research and its central themes of power, scale and nature-society relations (section 2.3). The findings of chapters 4-8 have highlighted that the concept of power played a central role in explaining the case-study social learning processes and outcomes. Furthermore, the application of social learning approaches to water-resource management settings inherently rendered multiple scale analysis and nature-society relations of high relevance to this research, in light of the normative backdrop of the integrated water-resource management discourse.

9.3.1) Power relations and social interaction

Findings from chapters 4-7 indicated that both of the case-study processes were suffused with power relations, within and between actors operating at global, national and local spatial scales. Overt and subtle power imbalances contributed to relations of dominance and disempowerment between the different sectors, institutions and individuals of the case-study processes. At a primary level, chapter 4 revealed power asymmetries between the different levels of water management in the South African and Namibian water sectors, with the majority of decision making power and authority vested in state water-management agencies according to national legislation. This retention of significant control by top-down actors rebuts Swatuk's (2005: 872)

assertion that, "the new water architecture propose a profound realignment of decision making power". These higher level structural constraints, both legislative and institutional, were subsequently shown to constrain concerted action by participants of the case-study social learning processes within the context of decentralised water-management. Furthermore, as the concept of integrated water-resource management invokes ideals of decentralisation and devolution, differing expectations of power and authority had caused relational tensions and discord between participants and state agencies, and between implementing agencies and state agencies (section 6.4).

Amongst catchment-based actors, differences in socio-economic status and resource availability enabled the 'capture' of interaction and decision making processes within the KatRWUA by previously advantaged individuals, whose dominance of the proceedings was unequivocal (section 6.4.2). This detrimental outcome was also strongly influenced by the nature of the task at hand, which meant that historically advantaged participants were motivated to defend their stake rather than to consider alternative perspectives and actions, which would ultimately have been to their own detriment (section 7.2). Thus, although a favourable power balance towards state water-management authorities is normatively considered detrimental to participatory processes (e.g. Shackleton *et al.*, 2002b; Tyler, 2006), from a social equity perspective, such intervention was thought to be appropriate in the KatRUWA case study in light of the empowerment and dominance of historically advantaged actors.

The composition of the KuisebBMC meant that few of its members were representatives of livelihoods-based stakeholders located within the boundaries of the hydrological catchment, largely because they only made up a small percentage in terms of their volumetric use of the water resources of the catchment. Such stakeholders felt that institutional representatives of state water-management agencies held the power over decisions and were responsible for action. Nevertheless, both livelihoods-based and non-governmental institutional catchment-based stakeholders welcomed the opportunity to engage with empowered authorities, to potentially influence their decisions, and to hear first-hand about any decisions that would affect them. Furthermore, the willingness of institutional stakeholders to partake in the KuisebBMC had manifested in positive relational outcomes, if not a shift in the actual balance of power.

The domination of proceedings by local historically advantaged stakeholders of the KatRWUA was enabled by another set of power relations: those between the participants of social learning processes and the implementing and facilitating agency. For example, interpretations indicated that the history of RU researchers, as employers and facilitators of projects, meant that some historically disadvantaged participants are likely to have had expectations of RU researchers and, therefore, a sense of obligation towards them (section 5.2.1). This history is in turn thought

to have affected the willingness of such individuals to question the imposition of information and ideals promoted by RU researchers, thereby affording the latter actors a power of influence over the proceedings. In conjunction with power differentials between individual RU researchers, this influence had lead to the privileging of scientific and quantitative information within the KatRWUA process, notwithstanding that legislative requirements and the national ethos of water-management also affected this process (section 6.2.1). Consequently, historically disadvantaged participants also privileged an IT-based decision-support tool, despite their misconceptions of its envisaged purpose (section 6.2.4). This manifestation of the power relationship between experts, scientists and lay participants illustrates Foucault's concept of power-knowledge (see section 2.6), as the scientific and quantitative information supported the perspectives and knowledge of experts and institutional participants. In addition, such information synergised with the understandings (section 6.2.4) and the economic *modus operandi* of historically advantaged stakeholders (section 7.2.3), thereby ultimately contributing to the reproduction of power relations (Bourdieu, 1992). The power-knowledge concept also explains why the ontological perspectives and system understandings of a global set of academic and development actors have become privileged within the water-management sectors of South Africa and Namibia, as such actors have a combination of 'expert' and financial leverage that has enabled their stance to be legitimised and reproduced at lower levels. National-level policy-makers and practitioners are thought to have been under pressure to adopt these perspectives as best practice for legislative endorsement and implementation (section 2.6), whilst many academic and development actors working towards environmental and/or social justice agendas within these national contexts genuinely subscribed to the ideals that such understandings encompass (section 5.4).

Overall, these findings support those of Harrington *et al.* (2008) and indicate that power relations are imbued within social reality; they are multi-scale, and latent or explicit (Lukes, 2005). Power imbalances between the participants of the case-study social learning processes resulted, variably, from differentials in resource access, personality, institutional affiliation and socio-economic status. Ultimately, all these factors were influenced significantly by the national histories of the case-study contexts. The findings indicate the centrality of power relations in the explanation of social learning processes and their outcomes, as power relations limited local capacities of agency, both on the part of historically disadvantaged individuals within the processes, and also on the part of the locally-based institutions to pursue concerted action.

9.3.2) Embedded social learning

Whilst power relations were interpreted as influential in shaping institutional action and individual behaviour (chapters 4-7), chapter 8 also revealed that the political, economic,

physical and social characteristics of the respective catchments and countries affected the play out of the social learning processes of interaction, learning and concerted action. Multi-scale economic factors were identified as being exceptionally influential, as they influenced the motivation and desire of stakeholders. The example of the small-scale farmer choosing economically rational behaviour and the inclination of many residents at the catchment vision workshop to propose economic visions attested to desires for economic and material wealth amongst residents of the Kat River catchment (section 8.6.2). This individual-level desire for material wealth amongst historically advantaged and disadvantaged actors is thought to have been affected by wider level societal features, such as the social status that such wealth confers (section 4.6) and the high intra-national inequality and the developing country status of South Africa and Namibia (sections 4.3 and 4.4). Historically advantaged social actors, both within national contexts and on a wider international level, have set the precedence for affluence and associated living standards, to which historically disadvantaged actors now aspire.

Material accumulation is frequently associated with selfish behaviour (Snooks, 1996; Sheldon *et al.*, 2000; Kasser, 2003). The research findings support this association, as the economic interests at stake within the water allocation process of the KatRWUA meant that prior assertions of learning were negated in practice, with historically advantaged stakeholders manipulating the process to secure their own advantage, thereby perpetuating inequity amongst the Kat River catchment stakeholders (section 7.3). Their increased capacity to participate in the KatRWUA, negotiate for water allocations and engage with the scientific information at hand had been largely produced by the historic advantages of white ethnicity. These findings support those of Waalewijn *et al.* (2005), who conclude that decentralised participatory water-management in the South African context will not be representative or free from power relations until wider society is correspondingly more equitable.

Thus, despite a body of [advantaged] global actors having acknowledged that economically rational behaviour may not be sustainable in terms of social harmony, social equity and/or environmental criteria, the primacy of economic motivation amongst catchment-based South African and Namibian stakeholders contributed to the lack of outcomes matching the ideals of sustainable and equitable outcomes of managed social learning (section 2.5.4). The status of South Africa and Namibia as developing countries within a wider global capitalist economy is considered to have contributed significantly to this situation, through its: reinforcement of power relations; impact on individual motivation to act in the self interest and wider societal desire for economic development, and; constraints on the financial resources of individual actors and institutions, for participation, and for the pursuit and viability of different livelihoods.

The plurality of cultures, and associated linguistic and cultural preferences, of the Southern African context created significant differences in the knowledge and understanding of local catchment-based actors compared with the global discourse, especially amongst historically disadvantaged actors who had historically been denied access to formal education based on Western scientific knowledge. This mismatch had a negative impact on institutional legitimacy and, therefore, their capacity to act and to influence wider behaviour. For example, involvement in the KatRWUA and KuisebBMC by historically disadvantaged individuals was hindered by a widespread unwillingness to pay for water and suspicion of formal registration of water use (a key activity of the KatRWUA). The unwillingness and suspicion were directly linked to recent Southern African history, including: extreme economic inequality and high unemployment; the tradition of boycotting service-provision payments as a protest against discrimination; and a pervasive expectation, endorsed by post-democracy election campaigns, that the liberation governments would provide basic services at no cost in order to redress prior discrimination (chapter 4). Such mismatches between the perspectives and expectations of different actors, both within the social learning forums and between their participants and wider catchment-based stakeholders, prevented the 'representative' participation that was necessary for legitimising the case-study institutions and, therefore, any action taken by them. Overcoming this problem would either require political will to break previous 'promises', which would therefore also risk a decline in voter support. However, such a turnaround may not ultimately have such a detrimental impact in practice, given the lack of alternative political parties (section 4.2.2) to which South Africans and Namibians could resort. For this option to result in 'desirable' change, a unified political stance, followed by visible implementation and/or enforcement, would be needed. Another option is that actors with 'dissenting' perspectives and expectations be invited to participate in processes, in which higher level authorities are willing to negotiate concessions on their own pre-existing stances, in order that a *genuinely* collectively identified solution can be reached. However, research findings suggest that, either way, overcoming 'tradition' is likely to be difficult.

Physical and social factors were also interpreted to have contributed to the lack of concerted action by the KuisebBMC. For example, the climatic extremity and ephemeral nature of the Kuiseb River catchment meant that catchment-based stakeholders resisted behavioural change because of their perceptions of their low impact on other actors and the natural environment (section 8.6.1). This perception was compounded by social factors, such as catchment-based stakeholders' perceptions of water use *in relation* to others (section 8.6.3). Furthermore, the wider social contexts of South Africa and Namibia were interpreted from primary and secondary data to have been characterised by limited bridging social capital, including a lack of networks, a lack of inter-stakeholder trust and intra-community tension (chapter 8). Despite the social learning processes within the KatRWUA and the KuisebBMC having contributed to

limited improvements in relational capital, these pre-existing social capital constraints restricted the necessary processes of participation and representation that allow learning to be transmitted to a wider social scale and, therefore, potential associated changes of behaviour. In addition to the prevalent desire for material gain, the pervasive lack of inter social group trust and networks are considered to limit the ability of 'social pressure' as an enforcement mechanism of behaviour in the collective interest. It is recognised that such concepts implicitly denote, and relate to, social capital, as defined and acknowledged previously in section 2.5.5. However, as the main objective of this research was to analyse the case-study processes through a social learning conceptual framework, its related language and terminology was used rather than that of the social capital discourse. Overall, the historical context of Southern Africa is considered to underlie the social, political and economic obstacles to social learning processes, as the resultant social and resource constraints continued to affect ongoing processes of social learning through their impact on stakeholders' capacity and willingness to participate and, subsequently, to enact the behaviour deemed 'appropriate' by higher level authorities and discourses.

9.3.3) Environment-society relations

Understandings of human relations with the biophysical domain varied amongst wider catchment stakeholders and between participants of the social learning processes. Although the knowledge of participants of the KatRWUA and the KuisebBMC had become increasingly normalised to the understanding of the global discourse through their managed learning processes (section 6.2), those of wider catchment-based actors were characterised by the widespread perception that the natural environment was not under threat, in crisis, or interconnected in the [same] way that hydrological and interdisciplinary academic wisdom perceive them to be (section 8.6). Hence, this difference in knowledge and understandings was interpreted as a contributing factor for the failure of the managed social learning processes to engender subsequent action and behaviour change in the collective and environmental interest.

Findings that participants' and wider actors' perceptions were guided by agendas and desires rather than by 'factual' information alone suggest that society-nature relations are further influenced by wider societal desire. The pervasive nature and primary of demand for socio-economic development amongst catchment-based residents was reflected in the catchment visioning process of the KatRWUA (section 7.2), the development plans for the Kat River catchment (Nkonkobe Municipality, 2006), and the authorisation of prospective mining activities in the Kuiseb River catchment and adjacent areas by the Namibian government (section 3.4.4). Thus, although water-quality data pointed to a relatively low impact of human activity in the case-study catchments to date (Muller, 2005; Lerotholi, 2005; van Langenhove, 2007: pers. comm.), societal desire is likely to drive future biophysical change, and to alter

society-nature relations. According to the perspective of integrated water-resource management, within the broader environment and development discourse, such change is detrimental from an ecological and, ultimately a longer term social, perspective. This interpretation supports wider literature, which critiques the capitalist economic system on the basis that it causes environmental degradation (e.g. Kutting, 2004; Paterson, 2008; Morse, 2008). However, such findings also imply that once a critical level of socio-economic affluence or equality is reached, then society-nature relations may change to incorporate environmental interests, as individuals may become increasingly willing and/or able to place a higher value on the quality of their natural environment.

9.4) Theoretical considerations

These key findings have several implications for the theoretical frameworks and principles that underpin and relate to this research, which were discussed in chapter 2. In particular, the findings have ramifications for the concept of integrated water-resource management, and the associated broader discourse of environment and development, as well as the varied concepts of social learning. As the concept of managed social learning has been practically applied to the field of water management in the case studies, a further theoretical consideration relates to the application of social learning to this context of water management.

9.4.1) Integrated water-resource management

Beyond the broad allocation of water resources amongst the three categories of the triple bottom line (section 2.4), the official South African water-management approach calls for numerical estimates of use and allocation, necessitating that the decision making process of the KatRWUA was taken to a corresponding level of numerical detail for the issuance of licenses. In this respect, the 'new' management approach exhibited little difference from the previous technical management tradition, as it continues to implicitly assume that people are able to calculate the extent of the resource accurately and, moreover, are able to control and enforce its subsequent use (section 4.7.1 and 6.2.1). Thus, whilst the discourse of integrated water-resource management advocates public participation, research findings indicated that this requirement for scientific and quantitative information pertaining to water resources precluded and discouraged the active participation of some stakeholders, especially previously marginalised stakeholders. This contradiction is thought to be of particular salience for the practical implementation of integrated water-resource management in developing countries, where populations are unlikely to have large populations that have been exposed to formal Western-style education.

Research findings suggest that the concept of integrated water-resource management also overlooks politics and power relations. Incumbent governments of South Africa and Namibia

retain high levels of authority by virtue of their overwhelming majority support base and lack of opposition. Political goals are heavily influenced by the demands of majority or of powerful social actors. Although balanced decision making may be optimal from a social and environmental justice ethos, previous data analysis indicated that both majority and powerful groups' desires were related to economic reward. Furthermore, the research findings suggested that local level motivation and desire for economic development and increased socio-economic affluence outweighed concerns about the natural environment. Swatuk (2005) and Funke *et al.* (2007) also observe that the implementation of integrated water resource management in South Africa is constrained by a lack of 'buy in' to the concept on the part of local actors. It is therefore considered unlikely that decision making pertaining to the management of water resources will be 'balanced', according to the notion of the triple bottom line (section 2.4), in the immediate future of the developing country contexts of South African and Namibian due to the wider social, political and economic forces that encourage deviation from this ideal towards decisions that engender more tangible and immediate socio-economic rewards. This analysis also highlights a further contradiction within the integrated water-resource management concept, as ideals of optimal holistic decision making may not necessarily match those of decentralised actors. These findings are in accord with a wider body of literature, which attests to the widespread failure of integrated water-resource management as a framework for realising sustainable water management in developing countries (Biswas *et al.*, 2004; Merrey, 2006). A final salient point relating to the concept of integrated water-resource management is that its ambiguous definition (section 2.4) renders any judgement of whether decisions are 'balanced' inherently subjective, which is made further difficult because the criteria generally used to assess each dimension are variable, thereby complicating their comparison.

9.4.2) Managed social learning

First and foremost, observations that the case-study processes involved variable elements of external education (section 6.2) contradict common portrayals of managed social learning as a constructivist approach that allows for a multiplicity of perspectives based on the differing 'realities', world views and experiences of participants (e.g. Lave & Wenger, 1998; Pahl-Wostl & Hare, 2004; Taylor *et al.*, 2006). As learning is assumed to lead to behaviour and action outcomes (figure 2.3), this observation inherently implies that managed social learning can be used to trigger specific 'desirable' behavioural outcomes (sections 2.5.3 and 6.2.2). The interpretation of social learning as an education process thereby further implies that social learning is a subtle form of coercion, made possible by the power relations that were discussed in section 9.3.1. In this way, managed social learning is rendered more akin to the concept of social engineering that denotes the manipulation of popular social behaviour by an actor or group of actors (Podgorecki *et al.*, 1996). Nevertheless, this concept of social learning

inherently ascribes a power of agency to the participants of this process, such that they can then act upon their new knowledge and understanding (section 2.5.3).

However, the subsequent failure of case-study participants to realise intended behavioural outcomes, either individually or collectively at the institutional level, indicated that other factors influenced both learning and behaviour (chapter 7). Motivation to participate, motivation to accept knowledge as a basis for action, and wider structural constraints, were identified as major factors governing this outcome. Chapter 8 revealed in detail how the chain linking information, learning and behaviour (figure 2.3) was hindered in practice by the wider structural constraints of hierarchal institutional frameworks, ambiguous legislation and wider economic structures, as well as internal constraints associated with motivation and self-efficacy. Section 9.3.2 later highlighted how both external and internal constraints were influenced significantly by the historical contexts of the respective catchments, thereby implying that historical contingency is a fundamental determinant of the ability of social learning processes to achieve their desired outcome of behaviour change and action. As a consequence, Kolb's (1984) theory of learning did not arise amongst the majority of learners, or this fourth stage had not been reached by the process, as this theory requires that learning be expressed as an action (section 2.5.1).

Furthermore, whilst double-loop learning (a learning-stimulated realignment of world view and rethinking of purpose and operational goals) was identified in chapter 2 as an additional theoretical outcome of social learning, this research found no evidence of double-loop learning within the case studies, amongst either individuals or the wider water-management sector. Instead, water-related decision making and action continued largely on a 'business as usual' basis, albeit with increased transparency and goodwill in the KuisebBMC case study. This outcome is likely to result from the continued top-down nature of water management and retention of power by traditional state water-management authorities (section 4.8), who were ultimately under significant pressure to meet political development goals of economic development and popular demands for agricultural development, and to therefore continue pursuing supply-side rather than demand-side management strategies. At an individual level, the prevalent desire for material wealth of catchment residents, to which the social learning approach was applied, further prevented a realignment of individual worldviews. These insights indicate that the second phase of action envisaged by managed social learning was constrained by wider contextual factors, via a socialisation process that normalised existing behaviour, thereby perpetuating the status quo. In turn, this finding reveals that a key underlying principle of the managed social learning concept, that learning alone triggers behaviour change, is flawed. Whilst this finding does not overlook the positive social and relational outcomes (section 6.4), which are of high significance to the case-study contexts of high societal tension and mistrust (section 4.2.1), it nevertheless illustrates that a managed social learning approach cannot be seen

as a 'quick fix' or panacea solution to water resource 'problems' that are linked to human activity, principally because additional factors were also observed to affect human behaviour within the case-study contexts. Consequently, overlooking the two examples provided in section 8.6.2, which supported a humanist perspective of agency, the observations of this section primarily support a structuralist determinist sociological perspective when viewed in isolation.

However, according to analysis and interpretations in section 9.3.1, power relations interfered strongly with this prevention of change in both water-management approach and wider social behaviour. Within the case studies, relations of dominance and disempowerment impacted positively or negatively on individual agency. This observation, that social interaction played a significant role in governing wider social outcomes as well as individual action, synergises strongly with the sociological interaction paradigm, in which interaction mediates between wider societal structures and its individual components (Sawyer, 2005). Thus although limited examples within the dataset intimated that the paradigm of structural determinism affected local capacity of agency, further examples overwhelmingly demonstrated that human agency was more significantly influenced by the nature of interaction between individuals within the social learning processes. Furthermore, social interaction on a wider scale also impacted on wider societal outcomes via the pursuit of economic development that was called for by empowered actors of both case-study contexts, which in turn had influenced the desires and expectations of historically disadvantaged actors.

Nevertheless, the findings of section 6.4.1 demonstrated that positive relational change had resulted from individuals learning about each others' character, trustworthiness and legitimacy of views through interaction within a group context, and access to information regarding others' use of water. The observed relational outcomes support the findings of Forrester (1999) and Schusler *et al.* (2003), as well as assertions that social learning processes foster networks across previously disparate social groups (e.g. Eames, 2005). In particular, the 'unthreatening' nature of the KuisebBMC forum allowed social capital to be generated, including goodwill and trust between most participants, social networks, transparency and accountability. Although such outcomes have not translated into concerted action to date, the potential for action and, therefore, change in the longer term is thus considered to have significantly increased. In contrast, after the fieldwork for this research had finished, one KatRWUA member resorted to legal means to solve an ongoing conflict with dominant actors and their related exclusion from the water-management process (section 7.4). This observation indicates that dialogue-based approaches may not necessarily always be the optimal approach for solving natural resource conflicts, particularly in contexts where pre-existing power imbalances between local stakeholders are significant and the nature of the conflict has severe, direct implications for livelihoods. This interpretation in turn indicates that a critical awareness of the social dynamics

of the context should be a pre-requisite to the application of interventionist environmental-management approaches.

9.4.3) Combining social learning and integrated water-resource management

That the case-study social learning processes had strong educational elements when applied to the contexts of water management was ascribed to the strong normative backdrop of integrated water-resource management. Thus, although a constructivist perspective ideally "allows an understanding of different points of view from within a situation, without an imperative to choose between them" (High *et al.*, 2004: 3), the discourse of integrated water-resource management encompasses specific perspectives: that the current state of society-nature relations is unsustainable in terms of ecological functioning, and that the economic and environmental values of water should both be realised (section 2.4). Furthermore, whilst a constructivist epistemology acknowledges that 'reality' is subjective, variable and socially constructed; the integrated water-resource management discourse is underlain by a critical realist perspective, which accepts biophysical and social interconnection as fact. Thus in practice, as the wider understandings of many catchment-based stakeholders differed from the understandings and perspectives of the integrated water-resource management discourse (section 8.6.1), the managed case-study social learning processes incorporated capacity-building and educational activities designed to foster local alignment with the knowledge and ontological perspectives of the global discourse (section 6.3.1).

In this way, capacity-building activities and projects transmitted global ideals, understandings and perspectives to lower level actors (section 5.2.3). As a consequence, learning processes within the case studies inherently involved the replacement of pre-existing multiple and/or alternative perspectives with those of the integrated water-resource management discourse, which perceives water resources as being in crisis due to detrimental society-environment relations (section 2.4). These observations reveal the contradiction that stems from the application of social learning theory to the context of environmental management, as the application of social learning to the power-laden context of water management meant that the understandings, knowledge and perspectives of the global discourse became privileged over those of local stakeholders, despite a theoretical constructivist principle of the equality of knowledge and, therefore, lack of a universal truth (Fleury, 2001; Windshitl, 2002). Social learning as a water-management approach is therefore viewed as strongly ideologically driven.

However, in spite of the significant power differentials between global and local actors, concerted action and behavioural change on the part of catchment-based did not arise from the learning processes imposed by top-down actors. This outcome is explained by further sets of

power relations. For example, the political goals of South African and Namibian governments – of social equity – did not necessarily synergise with the longer term and environmental dimensions of the scientific perspective of integrated water-resource management, as restrictions on water use in the ecological interest limit economic development activities. The ultimate authority for decision making and sanctioning of action rested with the governmental actors according to statute. Furthermore, the findings of chapter 7 indicated that managed social learning approaches do not necessarily lead to sustainable and integrated management outcomes in the socially equitable and environmentally non-detrimental manner envisaged by the global discourse, as these outcomes did not synergise with those sought by the *dominant* social actors of the case-study and/or the desires of majority populations.

In order to negate these power relations, and to produce genuinely collective knowledge and decisions regarding acceptable solutions and actions, social learning within water management requires skilled facilitation and implementation (e.g. Hagmann & Chuma, 2002). However, such roles were observed to be complicated by the highlighted contradictions between, and ambiguity of, the multiple agendas of the integrated water-resource management discourse and, therefore, the South African and Namibian national water Acts that were largely based upon this discourse (section 4.7.7). These contradictions and ambiguity placed the facilitators of the KatRWUA in a 'Catch 22' situation. For instance, although early concept of social learning as an approach, including action research (section 2.5.3), emphasise the 'self-discovery' of problems and solutions (Freire, 1996; Chambers, 1997; Figueroa *et al.*, 2002), the normative discourse of integrated water-resource management meant that water resources, their issues, and their solutions, had already been framed in specific ways. This observation supports McFarlane's (2006: 1) assertion that, within the broader context of development, "there is a pervasive rationalist conception of knowledge and knowledge transfer as objective and universal", which is reproduced by powerful organisations. Such knowledge transfer was observed within the case study processes, where the representatives of stakeholders with differing views and perspectives either realigned them to those of this discourse within the social learning processes, or eschewed the processes altogether due to motivations not to accept such knowledge as 'correct'.

A further contradiction arose from the RU researchers' emphasis on facilitating the participation of historically disadvantaged actors in formal water-management processes through additional targeted educational activities (section 5.4). Although designed to assist such actors to participate in formal water-management, such activities are interpreted to have reinforced feelings of low self-efficacy amongst such groups, as reflected in the comment of a historically disadvantaged KatRWUA participant that, "we just can't seem to do things for ourselves, that's when it all goes wrong". In this way, the intervention intended to overcome historical imbalances in power ultimately, inadvertently reinforced them. Although this observation did

not apply to all historically disadvantaged individuals (cf. cases in section 7.4), this dependency mentality ultimately presents a risk to the use of managed interventionist approaches as a means for realising change/action, as they created or reinforced an impression amongst some local and historically disadvantaged actors that such outcomes would not otherwise be possible.

Another key dilemma that resulted from the application of participatory approaches to water-resource management also relates to stakeholder participation in the wider societal context of high socio-economic inequality. In the KatRWUA case study, the water-management approach of DWAF, as well as the process implementation and facilitation by research-oriented actors necessitated stakeholder engagement with scientific and quantitative information (section 6.2). Involvement in the KuisebBMC on the part of research-oriented and institutional organisations meant that technical information and terminology was also used frequently within the KuisebBMC forum. However, the observations that some participants were variably unable to analyse such data, question their outcomes and recognise their limitations (section 6.2.4), supports calls that science be viewed as a 'tool' for providing information to decision makers rather than as an objective or optimal 'solution' to environmental issues in isolation (Freyfogle & Newton, 2002). Nevertheless, research findings revealed that even the use of science as a tool may be problematic due to these differences in individual capacity, as they had contributed to the dominance of historically advantaged participants in both case-study forums (sections 6.2.4 and 8.2.2). These findings necessitate that managed social learning processes be implemented with due and unbiased consideration of stakeholder diversity, which may in involve the need to use a variety of media, languages and networks to disseminate information. Although such activities would increase the likelihood of social learning processes being more inclusive, they would also require significant resources for practical implementation and may not, therefore, constitute the best option for developing countries.

Ultimately, under concepts of social learning, it is assumed that access to new knowledge, people and perspectives transform underlying attitudes and values, which ultimately modify society-environment relations for the longer term and environmental interest. However, such outcomes were prevented by the wider social context of the case studies, which affected behaviour because of conflicting motivations and desires. This observation highlights a major incongruity between the assumptions and ideals of laissez-faire 'participatory' approaches and the reality of social situations: the former approaches presuppose that humans are social, altruistic and equal versus the observed 'reality' of the case studies, in which some actors were selfish, economically rational and individualist. This finding should be placed in the wider context of a global capitalist economy, which means that people are compelled to pursue livelihoods based on the attainment of economic gain to function within contemporary society. Some social commentators attribute the decline in the traditional and collectivist African ethos

of 'ubuntu' [23] in the face of this emergent capitalist culture, which is characterised by individualist, consumerist and materialistic aspirations (e.g. Tutu quoted in BBC, 2006; Makhanya, 2009).

The above analysis suggests that the developing country contexts and specific historical trajectories of the case studies impacted detrimentally on social learning processes via multiple and complex interlinkages. In contrast, reports of 'successful' managed social learning processes, i.e. those which have produced more environmentally sustainable environment-society relations, mainly relate to processes undertaken in developed countries, where, variably: socio-economic inequalities are less extreme, a common language generally prevails, the majority of populations have a formal education background that is rooted in Western scientific understanding, and national agencies are increasingly willing to actively adopt demand-management and integrated-management strategies (e.g. European HarmoniCOP and SLIM social learning projects[24]). The relative heterogeneity of South African and Namibian societies, which is linked to their historical contexts, may therefore constitute a further explanatory factor for the lack of tangible outcomes and action of social learning processes to date.

The above interpretation of the negative impact of a wider capitalist economy on human behaviour in the environmental interest also supports the critique of the sustainable development concept that was alluded to in section 2.4. For example, several theorists variably criticise the notion of sustainable development as being: an oxymoron; a form of post-colonialism that, at best, retains a historic 'we-know-best' attitude; and as a hypocritical and concerted restraint imposed by Western nations to maintain the *status quo* in their favour (e.g. Escobar, 1995; Pieterse, 1998; Brunel, 2004; Amin, 2004; Morse, 2008; Park *et al.*, 2008; O'Brien & Leichenko). In conjunction with this wider body of literature, the research findings thereby suggest that 'environment *versus* development', rather than 'environment *and* development', may be a more appropriate framing the society-environment relationship within the overarching context of a capitalist political economy.

A final consideration relating to the application of managed social learning to a water-management context is that in doing so, a wide range of theories from psychology, education, management, ecology and sociology were woven together, incorporating theories with a diverse set of assumptions. The research findings indicated that this "pic 'n' mix" approach is flawed, as such assumptions did not always play out in reality and/or contradicted each other within the

[23] 'Ubuntu' is a humanist ethos that defines the individual within a wider web of social relations (Schutte, 1993). The phrase, 'I am because we are' is often used to represent the concept of ubuntu in English. Ubuntu evokes the sense that individual identity is defined by a greater collective identity and that individual action should be carried out in the interest of the whole (Swanson, 2007).

[24] See websites at: http://www.harmonicop.uos.de/ and http://slim.open.ac.uk/page.cfm for further information

broader settings of water-resource management and developing countries. Moreover, observed similarities between the concept of managed social learning and other approaches within the environment and development discourse (as highlighted in specifically section 2.5.6 and at other points throughout this thesis) imply that proponents of managed social learning have primarily re-packaged and re-labelled existing concepts. For instance, although its proponents reposition social learning as 'above and beyond' participatory approaches, this claim is restricted by the fundamental consideration that managed social learning approaches cannot practically take place without participation. Indeed, the findings of this research indicated that the restricted participation of social actors within the case-study processes contributed to the lack of subsequent action (section 5.5.3), which is envisaged as a key element of social learning. Consequently, it is considered here that the amalgamation of theories and concepts within a managed social learning conceptual framework that the case studies adopted does not shed significant further insight into the social processes surrounding environmental management, beyond those of the pre-existing participation discourses. Furthermore, the application of social learning as a management approach within the case studies did not result in changes to intra-society or society-nature relations. This approach is therefore perceived to offer little in the way of a solution to natural resource 'problems', if indeed these 'problems' are caused by detrimental social behaviour and inter-relations. Fundamentally, the research findings have indicated that the application of social learning to the context of water-resource management encompasses a series of tensions, between:

- The power of social structure versus human agency;
- Individual behaviour in the collective versus self-interest;
- The agendas of multi-scale water managers; and
- Environmental, social and economic development objectives of multi-sector stakeholders.

9.5) Methodological implications

Data collected via different methods was sometimes contradictory, as demonstrated by the example in section 3.5. In addition, observations noted the difficulty of separating data from latent power relations, motivations and agendas. The triangulation approach of this research process is therefore considered to have constituted an appropriate data-collection method, as the multiple data sources not only improved the validity of the conclusions drawn from the dataset for the reasons discussed in section 3.5, but also exposed some of the aforementioned subtleties when interpreted in light of one another. For instance, the findings of section 6.3.1 indicated that case-study participants had recognised a 'normative' behaviour, which had in turn influenced

interview responses provided to researchers, including myself, whom they associated with environmental and/or development agendas (section 3.7).

Ethnographic data-collection methods were further justified by the findings that features of the local socio-economic context influenced the processes under study, as much of the information of relevance to this analysis was assimilated via such methods. The research findings that issues of scale, power and structure affected social learning processes and human behaviour also support the multi-scale analytical framework of political ecology. By encompassing elements of both structural determinism and the interaction paradigm sociological perspectives, the political ecology framework was rendered an ideal lens for this research, through this ontological opposition to the human agency perspective of social learning theory. As such, the use of a political ecology framework inherently entailed a critical evaluation of social learning processes. Improved understanding of social learning in the context of water management is considered to have been yielded through the use of this critical approach and, therefore, the achievement of research objectives 1 and 2 (section 9.1).

Inherently, the determination and evaluation of the processes and outcomes associated with social learning requires time and resources. Whilst the resource burden of such research can be restricted to the researcher, the research process indicated that the time burden cannot, as erroneous interpretations were initially made from the use of observational data alone (e.g. section 3.7.1). However, as significant levels of research had already been conducted amongst social actors of the two case-study catchments (section 3.5.1), this time burden posed a considerable obstacle to the collection of such data from an ethical perspective. The consequential reduction of proposed interactive research activities meant that my own bias and positionality may therefore have influenced the research findings more than they would have done if less-researched case-study institutions and areas had been selected, which would have allowed increased interactive research activities from both practical and moral perspectives. The interpretivist perspective of this research nonetheless dictates that data analysis and, thus, the research findings remain subjective.

Of further significance to the research findings were temporal parameters. As the research was carried out within the time frame of a PhD programme, the findings of this research are based on a specific temporal 'snapshot', whilst social learning is viewed as a longer term and multi-step process (Craps & Maurel, 2003). The limited periods of fieldwork, upon which this analysis and subsequent findings are based, may therefore account for erroneous and/or incomplete interpretations within this research when compared against those made in future over a longer time period. For instance, double-loop learning may yet be achieved over longer time periods, especially on the part of the KuisebBMC participants, whose participation was

predominantly less linked to personal reward compared with KatRWUA members. Nonetheless, it is expected that these findings can support, and assist with, the future implementation of managed social learning, and to inform debates on human behaviour and decision making with regards to environmental outcomes. Additionally, although the use of case studies can limit the 'generalisability' of research findings (sections 3.2 and 3.4.1), it is reasonable to assume that these research findings retain wider applicability, as the major constraints of the case-study social learning processes were related to higher level structures, which therefore remain relevant on a wider basis.

9.6) Research overview

9.6.1) Summary of findings

The research has highlighted that processes envisaged by the theoretical concept of managed social learning played out at an internalised individual level, but that an ultimate vision of behavioural outcomes was largely restricted by structural constraints and/or subverted by power relations. The findings of this research are based on empirical data collected from two case studies. Overall, they indicate that social learning is unsuccessful as both a conceptual and practical approach when applied to the context of water-resource management, due to constraints associated with power, politics, history and precedence. The key findings of this research are summarised as:

- Decision making power ultimately resides with national government within the contexts of water management in South Africa and Namibia, as decentralisation can only exist with national government authority according to statute, and even once devolution of such power has been sanctioned, caveats in the relevant water legislation allow central government to recoup this authority, at any time and without justification (chapter 4);

- Participation and representation of diverse stakeholders in participatory institutions are affected by resource capacity, motivation, institutional objectives, and institutional history. These factors facilitated the participation and representation of historically advantaged compared with historically disadvantaged actors (chapters 5 and 8);

- Multi-stakeholder interaction and collective learning processes in the South African and Namibian contexts are problematic due to social capital constraints, power relations and high social inequality (chapter 6);

- Whilst social actors create understanding through experience, interaction and education processes; they simultaneously operate within structural and social capital constraints, which are time and space specific. Thus, learning alone does not produce behavioural change and collective action (chapter 7);

- The five Ps are key determinants of the nature and outcomes of managed social learning processes: power relations, politics, precedence, personality and the past (chapter 8);

- A favourable wider social and physical context is a pre-requisite for managed social learning, as a process that leads to concerted action and collective behaviour change (section 9.3);

- Managed social learning is a normative and ideologically driven approach when applied to the context of water-resource management, which requires significant financial resources to implement (section 9.4);

- The limitations to pre-existing concepts of participatory approaches are not overcome by simply reframing and renaming them (section 9.4);

These findings meet the original research objectives that were outlined in section 3.2 and represented at the onset of this chapter. However, two final sub-sections briefly consider the implications of this research for future research and practice.

9.6.2) Recommendations

The research has indicated that a managed social learning approach to water-management is inappropriate in contexts where historical factors had created significant inequalities and disparities between participants, as such inequalities were ultimately perpetuated, rather than overcome, by such an approach. As such, critical consideration regarding when and where to implement such approaches is necessary. If decisions are made to apply managed learning approaches, it is further recommended that due consideration is given to the social, physical, legislative and institutional contexts prior to their implementation, in order that the tensions embedded within the application of social learning to water-management contexts (section 9.4.3) may be mitigated from the onset. However, as the research findings overall synergise with an emerging body of literature relating to the limited success of participatory processes in developing countries (e.g. Guijt & Shah, 1998; Cooke & Kothari, 2001; Mansuri & Rao, 2004), it is recommended that top-down approaches to natural resource management are not abandoned altogether, especially in developing countries. Instead, efforts to provide higher level authorities

with sufficient human and financial resources may be more appropriate, in order to increase their institutional ability to make a genuine commitment to: facilitating and encouraging wider stakeholder input into decision making processes, taking such input into consideration, and then publicly justifying and accounting for the decisions that are made based on such input.

9.6.3) Areas for future research

Temporal parameters of the research restrict the wider applicability of the findings of this research (section 9.5). Thus, as the case-study processes are ongoing, revisiting them would add temporal depth to this research on the processes and outcomes of social learning, which is, in theory, a dynamic process. Continued ethnographic and interactive research over a longer timescale would provide a longitudinal dataset, which would enhance insight into social learning processes. In particular, a longer timeframe would potentially allow research into the reflection phase of the learning cycle that forms a key part of social learning theory, but which was prevented by the lack of concerted and/or collective action at the time of this research.

A further area for future research stems from the observation that the outcomes of social learning processes differ between those occurring within relatively homogenous and economically developed Western contexts and the developing and socially diverse nature of the case-study contexts (section 9.4). This observation is further supported by the relative success of the KuisebBMC, whose membership was more 'European' in terms of diversity (linguistic, cultural and ethnic) and in terms of socio-economic affluence and pre-exposure to Western education systems, compared with the membership of the KatRWUA. Such observations indicate that there may be a 'threshold of diversity' within a society, above which conflict arises, rather than the cooperation that the managed concept of social learning envisages, notwithstanding that defining 'societal homogeneity' would present a significant challenge. Nonetheless, in light of this interpretation, research focussed on a comparison between social learning processes in developed and developing countries may shed further insights into the inter-relationship between cultural diversity and social learning.

A final key area for future research is related to the observations that power relations played a significant role in terms of explaining the social learning processes of the case studies through their impact on individual and institutional: capacity to act, discretion to act, inclination to act and ability to influence others. However, concepts of power remain vague and variable amongst the literature (e.g. Veneklasen & Miller, 2007; Sandstrom, 2009). Therefore, theoretical and methodological improvements concerning this research's central theme of power, including conceptualising power, measuring power, and evaluating its impact on social processes, would

improve the validity of research and facilitate comparisons of research findings across different cases and contexts.

9.7) Concluding the personal perspective: A final word

This research has found that the theoretical concept of social learning, as a means for triggering social change and/or the modification of society-environment relations, was limited within the case studies by a set of hindering factors. Nevertheless, as my personal ontological viewpoint currently synergises strongly with the moderate constructivist perspective of critical realism, I support the assertion of Figueroa *et al.* (2002: 2) that, "theories are not right or wrong, only appropriate or inappropriate given the circumstances and the nature of the phenomenon to which they are applied"...if only power within the social setting could be as easily manipulated, as the notion of physical power developed by Watt (e.g. Marsden, 2004).

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Appendix 1: Pointers used for participant observation notes at meetings

- Where is the meeting taking place?
- What time?
- Who defined the agenda?
- What is happening?
- Who is dominating proceedings?
- Is there a natural 'spokesperson' or elected one?
- Is there a 'representative' mix of water users (gender, age, user type, ethnicity)?
- How do participants interact, both formally and informally? (e.g. do they stay within user groups, gender groups etc. during working sessions and breaktimes?)
- What type(s) of information is available and/or presented at the meeting? By whom?
- What kinds of decisions are being made?
- What kinds of action proposed?
- How, and by whom, are actions implemented and or carried out?

Appendix 2: Questionnaire given to KatRWUA members

Quick questionnaire

Since becoming a member of the KatRWUA...	Agree	Ambivalent	Disagree
I have learned new things about water in general	☐	☐	☐
I understand other stakeholders better	☐	☐	☐
I have learned new things about the Kat River Valley	☐	☐	☐
I know more about the different uses of water	☐	☐	☐
I feel more positive about water management in S Africa	☐	☐	☐

1.) Who do you think is the most important person/group of people present at the WUA meetings? Why?

2.) Which meetings/workshops/research since you became a member of the WUA have been the most useful for helping you in your role as member of the KRWUA [please feel free to list more than one]? Why?

3.) Is there anyone in particular at the WUA meetings who you feel that you have learnt a lot from? [Who, and what kinds of things did you learn?]

4.) Who do you think has been the strongest force in getting the WUA to its present state?

5.) Does your household treat or purify water at home for drinking water purposes? [If yes, how?]

6.) In your opinion what is the main way by which the Kat River becomes polluted?

7.) Has anything that you learned at the WUA meetings changed the way that you do anything today?

8.) If I gave you a glass of water from an unknown source, how would you know if it was dirty or not?

9.) How do you think water use in the Kat valley will change in the future?

Appendix 3: Questionnaire given to KiusebBMC members

QUICK QUESTIONNAIRE

Since becoming a member of the KBMC...	Agree	Disagree	No change
..I have learned new things about water in general	☐	☐	☐
..I understand the other stakeholders better	☐	☐	☐
..I have learned more about the hydrology of the Kuiseb	☐	☐	☐
..I know more about the different uses of water in the Kuiseb	☐	☐	☐
..I feel more positive about water management in Namibia	☐	☐	☐
..I am more 'environmentally aware' than I used to be	☐	☐	☐
..I think that it is important for all sectors to be involved in water management	☐	☐	☐
..I feel that decisions on water allocation are more fair and equitable now than they used to be	☐	☐	☐

1.) What do you think are the main issues regarding water in the Kuiseb basin?

2.) What is the most important thing that you have learned through participating in the KBMC?

3.) Has anything that you have learned at the KBMC meetings changed the way that you do anything today?

4.) Is there enough water in the Kuiseb for humans and the natural environment? Please explain why/why not

Please indicate on the table below which attitude best describes your feelings towards other stakeholders. Please try to remember as accurately as possible how your attitude towards the other stakeholders was at the very first meeting compared to how it is today.

Attitude towards:	**Before the KBMC**			**Today**		
	Positive	Neither	Negative	Positive	Neither	Negative
Gobabeb training centre						
Topnaar community						
Commercial farmers						
Walvis Bay municipality						
Department of Water Affairs						
NamWater						
Rossing Uranium						
Ministry Environment & Tourism						
Directorate of Rural Water Supply						
Desert Research Foundation of Namibia						
Erongo regional council						
Khomas regional council						

Please indicate on the table below how often you had contact with the other stakeholders before the KBMC and today

Contact with:	**Before the KBMC**			**Today**		
	Never	Occasional	Regular	Never	Occasional	Regular
Gobabeb training centre						
Topnaar community						
Commercial farmers						
Walvis Bay municipality						
Department of Water Affairs						
NamWater						
Rossing Uranium						
Ministry Environment & Tourism						
Directorate of Rural Water Supply						
Desert Research Foundation of Namibia						
Erongo regional council						
Khomas regional council						

Many thanks for your time in completing this questionnaire
Helen Brown

Appendix 4: Focus group with water users (5-8 people)

Intro: Stress impartiality, confidentiality, and no right or wrong way of answering
Refreshments provided (package of tea, coffee, sugar and biscuits)

Point 1: [linkages between systems, scale]

There is already a large dam on the Kat River at Seymour. What are the good points of having a dam? What are the bad points?

Do people generally feel that the dam is a good or bad thing? Why?
Has it affected lives in [village]? In what way? Positively or negatively?
Has it affected the way that the river flows or the plants and animals that are in the river (positively or negatively)?

Point 2: [linkages between water-livelihoods]

Have you experienced any changes in the rainfall over the last 10-20 years?

Some scientists believe that rainfall reliability will decrease over the next few years – it will become more unpredictable:

What do you think will be the possible effects on your lives if the amount of rain is reduced and becomes less reliable? Why and how?
Do you think these predictions are reliable? Why/why not?

Point 3: [linkages between water and land-use]

How do dongas (erosion gullies) form?
Are there more or less than there used to be?
Why?

Do you think that people in the community 'waste' water? If so, who? And how?

Point 4: [value of water, linkages between water-economy-health]

I saw it written in the newspaper last week that "everyone should have as much free water as he/she wants". What do you think about this?

Who should/shouldn't pay for water?
Why/why not pay for water?
Why do you think that some people in some places have to pay for water?

Point 5: [links between ecology and society]

In South Africa, the new government legislation says that we should leave enough water in the river for the plants and animals that live there. What do you think about this?

How can we know how much water the river needs?
Who should decide this?
Would it cause problems if there is not much rain and you also need the water in the river?

Appendix 5: Individual interviews with water users from an Upper Kat community

Water use [relationship with water]

1. What do you use water for?

2. Where does your water come from? (list **all** sources used)

3. Do you prefer the water from rivers, taps or rain? Explain why/why not

4. Are there any purposes for which just men use water?

5. Are there any purposes for which just women use water?

6. Do you use water for any religious, spiritual or ritual purposes? (How? Does this have to come from a specific source? Does it have to be cleaned first?)

7. Do you use water to grow crops?
   - What kind of irrigation do you use?
   - For subsistence/sale/both?
   - Do you own the land on which you grow the crops?
   - Do you pay for water use for this purpose?

8. Do you own any livestock?
   - How do they get their drinking water?

9. Do you pay for any water?
   - Who do you pay and how much?
   - Do you use this water for a specific purpose?

10. Who do you think in your household uses the most water?
    - Why?

11. Where does dirty or wastewater from washing and cleaning go?

12. Where does wastewater from the toilet go?

13. Do political parties use water in their election campaign?
    - How?

Water issues [understanding of water system, social learning]

14. Could you rank how important the following water issues are to you (1-4)
    - Water availability
    - Water pollution
    - In-dwelling water supply
    - Water for nature/the environment

15. Do you think that the importance of these will change in the future?
    - How and why?

16. What is your main priority from the Kat River?

17. What does the river mean to you?

18. Do you think that other people in the valley have the same water issues?
    Why/not? (who does/doesn't?)

19. Is water reliable? (if not, why not and when unreliable?)
    Tap
    Rain
    River

20. Is water clean? (if not, why not and when dirty?)
    Tap
    Rain
    River

21. How do you know if water is 'bad'? (e.g. smell, taste, colour, vegetation)

22. Are there any diseases that are caused by dirty water?
    Do any of these diseases ever affect people in this community?

23. Do you ever talk about water issues with your family?
    What do you talk about?

24. Do you ever talk about water issues with your friends?
    What do you talk about?

25. Do you hear about water issues from anywhere else (e.g. TV, radio, newspaper, govt)?
    What do they tell you?
    Do you do this? How?

26. If we change the water in the river here does this affect anyone else in the valley?
    Who? or Which villages?

27. Do you think that water in the river is connected to water in the ground/soil?
    Why/not?

28. Where does the Kat River start and where does it go to?

29. At what level should water be managed? [e.g. the village, district, whole river area]
    Why this level?

30. How does the river become polluted [unclean]?

31. Do you think that people living by the river in Fort Beaufort have a cleaner or dirtier river?
    Why?

Social learning [social learning; roles, empowerment, information]

32. Do you think that there is anything that you personally could do to improve the amount of water you have access to?

What?

33. Do you think that there is anything that you personally could do to improve the cleanliness of water in the river?
What?

34. Who do you think should be responsible for providing a clean water supply (e.g. local government, national, community, private, everyone)?

35. How can we use water wisely and not waste it?
How did you know about this?

36. Are you aware of any ways by which we can clean water/make it safer for drinking?
How did you hear about these?

37. Do you 'clean' [purify] water at home?
When?
How?
Why?
What sort of water do you clean?

38. Is there any sort of information on water that you think you need, which you are not getting?
Why?

Timeline [temporal aspect]

39. Do you think that water reliability has improved over the last few years?
Why/why not?

40. Do you think that access to water has improved over the last few years?
Why/why not?

41. Do you think water cleanliness has improved over the last few years?
Why/why not?

42. Has your household changed the way in which it uses water over the last 10 years?
In what way? [more or less?]
Why did you make this change?

43. It has rained a lot this year, has this caused any changes to your everyday life?
How?

44. When it rained earlier this year, did you collect any of this water at your home?
Why/why not?

45. Has there ever been a time when you couldn't get enough water?
When?
How did this affect your life?

46. Has water use in the Kat area changed over the last 10-20 years?
How do you know this? (e.g. personal experience, observation of others)

47. How do you think water use in the area will change over the next 10 years?

Roles, responsibilities and allocation

48. Do you think that you have an important role in managing water resources in the area?

49. When a dam/tap is constructed, are people in the community consulted?
By who?
How?

50. Who is responsible for controlling the releases from the Kat River dam?
Do you know when water is going to be released? How?
Do they let enough water through?

51. Are you aware of the KRWUA and their function?

52. Are you familiar with the term 'ecological reserve'?

Respondent information

Age	under 20	20-30	30-40	40-50	over 50

Gender	Male		Female	

Education level	

Occupation	

Employment	Seasonal		Permanent	

	Yes	No
Have you ever been a member of a formal water user group?		
Have you been involved in the development of the KatAWARE model?		
Have you participated in any research instigated by Rhodes University?		

Ethnicity	African-black	Coloured	White	Indian-Asian	Other

Income	R per week	R per month

Appendix 6: Questionnaire given to Kuiseb River catchment residents at the GTRC open day

Please be assured that there are no right or wrong answers to these questions. The purpose is to gather information on knowledge and opinions on water issues and water-use.
Please write your name, occupation and cell number on the back for prize-giving and data quality purposes. All responses will remain strictly confidential. Please answer as many as possible.

1. Is there enough water in the Kuiseb river system for both humans and the environment? Please explain why/why not?

2. Is the water that reaches the sands at Walvis Bay after heavy rainfall 'wasted water'? Please explain why/why not

3. Where does the water that flows in the river after rainfall go to when it 'disappears'?

4. Is the water that sometimes flows in the river connected to the water that you get from your borehole?
   If yes, please explain how.

5. Have you ever heard of the Kuiseb Basin Management Committee?
   If yes, please describe what it is that you think they do.

6. Should water be paid for? Please explain why/why not

7. If someone builds a dam on the river, will this affect anyone or anything else? If yes, please describe how

8. Do you collect rainwater? If yes, please describe how, and how you learned to do like it this?

9. Some scientists think that climate change is happening now. Do you think that this is affecting you?
   If yes, please describe how

10. Do you purify water at your household before using it?
    If yes, please explain how and why?

Appendix 7: Key themes and research questions derived from the initial literature review

A) Key themes:

1. Behaviour change
2. Capacity and empowerment
3. Motivation to be involved
4. Knowledge and information
5. Interaction
6. Learning
7. Expectations of others
8. Engaging stakeholders
9. Role of science and knowledge
10. Role of individuals
11. Social networks
12. Conflict and power
13. Perceptions
14. Institutional roles and responsibilities

B) Research questions:

1. Context

- Physical system: size, water quantity, quality, biodiversity
- Issues and problems
- Stakeholders
- Incidents (e.g. flooding, pollution, exceptional droughts)
- Governance system (e.g. institutional and legislative frameworks)

2. Stakeholders

- Type and interest
- Prior participation in basin management/catchment initiatives
- Who designed and put into practice the participatory initiative
- Who has authority to make decisions water resources
- Who is included and exclusion
- Is there already a tradition of participation or expert approaches

3. Stakeholder relationships

- Relations between stakeholders
- What kind of conflicts exist and what are the stakes
- How do different actors hold power (e.g. legal, financial, expertise, social pressure, experience, prestige, implementation dependence etc)

4. Social construction of the river system

- How are current perspectives of the system a problem
- Are these different

5. Role of experts

- Do the problems require data from experts to solve
- Why is participation advocated and by who

6. Traditional authority willingness to devolve power

- Are traditional authorities willing to devolve power and responsibility
- How are stakeholders involved in public decision making
- What are the pros and cons of involving stakeholders

7. Social learning process

- How do stakeholder interactions evolve
- How do issues change
- What is nature of social learning community e.g. institution, public forum etc
- Who is interacting
- What are they doing (tasks, activities)
- Are participants able to reflect on their tasks and activities
- Which actors give their views on problems and issues
- Are there opportunities for alternative problem definitions and are they taken seriously
- Are there certain definitions or issues that are ignored or refuted
- Do participants acknowledge and deal with differences
- Whose terms and concepts become dominantly used to define and address the problem within the multi-stakeholder group
- How were the participating representatives appointed
- Which kind of mandate do the representatives have
- Do their communicate with their stakeholder group
- Are stakeholder groups represented in the process by the same person over a long time period, or do the representatives change frequently
- Are the representatives put under pressure by their wider stakeholder groups
- How homogenous are stakeholder groups
- Do representatives express all concern or only those of limited sub-groups
- Do stakeholders organize themselves to participate
- Is it possible to observe expressions of tolerance, understanding, empathy by representatives for the views and positions of others
- Does stereotyping of each other occur
- Do representatives feel positive about their participation and institutional identity
- Describe interaction processes e.g. leadership, facilitation
- Are there intentional and deliberate measures to deal with the unequal access to resources
- Are there some joint informational products co-developed by the different parties
- How are uncertainties addressed e.g. do the experts specify the level of uncertainty when they communicate their results
- What are the implicit assumptions about social and natural system
- Is there any reflection or discussion on these assumptions
- Which actor(s) assume leadership positions and how
- Is there a clear leadership
- Is the leader perceived as neutral by other participants
- Is the leader concerned with technical or relational goals
- Is anyone facilitating the process, who and how
- How do stakeholders share information, data and technical resources
- Is financial or technical assistance given to resource-poor stakeholders
- Do some actors use their informational power to promote their own positions
- Are marginalised stakeholders able to influence proceedings
- What is the format of information
- Are there agreements to share information
- Who decides on, and provides, the data and information used
- Who proposes the use of information technology, manages it, and is able to access it
- Who decides on action and solutions
- How successful were wider public events organised by the stakeholders

8. Social learning outcomes

- Do participants awareness of catchments identification increase in the process
- Does inter-stakeholder competition increase or decrease
- Does communication amongst participants improve
- Which actors are committed to the process
- How do participants' perceptions of other change through the process
- If tools were used, how did they influence the outcomes
- Was new knowledge formed
- Were any problems or conflicts resolved
- Did any actions arise that have a benefit on the water resource
- Were there any outcomes that constitute sustainability, in an environmental, economic, or social sense

9. Feedback and reflection

- Have the outcomes of the process had an impact on the governance system of the water resource
- Are there lasting effects of the process on the physical qualities of the river basin (e.g. water quality, quantity, biodiversity)
- Have any new structures, procedures, policies or regulations been put into place that affect efficiency resource management and future learning opportunities
- Was there a change in terms of information sharing between stakeholders
- Are there new river basin characteristics, eventually new challenges, problems or risks, produced by or attributed to the current management under study, that need to be addressed?

Appendix 8: A simulation interface of the KatAWARE model sourced from Farolfi & Rowntree (2005: 10)