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Scalar politics in the South African waterscape

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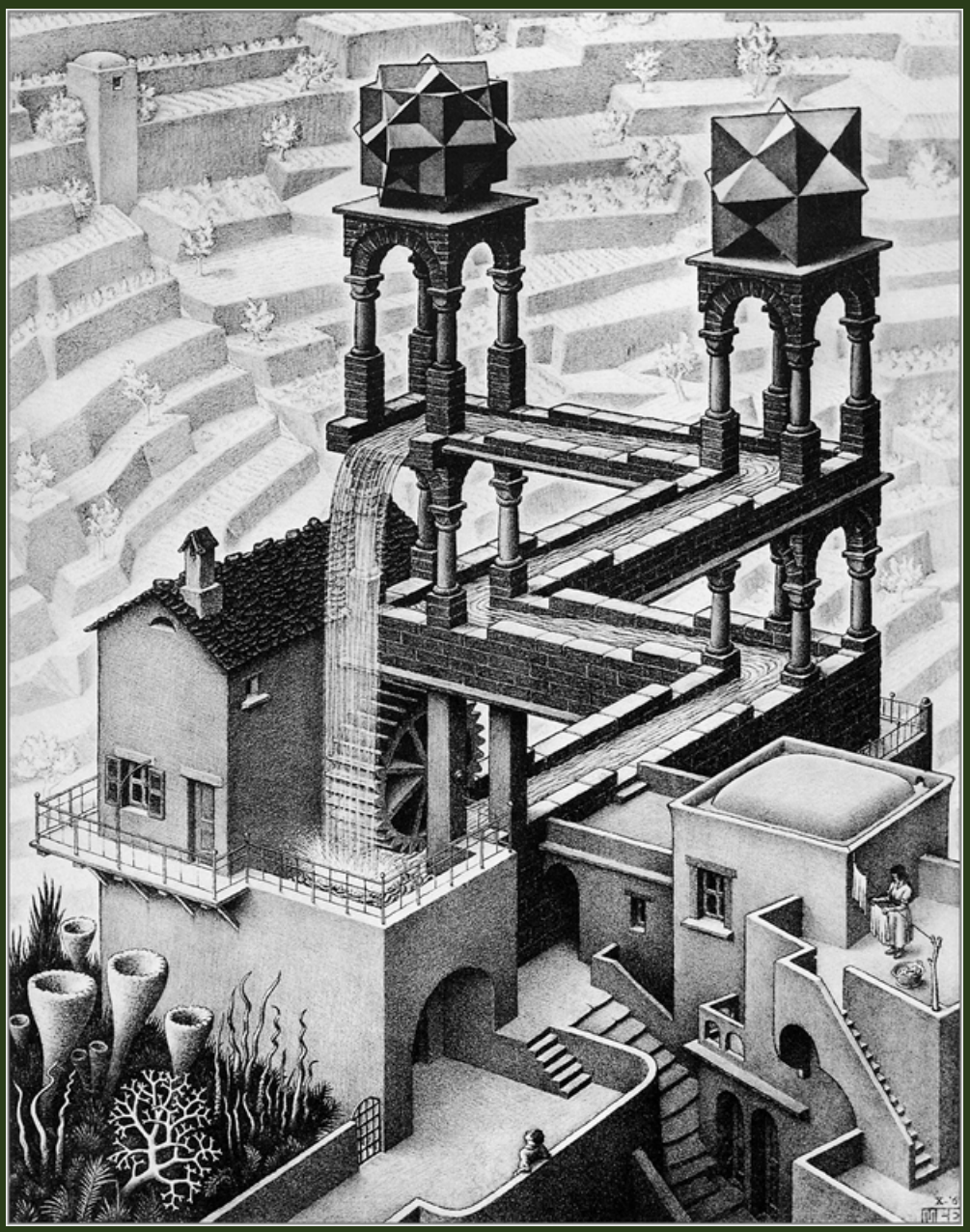

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3 Localizing global environmental governance norms

Implications for justice

Melissa Hansen, Vasna Ramasar and Kent Buchanan

Introduction

With the increasing scale and complexity of environmental and social problems, there has been a trend of elevating responses to the global level. The call to 'think global and act local' means that a global perspective on what is required for sustainability strongly influences actions at national and subnational levels (United Nations [UN] 1992). Global environmental governance is underpinned by a set of normative discourses which hold assumptions on the causes of unsustainability and the corresponding solutions to these challenges (Kates et al 2001; Clark and Dickson 2003; Ostrom 2010). Such normative discourses are important in providing a coherent frame for international strategies in response to large-scale problems such as biodiversity loss, climate change and desertification.

Normative discourses on sustainability, as well as social goals and values are deeply embedded in the minds of agents, the structures of institutions and rules of policy. When global sustainability goals are introduced at the national and local levels, they meet and are influenced by traditional normative objectives that nations aspire to, such as democracy, human rights and economic growth. This chapter explores the intersection of global normative sustainability discourses with others of social and economic development. This is done in order to understand how, at a local level, these normative discourses may correspond or clash, and what the outcomes are for social justice of resulting management decisions. The analysis is based on a case study of the iSimangaliso Wetland Park (IWP) undertaken in 2010 and 2011 in South Africa.

A theoretical discussion on the role of normative discourses in governance follows immediately below, after which the case study is introduced and contextualized. The third section presents the actors involved in the IWP's governance, tracing their primary legislative mandates and the underlying normative discourses that direct their management decisions. The tensions that arise through the application of differing normative discourses at all levels are then described – tensions most often related to a conflict between the divergent goals of the conservation of World Heritage sites and national goals of social and economic development. Evidence from the case study is used to explicate these conflicts in South Africa. This is followed by a discussion of the overall findings and some final conclusions.

Theoretical background

Norms and normative discourses in governance

In our definition, 'governance' refers to ordered rules and collective action in society, where a system of rules around decision-making is implemented by social actors in a coordinated way (Hydén 2001). A system of rules has a distinctive normative foundation, and this is true at all levels. Norms have an influence on the governance regime of the IWP through various initiatives at the global and regional levels, as well as through national legislation and policy frameworks. The Constitution of the Republic of South Africa is based on a cooperative government approach – and this is integral to the governance framework of the IWP[1] (Republic of South Africa 1996: 1267–9). Here it is important to recognize that different agents involved in governance have their own particular mandates and normative approaches.

The *Oxford Dictionary* describes a 'norm' as 'a standard or pattern, especially of social behavior, that is typical or expected' (*Oxford Dictionary* 2012). Norms are embedded in our thinking and often not explicit. They are, however, extremely powerful, in that they represent a prevailing view on a topic and therefore often assume consensus. To better understand what we mean by a 'norm' here, we follow Hydén and Svensson's (2008) ontological analysis, founded on the Aristotelian ideas of 'essence' and 'accident'. A distinction is thus made between the 'essential' and 'accidental' attributes of norms. Three essential attributes of norms are that they are behavioural imperatives, they are socially reproduced and they are the individual's understanding of surrounding expectations regarding their own behaviour (Hydén and Svensson 2008). Accidental attributes of norms include the presence of sanctions, the origin of the norm, the context or arena in which the norm is socially reproduced, whether the norm is system-oriented or value-oriented, the internal function of the norm and the purpose of the norm (Hydén and Svensson 2008).

A legal norm is a compulsory rule of conduct established by the state. For example, South Africa's National Environmental Management Act (Act 107 of 1998) directs the state to 'respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities' (RSA 1998a: 2). Legal normative discourses here are those around human rights and restorative justice. A social norm is a habitual rule that governs behaviour in groups and societies. A social normative discourse in the post-apartheid South African context may favour the embracing of a vibrant multiculturalism (Sonnichsen 2009). A technical norm may relate to rules of conservation, for example the necessity of a fence to protect 'sensitive' ecological areas from human impact (United Nations Educational, Scientific and Cultural Organization [UNESCO] World Heritage Centre 2011, p. 1, p. 11). An economic normative discourse may presume, for example, that job creation is integral to economic growth, or that gross domestic product is an indicator for economic growth (RSA 2010). A bureaucratic normative discourse may be that of transparency or of democratic participation (RSA 2000).

Normative discourses prescribe what ought to be done. They are the rules that are implicitly followed in management decisions. This chapter delineates the normative discourses underlying legislative and policy documents at different levels (global and regional, national and local). This has important implications, in that conflicting normative discourses may lead to the precedence of global, regional or national priorities and values over those at the local level, or vice versa, leading to important outcomes for social justice. This chapter will look specifically at contradictions arising through normative discourses directing the divergent goals of the conservation of World Heritage, and social and economic development, influencing the management decisions of actors at different levels.

Normative discourses of sustainable development and the iSimangaliso Wetland Park

The IWP is a UNESCO World Heritage Site. Our analysis is based upon the argument that, as a site of ecological world heritage, the governance framework of the IWP is partly founded upon normative discourses of global conservation and the public interest. Through the World Heritage Convention Act (Act 49 of 1999), which incorporates the World Heritage Convention into South African legislation, a global commitment to the conservation of areas of 'outstanding universal value' has received national legislative support and, in this case, been given effect through the establishment of the IWP. Thus global norms of conservation become entrenched in national and local levels of government.

At the national level, although normative discourses around economic development are present, intersectional justice, human rights and social development also come strongly into play, in light of South Africa's post-apartheid priorities. The Bill of Rights in the Constitution of South Africa states: 'Everyone has the right to an environment that is not harmful to his or her health or well-being' (RSA 1996). Even the World Heritage Convention Act includes a strong emphasis on intersectional justice. Among the fundamental principles of the Act are that 'participation by vulnerable and historically disadvantaged persons must be ensured' and that 'decisions must take into account the interests, needs and values of all interested and affected parties' (RSA 1999).

At a southern African regional level, the IWP comprises a major node of the Lubombo Spatial Development Initiative (LSDI) and of the Lubombo Transfrontier Conservation and Resource Area (LTFCA)[2], two collaborative development projects of the governments of Mozambique, South Africa and Swaziland. Jourdan (1998) has argued that spatial development initiatives are guided by growth-based definitions of development. Among the priorities for the LSDI are to generate economic growth by making maximum use of the inherent, but underutilized, potential of the area; to maximize private-sector involvement and create an attractive and stable climate for investors to operate in; and to maximize job creation by ensuring that the new industries being stimulated are competitive and have a long-term future in the region (National Department of Environmental Affairs [NDEA] n.d.). At the signing of the Trilateral Protocol for the LTFCA on 22 June 2000,

Mohammed Valli Moosa, South Africa's Minister of Environmental Affairs and Tourism at the time, stated that the LTFCA 'aims to consolidate conditions for the development of Lubombo's considerable tourism potential that underpins the promise of a revitalized regional economy' (Moosa 2000). The role of the iSimangaliso Wetland Park Authority (IWPA) (then the St Lucia Wetland Park Authority) would be to 'accelerate development, generate sustainable jobs and create conditions for the establishment of an internationally competitive tourism destination' (Moosa 2000). This shows that there is a strong emphasis on economic development goals at the southern African regional level. Here the policy view is that the IWP will facilitate socio-economic development through tourism.

Introduction to the case study

The study area

The IWP in northern KwaZulu-Natal was listed as South Africa's first UNESCO World Heritage Site in December 1999, in recognition of its superlative natural beauty and unique global values (UNESCO World Heritage Centre [WHC] 2000). Specifically, three of the ten criteria of UNESCO were met (UNESCO WHC 2000). First, the IWP is an example representing ongoing ecological and biological processes in the evolution and development of ecosystems and communities of plants and animals. Second, it contains superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance. Lastly, it contains the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation. The IWP also contains four wetlands of international importance under the Ramsar Convention (DEAT 2009).

The IWP was elevated to the status of an icon in the history of the environmental struggle in South Africa (Department of Environmental Affairs and Tourism [DEAT] 2009). In the late 1980s and early 1990s, a proposal by a multinational company to mine the dunes on the eastern shores of Lake St Lucia for titanium and other heavy metals was met with vehement and polarized public debate (Bainbridge 1993/1994). An extensive environmental impact assessment (EIA) process was characterized by a clash between two contrasting views: economic benefits versus aesthetic value and sense of place (Kruger et al 1997).

An independent review panel, chaired by Justice Ramon Leon, was appointed to review the EIA process and the final reports, to assess public opinion and to submit a recommendation to the cabinet as to which land use for the area was considered to be the most appropriate (Bainbridge 1993/1994). The panel put forward a proposal that future development be based on ecotourism as the primary land use option (Dominy 1993/1994). This proposal was influenced by an overwhelming national and international outcry about the loss of a global biodiversity hotspot, representing an explicit connection of the IWP to global conservation goals. Significant normative discourses here were those around global biodiversity conservation and the public interest.

Informed by the recommendations of the Leon Commission, South Africa's new democratic government ruled that dune mining on the eastern shores of Lake St Lucia be prohibited and the area's fragile beauty and sense of place protected for future generations (DEAT 2009). This was a landmark decision for the South African environmental movement, contributing to a change in the way conservation areas were thought of in South Africa, and creating the opportunity to view ecotourism as a viable alternative to primary-sector natural-resource extraction as an economic growth strategy (Dominy, 1993/1994; Chellan and Khan 2008; Walker 2008).

Saved from dune mining, the IWP (then known as the Greater St Lucia Wetland Park) was proclaimed in 2000, in terms of regulations published under the World Heritage Convention Act. At the same time the IWPA was set up to manage the park on behalf of the state. The IWP effectively consolidated 16 parcels of previously fragmented land – a patchwork of former proclamations (the earliest going back to 1895), state-owned land, commercial forests and former military sites[3] – to create an integrated park for the first time (DEAT 2009; IWPA 2009).

The IWP covers more than 330,000 hectares, stretching 220 kilometres from Kosi Bay, just below the Mozambican border in the north, to Maphelane, south of the St Lucia estuary (DEAT 2009) (Figure 3.1). Its eastern boundary is the Indian

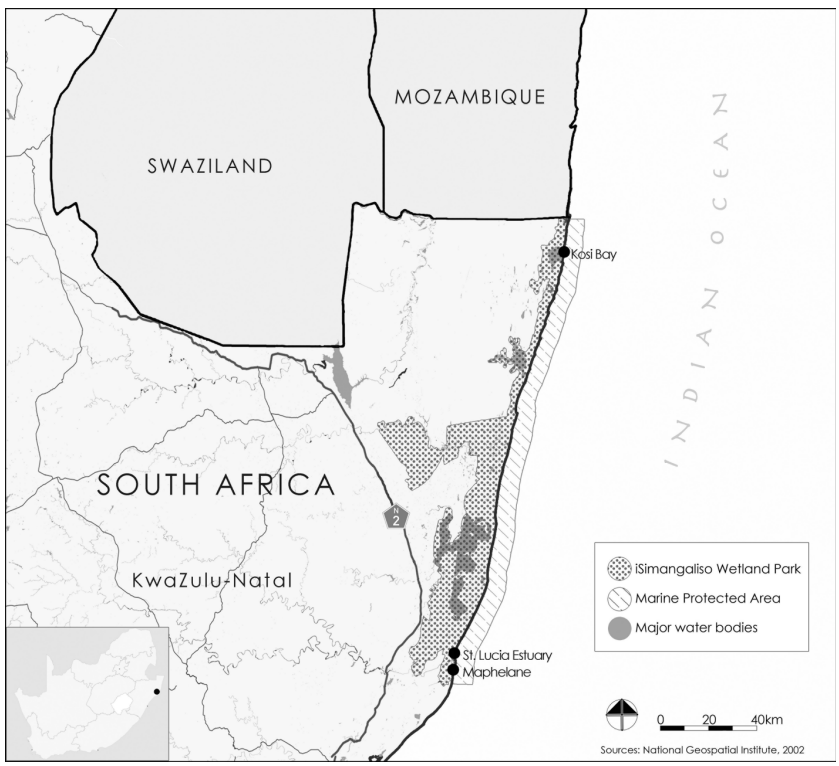

Figure 3.1 Geographical location of the iSimangaliso Wetland Park.

Ocean and its western boundary is irregular, incorporating the entire Kosi, Sibaya and St Lucia lake systems, as well as the uMkhuze Game Reserve. It encompasses one-third of the KwaZulu-Natal coastline and 9 per cent of the entire coastline of South Africa (DEAT 2009).

Socio-economic context

The IWP falls almost entirely within the boundaries of the uMkhanyakude District Municipality (IWPA 2008). Some of the most impoverished communities in South Africa are found in the uMkhanyakude region, and areas neighbouring the IWP in particular (IWPA 2008). As of 2007, 614,046 people live in the uMkhanyakude council area, translating into 114,973 households (Community Survey 2007, cited in uMkhanyakude District Municipality 2011/2012). Within the Coastal Forest Reserve section of the park, there are six small townships[4] whose combined population in 1998 comprised approximately 200 families (KwaZulu-Natal Nature Conservation Services [NCS] 1998). The area is characterized by high levels of underdevelopment, unemployment and poverty, along with some of the highest rates of HIV/AIDS in the country (uMkhanyakude District Municipality 2011/2012). Significantly, many people rely on natural resources for their livelihoods. For example, our fieldwork identified the common use of ncema reeds (*Juncus krausii*) for mat-making and the building of traditional Zulu structures, ilala palm (*Hyphaene coriacea*) for the production of ilala wine, fish from the coastal area and grazing land for cattle. The integrated management plan for the IWP raises a concern about increasing pressure on such resources inside the park, through the depletion and degradation of natural resources in communal areas (IWPA 2008).

Data collection

Field research was carried out in 2011 and 2012, with numerous visits to communities residing both in and adjacent to the IWP, as well as interviews with local tribal authorities, municipal officials from the Big Five False Bay Local Municipality (a subdivision of the uMkhanyakude District Municipality) and several non-profit organizations working in the Big Five False Bay local municipal area. Data collection consisted primarily of semi-structured interviews and direct observations (Kvale 1996; Brockington and Sullivan 2003), as well as focus groups (Bryman 2008) in KwaDapha, a small community residing within the boundaries of the IWP. In addition, household surveys were conducted with around half of the 49 households belonging to this community, in order to gain information about the socio-economic context of the area and perceptual data on the impacts of the IWP on everyday life and the nature of community relations with the IWPA. Relevant legislative and policy documents were also collected and analysed and newspaper articles relating to the management of the IWP were also reviewed. To improve the credibility of results, most of the findings were verified through triangulation.

Interviews with the IWPA were limited because their officials were often unavailable. However, five interviews of approximately an hour each were undertaken with officials from the IWPA in February and March 2011 and August 2012.

The governance framework of the iSimangaliso Wetland Park

This section discusses the actors constituting the governance framework of the IWP, their enabling legal framework and the normative discourses that guide their management decisions.

The iSimangaliso Wetland Park Authority

The IWPA is the management authority for the IWP. Its major objective is to ensure the implementation of the proposal put forward by the Leon Commission – that the development of the park be based on ecotourism as the primary land use option, integrating both the conservation of World Heritage and local economic development. The authority reports directly to the national Department of Environmental Affairs, from which it receives its core funding[5] (DEAT 2009). It has a board of nine members, including the CEO, who represent business, traditional councils, land claimants, the provincial government (specifically Ezemvelo KZN Wildlife), the national government (specifically the Department of Environmental Affairs) and local government (DEAT 2009).

The goal of the IWPA is 'develop to conserve' (IWPA 2008, p. 2). The authority specifically strives to balance conservation and sustainable development, taking into account the 'pressing social development priorities of the region' and aiming to end the 'paradox of poverty amongst natural plenty' (IWPA 2008, p. 2). Conservation objectives however, are foremost, in order to ensure that World Heritage values are not compromised (IWPA: 2008). Although the goal of intersectional justice is of fundamental importance in the IWP's policy framework, it is overshadowed by that of global conservation.

In addition to conservation as its primary aim, the mandate of the IWP includes the facilitation of optimal tourism-based development in the park (IWPA 2008). The integrated management plan for the IWP aims to achieve this through creating an enabling environment for tourism development. It clearly recognizes the role of the private sector as the primary actor in the development of tourism (IWPA 2008). The plan explicitly strives to balance conservation, tourism development and the local economic development of historically disadvantaged communities in and adjacent to the IWP (IWPA 2008). The latter is expected to be achieved through equity partnerships between the private sector and mandatory community partners (IWPA 2008). An example is the Thonga Beach Lodge and Mabibi community campsite – cited as benchmarks for the development of ecotourism partnerships between the private sector and communities (Sunde and Isaacs 2008). Here, normative discourses centre strongly on human rights and restorative justice.

The IWP is also conceptualized as a 'commercial asset that has the potential to help drive the economic revival of a region that was systematically underdeveloped in the past' (IWPA 2008, p. 3). This is typical of an ecological modernisation discourse, which views nature as an instrumental resource (Cock 2007, cited in Walker 2008).

Ezemvelo KZN Wildlife

The IWPA has contracted the provincial conservation agency, Ezemvelo KZN Wildlife, as its nature conservation agent (IWPA 2008). The organization consists of the KwaZulu-Natal Nature Conservation Board and the KwaZulu-Natal Nature Conservation Service. The board is a public entity reporting to the KwaZulu-Natal provincial Department of Agriculture and Environmental Affairs. The service carries out the day-to-day operation of nature conservation in KwaZulu-Natal and is accountable to the board. In line with its statutory mandate, Ezemvelo KZN Wildlife is responsible for the management of nature conservation within the province of KwaZulu-Natal, and the development and promotion of ecotourism facilities within protected areas (EKZNW 2009). Most tourist facilities within the IWP, such as camping grounds and rustic cottages, are managed by Ezemvelo KZN Wildlife, although there are some community-owned and private facilities within the park, for example the Thonga Beach Lodge and Mabibi community campsite (interview, 14 February 2010).

The mission of Ezemvelo KZN Wildlife is 'to ensure effective conservation and sustainable use of KwaZulu-Natal's biodiversity in collaboration with stakeholders for the benefit of present and future generations' (EKZNW 2009). Since democracy, the organization has invested in repositioning ecotourism so that it contributes more substantially to provincial growth and development (EKZNW 2009). The Ezemvelo KZN Wildlife strategy for the period 2009–14 states that responsible management of biodiversity conservation is recognized worldwide as being a critical factor in the success of sustained economic development, and that often protected areas are a catalyst for economic development (EKZNW 2009). Objectives guiding Ezemvelo KZN Wildlife involve stakeholder participation, as well as ecotourism and conservation as means for achieving economic growth.

uMkhanyakude district and local municipalities

Until mid-2011, the IWP was a district management area[6] falling almost entirely in the uMkhanyakude District Municipality and contiguous to all five of its local municipalities. Since mid-2011, however, district management areas have formed part of their adjacent municipalities (uMkhanyakude District Municipality 2011/2012). This means that the IWP is now geographically split among three local municipalities, the Big Five False Bay, Mtubatuba and uMhlabuyalingana (uMkhanyakude District Municipality 2011/2012). Local municipalities represent a subdivision of district municipalities, usually in rural areas, with district munici-

palities offering coordination and support to those local municipalities under their respective jurisdictions (Frödin 2009).

The South African Constitution declares that the South African government is founded on three distinct but interdependent and interrelated spheres, thus making local government not just a subordinate level of government, but a significant sphere in its own right (Frödin 2008). Local government has considerable autonomy and the responsibility to promote social and economic development, in addition to providing water, sanitation, roads, stormwater drainage, electricity and municipal health services (Cameron 2003, cited in Frödin 2008). Municipalities also provide the linkages to the provincial and national departments that are responsible for other services, such as health care and education (RSA 1998b).

Tribal authorities

An important intricacy of the South African Constitution is the provision it makes for traditional government, acting through customary law, to function within the local governance sphere (RSA 2003). This manifestation of traditional government is commonly referred to as a tribal authority, which comprises an inkosi, or chief, and indunas, or headmen, who oversee the community. The inkosi is entitled to the position through his bloodline, while the indunas are usually appointed by the inkosi.

Formally, the role of the tribal authority is to work with the municipality while promoting functions under customary law (RSA 2003, section 4). In practice this parallel governance is characterized by unclear roles and questionable jurisdictions over the people, necessitating the negotiation of memorandums of understanding between the municipalities and tribal authorities (Buchanan 2011). There is thus some uncertainty as to how much power and influence they have within municipal structures (Buchanan 2011). Nevertheless, data collected from our interviews and observations show that the tribal authorities were consistently considered the legitimate representatives of local communities in and adjacent to the IWP, by both the IWPA and the communities themselves. Tribal authorities functioned as the communication link between the IWPA and local people. Tribal authorities also oversee much of their community's affairs, including social rules and regulations.

Governance through tribal authorities comes with its own set of legal, social, economic, technical and bureaucratic norms. Though tribal authorities showed respect for the ecological system managed by the IWPA, the importance of social and economic development – and guarantees to uphold their traditions, including the medicinal, spiritual, nutritional and economic uses of natural resources – were observed to be their main priorities (Buchanan 2011).

Tensions between normative discourses and resulting management decisions around the conservation of World Heritage, and social and economic development

Various actors play a role in the governance of the IWP, mandated through policy and legislation at all levels – global and regional, national and local. Management

decisions taken by these actors are in turn guided by various normative discourses. As these discourses can be contradictory or ambiguous, management decisions often lead to conflict. This chapter highlights three areas where tensions are visible: the imposition of restrictions on everyday life for people residing within the IWP, the construction of physical conservation measures such as fences and the conditions and channels for participatory governance.

Restrictions on everyday life as a source of conflict between the public interest and local social and economic development

The consolidation of the IWP has led to the imposition of new rules of governance, which constrain the economic and social development activities and opportunities of local people falling within its boundaries. Our research in KwaDapha showed that negative perceptions of these restrictions are widespread. For example, one interviewee stated that: 'fter iSimangaliso came in 1999 they put sanctions on us. Life was better before. Now there are sanctions even in the lake. People can't renovate their houses, can't fish on the lake.' (interview, 6 September 2012).

One example of local perceptions of limitations to social development is the accusation that the IWPA was opposed to the building of the KwaDapha Primary School (interview, 6 September 2011). This is, however, in contradiction with the stated position of the IWPA, which aimed to ensure that the school was constructed in an ecologically sensitive manner (interview, 3 August 2012). It has also been stated that community members have been stopped from renovating the (Methodist) church in KwaDapha (interview, 6 September 2012).

Another example of perceptions of restrictions on economic activities and opportunities is related to illegal tourism development on the part of individuals in the Coastal Forest Reserve section of the IWP. As of 2 August 2011, there had been at least three concluded civil cases and one concluded criminal case, and there remained one outstanding criminal case, against local people (Savides 2011). The applicants in these cases – the Minister of Water and Environmental Affairs, the IWPA and Ezemvelo KZN Wildlife – feared that the IWP would suffer irreparable damage, that it might lose its status as a World Heritage Site and that the communities which could benefit through controlled management of the park might suffer hardship, unless unlawful occupiers were stopped and evicted before it was too late (Kuppan 2009). The IWPA likened these tourism development initiatives to 'ecological theft' (Kuppan 2009). Nevertheless, two interviewees involved in these initiatives in KwaDapha stated that they believed they had gone through the necessary channels for authorisation – receiving the go-ahead from the local induna and the owners of the land, the iNgonyama Trust (interview, 7 September 2011). One interviewee, quoted in a newspaper report, stated that 'we believe that the court was wrong to rule against us. We followed all the relevant channels before we started building' (South African Press Association [SAPA] 2009). In addition to obtaining permission from the local induna, they had also submitted their plans to the magistrate at iNgwavuma who allowed them to build (ibid.). It was additionally reported that developers would mobilize the community against

the IWPA (ibid.). During our household surveys and interviews in the area, it was clear that many community members held significant feelings of anger and resentment towards the IWPA because of the actions taken against tourism development initiatives in the area. The local induna stated in reference to this, that 'we are not free in this area' (interview, September 11, 2011).

Our interviews, focus group meetings and household surveys in KwaDapha also show that many community members had negative attitudes towards the IWPA as a result of a perceived lack of jobs in KwaDapha, due to these restrictions on tourism development. One interviewee stated in reference to this: 'employment gives money. Money gives food.' (interview, 11 September 2011). Another interviewee stated that

> we want the government to intervene to build big lodges for people to have jobs at KwaDapha. People won't then have a problem with permits or sanctions. . . . We have submitted an application to develop a 4-star diving lodge where the community tented camp currently is and to upgrade the Kosi Bay Beach Camp. Then iSimangaliso will find it easier to work with communities. If iSimangaliso doesn't stop development, they will find it easier to work with the community.
>
> (focus group meeting, 6 September 2012)

The above examples reveal a tension between the IWPA and local people's perceptions of their socio-economic development opportunities. There seems to be a conflict between sustainability norms of intergenerational justice and the conservation of World Heritage on the one hand, and those of intersectional justice on the other. Although perceptions from local people of the restrictions placed on their livelihoods and social and economic development opportunities might be inaccurate or exaggerated, it is important to note the lacking or insufficient communication between the IWPA and local people (discussed in more detail in the section on democratic participation in the IWP). Negative perceptions of the impact of the IWP on everyday life is further complicated in the case of KwaDapha, as the area falls under the Coastal Forest land claim, which is yet to be settled. In practice this means that there has been limited benefit flow from the designation of the IWP as a World Heritage Site to local people. Walker (2008) highlights the issue of the public interest in protected areas in national environmental legislation and policy frameworks. She argues that the current orthodoxy for settling land claims in protected areas in South Africa, premised on commitment to social justice for those who were dispossessed of their rights in the past, tends to downplay or disregard the interests of other constituencies who are not claimants. Nevertheless, although we recognize the overall benefits of the IWP in terms of the public interest, we argue that where local livelihood and socio-economic opportunities are constrained, in light of South Africa's post-apartheid priorities that include intersectional justice and human rights, but also in terms of the policy framework for the IWP, some measure of recompense is necessary.

Fencing as a source of conflict between conservation and livelihoods

The IWP is considered a natural asset of global significance that must be conserved for the people of the region, the country and the world (IWPA 2008, p. 2). In order to conserve this asset, conservation and preservation measures have been instituted. In many instances, these measures have entailed restrictions on the livelihood activities of local communities, resulting in tensions.

A vivid example of such tensions between conservation and livelihoods is the construction of a fence between the IWP and adjacent areas. The IWP managers use the fence to preserve ecological integrity and endemism at the site in accordance with technical conservation norms (UNESCO WHC 2011). For adjacent communities however, access to natural resources in the IWP (for example land for grazing and agriculture) has been an important social and economic norm. Tribal authority leaders of the Mbila, Makhasa, Nibela, and Mnqobokazi communities adjacent to the IWP have all criticized the construction of a fence as potentially limiting their access to natural resources that are considered important for traditional use, economic use, health and food. Even where gates allow access, the communities are not confident that they will be allowed in.

Representatives of three of these four communities have refused to allow a fence. The other community has permitted the erection of a fence, even though the residents knowingly ignore the IWPA's rules for access to the park. For instance, a tribal authority representative of the Mnqobokazi community explained that the tribal authority was not complying with the IWPA's requests to restrict cattle grazing in the park, because the authority was not 'listening to them' (interview, 15 March 2011). Fences between the IWP and adjacent communities have even been cut down at various times and locations, according to the tribal authority leaders interviewed. The Mbila tribal authority representatives confirmed that such a fence cutting event occurred at the time of our fieldwork in 2011 (interview, 20 February 2011).

In a media statement released on 4 November 2009, the committee representing the Bhangazi, Dukuduku, Western Shores, Sokhulu, Mbila, Mdletsheni, KwaJobe and Triangle communities expressed their 'wish to bring to the attention of the world and government', the concern that their 'rights to access land for grazing, cropping and hunting are severely curtailed' and that 'community members who are trying to access the land to support themselves and their families are being subjected to all sorts of injustices' (Savides 2009).

Fences have also been a problem for communities residing within the boundaries of the IWP. One interviewee recounted an instance when they had been denied access to the park at its Coastal Forest Reserve access gate, after returning on foot from KwaNgwanase late at night. The gate was burned down in 2009 (interview, 24 September 2011).

In our surveys, most households reported that they had experienced difficulties with what they called 'nature's problem'. Older respondents in particular explained that they had detected an increase in forest cover over the preceding ten

or so years. They viewed this in a negative light, as they were not allowed to cut the trees down for fuel wood, and because hippopotami (*Hippopotamus amphibious*) and vervet monkeys (*Chlorocebus pygerythrus*) frequently destroyed household subsistence gardens.

Depending on one's perspective, a fence is either a progressive tool for ecological conservation or a stumbling block to local social and economic development. The tensions between the elements of sustainability and different normative approaches to sustainable development become clear in any attempt to constitute a governance structure that brings these together.

Democratic participation in the IWP

'Democratic participation' is a normative discourse that appears frequently at all levels of governance. The South African Constitution emphasizes 'cooperative government' and 'participatory democracy'. This democratic norm has established channels and conditions requiring governance to be conducted with consideration of the voices of stakeholders, including local residents. In practice, it is important to consider the depth of stakeholder engagement or public participation. If participation lacks depth, either purposely or accidentally, voices from the community and/or other actors are excluded. This can result in a bias towards some normative discourses in preference to others, leaving social justice and democracy in question.

The history of nature conservation in southern Africa is complex, with conservation more often than not in conflict with democratic values of participation (Fabricius 2004). In addition, the demarcation of conservation areas has often resulted in forced evictions and exclusion from natural resource use (Fabricius 2004; Sunde and Isaacs 2008). The IWP is no exception in this regard: there have been a total of 14 land claims within the park (interview, 14 February 2011). Three of these were settled in 1998 and 2002, six in 2007, and five remained to be settled at the time of writing (IWPA 2010). Land claims within the IWP have been settled through co-management agreements. The co-management process includes representatives of IWPA and the land claims committee, usually made up of tribal authority members in a given community.

At the People and Parks National Conference in 2010, communities presented a list of persistent problems and challenges they faced. A major concern related to co-management agreements. Many communities represented at the conference felt that co-management arrangements were not being implemented in a way that allowed communities to participate as much as they would like in local, regional and national decision-making processes, and that the government was failing to involve them adequately in the management of protected areas (NDEA 2010).

In the case of the IWP, the relationships between the IWPA and land claims committees vary from community to community, as our fieldwork revealed. They range from cooperative to obstructionist, with co-management agreements ignored in the latter case. In an interview with the Nibela tribal authority, the relationship with the IWPA was described as good, because both sides respected

the co-management agreement (interview, 25 February 2011). In the case of Mnqobokazi, however, the community was not observing the rules and regulations established in their co-management agreement, which had not yet been formally signed, and the IWPA was not meeting the community's expectations. For example, according to a Mnqobokazi tribal authority representative, the community is not restricting access to the park, while the IWPA is withholding the gate fee payout promised to the Mqnobokazi tribal authority (interview, 15 March 2011).

In addition, we find the depth of participation in planning and development activities related to the IWP to be lacking. According to various community members and tribal authority representatives in the Nibela and Mbila communities, as well as officials of the Big Five False Bay Municipality, the views of many community members are not always heard, since attendance at stakeholder and public meetings can be low. Nzama (2009) has found that despite the fact that regular outreach workshops are held to foster communication between the IWPA and local communities, participation in planning and development activities is still limited. One reason elicited by our research for low attendance at stakeholder meetings, is that community members know that instead of attending decision-making meetings, they can go to a second, and shorter, informational meeting the next day. The result is that those community members have no voice in decision-making.

Another reason is that participation through tribal leaders may favour community members close to those leaders and exclude others. Sunde and Isaacs (2008) report that the Mabibi community, who reside within the IWP, are adamant that they are not able to participate in the management of the IWP – and that the community is unaware of the potential benefits flowing to them from the Thonga Beach Lodge and the Mabibi community campsite. The fact that some members of the community are unaware of this demonstrates the lack of adequate and effective participation in the planning process (Sunde and Isaacs, 2008). One of the reasons Sunde and Isaacs (2008) give is the hierarchical structure of the local tribal authority.

The depth of participation is further limited by conflicting rationales, including sustainability norms and political interests. One such limiting factor observed during research was the lack of interaction between the IWPA and the municipalities. This relationship is limited at best. Municipal officials from the Big Five False Bay Local Municipality stated that they had never had contact with the IWPA (interviews, 11 and 22 February 2011). The IWPA, for its part, stated that the roles of the authority and the municipalities were 'separate and unrelated' (interview, 14 February 2011). This suggests that differing normative perspectives of sustainability – the municipality striving for social development and the IWPA mainly for the conservation of World Heritage – can limit participation. Nevertheless, the municipalities hold information about the local residents, such as details of the areas needing social development more urgently (Big 5 False Bay Municipality, 2010/2011) that could well serve the socio-economic development objectives of the IWPA.

In addition, observations during our fieldwork showed that elected officials have been known to steer the municipalities' social development activities in directions

likely to win themselves political favour. For example, both Operation Upgrade and the Makhasa Adventist Group, non-profit organizations working in the area, stated that the mayor of the Big Five False Bay Municipality took credit for their work, without publicly acknowledging them in any way.

Discussion: The iSimangaliso Wetland Park as a place for inclusion and exclusion

The IWP's status as a UNESCO World Heritage Site indicates that normative discourses around the conservation of World Heritage and the public interest play a significant role in the management decisions taken by the IWPA, as well as its very existence. As the IWP's integrated management plan affirms, the World Heritage concept implies that some sites on earth are important to all peoples of the world, irrespective of where they are located (IWPA, 2008). In these terms, the IWP is a site for global conservation, its declaration as a World Heritage Site is introduced and justified in part by UNESCO, a global actor. World Heritage status places extra responsibilities on member states and site managers. In this context, questions arise about who should bear the costs of the IWP's designation, particularly relating to communities living within and adjacent to the park.

The case study presents a local space where we see global, regional, national and local normative discourses intersecting (Cox 1998). Norms from all levels and all aspects of sustainability (ecological, social and economic) influence the management of the IWP. This is a space where different agents exert their normative beliefs about what is required to achieve sustainability. At the same time, norms are embedded in the policies, institutions and management decisions related to the IWP. In the context of the IWP, there are tensions between the different goals of sustainability, the conservation of World Heritage, and social and economic development and livelihoods. The achievement of all of these goals requires some trade-offs in decision-making. For example, the fence surrounding the IWP represents a strategy to conserve biodiversity, but can also be seen as an instrument reducing the livelihood options of local communities.

This raises questions of justice in the governance of the IWP. Arguably, South Africa's political and conservation history demonstrates the need to think about reducing the injustices of the past, more than aspiring to achieve an ideally just society in the present. The theoretical approach to justice we take in this chapter is thus realization-focused and comparative, following Sen's work presented in *The Idea of Justice* (2009). This approach focuses on the pressing need to remove identifiable injustices in the world, and is concerned with social realizations resulting from actual institutions, actual behaviours and other influences (Sen 2009). Specific questions asked around justice in this chapter focus on 'Who gains what?' and 'At the expense of whom?' The divergent goals of the conservation of World Heritage, and social and economic development, are admirable and essential for sustainable development. This is reflected clearly in the numerous policies that speak to society's conception of sustainability that demands intersectional justice, in addition to the maintenance of ecological integrity.

Achieving environmental governance for social justice is, however, a formidable task. Part of the challenge stems from the interaction of the underlying norms that guide different actors in trying to achieve this goal. Different normative approaches may be in conflict, leading to tensions that result in social injustices.

In the case of the IWP, management choices, decision-making structures, and policies, in support of conserving a World Heritage Site, are guided by a normative discourse around the global conservation. Although local needs are acknowledged, the impetus to 'think global' means that some choices have been made beyond the bounds of the local area. A question of justice arises not from simply looking at the local level, but rather through understanding the interplay caused by the intersection of several levels – in this case, the implementation of different policies and initiatives relating to the IWP. Nancy Fraser suggests that injustices at intersecting scales can lead to the social exclusion of the global poor (Fraser 2010).

The IWP's identification as a UNESCO World Heritage Site raises it above the status of the local territory and, sometimes, beyond the decision-making authority of local people. There is no prioritization in explicit policy of the global conservation need over local social and economic development needs. Nevertheless, the strength of the global impetus is reflected in the fact that World Heritage status privileges certain actors and goals over others. This could lead to injustices of 'misframing', in which some issues are framed as being primarily of local importance, yet obliged to compete for resources with issues that are considered to be of international or national importance.

The construction of physical conservation measures can also be regarded as a matter of distributive justice. According to technical norms of conservation, the fence is a logical choice to manage the movement of people and animals in and out of the IWP. Legally, the IWPA is well within its rights to erect such a structure. The tension arises when we consider the notion of access. People living in and around the IWP have had access to the park's natural resources for decades. Although the question of ownership and property rights is still a contested one and will not be addressed here, another aspect of access refers to the 'right to benefit from things' (Ribot and Peluso 2003). In this case, it is a question about not simply a bundle of rights, but a bundle of powers. Clearly, the construction of a fence removes the power of the local residents to manage their movement in and out of the park. Management of people and animals is at the discretion of the IWPA. Building a fence implicitly suggests that the local residents will not self-manage their use of natural resources sustainably and must be managed instead. This limits the powers of the local community to play an active role in governing natural resources sustainably.

Finally, channels for participation and cooperative governance can also be used as means of inclusion and exclusion. A wide range of local, national and international actors operate in the area, and this raises questions of legitimacy and accountability. It is not clear whether cooperative governance actually does foster democratic consolidation, or whether the multitude of approaches and actors produces fragmented forms of authority, where the involvement and voice of individuals, and some groups, are lost (Ribot, et al 2008). Local leaders are involved in specific decisions that are deemed to pertain to them, but management of the

IWP, for the most part, is left to the conservation 'experts'. Local people are recognized as important constituents of the heritage site, but more as beneficiaries than as conservators. In this light, socio-economic development is limited to a model based on ecotourism. Benefits for local people are in the form of material gains.

There are indeed present and potential injustices around the IWP, but these clearly do not result from explicit strategies to exclude local people. The pervasive nature of norms means that there are some fundamental beliefs about how protected areas such as the IWP should be managed. The World Heritage Convention Act and the IWPA espouse the goal of recognizing intergenerational equity with a level of priority that is not the same for municipalities or tribal authorities. Also, the means of achieving intergenerational equity may differ greatly based on the normative perspective. For example, to one person intergenerational equity is best achieved through conserving biodiversity, while to another person this may be done by improving the living conditions of the current generation (Sen 2009).

In this way, norms pervade decisions and actions about the IWP. In the process, different groups are recognized and have access differently to resources, decisions and benefits. In the end, the way people are included or excluded has implications for justice.

Conclusion

The analysis has revealed significant tensions between varying normative discourses of sustainability and sustainable development at different levels: global and regional, national and local. Firs, the conservation of World Heritage is in conflict with the IWP as a regional political economy and development project through ecotourism development. Second, both of these have an impact upon social justice at a local level. These impacts must be addressed if the governance of the IWP as a World Heritage site is to be truly sustainable.

In effect, what this case study demonstrates is that management decisions arising from normative discourses around the conservation of World Heritage, as well as social and economic development, and livelihoods, are often in conflict. Effective governance cannot be negotiated without taking this into account. The study also illustrates the complex nature of conservation in the southern African context, and highlights important tensions that exist in realizing admirable concepts such as World Heritage at a local level, where competing goals exist.

Negotiating the environment-development nexus demands a deeper examination of diverging values and normative discourses. In this regard, analyses that take into account the normative concerns of multiple actors at varying scales (global, regional, national and local) are integral to a reflexive and adaptive governance regime.

Notes

1 The Constitution of the Republic of South Africa states: 'All spheres of government and all organs of state within each sphere must exercise their powers and perform their

functions in a manner that does not encroach on the geographical, functional or institutional integrity of government in another sphere; and cooperate with one another in mutual trust and good faith' (RSA 1996, section 41(1)(g) and (h)).

2 Transfrontier conservation areas (TFCAs) are conservation areas that straddle the boundaries of two or more states, aiming to promote regional cooperation and development.

3 Cape Vidal State Forest, Dukuduku State Forest, Eastern Shores State Forest, False Bay Park, Makasa State Forest, Maphelane Nature Reserve, Maputaland Marine Reserve, uMkhuze Game Reserve, Nyalazi State Forest, Sodwana Bay National Park, Sodwana State Forest (Ozabeni), St Lucia Game Reserve, St Lucia Marine Reserve, St Lucia Park, Coastal Forest Reserve and Lake Sibaya Freshwater Reserve (IWPA 2008).

4 Enkovukeni, KwaDapha, Mqobela, Mbila, Shazibe and Hlabezimhlope.

5 Additional funding for specific projects has been received from the Global Environment Facility through the World Bank, among other sources.

6 The Local Government: Municipal Structures Act (Act 117 of 1998) defines a district management area as part of a district municipality which has no local municipality and is governed by that district municipality alone (RSA 1998b).

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Governance and politics in the upper Limpopo River Basin, South Africa

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Abstract Everyday international political economy (EIPE) offers an opportunity to rethink the role of individuals and citizenry in shaping governance of natural resources. In South Africa, significant progress has been made by government in re-shaping water governance since the end of apartheid in the early 1990s. The role of government in water governance and water politics has thus been emphasised to a large degree. This study looks at historical material to assess the role that water politics and EIPE has played in shaping the use and management of water resources in the country. Case studies are analysed of two quaternary catchments, A63E and A71L in the Limpopo River Basin, to show how everyday actions by different actors has shaped the current waterscape in the basin. Four events, namely, the politics of the Middle Iron Age State at Mapungubwe; the development of the Mapungubwe National Park and World Heritage Site; the management of water for the De Beers Venetia Diamond Mine; and the establishment of the Coal of Africa Limited colliery are discussed in terms of the agential power at play during each event. The conclusions of the study are that EIPE and reflexive agential power are important factors in water governance that can sometimes be ignored through neoliberal institutionalism. In the current and future governance of water in South Africa they can offer an alternative view of the role and importance of actors and pathways for development.

Keywords Water · Governance · Politics · South Africa · Limpopo River · Quaternary basin · Interest groups · Mapungubwe

Introduction

To understand dynamics in the socio-ecological landscape theoretical lenses are necessary. We do not always have all the information of a socio-ecological landscape. To understand such systems theories are also necessary. Theories are simplified representations or pictures of reality (Mearsheimer and Walt 2013) and not carbon copies of reality. Theories are representations of reality because of the limited volume of data and information at our disposal. The scantiness of data and information is not only a function of technological developments in the measuring of things, capturing data and modelling the data. Our senses and cognitive processing systems limit us from handling all the information we perceive in the environment. We develop theories to fill the gaps (Walt 1998). This also means not one theory can capture everything there is to know about issues, situations, actors, relations and so on. Complexity

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theory, or derivatives thereof such as critical complexity, comes to mind that has over the years been advanced as a theoretical lense to make sense of and understanding complex socio-ecological systems (e.g. Nooteboom 2007; Ostrom 2009; Audouin et al. 2013; Meissner and Jacobs 2014). To take the argument one step further, Molle (2008) says that cognition plays an important part in the formulation of policies. This cognition involves ideologies, theories, and paradigms or world views. Molle (2008) goes further to say that ideas are never neutral. He contends that they are influenced by social settings and the world views of those in power.

Theories are central to the policy process informing the choices of decision-makers (Katzenstein 1976; Hobson and Seabrooke 2007). Theories are able to improve the analysis and efficiency of policy. The non-neutrality of ideas and presence of power wielders are important in this regard. Power wielders are not only those in government or political leaders. There are power wielders in the water research sector and they use non-neutral paradigms and theories to advance their thinking and influence policy. For instance an extensive literature review conducted by Meissner et al. (2013) on research in the South African water research sector, indicates that natural scientists are doing social scientific research or research on themes that are more at home in the social sciences, such as catchment management agencies. Adaptive management is also put forward as a theory to understand water resource management institutions and how they should function. Social science theories, like adaptive management, apply to specific realms of activity, time and scope (Mearsheimer and Walt 2013). In other words, since natural scientists are dominant, rationalism and rationalist type theories are put forward to understanding and problem solving. Yet, other theoretical lenses could bring to the fore different empirical results, conclusions, recommendations as well as a nuanced understanding of water resource management (Meissner et al. 2013). The theoretical tact a scientist employs influence his/her research agenda and the advice presented to decision makers. It is therefore important to diversify one's theoretical 'tool kit'—with only a saw, a carpenter will be good at sawing, not carpentry. 'It is hard to make good policy if one's basic organizing principles are flawed, just as it is hard to construct good theories without knowing a lot about the real world' (Walt 1998: 29). Assisting decision makers to make choices with dominant theories could have undesirable effects.

There are many theories explaining issues, situations, actors, relations and phenomenon (see for instance Lemert 1993). 'Theories are heuristic for generating…strategies and for dealing with anticipated and empirically encountered problems' (Rowell 1984: 1). Not one strategy is without problems and makes sense in its own context. Under certain circumstances certain theories work. Yet, all theories are meaningful (Rowell 1984). This raises the issue of competing social scientific theories, which is not a bad thing. Theories are the collective inventiveness of humanity and this result in the development of competing theoretical perspectives. There also exists an impossibility of being certain that a particular idea is wrong by means of an empirical test. That said if a theory or set of theories are dominant within a discourse, it can lead to participants in that discourse to adopt its prescriptions and proscriptions when it comes to practices (Rowell 1984). This is the case in the South African water discourse, where integrated water resources management, adaptive management, complexity and sustainable development are the main theoretical trends being followed (Meissner et al. 2013). Within transboundary river basins, like the Limpopo River Basin, there is an implicit acknowledgement that neoliberal institutionalism is the foundational theoretical outlook giving prescriptions. Neoliberal institutionalism emphasises states and the inter-governmental organisations they create to manage their relations towards deeper cooperation (Stone 1994; Nel 1999; Du Plessis 2000; Meissner 2004a). The cooperative arrangements constituted by states like the Limpopo Watercourse Commission (LIMCOM) is just as important in the management of relations between states as the states themselves, according to neoliberal institutionalism.

The arguments outlined above will form the basis of this paper. I will advance these arguments by investigating the governance and politics of two quaternary catchments designated A63E and A71L in the upper Limpopo River Basin in South Africa. The paper describes the role that everyday international political economy (EIPE) and agential power have played through historical events in shaping the biophysical, social, cultural, economic and political environment of the area. In this paper we would like to move away from the dominant theories and focus on those theories

that are not known in the water discourse. The purpose is to see what other interpretations and understandings can be generated using such unknown theories and conceptualisations. As already mentioned, neoliberal institutionalism is usually the theory of choice when discussing transboundary rivers at the basin scale. Boredom is bound to set in when analysing relations from this theory all of the time. In this paper we are zooming in, so to speak, on a portion of the Limpopo River Basin—two quaternary catchments—and for this we would like to employ other theories and conceptualisations to explain and understand actors that are not states. The traditional or dominant theoretical perspectives we use to explain reality can be replaced with alternative premises and concepts. That is not to say that dominant theories are wrong. It also means that they are not entirely right. If we should replace dominant explanations with alternative ones, we might just highlight other aspects of reality that dominant theories are incapable of shedding light on. In other words, theoretical diversity needs to be valued (Dunne et al. 2012). What is more, and since the dominant theories used in the South African water discourse are mainly positivist, agential power and EIPE is interpretivist and even critical in their paradigmatic position. These alternative theories might just give us other strategies to deal with anticipated and empirical problems in the two quaternaries.

A quaternary catchment is the lowest level of operational catchment in South Africa (Midgley et al. 1994). The two quaternaries under investigation are interesting research subjects—not only are they situated in one of South Africa's driest parts, they also exhibit governance and political interaction between numerous and diverse stakeholders ranging from government departments to transnational corporations and interest groups. The quaternaries also contain a large number of conservation areas. By taking into account the historical description of the quaternaries starting in 500 AD, adds another dimension regarding their cultural significance.

The paper begins with some theoretical aspects of governance and politics, against the backdrop of Hobson and Seabrooke's (2007) notion of EIPE and Hobson's (2000) conceptualisation of agential power. The involvement of non-governmental actors is here informative to indicate the applicability of appropriate theoretical lenses. The paper then gives a geographical description of the quaternaries. After this it investigates four prominent developments since 500 AD: the Middle Iron Age State at Mapungubwe, the Mapungubwe National Park and World Heritage Site, De Beers' Venetia Diamond Mine and Coal of Africa Limited's (CoAL) Vele Colliery and the role of actors in shaping these developments. A discussion and conclusion summarises the main findings.

Governance and agential power

Governance issues play an important role during interventions in socio-ecological systems impacting on their resilience. This means that socio-ecological systems are resilient and as soon as humans or nature intervene there is a positive or negative impact on their resilience. The concept 'resilience' is derived from the Latin word *resilire* 'to recoil'. Its modern English meaning is the ability to feel better quickly after something unpleasant such as an injury or shock (OALD 2013). Even so, this is not the only meaning of the word 'resilience'. According to Holling (1996: 33 cited in Davoudi 2012) ecological resilience is 'the magnitude of the disturbance that can be absorbed before the system changes its structure'. Looking at resilience from a human intervention perspective, questions such as who decides what should be made resilient, for who is resilience managed and for what purposes highlight governance dynamics. It is not enough to only ask what should be made resilient, but also 'for whom' (Lebel et al. 2006). This question also highlights the ways and means humans perceive reality based on paradigms and theories and the recommendations that follow from paradigms and theories. The notion 'governance' spotlights 'for whom' as well as who governs and with what consequences (Hobson and Seabrooke 2007). In light of this, governance is the result of interactive socio-economic and political forms of governing (Rhodes 1996) resulting in solutions and opportunities (White 2001).

Explaining the notion further, 'steering is a synonym for governance' where steering is equated to policy decisions and policy outcomes to rowing (Osborne and Gaebler 1992; Rhodes 1996: 655). Governmental institutions don't always control the rudder while other actors pull the oars. As already mentioned, the governance process is not the product of the actions of government alone (everyday

governance). The opposite (regulatory governance) gives a limiting perspective, not only from a practical but also a research point of view. No doubt, governance hierarchies have no clear boundaries and one actor is not always at the top (Knill and Lehmkuhl 2002; Rosenau 2006, 2008). Collaboration and contestation entails the involvement of different actors and thus the multi-varied nature of governance systems (Funke and Meissner 2011) and their enmeshed hierarchical nature.

Describing governance as a governmental process creates a top-down sense thereof. How scientists conceptualise and describe their concepts to decision makers, influences their perception and way of thinking and doing. Ideally scientists should move away from restrictive conceptualisations. Other actors do operate autonomously that influence government (Kickert 1993) both domestically and transnationally (Finnemore and Sikkink 2001; Rosenau 2001, Meissner 2004a, b, 2005). A broader conceptualisation of governance could inform policy processes so that old ways of explaining transform into new insights. Here agential power becomes relevant. Agential power is the power of an entity to determine and implement policy without the interference of other entities or structures inhibiting action (Hobson 2000). Of relevance is reflexive agential power, which is the ability of an actor to imbed itself into a 'broad array of social forces' and to structure its influence sphere (Hobson 2000: 227). The concept agential power should not be confused with the concept 'agency' as used by Giddens (1984) and Long (1990). The type of agency they are referring to is in relation to social experiences and how people cope with their daily lives, even in the face of coercion. There is a power dynamic here, and one could argue that people put policies in place to cope with life. Yet, Hobson's (2000) conceptualisation of agential power places policies at the centre whereas agency's conceptualisation hides policies.

An actor's governing capacity is a factor of its agential power. This is also the frontier where governance and politics come together. Politics should also not only be conceptualised as 'power'. By describing politics in terms of power and power wielders can distort what scientists think of politics. A picture might arise that politics is the sole domain of the power hungry narcissistic politician. Politics is authoritative resource allocation in society (Easton 1965, 1985) and here society is not a synonym for government. Such a view can deform the sense of reality wherein resources are allocated. Where governance is synonymous with interaction, politics' claim lies with authority (Rosenau 1990) and authority does not rest on the shoulders of government officials or the leaders of states or intergovernmental organisations such as the United Nations.

Everyday governance

The notion of everyday governance as opposed to regulatory governance is borrowed from Hobson and Seabrooke's (2007) conceptualisation of EIPE juxtaposed with regulatory international political economy (RIPE).

Meissner et al. (2012) found that the current South African water discourse is underpinned by a predominant state-centric theoretical foundation. This highlights the regulatory side of water governance and politics and the actions of the political élite are emphasised. When non-state entities are included it is predominantly within the context of the regulatory environment and the top-down relationship they have with the state. The water policy sector relies on the research output of scientists to inform policy directions and seek new opportunities, and as already mentioned, should dominant theories prevail it could influence the policy maker's sense of reality.

If questions regarding governance and politics are framed outside the ambit of dominant theoretical stances it will reveal 'information at the local and transnational levels that tell us how the actions of the key players are contested by everyday actions' (Hobson and Seabrooke 2007: 10). We will broaden the research domain and 'discover information about how everyday actions inform the dominant processes of [governance and politics]' (Hobson and Seabrooke 2007: 10). This widened research domain will highlight transformative moments and processes and sketch a more complete vista, moving away from distortions (Hobson and Seabrooke 2007) of how governance and politics operate in a multi-varied and complex social and natural environment. Table 1 summarises the aims and approaches of EIPE.

Everyday international political economy rests on a number of assumptions. By asking 'who acts and how do their actions produce and [bring about]…change in various spatial dimensions' (Hobson and Seabrooke 2007: 12), EIPE might give new insights into agency.

Table 1 Aims and approaches in regulatory and everyday IPE (Hobson and Seabrooke 2007: 6)

	Regulatory IPE (neorealism/ neoliberalism/systemic constructivism)	Regulatory IPE (classical structuralism)	Everyday IPE (sociological/complexity/ social constructivism)
Organising question	Who governs?	Who benefits?	Who acts and how do their actions enable change?
Unit of analysis	Great powers (e.g. United States), other states, international regimes, ideational entrepreneurs	Capitalist world economy, structures of rule	Everyday actors interacting with élite and structures
Prime empirical focus	Supply of order and welfare maximisation by leaders	Maintenance of the powerful and the unequal distribution of benefits	Social transformative *and* regulatory processes enacted or informed, by everyday actions
Locus of agency	Top-down	Top-down	Bottom-up

This means that those actors that were traditionally seen as power takers are now defined as power givers. The question also highlights bottom-up instead of top down governing processes. The theory is founded on the 90/10 principle. The bottom 90 % of the world can influence the top 10 % of the world's powerful population. Even so, not all bottom-up processes will influence the economy or policy environment. Dominant élite, like politicians, still play a role, but no longer an exclusive role. Should we become more attentive of the actions of the bottom 90 %, we will learn more about the power, limitations, legitimacy and authority of the dominant role players. The bottom 90 % do not only use protest to reject the dominant role players' legitimacy. They can also use subtle forms of resistance to drive change. Actors reject the dominant's legitimacy because it clashes with the rejecter's identity. This identity is created within broader society through everyday actions while interacting with other members of society. Identities are created, maintained, reshaped and discarded. This might give the impression that everyday actors can do as they please. This is not the case. Societal structures, like regulations, policies and norms, restrict actor's actions. At times actors are victims and other times they have agency to affect change (Hobson and Seabrooke 2007).

Agency is always expressed and even structures are the products of agency. Everyday actions take the form of negotiations, resistance or non-resistance happening suddenly or over a period of time. The acts shape, constitute and transform the natural and political environment around and beyond everyday actors. Everyday actions can include verbal taunts, rumour and subversive stories. These acts can have ramifications at the wider system level although they originate at the meso-level. Bottom-up changes take place through three actions: defiance, mimetic challenge and hybridised mimicry and axiorationality. Deviance happens when actors resist the dominant's coercion through unconcealed activities such as riots and defiance campaigns. Mimetic challenge is concealed. Resistors adapt the discourse and/or characteristics of the dominant and camouflage their resistance challenges to the dominant's legitimacy. Hybridised mimicry occurs when the resistor adopts the dominant's discourse, filter it through cultural lenses to produce something new and then hybridise it within the receptor society. Axiorationality happens when actors reflect on norms and conventions as well as the interests they form. They then choose to act in accordance with broader intersubjective understandings of what is socially legitimate. People operate rationally but their actions are also informed by norms and identities (Hobson and Seabrooke 2007). Before discussing the geographical delimitation of the study area, a few words on the name change of the South African Department of Water Affairs. This will explain the different titles of the department used throughout the article. Between 1994 and 2009 this department was known as the Department of Water Affairs and Forestry (DWAF) and between 2009 and May 2014 it was referred to as the Department of Water Affairs (DWA). Currently it is the Department of Water and Sanitation (DWS) (Meissner and Funke, in press).

Geographical delimitation

A quaternary catchment is the lowest and most detailed level of operational catchment in South Africa (Midgley

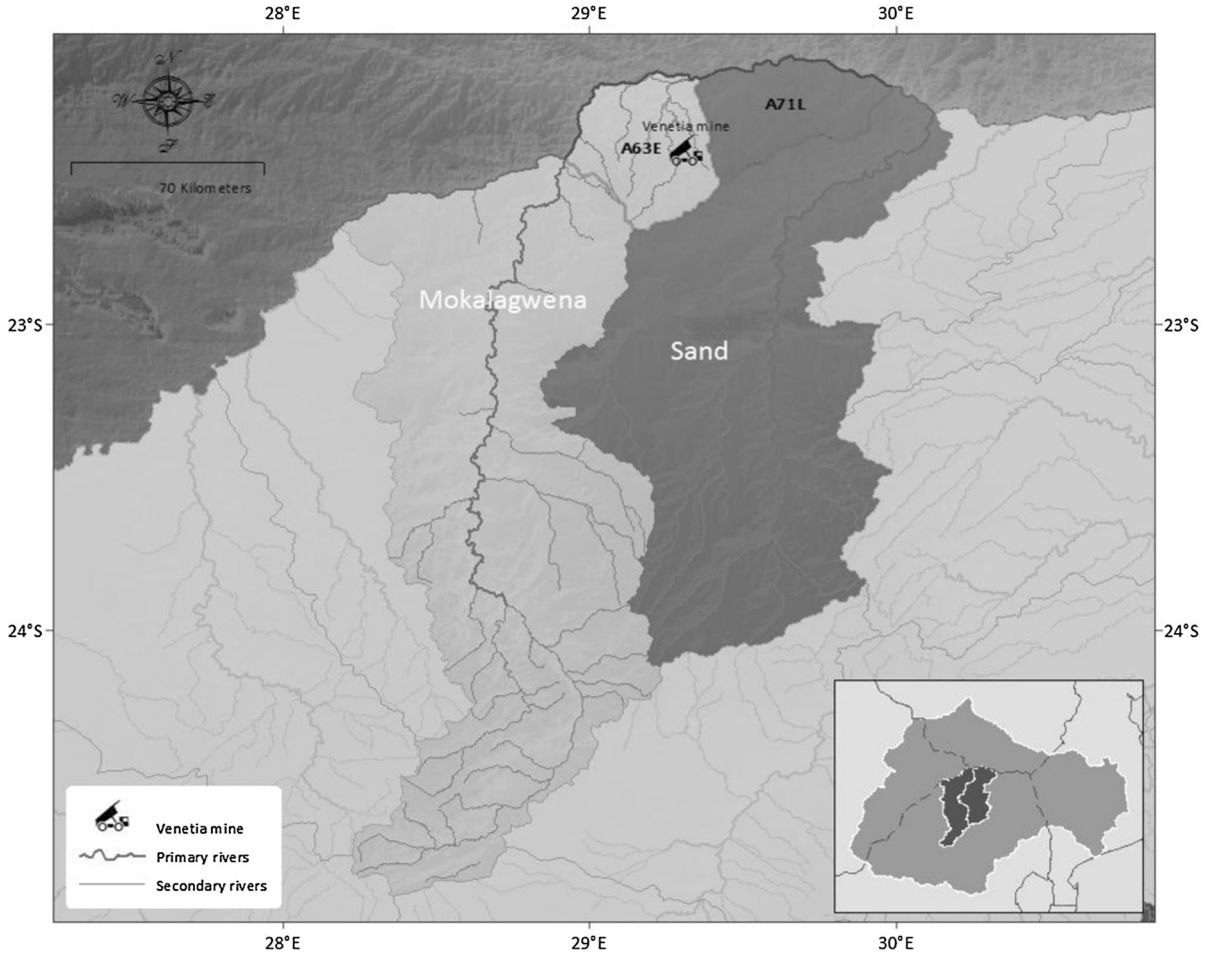

Fig. 1 The Mogalakwena and the sand tributaries indicating the A63E and A71L quaternaries (Meissner 2011 map produced by Ashton Maherry, Council for Scientific and Industrial Research)

et al. 1994). South Africa's primary catchments are areas where water flowing in the catchment drains into the catchment's main river. The Department of Water Affairs (DWA) has delineated South Africa, Lesotho and Swaziland, into 22 of these primary catchments. These have been divided into secondary, tertiary and finally 1,949 quaternary catchments with an average surface area of 650 square kilometres (km^2) (Schulze 2006). Quaternary catchments can therefore be the smallest unit of analysis within a primary catchment like the Limpopo River Basin. Quaternaries A63E and A71L are, respectively, part of the Mogalakwena and Sand River tributaries situated in the Limpopo River Basin, South Africa (Figs. 1, 2).

Quaternary A63E, also known as the Kolope-Setonki, begins some 50 kilometres (km) south of the Limpopo River and joins it immediately upstream of the Shashe confluence. The quaternary covers an area of 1 992 km^2. The mean annual rainfall (MAR) is around 370 millimetres (mm), while the annual evaporation rate is around 2,050 mm—exceeding the rainfall for every month of the year or a net evaporation rate of 1,680 mm. During some years of low rainfall, streams in the sub catchment will not flow, indicating extended periods of water deficit (O'Connor 2001).

A71L, also known as the Kongoloop-Soutsloot, joins the Limpopo directly below the Shashe confluence. The quaternary covers 1,765 km^2 with a MAR of 288 mm and an annual evaporation rate of 2,050 mm—an annual net evaporation rate of 1,762 mm (WSM Leshika Consulting 2009). Like

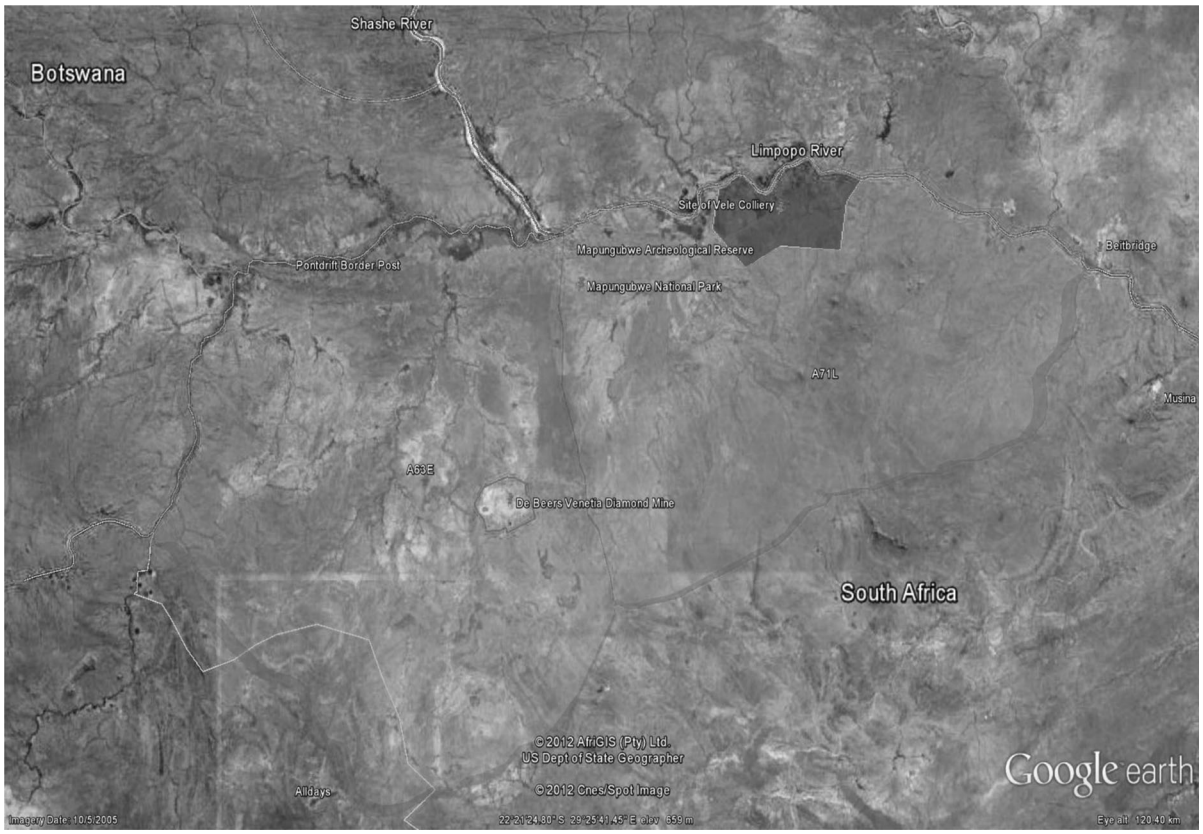

Fig. 2 Satellite image with A63E and A71L highlighted

A63E, it also has a constant water deficit. Climatologically and hydrologically the two areas are similar. The dry conditions of both make water resources management an important issue underlying all other development activities in the past and presently.

Historical developments

This part of the paper investigates four historical developments in the quaternaries: the Middle Iron Age State at Mapungubwe, the Mapungubwe National Park and World Heritage Site, De Beer's Venetia Mine and Coal of Africa Limited's Vele Colliery. Each of these developments offers an example of agential power and EIPE at play. In each case governance in the quaternary is shaped by the agential power of different actors acting in support of or against each other. From an institutional perspective, the DWS operates 'a sparse monitor network in the region' (DWAF 2004). The LIMCOM was established in September 2011 and, although an important state actor, it has not yet had a significant impact on governance processes. The Commission is in the process of being capacitated with human and financial resources (LBPTC 2010). Other government entities are active in the area, especially South African National Parks (SANParks) because of the numerous nature reserves and the Mapungubwe National Park. Recent mining developments resulted in the active involvement of the national Department of Environment Affairs (DEA) and DWA.

Middle Iron Age State at Mapungubwe

Between 500 AD and 750 AD Bantu-speaking farmers occupied the area. It was around 900 AD that the Zhizo people moved into the Shashe/Limpopo basin and established their presence. Between 1000 AD and 1300 AD, an indigenous class-based state, that traded

with 'more developed societies…' was present at Mapungubwe (Huffman 2009: 37). During this period rainfall was adequate to support this society (Huffman 2008). According to Huffman (2009) a medieval warm period started around 1000 AD and it was from between 1200 AD to 1250 AD that this warm period affected farming over a wide area; rainfall decreased and a severe drought was dominant. It was around 1300 AD that Mapungubwe was probably abandoned due to cooler and drier conditions with the onset of the Little Ice Age (Huffman 2008).

Analyses, through Raman spectroscopy, on the pigments of glass beads excavated on Mapungubwe Hill and K2,[1] indicate that beads were manufactured after the thirteenth century and some dating back to the nineteenth century. This is the 'proposed date of Gardner for the last occupation of Mapungubwe' (Prinsloo et al. 2011: 3275). Mapungubwe was probably not abandoned suddenly but over a period of about 500 years. In 2005, Prinsloo (2005) conducted a re-dating, again with Raman spectroscopy, of Chinese celadon shards excavated in 1934. This showed that the shards possibly dated back to the Yuan (1279–1368 AD) or even Ming (1368–1644 AD) dynasties. It was previously believed that the shards dated back to the Southern Song Dynasty (1127–1279 AD). Earlier analyses of glass beads by Prinsloo and Colomban (2008: 89) shows 'that there is some relationship to Mediterranean/Islamic production technologies…' This indicates that the pre-modern Mapungubwe state was connected to an 'extensive maritime trade network, established already in the first century AD, which linked East Africa with the…commercial systems of the Indian Ocean' (Prinsloo 2005). According to Prinsloo (2005) raw commodities like gold, rhinoceros horn, ivory, ambergris, frankincense and myrrh were traded for cotton, porcelain and glass beads. The gold beads and animal statues uncovered in the 1930s, suggest that the pre-modern Mapungubwe state employed sophisticated goldsmith techniques or were wealthy enough to procure such objects. It is therefore possible that not only raw materials flowed from Mapungubwe into the Indian Ocean trade network, but also manufactured goods. Different forms of economic activity played an important part in the pre-modern governance structure of the area.

[1] An archaeological site near Mapungubwe Hill (Meyer 2000).

A further reading of the history suggests that it was not only agriculture, water and other resources influencing settlement dynamics. Shifting alliances and power bases, wider competition over trade networks and the expanding powers of Greater Zimbabwe, as well as cultural perceptions also had an impact (Smith 2005; Huffman 2008). '[T]o sustain a capital the size of Mapungubwe and to reinforce its importance, networks of management and by extension, control of resources and tribute for extended communities were critical' (Smith 2005: 196).

Ideology played its part too, especially in light of agricultural failure. Sacred leaders were chosen by God via the ancestors. When natural calamities occurred it indicated God's displeasure of the king that would be blamed for the disaster and his leadership challenged with possible succession disputes. This was probably the case around the mid-thirteenth century when sacred leaders had fully nationalised rainmaking (Huffman 2008). A reading of the history of the Middle Iron Age State should not be confined to one theoretical interpretation. That is, by highlighting the role of the ruling élite can lead to a situation where other non-tangible variables are ignored.

In the case of the Middle Iron Age State, one can see that it was not simply biophysical factors or the rule of the king which determined governance of water resources. Trade would have played a role and the engagement with international trading partners brought new resources to the area which was not locally available. Through these trade relations external norms and ideas could also have had an impact on the governance and politics of the society and its resources. In addition, social and cultural practices relating to rainmaking at the time played a significant role in determining who governed during the period. A combination of environmental factors (rainfall patterns) as well as cultural beliefs influenced who ruled the state.

Mapungubwe National Park and World Heritage Site

Archaeology, history and botany played an important role in the establishment of the Mapungubwe National Park (MNP). But it was politics, and particularly ideological contestation between the ruling South African Party (SAP) and the opposition National Party

(NP) that influenced the Park's future between 1922 and 1948. It was in 1932 that the famous gold work was discovered in an unknown grave on a rock summit by J. C. O. van Graan, a student at the University of Pretoria (UP). An academic study was launched by Leo Fouché, a founder of the UP's Department of History, and one of Van Graan's lecturers, whom Van Graan had told about the discovery. Jan Smuts (who became Prime Minister in 1919) (Carruthers 2011), a friend of Fouché supported the endeavour. Smuts believed that archaeology was 'a great field awaiting investigation in South Africa' (Mason 1989: 107–108 cited in Carruthers 2006). In April 1933, Fouché led the first archaeological team to Mapungubwe. Two other archaeologists continued the dig after Fouché: Dr Neville Jones and Captain Guy Gardner, who started a second series of excavations. After the National Party came to power in 1948 (ousting Smuts' government) the government-funded Archaeological Survey slowed down and was closed in the early 1960s (Carruthers 2006).

The establishment of the Park started in '1922 when nine farms were set aside as a botanical reserve' (SANParks 2010). Dr. I. B. Pole Evans drove the establishment of the Dongola Wild Life Sanctuary. In 1918 the Department of Agriculture established a Botanical Survey of the Union, and reserves were set aside for this purpose. One of these was near Mapungubwe and known at the time as the Dongola Botanical Reserve. In the early 1940s the government acquired Greefswald farm (where Mapungubwe is situated) and added other farms to the Reserve. It was Pole Evans that lobbied for the proclamation of Dongola as a national park. Smuts came to power in 1939 and the initiative gained momentum as the Minister of Lands, Andrew Conray, became a supporter and proposed that Dongola be transformed from a 'botanical reserve' to a 'national park'. He tried to acquire new land through support from farmers and other government departments (Carruthers 2006, 2011).

In 1944, Conray started negotiations and appointed a Parliamentary Select Committee. The plan was to create a 240,000 hectare national park. Cooperation with the government of Rhodesia and the Chartered Company of Bechuanaland to have Dongola straddle the three borders, with Mapungubwe as its cultural centre, was also proposed. Opposition came from all quarters and the 'Battle of Dongola', ensued, involving local landowners, the opposition National Party defending white land ownership, the National Parks Board and the Afrikaner Press. Conroy did not falter. The matter was put to Parliament and it became a major election issue before the 1948 elections. In 1947 the Park of 92,000 hectares was proclaimed around much controversy (Carruthers 2006; MNP Brochure 2011), only to be disbanded by the new National Party government in 1948 (Carruthers 2006, 2011).

In 1967 the South African Association for the Advancement of Science lobbied to declare the park with the archaeological site. The Minister of Agricultural Technical Services and Water Affairs, Jim Fouché, the National Parks Board and the University of Pretoria opposed the initiative. Mapungubwe archaeological site and K2 were declared a national monument only on 9 September 1984. In the late 1980s there was another move to declare the Park as a tourist hub. This was supported by De Beers, after it established Venetia Diamond Mine in A63E. On 9 June 1995 an agreement between the South African National Government and the Limpopo Provincial Government was signed to commit both sides to the development of a new park in the Shashe/Limpopo area. Mapungubwe was officially declared on 9 April 1998 with the main objective to make the park a major component of a transfrontier conservation area shared by Botswana, South Africa and Zimbabwe (Carruthers 2006; SANParks 2010). In 2003 the Mapungubwe Cultural Landscape became a United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site (Carruthers 2006) with the Park officially opened in September 2004. In 2006, Botswana, South Africa and Zimbabwe signed a memorandum of understanding (MOU) to establish the Greater Mapungubwe transfrontier conservation area (TFCA) (Peace Parks Foundation 2012).

Mapungubwe National Park is a striking example of an event where everyday IPE shapes national and international conservation processes. The discovery by van Graan followed by the efforts of Leo Fouché led to the interest in the archaeological value of the Mapungubwe site. Their efforts, supported by politically influential actors, resulted in the Park's establishment. Interestingly, political actors, acting as inhibitors of change, later slowed down the process. This case shows how an archaeological and cultural exercise became entwined with political struggles at

the level of the nation-state. Conservation of cultural and biophysical heritage became a locus of agency for actors to exert power in the political process. This locus of agency shifted from a mere discovery by an individual to the establishment of a national park, just to be abandoned, re-established and enlarged to a transfrontier conservation area.

De Beers' Venetia Diamond Mine

Operations on Venetia's open-pit commenced in 1992 and in 2010 Venetia yielded some 4.287 million carats of diamonds from 4.036 million tonnes treated ore. Venetia is the largest producer of diamonds in South Africa (De Beers 2011a). In order to understand Venetia's role and involvement in the quaternaries, it is necessary to investigate the mine's stakeholder initiatives and its environmental programmes with De Beers' Water Stewardship initiative being significant (De Beers 2011b).

In November 2009, De Beers signed up to the United Nations Global Compact's CEO Water Mandate. Water is critical for mining operations since most of De Beers' mines are situated in water-stressed countries like Botswana, Namibia and South Africa. Priorities for De Beers are to find alternative sources of water and using water efficiently to minimise water use (De Beers 2011b: 1). De Beers is also aware that water is a commodity with competing use between humans and ecosystems. According to De Beers Venetia was planned with this in mind (De Beers 2011b). A pressing challenge for De Beers is equitability in accessing good quality water for its operations and water for local communities. For De Beers (2011b), the company is willing to engage, 'through dialogue with governments, water users and other Water Mandate endorsers', to increase its understanding of water resources governance and management and how it could affect its operations (De Beers 2011b). The signing up to the Mandate and the reporting of the company's progress thereon is a step in the direction of dialogical compromise.

In 2010 De Beers entered into an agreement with the Worldwide Fund for Nature-South Africa (WWF-SA) to understand: (1) Venetia's operation within the socio-ecological landscape regarding water risks, (2) how Venetia and other user needs are potentially at risk in a changing world, and (3) the responses needed to minimise shared risks and improve water security resilience (De Beers 2011b).

This culminated into a scientific study done by De Beers and WWF-SA. They, together with the Council for Scientific and Industrial Research (CSIR), collaborated on a project, the Limpopo Integrated Water Catchment Project, to assist De Beers in understanding change in the governance and bio-physical contexts. A collaboration strategy with stakeholders to address shared water risks was the result (De Beers 2011c). De Beers is an important player in the region since it abstracts groundwater from two well fields located on the banks of the Limpopo River that is conveyed through a 32 km long pipeline to the operation. The abstraction takes place upstream from Mapungubwe. The mine's water steering committee coordinates water conservation and demand management whereas its water strategy encompass governance, utilisation, quality, legislation and stakeholder involvement (Maree 2011). De Beers is not only embedding itself into the conservation structure of society (WWF-SA) but also the scientific structure (CSIR).

De Beers' role as a private mining company in A63E is significant because much of the above-mentioned effort was initiated independently by the company and not because of government involvement or pressure. Through its engagement in the UN Global Compact, De Beers embedded itself into an international normative structure. Through such everyday IPE, non-state actors are creating new spaces for water governance that can lead to more integrated water resources management. Even so, it is also important to note the type of scientist De Beers collaborated with. The majority of scientists were natural scientists that are used to do research according to the scientific method's rationalist paradigm. In other words, De Beers went about doing the study from a rational scientific point of view where problem solving theory dominates. Problem solving theory takes the world as it is, look at the issues and come up with solutions to the problems (Cox and Sinclair 1996). De Beers wears the proverbial Janus face when it comes to strategy: the company embeds itself in normative structures and conduct rationalist studies to enhance its agency. It is both constructivist and rationalist at the same time.

Coal of Africa Limited

A recent development within A71L is the opening of the Coal of Africa Limited's (CoAL) Vele Colliery. The operation near Mapungubwe attracted considerable attention from interest groups. In March 2010, an interest group coalition consisting of the Endangered Wildlife Trust, WWF-SA, the Mapungubwe Action Group, the Office of the International Coordinator for the Greater Mapungubwe TFCA and the Peace Parks Foundation voiced its reservations towards industrial development in the Limpopo River Valley without 'an approved integrated regional development plan' (Peace Parks Foundation 2010a). This was followed by the lodging of an appeal by the groups against the approval of the start of the Vele Colliery based on their belief that the environmental management programme (EMP) had severe shortcomings, including: the omission of certain consequences of mining in the area; misrepresentation of mining activities as well as the future impacts of mining activities. The interest groups, as the appellants, were represented by the Centre for Applied Legal Studies at the University of the Witwatersrand. The Coalition also pressured the Minister of Mineral Resources at the time, Susan Shabangu, to exercise her powers in terms of certain sections of the Mining and Petroleum Resources Development Act (No. 28 of 2002) to suspend the mining right of CoAL (Peace Parks Foundation 2010b).

In August 2010 the Save Mapungubwe Coalition launched interdict proceedings to CoAL and the Minister of Mineral Resources, to immediately stop mining activities near the World Heritage Site. The Coalition was joined by the Association of Southern African Professional Archaeologists, Birdlife South Africa and the Wilderness Foundation of South Africa (Groenewald 2010; Peace Parks Foundation 2010c). The Department of Environmental Affairs (DEA) stopped construction of Vele after it found that several regulations had been transgressed and insufficient consultation with affected parties was performed (Macleod 2011). The DWA issued a directive to CoAL in 2010 to stop illegal water use activities at Vele, where it started mining without a water licence (Prinsloo 2011).

The DWA awarded CoAL a water license for Vele in April 2011, which was a positive step for the company since suspension of its activities by the DEA (Zhuwakinyu 2011; Peace Parks Foundation 2010c). The Coalition appealed against the granting of the licence, stating that CoAL's record of non-compliance with legislation, especially the South African National Water Act (No. 36 of 1998), was of serious concern (Prinsloo 2011).

CoAL signed a memorandum of agreement (MOA) with SANParks and the DEA in September 2011 'to ensure the integrity of the Mapungubwe World Heritage Site' and 'to comply with the relevant provisions of the [National Environment Management Act] NEMA section 24G environmental authorisation that was issued on 05 July 2011'. Other objectives include the development of biodiversity offset programs and action plans, developing means for local communities and other stakeholders to participate and benefit from the management and sustainable use of Mapungubwe's natural and cultural resources, the establishment of a steering committee to monitor these activities and effective implementation (MOA 2011). The Save Mapungubwe Coalition responded to the signing stating that the offset programmes and the environmental monitoring are in any case requirements under 24G issued by the DEA implying that the MOA is not necessary since these are required by law. The Coalition also indicated its concern with the 'blanket confidentiality provision' in the MOA (Hiltermann 2011). The negotiations and implementation of the agreement should be made public, since it relates to a 'national treasure', the Coalition argued. The issue of transparency was also raised in that the DEA, SANParks and CoAL negotiated and signed an agreement without the input from the public, non-governmental organisations or the Coalition that are affected and interested parties (Hiltermann 2011). For the interest groups, this went against the grain of democratic principles.

The DEA gave Vele's go-ahead in October 2011, which was greeted with opposition from the Coalition (Macleod 2011). The Endangered Wildlife Trust, through their Chief Executive Officer (CEO) Yolan Friedmann, noted that opposition to the Vele Colliery was based on 'detailed scientific studies on the groundwater, biodiversity, heritage, air quality, and noise and tourism impacts posed by the mine' (SAPA 21 July 2011). Scientific evidence was also the basis for the DEA to give the go ahead (SAPA 21 July 2011).

On 24 November 2011, the Coalition and CoAL signed a memorandum of understanding (MOU) that

will complement the MOA signed between CoAL and the government. The purpose of the MOU is to strengthen cooperation between the Coalition and CoAL for the sustainable development and preservation and protection of Mapungubwe. Yolan Friedmann said that the 'Coalition would suspend all legal proceedings and administrative appeals against CoAL's new order mining right, environmental management plan and integrated water licence, and aimed to sign [an] MOA by January 31 [2012]' (Odendaal 2011). CoAL indicated that it is expected to sign the MOA by 31 May 2012 (CoAL 2012a), but by June 2012 CoAL announced that both parties agreed to postpone signing of the final agreement. This was so that enough time could be granted for the final review of technical information and conclusion of the agreement with the Coalition (CoAL 2012b).

According to the Peace Parks Foundation, the contestation over the Vele Colliery as well as CoAL's plans for another mine at Mooiplaats in the Mpumalanga Province resulted in the company's share price dropping by half. It also delayed the company's transfer of its primary listing from Australia to London. Because of contraventions of legislation the company had to pay fines of R9.25 million. John Wallington, CEO of CoAL told the *Financial Mail* that: 'It is impossible to quantify the capital costs of putting more environmental precaution in place than are required by law, but it would probably add about 5 % to operating costs' (Mathews 2012).

To assess the impact of Vele on the Mapungubwe Heritage Site UNESCO visited the area in 2010 (Peace Parks Foundation 2010d; Macleod 2011). This could explain De Beers's partnering with WWF-SA and the CSIR—to not attract negative attention and show that it is caring for the environment and the heritage site. Venetia Mine also has a more direct impact than Vele Colliery. De Beers pumps water upstream from the Park out of the Limpopo River. Be that as it may, UNESCO concluded that it is extremely concerned at the impact of opencast and underground mining operations on the Mapungubwe cultural landscape…' since Mapungubwe is downwind from Vele and the mine is situated in a buffer zone of Mapungubwe as well as in the middle of the TFCA. UNESCO also concluded that 'if an appropriate [environmental impact assessment] EIA, which takes into account the impact on cultural heritage and the Outstanding Universal Value of the property, had been carried out, a mining permit should not have been granted' (UNESCO 2011: 96). UNESCO (2011: 95) furthermore noted that the EIA for the mine 'hardly focused on the cultural attributes…and not at all on [Mapungubwe's] Outstanding Universal Value'. A further concern raised by UNESCO (2011: 97) was that the 'State Party [government departments] acknowledges that the mining licence appears to have been issued without appropriate consultation with relevant ministries and that work has been suspended while a "process of rectification" is undertaken that will entail the mining company carrying out a further impact assessment which must include impact on the cultural attributes of [Mapungubwe] and its setting'. UNESCO visited the area again in January 2012 and concluded that progress has been made regarding its recommendations after the first visit in November 2010. CoAL subsequently revised the Vele Colliery Heritage Impact Assessment report which was submitted to the DEA in April 2012 (CoAL 2012a, b).

Within A71L, the situation regarding the governance of mining activities is a contrast to that within the A63E quaternary. The environmental and water regulations of the country were tested by a private sector actor. Environmental groups did not however wait for government's response but took action themselves to halt potentially harmful practices on Mapungubwe. Legal instruments through the court as well as less formal tools such as MOUs were used to ensure environmental protection by demanding adherence to environmental and water regulations. Interestingly, this case of everyday IPE had consequences beyond the boundaries of the quaternary or even the Limpopo catchment. The impact on CoAL's share price is another example of how bottom-up action can influence global economic activities.

All four cases illustrate how actions by varied actors operating at different levels and using different loci of agency and empirical focus have worked to shape water resources and water governance in the Limpopo River Basin. Table 1 below presents a crude illustration of how these developments reflect the influence of EIPE in the two quaternaries (Table 2).

Discussion and conclusion

Interaction between actors over complex interdependent issues such as the establishment of the

Table 2 EIPE in the A63E and A71L quaternaries through historical developments

	Middle Iron Age State	Mapungubwe National Park and WHS	De Beers Venetia Diamond Mine	Coal of Africa Limited Vele Colliery
Who acts and how do their actions enable change?	Traders who shaped the environment through international partners Social and cultural systems of rainmaking are enabled and shape leadership successions	Van Graan/Jan Smuts/I.B. Pole Evans/Andrew Conroy Supporters of conservation movement established Park Those from the opposition party also played a role in slowing down the establishment process	De Beers Mining company, WWF South Africa and the CSIR WWF South Africa and the CSIR assist De Beers to recognise previously unknown risks and thereby potentially increase De Beers' agential power	Coal of Africa Ltd—disregarded environmental legislation, at first CoAL embedding itself in the government structure through the MOU, evoking a response from interest groups that they also need to be included. CoAL can increase its agential power through the MOA with the interest groups Interest groups could become more vociferous in their monitoring activities Environmental interest groups represented by Centre for Applied Legal Service—appeals and put pressure on government to act against CoAL Government Departments awarding licences for water abstraction and mining activities DEA stopping Vele
Theoretical tradition	Structural constructivism	Political realism, Liberal Institutionalism, Structural constructivism, Nationalism	Complexity/Sustainable development/Social constructivism	Political Neorealism, Structuralism, Neoliberal Institutionalism, Capitalism
Unit of analysis	Traders/farmers/subjects/State Epistemic community	Conservationists/Politicians/Land owners	Private sector company, Environmental non-governmental organisation, research institution	Private sector company, Environmental non-governmental organisations, Centre for Applied Legal Studies, Government Departments, International Organisation (UNESCO)
Prime empirical focus	Trade and rainmaking	Conservation Construction of a racialised state	Surface and ground water resources management	Environmental and water regulations
Locus of agency	Livelihood activities and stability and safeguarding of the state Increasing knowledge about the Middle Iron Age State and highlighting its cultural and historical significance in the contemporary period	Conservation Regarding the National Party, the denial of the existence of a Middle Iron State in pre-European settled South Africa	Integrated water resources management, CEO Water Mandate and scientific knowledge and how it can assist in decision making and policy implementation	Environmental and cultural heritage protection Political regulation and implementation Watchdog Monitoring agents

Mapungubwe National Park and World Heritage Site as well as resource utilisation within and around its vicinity within A63E and A71L gives rise to governance networks that involve numerous actors. Various stakeholders, governmental as well as non-governmental, are interacting with one another to form a governance network. This means that multiple identities and structures are at work in the debates concerning the utilisation of the areas' natural and cultural resources.

To understand the current governance climate in A63E and A71L it is necessary to understand the historical developments within the natural environment and the involvement of societal actors. Another aspect that should be acknowledged at this stage is that the Raman spectroscopic analyses of Prinsloo and Colomban (2008) and Prinsloo et al. (2011) shedding light on the pre-modern Mapungubwe state's possible interaction with other nations (e.g. Oriental states) is a good example of interdisciplinarity, where Physics and International Relations intersect to indicate not only pre-modern state interaction through trade but also the possible advent of globalisation. Cross fertilization between International Relations theory, Physics and Archaeology has the potential to interpret past socio-political dynamics. The current interpretation of the history indicates that neoliberalism and even neorealism is dominating as theoretical beacons; these theories emphasise the balance of power between collectivities, the state at Mapungubwe and Greater Zimbabwe as well as the power of political élite. Should we change our theoretical tact regarding its interpretation, it could open a new frontier of research on the Middle Iron Age state. A governance structure consisting of an agrarian and trading state was established between 1000 AD and 1300 AD. How this governing structure functioned exactly is not fully known, but we know that rainfall played an important role in the area's natural resource base supporting economic activities ranging from farming to hunting. According to Steyn (1997) the people of Mapungubwe were quite healthy indicating that they relied on cattle herding to supplement grain cultivation. Her research also shows that the population of the state grew rapidly, another indication of a healthy population. Meyer (2000), in his research, notes that Mapungubwe Hill was a royal African metropolis and a centre of subsistence farming, trade and social development. Other subordinate sites in the vicinity indicate that there were smaller settlements such as agricultural villages and cattle outposts. Henneberg and Steyn (1994) note that there was the presence of 'an economically successful population'. According to Raman spectroscopy Mapungubwe was not abandoned suddenly, but over a couple of centuries. That rainfall played an important part in sustaining the economic base of the state and that the state traded with other entities suggests that a governing system was in place where policy decisions were made with consequences on policy outcomes. Because of the presence of a royal metropolis, it is possible that the governing structure was hierarchical and possibly despotic. Interventions to practice agriculture and trade efficiently had to be decided upon to construct a society that lasted for a couple of centuries. With the onset of a cooler and drier climate governing interventions were necessary for the state to cope with the change in the natural environment. Should this be the case, resilience is very much an inventive action by humans to cope with shocks emanating from and impacting on the immediate environment. A system is not automatically resilient people put practices in place to make it resilient. It is possible that the construction of the state's resilience was in the hands of the ruling élite. Schoeman (2006) states that rain control in the state took place on hills surrounding Mapungubwe before it was centralised. Her research also shows that 'hunter-gatherers' participated in rain control. This changed with the advent of a more centralised ideology with rain control on Mapungubwe Hill. Yet, the rain control practices continued on the other hills. According to Schoeman (2006: 152): 'This suggests a non-uniform identity and implies that the Mapungubwe centre did not establish complete ideological hegemony.' This indicates that regulatory IPE and everyday IPE were practised alongside each other.

That the state had trade links with other entities is an indication of the type of agential power it possessed. Trade was likely the constitutive element of the state's reflexive agential power. Mapungubwe imbedded itself into a trade network and the production of manufactured goods (material structure). The production of goods and trade likely enabled the state to produce surplus goods. It is possible that the surplus could have been used to acquire other goods that became scarcer over time as the climate gradually changed. It is also not entirely impossible that the ruling élite used the surplus to 'appoint' people in rain

control positions, which would explain how rain control were centralised. This was possibly the way in which the state coped with its existence in the face of an unfriendly environment. In other words, the state's agency was vested in rain control and the production of surplus goods. Should this be the case, it indicates a link between agential power and agency—agential power constitute the ways through which coping tactics are implemented and agency the process to build strategies for survival. Be that as it may, the state at Mapungubwe was not only the product of a political and economic élite, but also ordinary individuals.

The Middle Stone Age state was also at the mercy of the biophysical environment; a dynamic that is still at play today. The agential power of the state was therefore a function of the biophysical environment as well as the utilisation of the environment. Yet, one should not put everything in the hands of the biophysical environment as the independent variable determining the fate of the state; but also the ideological shift in power from rain making methods in private hands to the nationalisation thereof. It would be interesting to see, as research continues to investigate the pre-modern Mapungubwe state, how this shift in ideological power base affected the society. A central question in this regard should go beyond; is there anything new we can learn from ongoing research of the pre-modern state, to include, should we frame any new research findings within different (Anthropological, International Relations, Political Science and Sociological) theoretical frameworks and what can we learn from the pre-modern state compared with today's society.

The Dongola Wild Life Sanctuary, the forerunner of the Mapungubwe National Park, was the victim of an ideological power struggle between two opposing political forces. This ideological struggle was not only for the preservation of South African society and breaking free from the ensuing isolation of the country, but also for the hearts and minds of white South Africans regarding the future of the country. This is the classic example of the environment being relegated to second place behind the interests of society.

It is also noteworthy that scientific disciplines played an important part in the establishment of the Mapungubwe National Park. The Middle Iron Age State at Mapungubwe gave the original impetus for archaeologists to conduct research on its history. It is fair to say that had the political leadership, during and after the discovery of the gold work, had not had an interest in science, Dongola might only later have been established. Jan Smuts was not only a politician and military commander. He also developed the theory of holism (Smuts 1927) and it is his scientific outlook and identity that played a constitutive part in lending support for Dongola and pushing for further archaeological research. Yet, we should also not forget the numerous scientists and their scientific studies that played their part. Which one of the actors were dominant is irrelevant. What is noteworthy is that a member of the ruling élite also had a scientific identity and played a scientific role in the establishment of Dongola. This is not to say that Smuts' political power counted for nothing—he used it to great effect in the endeavour. In the case of Dongola actors were simultaneously power givers and power takers. In the case of Smuts these roles were intermingled. That the artefacts had been produced by people centuries ago gave the gold work a sacred quality that needs to be treated with great respect. This sacred quality does not only bring to the fore the monetory but also the historical and cultural value of the objects. That some of the objects are linked with Middle Eastern and Chinese cultures heightens this sacred quality. This value was one of the foundations for establishing Mapungubwe as a UNESCO World Heritage Site. Policies and politics is in this case not only about the material and ideological. The historical and sacred aspects attached to the artefacts and the area also play a constitutive part. Inanimate objects alongside politicians and scientists can also wield power under certain circumstances. Such objects can indicate the existence of other ways of life that existed and that are at times denied for ideological reasons. All-in-all, it was not a number of distinct roles and identities that played their part in the early years of the National Park's establishment. The roles, identities and various structures were enmeshed to create a situation that led to political and societal support for Dongola. The everyday actions of the scientists are here telling in that the research they conducted laid the foundation for the founding of the National Park and its ideational presence in society. An actor's ability to practice agential power and more specifically reflexive agential power lies not only in contemporary structures, such as UNESCO, but also in those material and ideational

structures that were laid down in the past when scientific research of Mapungubwe started.

Yet, the National Party's focus on Afrikaner nationalism while denying a part of South African history's African identity scuttled plans for Dongola. Governance of natural resources is not always harmonious (Kooiman and Bavinck 2013). Governance is also filled with ideological fervour. The National Party's new normative structure of society brought to halt further plans for the park's establishment. Normative structures can therefore be constitutive and destructive.

The National Party's view of a desirable society influenced future plans for the park's establishment. An example would be the plan advanced by the South African Association for the Advancement of Science in 1967. In this case the epistemic community's agential power was quite low, since its plans were not in line with the normative structure proposed by the National Party. The Association reflected on the norms and conventions that inform its scientific interests of studying and preserving for future generations. For the Association the establishment of the archaeological site seemed legitimate. Yet, the government's nationalist ideology was not in line with the Association's thinking. The Association's actions show some rationality, but it was also informed by its scientific norms and identity. The Association's axiorationality clashed with the dominant élite's ideology.

The National Party's agential power was even lower than that of the Association. As it was denying an African historical culture before European colonisation, so it denied its place and role as a location for scientific investigation and cultural and historical advancement. It was only in the mid-1980s when the government felt the keen sting of years of international isolation and ever increasing economic and political sanctions that the government started acknowledging the cultural and historical importance of Mapungubwe. After 1994, with the newly elected majority government did Mapungubwe come to be recognised as a site of not only national, but also international importance. In short, identities were intact (scientists and Smuts), some identities were created in relation with Mapungubwe (National Party after 1948 and denial of an African heritage). The scientists maintained their identities as 'custodians' of historical, cultural, material and sacred structures. The National Party reshaped its identity in the mid-1980s as the dominant élite tried to break the country out of its isolation mould. In 1994, the denial identity was completely discarded with the advent of democracy. In other words, identities and their shaping go hand-in-hand with the change in structures. De Beers's commercial identity was also reshaped to a certain extent when it saw the value of supporting the National Park as a tourist hub. So, the answer to who act and with what consequences vary between historical time frames, the type of actors involved, the dominant élite's ideological position in relation to other identities, the international sentiment towards the dominant élite and the national structures the dominant élite propagated and implemented and the identity of commercial interests that hold harmful consequences for the environment.

Because the National Party was not supportive of the Association in 1967 does not mean that axiorationality will always play second fiddle. De Beers's support for the park in the late 1980s is a good example where axiorationality is, until today, standing the company in good stead. De Beers does not do as it pleases. The company is a keen observer of the normative structures in the national and international arena. When UNESCO visited Mapungubwe in 2010, it is quite possible that De Beers reacted to the normative structure of cultural heritage protection as a desirable norm manifesting in UNESCO's visit. By signing up to the Water Mandate, De Beers was able to mitigate the logic of interest group lobbying against mining companies' negative environmental impacts. It was also able to shape the international realm, since the company is a transnational corporation that operates in various countries. De Beers has a high profile because it is the largest producer of gem quality diamonds in the world. These factors make the company vulnerable to criticism from environmental interest groups (Neme 1997; Meissner 1998) and by signing up to the Water Mandate and by partnering with the WWF South Africa has increased the reflexive agential power of the company.

CoAL had low agential power when it started its Vele operation. Not only did the company transgress legislation, it also did not bring on board non-state actors with an interest in the area. It is as if CoAL was basing its perspective of the governance and political environment on thinking that was appropriate a couple of decades ago when development was placed before environmental considerations. In other words, its

paradigm was out of kilter with reality and hence the aftermath of its decisions. With the signing of the MOA with SANParks and the DEA, CoAL acted as if SANParks and the DEA are the only relevant role players. This begs the question 'why', especially after CoAL had already got much opposition from non-state actors. It was as if CoAL was operating in RIPE as opposed to EIPE 'mode', so to speak. Yet, CoAL signed an agreement with only government and, in effect, the environment, ignoring the other non-governmental 'everyday' interests and concerns.

Again one can see that governance is not always harmonious (Kooiman and Bavinck 2013). This is true not only for CoAL and the government, but also for the interest groups and UNESCO. The plethora of actors interacted with one another in such a way that it is actually impossible to say who pulled the oars and who steered. Even so, it would appear as if CoAL was treading water when it could not reflexively imbed itself in the governmental and normative structures of the interest groups. As already mentioned, it was as if CoAL was unable to get the balance between everyday governance and regulatory governance right. The case of the Vele Colliery is a prime example of the multivariate nature of governance systems in international river basins (Meissner and Jacobs 2014). As mentioned earlier, the actions of the various actors brought about not only change in A71L, but also in A63E. It is not entirely impossible that De Beers viewed the situation in A71L with trepidation and decided to partner with WWF-SA to avoid negative press. There was also reaction at the international ideational and normative structures when UNESCO became involved.

Domestically, the interest groups acted as power givers. They did so through legal, normative and regulatory means. Normatively the interest groups argued that the government and CoAL's actions are out of kilter with behaviour so close to a national park and World Heritage Site. The various legal proceedings enacted against CoAL sprouted from the interest groups' normative and ideational arguments. The interest groups, just like CoAL and the government, sought scientific opinion to back their arguments. This means that the dominant capitalist élite (CoAL) and the government élites did not play a dominant role during the saga. When they wanted to establish their dominance through the MOA and MOU, the interest groups argued from a regulatory point of view. This argumentation comes close to hybridised mimicry. Even so, something already in existence (NEMA section 24G) was not filtered through the interest groups' cultural lenses but was used to act defiantly. This rejection of the actions of CoAL and the government is constituted by the interest groups' interest, identities and ideology. The interest groups perceive themselves to act in the interest of the environment. They identify themselves as the custodians and guardians of the natural environment with an ecologist ideology informing their defiant behaviour. Ecologism views humans as an intricate part of the natural environment in a complex and interrelated manner. In relation to this connection, Vincent (1995) says that: 'What we sow in terms of industrial pollution, we will reap from the instability of the ecosphere'.

Throughout the Vele Colliery episode, CoAL was at times a victim and an agent of change. It can be argued that CoAL was a victim of its own devices—starting an open-cast coal mine not far from a World Heritage Site will attract negative attention no matter how well one intends on managing the setting up of the operation. It was also an agent of change, but unwittingly. The perceptions generated by its actions (a product of the interest groups lobbying against the mine) and CoAL's uneasy relationship with the interest groups, government (at first) and UNESCO created an opportunity for De Beers to act. The relationships between the actors in the two quaternaries changed. How and to what extent is difficult to say at this stage. It is not entirely impossible to speculate that whenever other companies want to start mining operations in the area, a similar reaction will come from interest groups. It is also possible that other mining companies would have learned for the episode and approach possible future operations differently. The everyday actions of the various actors over time will have a bearing on future activities.

The agential power of actors does not only depend on tangible structures, such as advocacy coalitions and the ruling élite. Non-tangible structures are also important. Here normative structures such as ideology, theoretical disposition, values, beliefs, generic traditional knowledge, etc. inform actors' actions to bring about change. It is therefore not only about identifying and interacting with stakeholders, but also about their normative perception of the environment and issues that need considering and interaction.

What's more, it is not only a matter of an actor imbedding itself into social structures but *appropriate* social structures. For this to happen an appropriate theoretical map or blue print of societal and, in particular, political realities are necessary. If such an appropriate map is absent, it can cost an actor dearly, not only in terms of financial resources but also its reputation. Moreover, the primary river basin is no longer the only appropriate unit of analysis; the quaternary unit can reveal just as much and possibly even more and finer nuanced research issues, actors, governance structures and politics. Everyday IPE and agential power are important factors in water governance that can sometimes be ignored when using dominant theories like neoliberal institutionalism. Everyday IPE and agential power offer alternative views of actors and pathways for development as well as highlighting alternative issues of significance such as culture. That said, we are unable to pinpoint with precision how the actors of the Middle Stone Age state operated on a daily basis. Yet, their daily activities constituted present-day Mapungubwe. The archaeological site at Mapungubwe plays a central role in the current and future governing of resources in A63E and A71L and will do so into the future.

Various stakeholders interact with one another in a policy/decision making and influencing network. This observation does not include the history of the pre-modern Mapungubwe state. Should it be included, it could shed further light on governance and political dynamics. What had been happening in this society has been under investigation for a couple of decades (e.g. Fouché 1937; van Riet Lowe 1955; Gardner 1963; Huffman 2008, 2009; Prinsloo et al. 2011 and others). Further investigation will progress our understanding of this society's interaction with the environment and other society's beyond Mapungubwe's immediate border and control. More research is needed within this domain, for it will indicate how a pre-modern society coped, adapted and reacted to a changing environment without the technological advances found in modern societies. The concern regarding mining is associated with the ecological sensitivity, water scarcity and cultural value of the area that had been established through developments in the Middle Iron Age State at Mapungubwe and the establishment of the Mapungubwe World Heritage Site. Historical developments have an enduring impact on actors and structures—actors separated through time have an influencing effect on each other and the societal structures they create. Overall, one can conclude that the agency of non-élite actors should not be underestimated as they have the potential to offer alternative approaches and resources for governing natural and cultural assets.

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Sustainable management of coastal zones: Six cross-scale and cross-level linkages

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Introduction

Coastal zones play a larger role in sustainability than their spatial extent might suggest. The thin strip of land within 100km of the shoreline hosts 14 of the world's 17 largest megacities, as well as countless smaller settlements, and account for more than 40 percent of the world's total value of ecosystem good and services (IGBP and IHDP, 2014, Wilson et al., 2005). The world's coastal population density is nearly three times higher than the global average (Small and Nicholls, 2003) and total coastal population is expected to reach roughly 2.75 billion by 2025 (The Earth Institute, 2006). In the future, the upsurge in infrastructure development and land use changes associated with the increasing coastal population, and the ever growing threats brought about by global environmental changes like climate change, will reduce the likelihood of achieving sustainability in the world's coastal settlements if ongoing environmentally destructive human activities continue business-as-usual (Day et al., 2013).

The sustainable management of coastal landscapes requires a thorough understanding of the dynamics of change that shape these environments. The change dynamics in all natural resource systems involve interactions within and between different scales (Cash et al., 2006), necessitating a scale-sensitive approach in their analysis and management practices. Throughout the article, we take management to generally mean the intentional activities executed 'with the goal to maintain and improve the state of an environmental resource affected by human activities' (Pahl-Wostl, 2007): 561). Human-environment interactions, historical and contemporary, play a defining role in determining current and future conditions of society and the non-human environment, and an understanding of which processes dominate these interactions can inform our cultural knowledge and contribute to our collective capacity for more sustainable planning and living (Crumley, 1994).

In this article, drawing on an exemplary case from the Atlantic coast of Florida, USA, we trace the interactions between ecology and society over time and show how linkages across scales and levels have influenced the development of the social-institutional and ecological form of the case area. We argue that these historical scalar linkages maintain relevance to contemporary coastal management and that accounting for and addressing the related challenges should be at the core of coastal management research and practice. We structure our analysis around six key social-ecological features which are prominent in the dynamics of change in coastal environments. These features include: demographic change; land control and property rights; trade and local-global economic links; resource extraction and use; infrastructure and transport development; bio-geomorphology. These features are derived from ongoing doctoral research on the changing human-environment interactions along Florida's Atlantic coast. We show how the different cross-scale and cross-level linkages associated with these six features intermingle, creating unique, often emergent context-based outcomes that complicate planning and pose site-specific challenges for management.

We begin by outlining an analytical framework which specifies and clarifies important concepts relevant to understanding cross-scale and cross-level linkages. We then introduce the case example and examine the historical changes in human-environment relations over time. We end with conclusions for how these cross-scale and cross-level linkages are relevant to current and future coastal management, including the potential to address scalar challenges by adopting and implementing principles of institutional interplay, co-management and boundary work.

Analytical framework

Political geography of coastal management

A look at the political geography of resource management provides a solid foundation for understanding the cross-scale and cross-level dynamics implicated in the management of the coastal zone. As (Hägerstrand and Clark, 1998): 21) remind us, 'the critical link between human society and the terrain with its living content is constituted by the parcelling of land and water in spatial domains of various size and shape'. These politically defined spatial domains, when combined and interlinked, form a mosaic that is superimposed over the heterogeneous patchwork of the world's bio-physical environments (Hägerstrand, 2001, Thompson, 2005). The boundaries formed by this political mosaic of domains, having 'come into being predominantly for regulating economic and social activities' (Hägerstrand, 2001): 40) define the freedoms and limitations of actors in the landscape, what Hägerstrand (2001) has called "territorial competence". Human influence on the biosphere has its origins in actions taken in the local landscape, but the politically defined domains that demarcate territorial competence generally exist as a nested system, with higher-level actors imposing (often legal) constraints on lower-level actions (figure 1). Lower-level spatial domains may involve more complex decision making environments than higher-level domains, what (Murawski, 2007): 687) called 'the paradox of scale', which refers to 'the fact that smaller scales of geographic organization may tend to involve higher numbers of management layers'. A nested, or intra and inter-level, perspective is needed to understand how environmental interventions affect and are affected by higher and lower level processes, social or bio-physical.

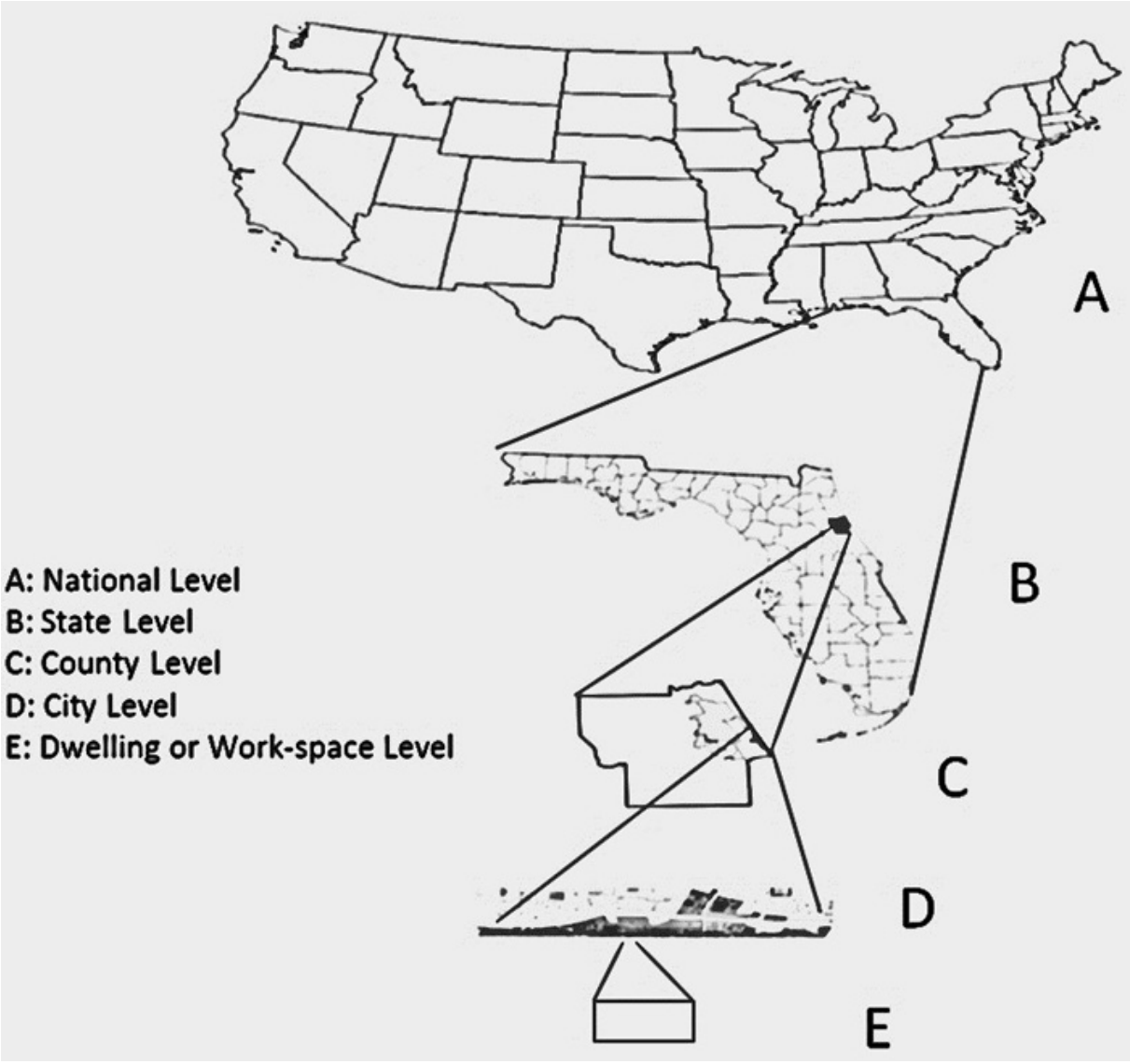

Fig. 1. Nested spatial domains for coastal management in Flagler Beach, Florida, USA. Adapted from Hägerstrand and Clark (1998)

The boundaries formed by the nested system of domains, and the related demarcated territorial competencies, tend to be stable over time (Hägerstrand, 2001). However, substantial changes in for example administration, systems of land ownership and property rights or economic restructuring are often accompanied by changes in the structure and number of spatial domains, which also implies a restructuring of territorial competence. This can include anything from the creation of new nation-states, re-working the voting districts within counties, or implementing new zoning codes within individual municipal boundaries. Managing the densely settled coastal zone, which by its very nature is dynamic and vulnerable to dramatic and often punctuated change, requires a multi-scale and multi-level approach (Swaney et al., 2012).

There is a density of physical and social scales implicated in the constitution and resolution of environmental problems (Meadowcroft, 2002). This density would be deepened even further when one considers "wicked" (Rittel and Webber, 1973) sustainability challenges like climate change, land use change or biodiversity loss. The coastal zone is an arena that brings together

complex and dynamic biophysical forces of nature along with human use activities, creating an environment characterized by intersecting sustainability challenges and overlapping ecological and social scales. Living sustainably in such environments, which engage many social and natural dimensions, often requires understanding cross-scale and cross-level dynamics. We have seen failures in policy and management by ignoring these interactions or their complexity and evidence shows that accounting for scale appropriately and using the opportunities of cross-scale and cross-level interactions leads to improvement in responses (Cash et al., 2006). Understanding scale and giving explicit consideration to scale choices in sustainability research may lead to a better understanding of complexity and promote wiser policy decisions.

Scales and levels

(Gibson et al., 2000) define scale as 'the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon, and the "levels" as the units of analysis that are located at different positions on a scale.' (Howitt, 1998) suggests that in geography, scale possesses three facets, namely, size, level and relation. This relational aspect is important as it acknowledges the interconnectedness of scales and levels. According to (Young, 2006) there are different types of scales that are relevant to how we use and protect natural resources including geographical space or spatial scale (the most commonly used scale); temporal scale; jurisdictional scale and institutional scale as examples. As discussed above, within each type of scale, there are levels which could be nested or hierarchical. For example, the jurisdictional scale in present-day Florida includes hierarchical levels starting from the global to the national, state, county, city and private levels.

All organisms practice what (Stallins, 2012) has called "ontological" and "epistemological" moments of scaling, where organisms manipulate their physical environment (ontological) and adjust their knowledge and conceptualization of that environment (epistemological) as a means to maintain predictability and thus increase their chances of success in the evolutionary game. In human social systems, scaling and the resulting cross-scale and cross-level interactions often reflect a deliberate exertion of power over the land, resources and people by different actors, from different levels and across different scales over time. (Swyngedouw, 2010) notes that in the context of environmental governance, there is a continuous manipulation of scales, shifting or reshuffling and reorganizing scales in a way that appears to be more a mechanism of maintaining control by some powerful institutions and actors rather than building capacity for multi-scale resource management. In the present day, scholars and managers tend to take the established scales of spatial organization as well as jurisdictional and institutional scales as given starting points for managing coastal environments. However, history shows us that scale is not necessarily a preordained hierarchical framework for ordering the world. It is rather a contingent outcome of the tensions that exist between structural forces and the practices of human agents (Marston, 2000).

When working with complex social-natural systems like the barrier islands which line Florida's Atlantic Coast, one must account for different levels and different scales at the same time. Cash et al. (2006) describe cross-level interactions as 'interactions among levels within a scale, whereas "cross-scale" means interactions across different scales, for example between spatial domains and jurisdictions.' Cross-scale and cross-level interactions may change in strength and direction over time, presenting scalar challenges for management. It is

recognized that a core problem of multi-scale coastal management is the difficulty in identifying the appropriate scales and levels for the management of natural resources that can coordinate both ecological knowledge and social resource use practices (Bruckmeier, 2012). Human societies have jurisdictional, institutional and cultural structures and rules that are not found in ecosystems and thus may be incompatible for cooperation and planning purposes. Not taking into account the scale and cross-scale dynamics of systems can lead to failure of the system or parts of the system, which can result in scalar mismatches that ultimately lead to stagnation or failure of policy and management (Gallemore et al., 2014, van Lieshout et al., 2011, Borgström et al., 2006). There is no single "size" or scale to coastal ecosystems and additionally, we recognize that they are influenced by activities outside their immediate boundaries. (Bricker et al., 2008) for example have shown how human activities in the watersheds of coastal ecosystems have degraded ecological communities, increased areas of eutrophication and dead zones and reduced abundance of fish and shellfish. Similarly, human activities over time can result in persistent impacts on coastal ecosystems, with dynamic environments like barrier islands being extremely susceptible to permanent manipulation and domain shifts by human interventions (Elko and Davis Jr, 2006).

Cross-scale and cross-level interactions pose many challenges when managing natural resources. Cash et al. (2006) define scale challenges as 'a situation in which the current combination of cross-scale and cross-level interactions threatens to undermine the resilience of the human-environment system'. Three types of cross-scalar challenges have been identified, namely, ignorance, mismatch and plurality (Cash et al., 2006). Ignorance is where there is a failure to recognize the importance of scale and level interactions at all, while mismatch is where there is a problem of fit between human action and ecological systems (Cumming et al., 2006). Another mismatch is between the knowledge we have about environmental processes and management approaches and the institutions and administration bodies we have that make decisions (Ahlborg and Nightingale, 2012). The problem of plurality is where there is a failure to recognize that there is heterogeneity in the way scales are perceived and valued by actors, even within a single level (Cash et al., 2006).

According to (Swyngedouw, 1997): 169) scaled places are 'the embodiment of social relations of empowerment and disempowerment and the arena through and in which they operate'. The history of the Atlantic coast of Florida since the arrival of the Spanish at the turn of the 16th century can be thought of as a changing process of control and power exerted across time and space by different interest groups. A review of the settlement history of Florida shows that actors adjust their power and authority by working at different spatial levels and even by creating new spatial levels as well as other types of scales (Lebel et al., 2005). In the process, people, institutions and landscapes were made to fit levels and scales in the dominant authority's system of accounting and monitoring. Such scaling processes have tangible, material consequences, as well as social-institutional consequences, and can contribute significantly to the transformation of the social-ecological landscape (Smith, 1992). These changes can persist in the landscape over time, placing constraints on possibility and potentially locking landscapes and their inhabitants into a development path that may only be transformed at huge social cost (Mitchell, 2008).

An examination of cross-scalar and cross-level interactions associated with changing systems of land control, trade, infrastructure, resource use and demographics, along with unceasing bio-geomorphological processes, helps illustrate some of the dynamics of change that have

shaped Florida's coastal environment. Such an analysis can offer insights into the scalar challenges associated with managing complex, dynamic environments like those found at the land-water interface. Florida claims the oldest written history of any US state (Gannon, 1996b), and thus provides a particularly rich case example for exploring the short and long-term dynamics of change in human-environment relations in the coastal zone.

Background and Case Example

The history of human settlement in Florida begins at the transition from the Pleistocene epoch to the Holocene epoch, reaching back more than 10,000 years, when the first Paleo-Indians entered the Florida peninsula. Over several thousand years, these first settlers grew in population and diversified in relation to the bio-physical regions in which they settled (Milanich, 1994). Along the Atlantic coast of Florida, a loosely connected group of indigenous cultures known as the Timucua settled along the peninsulas barrier islands and riparian zones, where they practiced hunting and fishing, agriculture and horticulture, and introduced cultural practices like ceremonial burial and mound building (Milanich, 1996). The Timucua were among the first indigenous groups on the North American continent to come into contact with Europeans at the turn of the 16th century when Juan Ponce de Leon, a Spanish conquistador, landed on the peninsula, naming it *La Florida* (Gannon, 1996a).

After its discovery by Europeans, attempts were made at colonial settlement of the Florida peninsula by the Spanish between 1513 and 1763. During this time, dramatic demographic collapse of many indigenous groups occurred throughout Florida due to the spread of disease and violence between colonizers and indigenous groups (Milanich and Milbrath, 1989). After nearly two centuries of Spanish rule in the peninsula, and ongoing conflict between Spain, England and France, Florida was acquired by and subsumed under the control of the British Empire (1763-1783) who introduced a system of land grants and plantation agriculture. After a short return to Spanish authority (1783-1820) after the American Revolutionary War, the newly formed United States obtained authority over the Florida peninsula in 1821, making Florida the 27th US state in 1845, and expediting development and urbanization around the end of the 19th century. Throughout the 20th century, Florida grew from a sparsely populated frontier society to the nation's fourth most populous state (Mormino, 2005). Today, "the Sunshine State" ranks among the world's most popular tourist destinations, with nearly 94 million visitors in 2013 contributing some $76 billion to the state's economy (Visit Florida, 2013).

Today, coastal counties account for around 40 percent of the total US population and continue to grow (NOAA, 2013). The state of Florida, with its more than 2,000 km of coast line, saw around a 20 percent increase in over-all population in the last decade, reaching roughly 19 million residents in 2010 with approximately 70 percent of that growth and associated development occurring on or in the vicinity of the state's barrier islands (FDEP, 2010). Barrier islands are long and thin offshore deposits of sand or sediment that run parallel to the coastline and are separated from the main land by a shallow water body. Flagler County, located on the northeast Atlantic coast and lined by a barrier island, experienced the highest percentage increase of any county in the nation over the past three decades (FDEP, 2010), and doubled its population nearly five times since 1950 (figure 2).

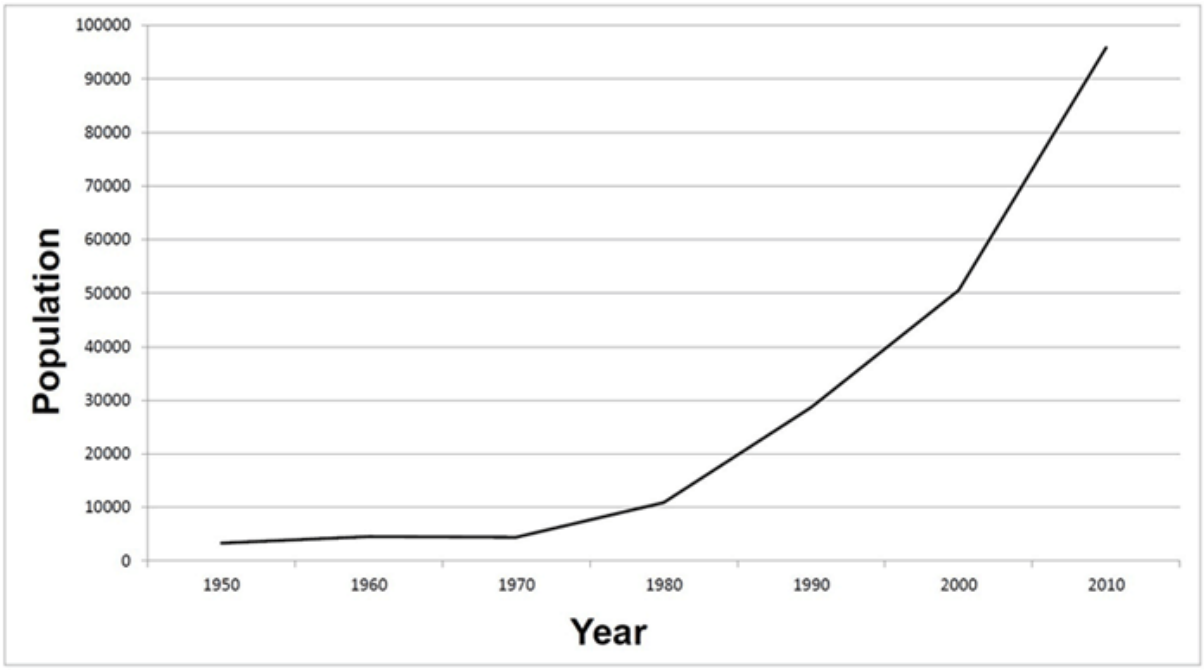

Fig. 2. Flagler County Population Change 1950-2010. Source (U.S. Census Bureau, 1995, U.S. Census Bureau, 2012)

Within the context of this dramatic increase in Flagler County's population, the city of Flagler Beach, a small barrier island community of around 4,583 people, in many ways embodies the challenges of balancing the growing and differentiated uses of the states coastal resources. Flagler Beach was established in 1923, making it the oldest coastal community in Flagler County. Since its founding, Flagler Beach has predominantly relied on beach-based tourism for its economic revenue. Historical investment in and development of residential, commercial and transportation infrastructure that serves the city's expanding tourism industry has created a situation indicative of path dependence, where the city's residents are unable to 'shake free of their history' (Martin and Sunley, 2006): 399) characterized by a tourism-based economy. As a result of this dependence on the local coastal environment, a substantial portion of the city's resources go to the often conflicting goals of continued maintenance of coastal infrastructure and attempts to conserve the integrity of the local sand dune system which provides protection for inland infrastructure from coastal hazards like hurricanes as well as recreational opportunities and important habitat for a variety of endangered species (Provencher, 2014).

Below we discuss six of the most significant social-ecological features implicated in the cross-scale and cross-level interactions which shape the dynamics of change in coastal environments. We utilize the north-east Atlantic coast of Florida, and Flagler Beach in particular, as an exemplary case, drawing on ongoing doctoral research in the case area. Through a review and qualitative analysis of historical and contemporary data, including scholarly articles and books, public planning and management documents, photographs and maps, and interviews with public officials, we show how these six features and their related cross-scale and cross-level interactions have persisted throughout the history of human habitation in Florida, and continue to shape the coastal landscape today. In concluding, we emphasize some important implications regarding how to address cross-scale and cross-level interactions, and suggest some future directions for coastal research and management practice

which is sensitive to the complex and multi-scalar dynamics of social-environmental change in the coastal zone.

Cross-scale and cross-level linkages along Florida's Atlantic coast

Demographic change

Throughout its history, Florida has seen dramatic fluctuations in the number and diversity of its human population. The initial influx of Paleo-Indians to the Florida peninsula in the early Holocene and the re-scaling of indigenous populations through the effects of violence and disease resulting from early European contact are some of the first and most dramatic cases of demographic change in the peninsula (Milanich and Milbrath, 1989). For example, the Timucua natives whom occupied the north-east Atlantic coast are thought to have once numbered over 200,000 in pre-colonial times (Stojanowski, 2005); however, by the 1760s, the effects of 250 years of Spanish colonization completely wiped out the Timucua population in Florida (Milanich, 1996). The death or physical removal of huge numbers of indigenous populations like the Timucua in the early decades of European occupation made available large portions of land for subsequent settlement, cultivation and capital accumulation by European, and later American, settlers. These outcomes link changing demographics, land control and resource extraction across scales and levels of time, space, administration and institutions. The long history of importation of slave labour for use in the production of plantation agricultural commodities is another exemplary case of the cross-scale linkages between features like economic development and trade, adjustments in administration and demographic change (discussed further below).

The promotion of colonial settlement through land grant systems, which produced experimental settlements and plantation development like that attempted by Andrew Turnbull at New Smyrna during the British Period (ca. 1765), brought with it demographic diversity from the Mediterranean, Great Britain and other colonies, and continues to influence population heterogeneity along the Atlantic coast today (Griffin, 1991). The advertisement of Florida as a world class tourism destination, which began around the turn of the 20th century also increased the diversity and numbers of Florida's residence as people from various regions moved into the peninsula looking for leisure or work in the growing tourism and service industries (Proctor, 1996). Huge inflows of capital from private investors like Henry Morrison Flagler (Bramson, 2003) and Walt Disney (Foglesong, 2001), were also a major contributor to the rapid demographic growth throughout the 20th century. Furthermore, the relatively recent influx of large numbers of Latin American agricultural labourers and rapid increase in permanent residents seeking retirement or work opportunities (Mohl et al., 1996) offer further testament to the historical fluctuations in Florida's demographic make-up, including the social-institutional and economic drivers of these changes.

Many of these changes in population number and diversity were connected to changes within other scales, such as adjustments in spatial domains and layout of administrative levels, expansion of industries like agriculture and tourism (Mormino, 2005) and increases in the spatial scale of transportation infrastructure development. The cross-scale and cross-level dynamics associated with such changes in demographics will continue to exacerbate the complexity of sustainable decision making in the coastal zone by modifying actor networks and increasing the probability of tensions between competing interests (Pilkey et al., 1984). Florida's population continues to grow at an average rate of 3-4% annually (U.S. Census

Bureau, 2014) and is expected to grow to over 23 million residents by 2030 (The Florida Legislature, 2013). Such an increase in population will undoubtedly place more pressure on coastal planners and managers and further underscores the need to understand and account for the cross-scale and cross-level interactions that influence the dynamics of change in Florida's coastal zone.

Land control and property rights

Control over land and the relations of property rights are at the core of human-environment interactions, and their connections with other areas like demographics, transportation, resource extraction, and trade networks cut across scales and levels. Changes in land control and property rights regimes have been part and parcel of every period in Florida's history, with incoming administrative actors often imposing new land control and property rights institutions on the preceding system, potentially influencing the structure of spatial domains and administrative networks for decades or centuries after. For example, though the organization of land under the Paleo-Indian, and, specific to Florida's north-east Atlantic coast, Timucua cultures, is not clearly documented, available evidence suggests it was likely based on tribal authority and communal land control and use (Milanich, 1978, Milanich, 1994). Beginning with the inauguration of the First Spanish Period (1513-1763), the Florida peninsula underwent the first known connection to a global-level system of land control associated with the colonial system of land ownership, symbolized by Ponce de Leon's claim of ownership of *La Florida* under the Spanish crown in 1513 (Gannon, 1996a). Following this administrative take over, Spanish colonial land control mechanisms and property rights systems were imposed on the existing institutions of the indigenous Timucua, paving the way for subsequent British and American land control systems.

Throughout Spanish, and later British, rule, land control and property rights were strongly linked across the spatial scale between Europe and America, as the land was administered by royal elites based in Europe or elsewhere but worked by settlers and natives in the local landscape (Lyon, 1996). They were also linked across jurisdictional and institutional scales with colonial authority being embedded into the local context through organizational structures and rules in the colony, such as regulations on indigenous ownership of lands or subdivision of property for purposes of inheritance (Tebeau, 1971). Throughout the European settlement periods, there were numerous instances of the re-scaling of land management through the creation of new administration units. Examples include the creation of the *La Florida* colony by the Spanish at the turn of the 16th century, the formation of East and West Florida under British rule in 1763 (Fabel, 1996), and the implementation of the county system (Florida Works Progress Administration, 1936) and the Public Lands Survey System (PLSS) (White, 1983) under U.S. authority (ca. 1821). Similar processes continued up until the present day, such as the incorporation of the City of Flagler Beach as the latest and smallest administrative level within the jurisdictional scale and the subsequent subdivision of larger tracts of land for sale to prospective beach dwellers which began around 1913 (Clegg, 1976).

In addition to trends in land control, there were also shifting property right regimes in force. From a communal system under the Timucua (Milanich, 1996), there was a shift in property rights under Spanish rule characterized by the development of trading outposts, Christian missions and military installations, each with their own regulatory institutions and rights of use and access (Tebeau, 1971). During English rule (1763-1783), the origins of the first

system of private property were established by offering opportunities to prospective settlers or capitalists to acquiring land grants for cultivation and homesteading (Mowat, 1974, Rogers, 1976). This primitive private property regime was continued by the Spanish in their second turn governing the Florida peninsula (1784-1821), epitomized by the well documented explosion of Spanish land grants at this time, particularly along the north-east Atlantic coast (Knetsch, 2002). In the American period, which began in 1821, a shift to privately financed development typified by the massive infrastructure investments made by Henry Morrison Flagler (Bramson, 2003) is a characteristic outcome of these shifts in property rights, as private ownership of land encouraged private investment and facilitated regional development. In fact, the federal government offered massive land concessions to private infrastructure developers (such as railroad companies) as a means to facilitate development in sparsely populated regions of the Florida peninsula (Proctor, 1996), made possible by the systematic surveying of public lands under the PLSS.

Cross-scale and cross-level interplay within and between different jurisdictional authorities is required to effectively coordinate the established property and infrastructure networks with other ongoing change processes, where a lack of coordination can lead to exacerbation of existing scale challenges, mismatches and potential failures in management (Cumming et al., 2006). In all decisions about land control and the forms of land administration and property rights, there have been cross-scalar and cross-level linkages, perhaps the most obvious being the influence of colonialism with its many linkages across spatial and jurisdictional scales. However, the substantial changes to land control and property rights under advanced capitalism (Harvey, 2006) have arguably transformed the spatial domains and territorial competencies of society as, if not more, dramatically than during the transition to colonialism, and will continue to do so in the foreseeable future as flexible capital accumulation continues to shape the built environments (Harvey, 1987) along Florida's Atlantic coast and elsewhere.

Trade and local to global economy links

From the time of European settlement, the coastal area of Florida has been intertwined with the global economy. The character and degree of these economic and trade links have influenced the demographic makeup and location of human settlements along the coast, as well as the intensity and scales of resource extraction from coastal ecosystems. The first Spanish expeditions which left Europe for the "New World" were part of a processes of global exploration to find new lands for trade and resource extraction. Even before formal settlement attempts were made in the earliest parts of the First Spanish Period (1513-1763), slave traders traversed the Florida coast line with the aim to capture indigenous peoples as slaves for sale or labour in other countries (Tebeau, 1971). The first settlements that were created during the First Spanish Period were military outposts installed to protect the newly claimed territory, also serving to monitor global trade routes along the coastline, particularly those routes along the Gulf Stream, as witnessed by still existing fortifications like Castillo de San Marcos in Saint Augustine. Many of these early military instalments have persisted as population loci, including the cities of Jacksonville, Tampa, Tallahassee, and St. Augustine, all settled during the First Spanish Period. In this way, human settlement patterns developed in part to meet the needs of global trade, and resources were extracted to provide for the wants of those who travelled by ship or lived in or traded with Spain, linking spatial, administrative and network scales at a global level.

Over time, many colonies were more and more seen as places for permanent settlement. The Florida peninsula became populated by those seeking to find new economic and social opportunities in new territory, a perfect example being the attempt to settle the experimental New Smyrna colony during the British Period by Andrew Turnbull (ca. 1765). Turnbull was a Scottish gentleman-capitalist who had plans to establish a lucrative plantation on the East Florida territory. In his attempt to establish the plantation, he brought with him around a thousand immigrants from Mallorca, Greece, and Italy, the decedents of which influenced regional demographics for centuries (Griffin, 1991). During the early American period (1820-1853), the economic activities of the north-east Atlantic coast, centred on slave driven plantation agriculture, were heavily disrupted by a series of violent conflicts between the American military and indigenous groups claiming rights to the occupied territories, collectively known as the Seminole Indian Wars, where plantation and transportation infrastructure was destroyed, thwarting economic activity until after the American Civil War in the 1860s (Knetsch, 2003, Walton, 1977). Florida's involvement in the American Civil War itself had strong connections to global-local trade links and economic activity. The role of slavery on southern plantations, many of which were along the Atlantic coast, was deemed critical to the continued economic viability of such plantations, part of the reason Florida seceded from the United States in 1861 (Brown, 1996). During the war, Florida provided crucial resources like salt, timber and beef for the Confederate Army, and the Florida economy was a major target for the Union Army throughout the war's entire duration (Wynne and Taylor, 2003).

After the Civil War and subsequent reconstruction programs (Shofner, 1996), Florida was envisioned as a potential tourist destination, which incentivized investment in transportation infrastructure, such as the Florida East Coast Railroad (Bramson, 2003), which brought speculation, land booms, and increased urbanization along the Atlantic coast (Mormino, 2005). To further incentivize investment and settlement with the hopes of expanding the Florida economy, legislative acts like the Florida Homestead Act of 1862 made public lands available for "improvement", allowing many individuals and families to set up turpentine businesses, farms and coastal resorts. The development of Flagler Beach and its tourism based economy has its roots in the Florida Homestead Act, where George Moody, in 1913, homesteaded 169 acres of public land on the barrier island and developed it into a beach resort which eventually grew into Flagler Beach. The interactions between the local, state and national economies, including cross-scalar interactions between jurisdictional (administrative), institutional (legislative), and spatial scales, laid the foundation for urban development along the Atlantic coast which today provides the transportation and tourism infrastructure that services the more than 80 million visitors every year, and which continues to complicate the prospects for sustainable coastal management.

Resource extraction and use

Florida's coastal barrier island system, like many coastal systems around the world, provides habitat for rich biodiversity as well as a variety of ecological services including food, recreation, navigation, and aesthetics (Wilson et al., 2005). It is thus an attractive environment that has drawn people throughout history to the area, either to gain access to its transportation benefits (by land or sea), its biological and geologic resources, or simply as a quiet place for retirement with a nice ocean view. Resource use in Florida's coastal zone over time has been both in-situ and distant, treated communally and commodified, and its spoils have been

distributed around the globe, the nation and the state through trade. The Timucua, for example, are known to have harvested large quantities of shell fish from the inter-tidal ecosystems of the Atlantic coast barrier islands, often leaving massive piles of discarded shells, known as middens, which could reach up to 25 meters tall, their extraordinary size providing navigational landmarks for coastal seafarers for centuries (U.S. National Park Service, n.d.). During Spanish and British colonial periods, resource extraction was centred on agricultural production and forestry. From the beginning of colonial settlement, the great stands of e.g. long leaf pine (*Pinus palustris*) which covered much of the Atlantic coastal plains of Florida provided materials for housing and ship construction, leading to the removal of vast areas of old growth forest and greatly reducing the geographic extent of some species (Kershner et al., 2008). A similar process of over harvesting and systematic destruction of Florida's faunal populations began with British settlement, and greatly accelerated under American authority during the 19th and 20th centuries, as poetically documented in Marjory Stoneman (Douglas, 2007) celebrated book *River of Grass*.

Florida has also long been the site of extraction of geological resources. The earliest European uses of the geological resources along Florida's Atlantic coast comes from the First Spanish Period, where settlers quarried the local coquina rock for construction of houses and military forts, such as the Castillo de San Marcos in St. Augustine or the Matanzas Fort at Matanzas Inlet in St. Johns County. In the city of Flagler Beach, the construction of the Lehigh Cement Factory, opened in 1952, marked the beginning of the short lived industrial extraction of coquina rock resources in the area which were packaged and shipped to other regions in Florida and the United States via the East Coast Canal and East Coast Railway (discussed further below), and used to construct roads, bridges and buildings (Flagler County, n.d.). Today, much of the use of coastal resources is centred on visitor recreation, by far the largest sector of the ocean-based economy (FDEP, 2010).

There is a great deal of complexity in managing resource use and extraction in the coastal zone because of questions of fit between the scales implicated in ecological systems that form and provide natural resources and the scales implicated in human activities which consume or manage those resources (Swaney et al., 2012). Inadequate attention paid to cross-scale and cross-level interactions in coastal management can sometimes lead to scalar-mismatch, misguided decision making and social and environmental degradation (Cumming et al., 2006). A lack of systems thinking in the context of barrier islands in particular, the function and stability of which are fundamentally tied to both small scale and large scale bio-geomorphic dynamics and highly susceptible to human interference (discussed further below), can cause serious problems for coastal managers, both at the local level and over larger spatial zones as well as across various temporal durations (Magliocca et al., 2011, Elko and Davis Jr, 2006). These issues continue to grow in importance as Florida's population growth continues to outpace all other U.S. states.

Infrastructure and transport development

The development of large-scale infrastructure and transport links along the coastline has both symbolic and material value in creating cross-scalar and cross-level linkages. Many of the large infrastructure projects implemented over time have sought to connect the east coast of Florida to other parts of the peninsula or to the rest of United States more broadly. One of the first major infrastructure instalment comes from the development of the Kings Highway

during the British Period (ca. 1765), which connected the settlement at St. Augustine with the aforementioned Turnbull colony in present day New Smyrna Beach. This original road network has persisted in the landscape since its creation by establishing a transportation corridor that has been followed by many subsequent regional transportation development projects (Ryan, 2006). The most prominent transportation routes that loosely follow the original Kings Highway corridor are State Road US 1, which runs down the entire Atlantic coast of Florida, built in 1926, and Interstate 95, part of the Federal Highway System built in the 1950s, which runs nearly the entire length of the United States eastern seaboard.

Other important infrastructure and transportation networks have influenced the developmental history of Florida's east coast, and have had important interactions with economic, demographic and institutional change in the region. The dredging of the Florida East Coast Canal by the Florida Coast Line Canal and Transportation Company in 1885 allowed more efficient and safe transportation of goods along Florida's historically treacherous Atlantic coast, facilitating faster trade and economic flows through the region. This canal runs right through the city of Flagler Beach and facilitated the transfer of important building materials in the earliest days of the cities construction, before adequate ground transportation had been developed (Wilson, 1998). The construction of the Florida East Coast Railway by real estate tycoon and developer Henry Morrison Flagler at the turn of the 20th century also played an important role in bringing large investments into north east Florida, and helped establish the Atlantic coast as a nationally recognized tourism destination (Bramson, 2003).

In the early decades of the 20th century, with land prices on the rise and speculation becoming more common, more private and public investments were made in transportation and infrastructure development along the coast. For example, the land homesteaded by George Moody for the subdivision and development of Flagler Beach was initially connected to the larger settlement of Bunnell further inland by the construction of what would become State Road 100, now one of two major access points to the city of Flagler Beach, including the building of a series of bridges over the East Coast Canal. In the 1920s, with the expansion of the City of Flagler Beach being indicative of the rest of east coast Florida development at this time, the construction of what would become State Road A1A began. Newspapers like (The Flagler Tribune, 1925) at the time advertised the new road as "one of the most scenic routes down the east coast of Florida ever planned", and it was touted that "Property values along the route of this highway are increasing by leaps and bounds. Flagler Beach… has seen tremendous strides in development and real estate transactions since the plans for the boulevard were completed". SR A1A remains the principle transportation route along the barrier island coast, and today holds designations as a hurricane evacuation route, a national scenic byway, and a state historic highway, and is considered to be of fundamental importance to the future economic viability and safety of Flagler Beach residents.

The interactions between attempts to stabilize and maintain State Road A1A, and the bio-geomorphological dynamics of the barrier island dune system mentioned above, offer an important example of the cross-scale and cross-level interplay that is implicated in the development of transportation and other sorts of coastal infrastructure. Roads like State Road A1A offer network connections crucial to the local and regional economy, physical connections across space which increase access and help reduce travel times and costs for goods and people. These roads also offer an entry point for state and federal level institutions to influence the coastal management practices along the coast. The Florida Department of

Transportation (FDOT), among other agencies, have the legal authority to maintain these primary artillery roads in the interest of social and economic security. In fact, the FDOT, when submitting required documents for approval of emergency installations such as sea walls or rock revetments, is not required to subject proposed projects to consultation if it is deemed that "it is in the best interest of the public for reasons of public concern, economy, improved operations or safety", as covered under Florida Statues Section 287.055 (3) (a) and Section 337.11 (6). Thus a state level institution, via its legal and administrative prerogatives, can unilaterally decide on the need for and location of coastal management infrastructure, exemplifying the strong connections between transportation infrastructure development and the economy, control over land and property rights, and natural resource management. The maintenance of such coastal infrastructure, much of which is precariously located, is often undertaken at great public and environmental cost (Pilkey et al., 1996, Pietrafesa, 2012), including the degradation of vital habitat for numerous species protected under the endangered species act (USFWS, 2013, Mosier and Witherington, 2002). Much of this negative influence is related to how human infrastructural interventions interfere with the bio-morphological processes that form coastal landscapes like barrier islands in the first place.

Bio-geomorphology

Bio-geomorphology is a term which unifies themes in ecology and geomorphology and emphasizes how the 'feedbacks between geomorphic and ecological components are developmentally intertwined' (Stallins, 2006): 213). In the context of Florida's north-east Atlantic coast, the formation of barrier islands and the related coastal bio-geographical systems have been front and centre in the social-ecological developmental history of the area and continue to influence possibilities for development in the region (Bush, 2004). Florida's Atlantic coast barrier island chain formed from the collection and submergence of large dunes of sediment and sand over the last several thousand years (Hine, 2009). Much of this sediment originated from the erosion of the lower slopes of the Appalachian Mountains and was carried along the Atlantic coast by rivers and currents at the end of the last ice age (Davis, 1994, Lane, 1994). It is thought that sea level rise during the Holocene caused the resulting sand dune structures to slowly migrate towards the mainland until a reduction in the rate of sea level rise in the late Holocene allowed the newly formed islands to accrete sediment and sand and pro-grade seaward (Hine, 2009). Once sea levels stabilized, plant and animal communities colonized the islands, forming unique, zoned ecological communities (Bellis, 1995). The succession of these ecological zones in turn heavily influences hydrological and sedimentary processes, leading to alterations in the forms and trends of future island development (Stallins, 2005). As anthropogenic climate change forces sea levels to again rise at an accelerating rate, barrier island habitat around the world will be more susceptible to inundation and its various ecological zones will be at a higher risk of severe degradation or completely loss (FitzGerald et al., 2008, Feagin et al., 2005). These bio-geomorphic feedbacks interact with human settlement infrastructure like road ways and sea walls, complicating coastal management and often baring negative social and ecological consequences.

The related processes of erosion, over wash, and plant-mediated topographic modification are major characteristics of barrier island sand dune evolutionary dynamics, and these are also some of the aspects which most heavily affect the viability of anthropogenic infrastructure and development patterns (Feagin et al., 2010). Weak feedbacks between frequency of sand

dune disturbance events, such as hurricane storm surge over wash, and plant-mediated topographic modification, such as when a dune grass community holds sand in place and thus helps stabilize a sand dune, affect the longer-term probability of future disturbance in a barrier island dune system (Stallins, 2005, Wolner et al., 2013). In other words, the less disturbance a dune system experiences, the more dune building plant species available to help stabilize the dune system, the higher and more stable the dune crest and thus the lower probability of future disturbance events. Historical rates of shoreline erosion have also been shown to influence the height and stability of existing fore dunes, and where historical erosion has been higher, over-wash events have been shown to be more common (Houser et al., 2008).

These feedbacks between erosion, over-wash and plant-mediated topographic development have practical significance for the possibilities for continued human habitation on barrier islands (Feagin et al., 2005). Over-wash resistant dune faces and other buffers provided by intact barrier island sand dune systems help protect inland infrastructure and ecosystems against potential damages from oceanic hazards like storm surge and high energy waves (Arkema et al., 2013, Irish et al., 2010). These protective qualities are significantly reduced as the integrity and stability of the barrier island fore dune is diminished, either by shifts in rate of sea-level rise, increased frequency of disturbances like hurricanes, anthropogenic manipulation of dune system dynamics, or more likely an interactive combination of these factors (McNamara and Werner, 2008, Magliocca et al., 2011).

A prime example of the significance of these cross-scale and cross-level interactions between bio-geomorphology and other social-ecological features can be found in the city of Flagler Beach. A recent assessment of critically eroded coastline in Florida showed that around 5.76 km of Flagler Beach's approx. 7.2 km of sandy beach is considered critically eroded (FDEP, 2014): 22). Above-average tropical storms and hurricane activity, sea-level rise, and the loss of fore-dune vegetation due to coastal infrastructure (State Road A1A) being located on the primary barrier dune crest, have collectively severely degraded the local sand dune system (figure 3). At risk for the Flagler Beach community are some 1,476 structures (collectively worth approximately $340 million), economically essential recreational opportunities which support the local tourism economy, and critical habitat for various threatened and endangered species (USACOE, 2014): ES-01); (Carney, 2014) .

Fig. 3. The intersection of coastal erosion, loss of fore-dune vegetation, infrastructure placement and erosion prevention measures (failing rock revetment). Author's photo: January 2014. Taken from dune over-walk, looking south at South 18th Street in Flagler Beach, Florida, USA

The relevance of bio-geomorphological processes to sustainable management practices seems apparent in the coastal zone, however traditional management approaches have neglected such complex interactions in favour of simplistic, linear models of coastal change that result in static management strategies such as hard "stabilizing" infrastructure (Pilkey, 1984, Kay and Alder, 1998, Pietrafesa, 2012) (Figure 3). The use of such hard infrastructure has exacerbated problems of coastal erosion and degradation along Florida's Atlantic coast (Bush, 2004). The continued prioritization of preserving private property over coastal sustainability which such stabilizing infrastructure tends to serve is problematic, and holds serious implications for intra and inter-generational social justice (Cooper and McKenna, 2008).

Conclusion

Addressing cross-scale and cross-level challenges

In this article, we sought to elucidate some of the pervasive cross-scalar and cross-level linkages implicated in coastal management by examining the historical changes in human-environment interactions along Florida Atlantic coast. We framed our analysis around six social-environmental features that we derived from ongoing research in the case study area, and offered examples of how cross-scale and cross-level interactions have influenced the development of Florida's coastal landscape over-time. This analysis also exposed the interrelated nature of these different features and their inherent scalar linkages, using

particular historic events in Florida to exemplify the social and physical consequences. In conclusion, we would like to discuss more explicitly why and how these cross-scale and cross-level linkages matter for contemporary and future coastal management, and suggest promising avenues for accounting for and addressing them in coastal management research and practice. Taking into consideration the complexity of these cross-scalar dynamics, as well as the pervasive politics underpinning scaling, we recognize that there are many challenges to managing coastal environments, and barrier islands in particular, in a sustainable manner. Scale, however, should not be the only point of concern. (Howitt, 1998): 56) argues that scale should be understood 'as a factor in the construction and dynamics of geographical totalities – rather than simply as a product of geographical relations'. Scale, like environment, space or place is thus one of the elements from which geographical totalities are built (Marston, 2000). We thus call for a consideration of scale and cross-scalar dynamics as part of the totalities affecting coastal management. In doing so, we suggest that coastal management could benefit from strategic engagement with processes of institutional interplay, co-management and the use of boundary work as promising means to address cross-scalar challenges like ignorance, mismatch and plurality in various contexts.

When it comes to the management of complex environmental resource systems, (Young, 2002): 3) suggests that 'as the density of institutions operating in a social space increases, the likelihood of interplay between or among distinct institutions rises'. (Cash et al., 2006), however, suggest that interplay of institutions at higher and lower levels on the jurisdictional scale may not always be taking place. Coastal scholars like (Pilkey, 1984, Pilkey et al., 1996, Pilkey and Thieler, 1992) have shown that, in the context of Florida, this lack of interplay has often had deleterious consequences for the prospects for sustainable coastal management. For example, the historical development of transportation networks along Florida's Atlantic coast, and their cross-scale and cross-level linkages to features like demographics, economics and trade, land control, and resource extraction, remains at the core of Flagler Beach's numerous coastal management challenges. The coastal transportation infrastructure and private property rights of coastal residents has generally maintained priority over sustainable barrier island management, with institutions like the FDOT often taking unilateral actions to protect said infrastructure. This comes at the expense of the integrity of the local dune system, accelerating erosion problems and exacerbating existing land use conflicts. The resolution of such management issues requires interplay between coastal planning agencies, residents, business owners, and conservation organizations at a myriad of levels in the nested system of spatial domains responsible for coastal management. To date, such institutional interaction has been considered insufficient by local decision makers in Flagler Beach (Provencher, 2014, Carney, 2014).

The presence of institutional interplay alone, however, is not necessarily an indicator of sustainable management. (Lebel et al., 2005) have shown that, even when institutional interplay is occurring, it can be highly asymmetric, as in the case for trans-boundary water allocation along the Mekong River. Given that in coastal management systems, institutions do have overlapping jurisdictions over ecosystems and spatial domains (Kay and Alder, 1998), promoting institutional interplay, even when flawed, is necessary to address cross-scalar challenges, particularly those associated with scalar plurality. Special attention should however be paid to the potential asymmetries in power and influence in processes of institutional interplay, and efforts be made to develop systems for institutional interplay that promote social and environmental justice and sustainability. As a means to address the issues

associated with institutional interplay, co-management has been recommended as a strategy to improve the understanding of complex social-environmental interactions that affect coastal management, and can potentially reduce ignorance among individual actors and help address scalar mismatches in decision making environments characterized by scalar plurality (Armitage et al., 2007).

Co-management, while being manifest in many different forms, generally refers to a continuum of arrangements that rely on various degrees of power- and responsibility-sharing between governments, local communities and private actors (Cash et al., 2006: 8). Co-management of the coastal zone, which is characterized by a plurality of user values, goals and rationalities, is said to rest on principles of participation, transparency, shared responsibility, and support of values of justice and equity, though achieving desirable outcomes in practice is a monumental task (Jentoft, 2000). The nested system of authority that constitutes coastal management in Florida means that higher-level institutions, such as the FDOT, often have a significant amount of legal and financial resources to pursue their agency's agenda which decreases the capacity for lower-level institutions, such as the Flagler Beach City Commission, to meaningfully engage in management practices. Establishing a system within and between institutional levels and across the various scales implicated in management which account for institutional and cultural diversity is an important first step to develop processes of institutional interplay that facilitate effective co-management practices (Carlsson and Berkes, 2005). Regardless of the challenges of implementing co-management, the potential benefits, which include the development of innovative institutional arrangements and incentive structures capable of dealing with multi-scalar, social-environmental complexity, require that co-management remain one of the most important tools in the suite of governance options to modify unsustainable social–ecological feedbacks (Armitage et al., 2008).

Finally, and in relation to both institutional interplay and co-management approaches, boundary work has been identified as useful for managing cross-scalar dynamics and addressing cross-scalar and cross-level challenges. Such boundary work, often undertaken by boundary organizations (Guston, 2001), plays an intermediary role between different arenas, levels or scales implicated in natural resource management, and have been shown to facilitate the co-production of knowledge and conflict resolution in a variety of contexts. These include knowledge sharing in agricultural production in Africa (Clark et al., 2011), nature conservation and cultural preservation in China (Shen and Tan, 2012) and conflict resolution in coupled conservation and farming systems in Sweden (Olsson et al., 2007). At the moment, no such boundary organizations exist in Flagler Beach, and the inadequate collaboration between federal, state, county, city and private actors has led to frustration and a lack of engagement from many decision makers and residents (Carney, 2014). Future researchers and practitioners of coastal management, including those implicated in the management of Flagler Beach's coastal zone, should move away from compartmentalized decision making and reliance on traditional, panacea style solutions (Ostrom et al., 2007), and instead focus on incorporating a cross-scale and cross-level perspective in theory and practice. Since its founding, Flagler Beach's coastal management approach has almost exclusively relied on hard infrastructure such as sea walls and rock revetments, with severe consequences for the beauty and stability of the local barrier island beach. The utilization of boundary work within and between administrative scales and levels, reducing conflict and facilitating meaningful engagement and participation from all concerned actors, could enhance possibilities for

exploring and adopting alternative, more sustainable management strategies. It is our contention that these strategies, in combination with other promising coastal management approaches, may open up the spaces needed to address persistent cross-scale and cross-level challenges and help facilitate the sustainable management of barrier islands and other coastal resources in Florida and around the world.

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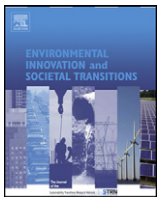

Transition in South African water governance: Insights from a perspective on power

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ABSTRACT

After apartheid, South Africa has stepped up to the challenge of reforming an inequitable water service delivery system to meet the needs of all citizens. We frame this systematic societal change as a transition in water governance. We argue that when evaluating this pathway of transition, we should not only look at the changes in water legislation and number with improved access, but also analyze the quality of the water service delivery in terms of different payment schemes, participation by local citizens and conflicts around equality of water provision. By analyzing power in transition studies, we explore the power dynamics at play in two regions of Johannesburg, namely Alexandra and Soweto. The paper highlights the need to explicate the politics of water service delivery and suggests opportunities to break the negative patterns in order to achieve equitable and sustainable water service delivery in South Africa.

1. Introduction

Following apartheid, South Africa was faced with the challenge of redressing the social and environmental imbalances of the past. As a water-stressed country, allocation of water has been tied to development and the changing political landscape of the country. The evolution of water service delivery and the political history of South Africa are inalienably related (Tewari, 2005). In the democratic

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dispensation starting in 1994, particular attention was paid to sectors such as water service delivery where services were previously distributed in a systematically inequitable manner across racial groups, with a specific focus on meeting the needs of whites and excluding Africans (Tewari, 2005).

The new water laws sought to address the social inequities and environmental concerns of the earlier political periods. The National Water Act of 1998 repealed over 100 water acts and related amendments and extinguished all previous public and private rights to water (s. 4 and Schedule 7, RSA, 1998). The significant change brought about by the new legislation was the recognition that water is a scarce and unevenly distributed resource, belonging to all people and no discriminatory law should be established to prevent water access and that sustainability should be the aim in distribution through which all users could derive benefits (RSA, 1997). In 1994, the new government thus had the responsibility to sustainably manage the water resources for the benefit of all people according to the constitutional mandate (s. 3, RSA, 1998).

We conceptualize the overall dynamic patterns of change in water governance in South Africa since 1994 as a transition toward sustainable and equitable water service delivery. Transitions are systematic, complex and long-term societal changes comprising multiple actors at different scales and levels (Geels, 2011; Loorbach et al., 2011). We approach the distributional effects of the water service delivery reform by analyzing the payments for water services and the mechanisms of service delivery provided in two former townships[2] in the City of Johannesburg, namely Alexandra and Soweto. In these two cases, we particularly examine the exercise of power in the processes of social and legal mobilizations with the aim of providing a contribution to the analysis of power in transition processes.

The paper is organized to provide a brief introduction to the methodology of the research in Section 2. This is followed in Section 3 by a discussion of transition heuristic including different conceptualizations and criticisms of the transition framework. The latter part of the section focuses on the role of power analysis in transition heuristic. Section 4 first traces the transition in water service delivery in South Africa and then addresses whether the transition is in lock-in or acceleration phase by examining the power of agents in shaping water service delivery. Section 5 provides reflections from the case studied and discusses opportunities to strengthen the power dimension in transition studies.

2. Methodology

The analytical framework to study power relations in connection with the water service delivery reform in South Africa was drawn from a literature review of transition studies, and academic writing on the transition framework. This analytical framework is tested through a study of water service delivery reform in the city of Johannesburg. This process offers useful material to study a social change as there has been an explicit transition from the pre- to post-apartheid system of water service delivery. The examination on water service delivery within two former townships of Alexandra and Soweto in the City of Johannesburg represent cases of previously disadvantaged areas, characterized by the inequalities that are the focus of reform process. The main data sources for this study consisted of water policy documents for the Republic of South Africa and reports and papers on the payments for water services in the city of Johannesburg. The mechanisms of water service delivery (i.e., the way water is accessed by households either through standpipes, shared taps or taps in houses) were investigated via interviews and field observations.

Since Alexandra, in comparison to Soweto, is less studied, and limited data is available, we carried out more primary data collection in this case. We had five in-depth interviews in three different parts of Alexandra (namely Tsutsumani, East Bank and Old Alex) over two weeks of fieldwork. The respondents were identified through a stratified sampling approach where we first identified the different water service areas in Alexandra. A random sample was selected within these stratified areas based on people's availability and willingness to talk to the researchers. Some of these interviews were conducted through a translator who was fluent in Zulu and English. In addition, we carried out five in-depth interviews with experts in the field including a manager from the city of Johannesburg, a water

[2] In South Africa, the term township usually refers to the (often) underdeveloped urban living areas that, from the late 19th century until the end of Apartheid, were reserved for non-whites (black Africans, Colored and Indians).

engineer from the Department of Water Affairs and Environment, director of the Water Research Commission, manager of the Alexandra Renewal Project and a development facilitator in Alexandra. These individuals were identified by the authors for their expertise and direct knowledge of water service delivery in the area. Given the rich literature available in the case of water service delivery in Soweto, we only conducted a few narrative walks with the residents of Phiri to gain a better understating of the implication of using pre-paid water meters

3. Theoretical framework

3.1. Transition heuristic

The patterns of change in water governance in South Africa are characterized by a complex and long-term process comprising multiple actors at different scales and levels. This process entails changes in technology, culture, policies, politics, power and economics where a wide range of vested interests are involved to promote particular solutions, policy instruments or packages. The complexity and multi-faceted characteristics of this process, so called transition, requires interdisciplinary frameworks that can explore processes of change from different disciplines and societal perspectives (Geels, 2011; Loorbach et al., 2011). In analyzing the change in the South African water governance system, from an old and inequitable to an (envisioned) modern and equitable water access in the city of Johannesburg, we employ transition heuristic (framework). This is useful in three ways.

First, it provides a frame to discuss differences in perception, ambition and understanding of objectives of transition as normative goals, and to orient these aspirations into efforts in a systematic way (Meadowcroft, 2011). Second, transition heuristic is a flexible framework meaning that different theories and concepts can be combined to explore the intricacy of interactions among critical components of a water governance system, i.e. water legislation, policies, and reforms, civil society, policy makers and water organizations (Geels, 2010). By incorporating different social theories on transitions, a comprehensive picture of change processes can be generated and used to assess the water governance practices. Third, transition heuristic compiles a practical toolbox of participatory techniques to choose from and scale up successful experiments to achieve the governance objectives (Rotmans and Loorbach, 2009).

3.1.1. Conceptualization of transition

From a multi-level perspective, transitions can take place when developments at landscape (macro), regime (meso) and niche (micro) levels move in the same direction (Geels, 2002). Landscape acts as a peripheral structure in which regimes and niches interact with each other. Developments at this level are relatively slow and correspond to the broad societal trends (Geels, 2002; van der Brugge et al., 2005). Landscape pressures can be identified at different scales. Climate change, population, international agreements, and MDGs are some of the driving forces from the landscape level on the current water institutions as regime actors in South Africa. The global and national approaches to these issues form dominant discourses that bound the policies and programmes of water institutions in South Africa. The regime may be defined as any form of rules enabling or constraining human activities within communities such as economic rules, legislation or social conventions (Foxon, 2002; van der Brugge et al., 2005). The regime actors may include different entities of the state, such as the Department of Water Affairs (DWA) at national level, City of Johannesburg and Johannesburg Water at local level and so on that are explained later in the 4th and 5th sections of the paper. Niches include organizations, individual persons or innovations instrumental in the take-off of the new regime (Foxon, 2002; van der Brugge et al., 2005). The niche pressures can be described as the experiments and projects formed by a small group of agents that deviate from the regime. These experiments can be scaled up by different means such as technological innovations or through different types of social mobilizations.

Until recently, there has been limited discussion of the role of power, incorporation of theories of power in transition studies or application of techniques that uncover power dynamics in transition frameworks (Lawhon and Murphy, 2012; Meadowcroft, 2011). Although power and politics are key aspects of any change process, most research has focused on socio-technological transitions with

less emphasis on socio-political transitions. Neglecting power in transition analysis brings the risk of ignoring important determinants of social change, and the distribution of costs and benefits within society. Hence, in this paper, we focus on the niche experiments in a more socio-political context than a socio-technological one by exploring the political dimension of transition and the interplay of power between and within different levels.

From a multi-phase perspective, the transition trend is the consequence of shifting from one dynamic state of equilibrium to another. This conceptualization of transition as an S-shaped curve is built on diffusion of innovations theory wherein the process of system transformation or regime-shift unfolds over time (de Haan and Rotmans, 2011). Comprising four main phases, *pre-development phase* is the first stage of transition where the marginal changes happen in the system's background and do not have any impact on the status quo. Second is a *take-off phase* in which the structure of the system starts to slowly change. Third is an *acceleration phase* where the new pattern of the system becomes visible because of accumulation of the changes in the previous stages. Finally, there is a *stabilization phase* where the rate of fluctuation is marginal, and the net effect of any changes is neutral (van der Brugge et al., 2005). We look at the indications of temporal phases not only in terms of progressive changes in water legislation but also their actual and practical implementations in our cases as illustrated in the fourth section of the paper.

Although the multi-phase perspective is often portrayed as a linear, progressive trend, the conceptualization does acknowledge that trends can stall or be reversed. Within the transition heuristic, it is assumed that transitions (toward acceleration) are driven by two mutually reinforcing mechanisms. First is the destabilization of the dominant regime due to landscape pressures, and second is the emergence and up-scaling of niche experiments, e.g., in terms of policy, behavior, technology, etc. (van der Brugge and Rotmans, 2007). In the absence of one of these mechanisms, transition pathways may turn into a lock-in situation. In transition studies, lock-in is considered as one of the transition pathways in which the regime is able to maintain and reproduce its internal dynamics (Geels, 2002; Rotmans and Loorbach, 2009). This can be seen as an exertion of power by the current regime to prevent a change in the status quo. As a result of this process, a set of actions and strategies that could be taken in the future will be limited or constrained by the current regime practices (i.e. actions taken by the regime actors, including institutions). In addition to this "non-ideal" transition pattern, there is a risk of "reverse" transition wherein niche experiments fail to become the new mainstream, and the system will return to its earlier state. This "backlash", is identified as a possible transition pattern and a special case of lock-in (Geels, 2002; Rotmans and Loorbach, 2009). It is suggested that it is at these points that overt conflict occurs and the influence of different actors diverges. Using a multi-phase perspective can offer an opportunity to identify moments of contestation and changing power relations during a transition.

3.1.2. Criticisms

Transition heuristic has been subject to various types of criticisms. Firstly, the framework is criticized for its hierarchical approach of employing landscape, regime and niche levels (Shove and Walker, 2010). The critics have argued for a multi-relational model of analysis emphasizing the notion of horizontal relations between niches, regimes and landscape (Shove and Walker, 2010). They point out that the "nested hierarchy" concept misses out the importance of local practices whose horizontal/flat circulation can be the trigger for transition (versus vertical/hierarchical niche–regime interaction). In response to this, recent work on transition heuristic states that levels (micro–meso–macro) are different degrees of structuration of local practices relating to different scales, and they are not necessarily hierarchical (Geels, 2010, 2011). The important point of this criticism is that one should not only look at the niche networks under the regime level to understand how niches scale up, or how the regime reproduces itself. It is equally important to scrutinize the interaction within a network of heterogeneous niches and how they communicate with each other. We attempt to present the niche interactions with regime actors and other niche actors through a lens of power in the cases presented.

Secondly, the concept of regime and its application to empirical cases is questioned (Berkhout et al., 2004; Genus and Coles, 2008; Markard and Truffer, 2008). Geels (2011) states in response that the regime is an interpretive analytical concept open to investigation from different angles (Berkhout et al., 2004; Genus and Coles, 2008; Markard and Truffer, 2008). In an attempt to specifying the concept, Holtz

et al. (2008) define different characteristics of a regime, such as purposefulness, coherence, stability, autonomy, and heterogeneity of actors. These attributes, in sum, indicate that regimes are autonomous and stable societal systems that serve one or several societal functions bearing on human needs while comprising multiple and heterogeneous actors (Holtz et al., 2008). As societal systems, regimes are also shaped by and shape power relations between actors. The concept of water governance, in its very broad sense, overlaps with this definition of water regime. While we strive to contribute to the development of the concept of water regime through its application in our cases, it is fair to use water governance system as an equivalent not only in terms of technological dimension but also institutional and socio-political aspects as explained in the cases

Third, the transition framework has been criticized for underplaying the role of agency in transitions (Smith et al., 2005). There is a concern that transition heuristic is too structural and therefore leaves little room for the analysis of agency. Geels (2011) responds by suggesting the multi-level perspective (of a transition) is "shot through with agency" (Geels, 2011) and that social changes are only possible through the actions of agents. Furthermore, he acknowledges that certain types of agency are less developed in the transition heuristic, including power struggles.

Finally, the transition framework is also criticized because it incorporates certain theoretical positions, namely evolutionary and structuration theories[3], to analyze the interplay of actors at different levels (Geels, 2010). Some critiques specifically draw attention to oversight of other social theories, particularly insights from conflict theory in capturing the interaction between and within different levels (Avelino and Rotmans, 2009; Lawhon and Murphy, 2012; Smith et al., 2005). The transition heuristic is however a middle range theory that can accommodate different theoretical positions (Geels, 2010). Although it is fair to say that a great deal of research in transition studies has a strong reliance on the theories noted earlier, this does not necessarily exclude the possibility of using other theories to explain the dynamic of transition processes. In responding to this criticism, we aim to contribute to the emerging debates on power in transition studies.

3.2. A perspective on power dynamics and transitions

In the first editorial of the Journal of Power, Haugaard and Malesevic (2008) discuss the ubiquity of power and raise a fundamental challenge to the study of power, namely, that it is "all around us, part of the everyday, and hence invisible to the taken-for-granted natural attitude of social practice" (Haugaard and Malesevic, 2008). This has resulted in conceptual and theoretical diversity in the examination of power.

Power can therefore be viewed as an example of Wittgenstein's term 'family resemblance concept' so that when we use the concept in different contexts, its meaning changes sufficiently so that there is no single definition of power which is covered by all usage (Haugaard, 2002). Haugaard (2002) identifies a broad classification of power theory which includes normative political theory of the analytical conceptual variety (Barry, Dahl and Morriss); political theory building of a non-conceptual variety (Aristotle and Arendt); and social theory of modern (Marx, Weber and Bourdieu) and postmodern orientations (Nietzsche and Foucault). This classification offers different language games which theorists employ. The challenge in entering the power debate lies in moving between the different theoretical approaches to power whilst being cognizant of the subtle variation between them. For a summary of the different theoretical works, *see* (Avelino and Rotmans, 2009; Haugaard, 2002; Murphy, 2011). This challenge of terminological subtlety as well as the fact that a great deal of power theory has a high level of abstraction seems to have deterred researchers from engaging with the complexity of analyzing power in transitions (Inglis and Bone, 2006). The research study "Power in Transition" is an attempt to elaborate power dynamics in relation to the transition framework (Avelino and Rotmans, 2009, 2011).

[3] The former assumes the core drivers for transitions are based on entrepreneurs and radical innovations leading to transformation of lock-in regimes (Schumpeter, 1939 in Geels, 2010). The latter, structuration theory, holds the assumptions that actors are knowledgeable agents that actively interpret the rules constraining their actions, and therefore they are capable of re-structure the currently established arrangements through their cognitive capitals, i.e. competences, skills, knowledge, etc. (Giddens, 1984 in Geels, 2010).

Avelino and Rotmans' approach to power can be characterized as lying within the realm of social theory of modern and postmodern orientation. The framework attempts to explicitly conceptualize the role of power in transition studies and connect the study of power to material realities (Avelino and Rotmans, 2009). The framework draws on the work of power theorists, most notably, Luhmann (1995) who views power as a social medium (Luhmann, 1995). Drawing on Parson's (1967) definition, Avelino and Rotmans (2009) define power as "the ability of actors to mobilize resources to achieve a certain goal". A departure from Parson's definition lies in the idea that resources are mobilized by actors rather than by the system and that the goal could be either collective or in one's self-interest (Luhmann, 1995; Parsons, 1967).

Resources are defined broadly by Avelino and Rotmans (2009) and can include persons, assets, materials or capital including human, mental, monetary, artifactual and natural resources. Each type of resource can be the object of power to more or less extent. The resources are themselves considered 'power neutral' but become 'power-ladened' when they are mobilized by actors to reach certain goals (Avelino and Rotmans, 2009).

How resources are mobilized is explained in the framework by looking at a typology of power exercise. Here, different ways in which one can mobilize resources and the different levels these are enacted are used to distinguish five types of power (Avelino and Rotmans, 2009).

- Innovative power: the capacity of actors to create or discover new resources. An example includes the development of new institutions for water management such as the river basin commission or catchment management agency.
- Destructive power: the ability to destroy or annihilate existing resources. An example includes ability of upstream users to restrict water access for downstream users thereby destroying their water supply from rivers.
- Constitutive power: the ability to constitute (establish, institute or enact) a distribution of resources. An example includes transboundary river agreements which create new ways of managing water that extend beyond national institutions.
- Transformative power: the ability to transform the distribution of resources, either by redistributing resources and/or by replacing old resources with new resources. An example includes the constitution of river basin organizations which re-organized the distribution of water resources and institutions around the physical river resource. This changed the way water management is viewed.
- Systemic power: the 'combined' capacity of actors to mobilize resources, for the survival of a societal system. An example includes the system of water rights and permits that may exist in a country to allocate water for different uses. The system only works because of the mobilization of resources by actors within the system to support its functioning, even if the goals of individual actors may not represent a collective goal.

Both regime and niche level actors can exercise power. In this exercise, it is possible to identify two dimensions, namely, the nature of mobilization: constructive versus deconstructive and the level of mobilization: resources versus the distribution of resources (Avelino and Rotmans, 2011). Constructive mobilization brings in resources through innovative power and the distribution of resources is through constitutive power whereas deconstructive mobilization brings in resources through destructive power and distribution of resources is influenced by transformative power. The former is a process of creation and building up new systems whilst the latter is a process of destruction and breaking down of old systems. In the process of applying different forms of power, regime and niche actors are able to influence a transition process. For example, niche actors may apply innovative power to produce alternatives to the status quo whilst regime actors may apply constitutive power to work to maintain the status quo. In mobilizing resources to exercise power, actors must have access to resources; strategies to mobilize resources; skills to apply those methods; and a willingness to do so (Avelino and Rotmans, 2009).

According to Avelino and Rotmans (2011), their most important lesson for transition studies, and 'sustainability governance' more generally, is that antagonistic power dynamics and relations (i.e. overt

critical debates, resistance, disobedience and political conflict) are essential elements for bringing about change and making 'transitions' occur.

3.2.1. Criticisms

Avelino and Rotmans have offered one of the first explicit attempts to conceptualize an analysis of power in transition research. The attempt with this conceptual framework is to move away from the abstract and introduce useable definitions of concepts of power. The intention is to offer a framework that explicitly encapsulates the range of resources and power exercises so that it can be applied across different types of transitions. Their attempt runs the risk of over-simplification, and it can be criticized for its limitations and biases.

Firstly, the labeling of types of power is done in relation to types of actors. Power is thus seen to exist only in relation to how actors mobilize resources. This is a limited view of power and the typology may be restrictive in application. The definition differs from that of Parsons where resources are mobilized by the system (Parsons, 1967). There is thus greater emphasis in the new framework on the role of agency which downplays inherent power of resources. Secondly, there is a lack of recognition of heterogeneity within levels. There is a risk of creating bundled actor categories when in fact there can be a great diversity of actors at different levels. This may result in ignoring potential conflicts within levels as well as the cooperation between some niche and regime actors. A further limitation of the framework is that resources are viewed as power neutral. This may be simplistic if one considers that resources themselves may have a materiality that affects relations (Bakker and Bridge, 2006).

Given the wide-ranging perspectives on power, there are many additional criticisms that can be raised against the framework. Nevertheless, we believe in the merits of this first attempt, and apply the Avelino and Rotmans framework to test its usefulness in the analysis of the transition of water service delivery in South Africa.

Looking at the different strategies for water service provision in the city, and especially within former townships of Alexandra and Soweto, it is possible to identify different resources and tactics mobilized by niche and regime actors to exert power. This influences the nature of the transition in water service delivery in South Africa and influences the equity of the system.

4. Transition in water service provision

4.1. A historical overview

Southern Africa is overall a water scarce region and projected to become more so over time (Hallowes et al., 2008). During the period of apartheid, water service delivery as well as other services were managed through a system of separate governance (Swatuk, 2010), which led to very unequal levels of service in 1994. The new ANC-led Government faced significant challenges for water services, with approximately 15 million people without access to safe water and 20 million without access to adequate sanitation (DWAF, 2006). In this section, the history of reconstructing the water services sector in South Africa, and thereby in the city of Johannesburg, is traced using a transition framework.

4.1.1. Pre-development phase

The first stage in the transition is the pre-development phase where changing socio-environmental conditions impinge on the regime structure. It is not possible to observe any important change of the regime but its resilience decreases. The political struggle from the 1950s and the shift to a democratic state in 1994 in South Africa, was one of the pivotal elements that imposed stress on the centralized and authoritarian water management system. The management of water in South Africa was in keeping with the apartheid policies of the time and there was thus differentiated access across the city of Johannesburg based on racially created spaces for White, Black, Indian and Colored residential areas (Hemson, 2002). Throughout the struggle period against apartheid, civil liberty struggles were coupled with the demand for legitimate housing areas for Black South Africans, especially in urban centers in South Africa (Desai, 2002). Townships such as Alexandra faced the risk of demolition and the removal

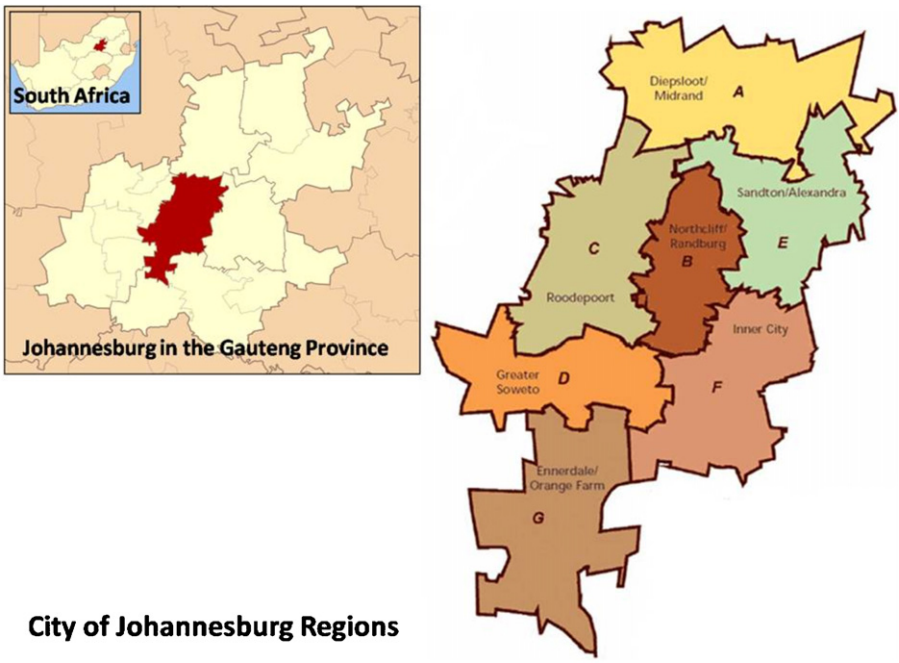

Fig. 1. The Regions of city of Johannesburg including Alexandra, E Region, and Soweto, D Region (City of Johannesburg, 2010b).

of residents to homeland areas or designated townships. In turn, townships formed centers of political activity for the liberation movement.

Post-apartheid, the newly formed Government of National Unity faced the challenge of addressing the inequality in the provision of basic services. Guiding the process was a set of policies that laid out a vision and mission for South Africa's future. The key documents included the Reconstruction and Development Programme (RDP), and the Constitution of the Republic of South Africa (RSA, 1994, 1996). These policies established the sustainability vision (including equitable access to water) in the transition from the apartheid to post-apartheid state. The Constitution states that, every South African has the right to basic access to safe drinking water (RSA, 1996).

4.1.2. Take-off phase

The second stage (take-off phase), in which the structure of the system starts to change, included the creation of new institutions and a new policy environment for water service delivery. The action that led the take-off phase was the introduction of the new National Water Act in 1998 and the policy of free basic water in 2001 (DWAF, 2002). The Constitution provided the basis for these policies. Through the co-operative government model laid out in the Constitution, the duty of water service provision was delegated down to district and local municipalities. This shift required that the City of Johannesburg, as a representative of the state, became responsible for ensuring that all its residents had access to safe drinking water within 200 m from their home (DWAF, 2002). The administration introduced new ways of mapping the city, different from the racial divides of the past. The city has been divided into seven service delivery regions (Fig. 1) including Region E of Sandton/Alexandra and Region D of Greater Soweto which form the focus of this study.

The City of Johannesburg, as the municipal authority is responsible for water service delivery has established Johannesburg Water as its utility responsible for water and sanitation services (City of Johannesburg, 2010b). Johannesburg Water was established in January 2001 as an independent company, the city of Johannesburg being the sole shareholder.

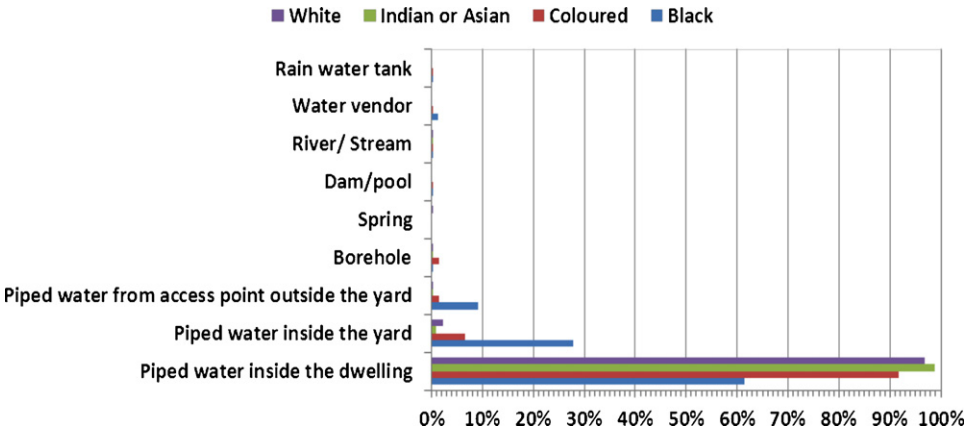

Fig. 2. Access to water by population group of head of household in Johannesburg (Statsa, 2010).

In keeping with global Integrated Water Resources Management principles of managing water as an economic good (Dublin Principles), Johannesburg Water operates under a neoliberal corporate model and provides services along business principles, with the aim of ensuring customer satisfaction and cost recovery (Johannesburg Water, 2011). Annual turnover exceeds ZAR1.6 billion (City of Johannesburg, 2009). The full cost-recovery mechanisms are also endorsed by municipalities as they have been under tight fiscal pressure imposed by national government to be self-sufficient. This pressure is the result of withdrawing central financial support based on landscape level actors such as the World Bank and IMF's advice on decreasing grants and subsidies to local governments (Dugard, 2010). The impact of following the advice has been directly on municipalities' basic services including water and electricity (Dugard, 2010).

As mentioned earlier, water service delivery and infrastructure for different population groups varies across the city of Johannesburg (Fig. 2). Although Johannesburg Water operates as an independent company, the plan for payments for water services is varied according to the needs of residents (City of Johannesburg, 2010a; Gauteng Provincial Government, 2008). Most households in Johannesburg are charged for water on a progressive scale with the cost per kiloliter of water increasing with increasing volumes consumed per month. In all cases, the first 0–6 kL per connection per month are free (City of Johannesburg, 2011). Other households across the city qualify for Expanded Social Package benefits of water and depending on the indigent category they fall into, are able to get an additional allocation of free water per person per day (City of Johannesburg, 2008a). In certain areas, previously deemed consumption areas under the Gcin'amanzi Project, domestic charges are based on a slightly lower sliding scale but water is pre-paid using a metered system (Johannesburg Water, 2006).

Although many new institutions have been introduced, the process of reform there is still a significant challenge to redress apartheid era access which perpetuates according to race as reflected in Fig. 2.

4.1.3. Acceleration or lock-in phase?

The third phase in a transition process is the acceleration phase where the new pattern of structural change becomes visible due to accumulation of socio-cultural, economic and institutional changes in the previous phases. This includes the transformation of power from the traditional regime toward the new regime. At present, it is difficult to say whether acceleration has been achieved or a lock-in situation has occurred. If we consider progressive water legislation as the only indication of the new regime pattern, one could argue that South Africa might be at acceleration stage toward an equitable water service delivery. Nevertheless, the effectiveness of this human rights approach on paper to result in an equitable water provision has been questioned. For example, Bakker (2007), points out the barriers to implementing a "right to water", such as lack of clear responsibility and capacity for

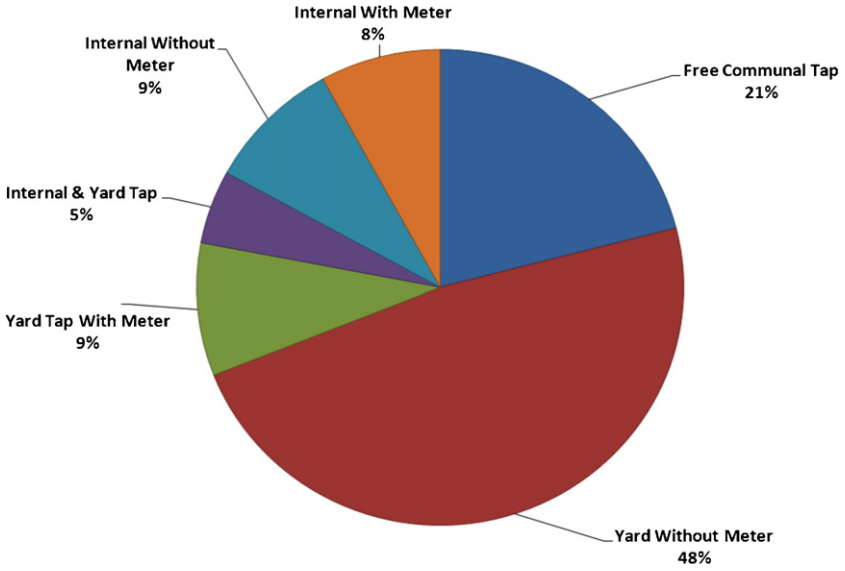

Fig. 3. Water infrastructure in Alexandra (Alexandra Benchmark Survey, 2006).

implementation as well as potential abuse of the concept by governments to over-allocate water to privileged groups at the expenses of other people and also the environment (Bakker, 2007). It is also argued that human right approaches have had little practical impact on tackling the inequality of water distribution in South Africa (Bakker, 2007; Bond and Dugard, 2008). In this sense, one can argue that the regime is in a lock-in situation if institutional changes in water governance have not changed water distribution effectively in term of equality of water access.

As might be seen from the account above, the distinction between different pathways of transition is linked with a set of indicators used to assess the process. We assess the direction of transition not only based on progressive water legislation, but also testing whether there is equitable water service delivery across the city of Johannesburg. Focusing on two areas in the city, namely Alexandra and Phiri in Soweto, we discuss whether the acceleration phase is reached or the transition pathway is in a lock-in situation given the power relations at play between actors at different levels

4.2. Transition dynamics and power in the city of Johannesburg

4.2.1. Water services in Alexandra

Alexandra is characterized by high population density, fast population growth, a young population, elevated levels of unemployment, relatively low levels of education, and low incomes (De Wet et al., 2001). The physical area of Alexandra is divided into 10 unofficial areas for purposes of development initiatives. These areas represent different forms of housing in Alexandra and include formal houses, yards with numerous houses, apartment blocks and informal shacks (De Wet et al., 2001).

A representative of the Alexandra Renewal Project said that all of Alexandra has access to water and the entire area has water infrastructure connections (Fenn, 2010). However there are major differences in water infrastructure amongst different areas. During site visits, we found that households in flats, East Bank and River Park have piped internal water. Those in Setswetla, hostels and Transit Camp share communal taps. In Tsutsumani, households have internal and yard taps.

On paper it seems as if the requirements of water service delivery are being met however the disparity between service levels is significant (Fig. 3). One-fifth of people still rely on free communal taps which require walking from houses to collect water in buckets. A significant improvement was made post-1994 in providing water services by including a tap and toilet on each stand in Alexandra.

However, the Alexandra Benchmark Survey in 2006 as well as our own numeration during fieldwork in 2010 showed that on average there are 19 households per stand in Old Alex. This translates to approximately 133 people sharing the same tap and toilet as compared to 7 people per house in the East Bank or less than 5 in houses in Sandton (where additionally, each house is likely to have more than two taps and toilets).

In Alexandra, we found the full range of payment schemes used by Johannesburg Water with the exception of the pre-paid meters. Some interview respondents paid according to the progressive scale, others benefited from the free water allocation under the Expanded Social Package whilst still others used communal taps. People in the informal settlement of Setswetla were also observed to be using the Jukskei River for washing needs. This is in keeping with the Alexandra Benchmarking Survey which found that household expenditure on water and electricity varied significantly across the different housing areas with only 4% of people living in Marlboro warehouses spending money on water and electricity (average expenditure of ZAR 6) while over 99% of households in East Bank included expenditure on water and electricity (average expenditure of ZAR 251) despite over 90% of households in Alexandra being connected (ARP, 2005). Interestingly, only 14% of households had ever had their water or electricity disconnected for non-payment.

Overall, our findings suggest that water service delivery has improved in Alexandra but the improvement is unevenly distributed across the former township and more so when one considers Region E as a whole. Payment for services is not consistent in Alexandra.

Although there was variability in the distribution of water service infrastructure within Alexandra, it was interesting to note that all interview respondents expressed satisfaction with the level and mechanisms of water service delivery (note, the interviews did not include residents from Setswetla but did cover the other main housing forms in Alexandra). Considering how varied access was, we as outsiders anticipated that people would express a wish to have the higher level of service delivery represented by the tapped water in formal housing structures found in East Bank. As this was not the case, one can ask why this situation is perceived as acceptable. The target of access within 200 m of a household makes perhaps sense in South Africa because of the limited water service during apartheid. However, the innovation of 200 m access enabled the further entrenchment of inequality of access and potentially obstructed the replacement of the older disparities by a new system of equal access. Many residents of Alexandra may feel that some tapped water is better than nothing but the level of service is not comparable to former white, colored and Indian areas. This would be an example of innovative power that 'enables' and 'enforces' constitutive power, meanwhile preventing transformative power (Avelino and Rotmans, 2011). The City of Johannesburg and Johannesburg Water have unintentionally reproduced traditional paradigms and structures that are used to reinforce the inequality in the water services system in South Africa. This has counter-productive results in terms of meeting the sustainability aspirations of creating intra-generational equity.

The subject of cost-recovery and payment for water services has been much debated in connection with poor communities across the world (Desai, 2002). We suggest that payments for water services is an important element in the transition in the South African water sector as it determines water access and raises questions of equity. We found that in Alexandra, many households did not pay for water, with some such as those people living in warehouses accessing water illegally according to one of our interview respondents. In an area with very high unemployment rates, inexpensive or free access to water is a significant benefit to households. However, this situation represents a great dependency of citizens on the state for basic needs. Most of the decision making authority to determine financial support and allocate water dispensations is held by the regime actors, City of Johannesburg and Johannesburg Water. According to the model of co-operative government in South Africa the local tier of government can decide how best to allocate resources internally (RSA, 1996). The establishment of the Alexandra Renewal Project also introduces a top-down influence and an additional regime actor into the agenda setting and decision making processes surrounding water service delivery in Alexandra. Both the identification of Alexandra for the renewal project and the decision to subsidize water in the area were made by regime actors and not through any direct intervention from the local residents. One of the interview respondents suggested that she was not aware why residents paid different fees for water. At present, the government seems prepared to subsidize the cost of water to Alexandra but if financial resources are reduced or diverted elsewhere, many households in

Alexandra will be unable to pay for water and therefore lose access. The power of the regime actors to determine resource allocations may prove unsustainable if the financing for water services change in the city. The regime actors in the transition in water service delivery in Alexandra have mobilized natural and economic resources in a constructive manner to constitute a sanctioned discourse and approach to payments for water services and economic cost recovery that is in line with international norms of Integrated Water Resources Management. The state has by far the greater access to resources, strategies to mobilize financial, technical and human resources, skills to apply these resources to water service delivery as compared to citizens and the willingness to do thus creating the conditions for the exercise of power (Avelino and Rotmans, 2011).

By framing the transition in terms of power, it uncovers an imbalance in the relationship between the state and local citizens (regime-niche interactions) in relation to the development processes of Alexandra. Under the banner of the Alexandra Renewal Project, the re-development of the area has been placed into the hands of outside experts, albeit with some engagement with local residents. Citizens' power and ability to mobilize economic and human resources has been reduced whilst the state's systemic power in managing development in Alexandra has expanded. "For destruction to be an act of power, it must be visible" (Avelino and Rotmans, 2009), but this does not necessarily involve violence or physical force. The destruction of resources, in this case, can be exemplified by destroying mental resources (e.g. an idea, a belief or knowledge) that may not be visible from an insider perspective. Residents seem to accept the disparate service levels across Alexandra and did not express a desire for more standardized service delivery. This is in line with the exercise of ideological power which prevents people, to whatever degree, from having grievances by shaping their perceptions, cognitions and preferences in such a way that they accept their role in the existing order of things, either because they can see or imagine no alternative to it, or because they see it as natural and unchangeable (Lukes, 2005). During the apartheid struggle, residents of Alexandra were actively engaged in the development of their community including providing services not provided by the state. In the current situation, regime actors in the form of the Alexandra Renewal Project and City of Johannesburg drive community development and local residents are less cohesive as a community. As outsiders we find that power exercised by regime actors has been destructive in a sense that has ignored the role of niche actors and their capacities have ultimately become neglected. Power has been exercised in creating a sanctioned discourse but also through organizing participation of local citizens through regime-led participatory initiatives. External actors have been brought into the area to lead the development process and decisions regarding resources are made at national and local government levels by regime actors. This finding is in line with the research pointing out that development agendas in disadvantage areas, as in Alexandra, pay little attention to local experience and knowledge (Mayekiso and Bond, 1996). The nature of mobilization of niche actors is thus limited and becomes deconstructive or disempowering.

4.2.2. Water services in Soweto

Soweto, the second case is also a township that was once established on the borders of the city of Johannesburg and has now been incorporated into the City of Johannesburg. Situated in Region D, Soweto has 15% of the city's informal settlements with an approximate total of 12 809 shacks and 1 300 000 people (City of Johannesburg, 2009). Johannesburg Water is responsible for the provision of water and sanitation to Soweto, ranked as one of the highest water consumption areas in Greater Johannesburg (City of Johannesburg, 2009). The situation in Soweto and particularly within the neighborhood of Phiri is used here as a comparison to Alexandra. The management of water service delivery in Soweto is contrasting sharply to Alexandra especially in terms of payment for water services and social mobilization of local citizens.

Although the situations vary greatly between the two areas, a comparison is appropriate given that both lie within the city of Johannesburg and share similar socio-economic characteristics. In theory, they should therefore be managed according to the same strategy and policies of water service delivery by the City of Johannesburg and Johannesburg Water.

In Soweto, similar to Alexandra, water services have historically been of a low standard and efforts were made from the mid-1990s to upgrade and improve water infrastructure. Problems with economic cost recovery rose for Johannesburg Water due to the inability of residents to pay for their water use. Cost recovery was exacerbated by water losses due to old infrastructure in the area. The over-riding

market logic to ensure cost recovery led Johannesburg Water to introduce a different approach to managing water service delivery. The Operation Gcin' Amanzi pilot project was introduced in mid-2001, to physically restrict water consumption in Phiri, one of the poorest suburbs in Soweto (City of Johannesburg, 2008b; Dugard, 2010). Based on the project objectives, a household could purchase additional water credit by means of pre-paid meters if the water consumption exceeded the obligatory free basic water allocation (6000 L of water per household per month or 25 L per person per day of free water) (Johannesburg Water, 2006).

The Phiri water right case in Soweto can provide us with insights on the power relations between the local citizens and the government in the city of Johannesburg. Johannesburg Water successfully promoted the pre-paid meters in all the communities in Soweto through a participatory process that was perceived as flawed (Barnes, 2009). Council employees were the main participants in stakeholder meetings and a majority of households were not consulted at all about the pre-paid meters (Barnes, 2009). The residents in Soweto were informed that the only way of receiving their free basic water allowance and having their debt written off, is through pre-paid meters while the normal credit meters (promoted in rest of Johannesburg) or the diverse subsidized options available in Alexandra weren't offered as viable alternatives (Ruiters, 2007). Following this process, pre-paid meters were installed across Phiri.

As with Alexandra, Soweto residents were active and vocal during the apartheid era as well as during the formation of the new government in demanding their rights to services and infrastructure. Where the inability to pay for water in Alexandra resulted in various packages which allow people to access water for free, in Soweto, the inability to pay became a threat to accessing water at all (Dugard, 2010). Residents that lagged behind with their payments had a weak bargaining position to resist the installation of the meters (Desai and Pithouse, 2004). The introduction of pre-paid water meters could be viewed as a form of destructive power that made the earlier/traditional system of water governance disappear in Phiri. Citizens living in Phiri were no longer treated the same as residents in other former township areas who had a similar system in terms of water provision (unlimited access) and water charges (pay post-use). Instead Phiri residents now had controlled access and a pre-paid system. In the process, Johannesburg Water also applied innovative power by establishing a new system. The new system included the pre-paid meters and can be seen as disempowering to the residents. The residents in this system were perceived as irresponsible and not able to manage their water use themselves (Ruiters, 2007). The neoliberal corporate model of water service delivery in effect worked to marginalize Phiri residents by treating them differently from other residents of the city of Johannesburg (Bond and Dugard, 2008).

Local citizens mobilized to resist the new system of water service delivery. Members of the Phiri community took the City of Johannesburg to court in December 2007 to challenge its installation of pre-paid water meters, and in April 2008, the South African High Court found this practice unconstitutional and wrote that denying the poor access to adequate water "is to deny them the rights to health and to lead a dignified lifestyle" (City of Johannesburg, 2008b; Dugard, 2010). Further, limiting free basic water to 25 L per person was reviewed and changed to 50 L of free water per person per day provided by the option of an ordinary credit-metered water supply (instead of pre-paid) for more use (City of Johannesburg, 2008b; Dugard, 2010).

The City of Johannesburg appealed the decision in the Supreme Court of Appeal, and in October 2009 the court overturned the ruling of the High Court and declared pre-paid meters lawful (Dlamini, 2009). It also ordered that account holders in Phiri, registered as indigent, should receive 42 L of water per day per resident (Dlamini, 2009).

The social mobilization in the case of Phiri initiated local residents and supported by the Anti Privatisation Forum (APF) and other activists, can be viewed as one of the niche experiments and application of innovative power which were later absorbed by the regime.

The residents constructed a legitimate case for the reconsideration of pre-paid meters as a device of restricting human rights. However, through the course of engagement with the City of Johannesburg, this power exercise was weakened through delays, conflict and a legal process. Through this slow process, City of Johannesburg and Johannesburg Water became quite successful in weakening the Phiri social movement through the judiciary's support for Operation Gcin' Amanzi. In August 2003 any obstruction of the project was banned and many activists and 14 residents of Phiri were charged in a

court of law with malicious damage to property. Consequently, the campaign by the Anti Privatisation Forum and its affiliate organizations was weakened since they had to divert their energy to defeat those charges (Dugard, 2010). One can argue that a relation of power existed where the City of Johannesburg could mobilize more resources that the residents of Phiri. The citizen resistance before 2005 only delayed the process of pre-paid meter installations but it was not able to affect the water management strategies at the regime level. From a power relations perspective, this is an example where innovative power at niche level was not sufficient to be constitutive, Or in other words, the destructive power at regime level was able to deconstruct the mobilization at the niche level and create a lock-in situation. The final decision of the South African Constitutional Court, which was in favor of City of Johannesburg in 2009, can be seen as a path dependent pattern toward a lock-in situation wherein the state dictates its *rules of the game*. The case can thus show how bottom-up approaches cannot be effective in moving toward a desired transition pathway in the presence of obstructive power relations and the absence of protected space for niche experiments.

There is however reason for optimism regarding the process of niche empowerment through legal mobilization. The voices of Phiri citizens were heard across the country and have already had an impact on the broader struggle in South Africa (Dugard, 2010). The presence of conflict may bring a potential change to institutions at regime level (Mahoney, 2000). This can be contrasted with Alexandra where there does not appear to be any overt conflict between citizens and the state with regards to water service delivery.

5. Discussion

5.1. Different exercises of power

By comparing the different exercises of power in the cases, we draw some initial conclusions on the nature of the transition in water service delivery in the city. Water service delivery varies greatly across the city and the inequities of the past are still apparent. Poor (and largely black) urban communities living in informal settlements and former township areas have a much lower quality of water supply than wealthier areas. The different water supply options in Alexandra and the different payment schemes across the city, show that the new system maintains inequities. Part of the reasoning given for the differential supply systems includes the ability to pay for services under a liberal model of water governance (Swatuk, 2010). Inability to pay has led to limited water supply options including shared standpipes. This distinction between wealthy and poor is not however uniform and between the two cases of Alexandra and Soweto, we see differences in the municipal water payment schemes. The neoliberal model of supply management has thus created new mechanisms of instituting inequalities within society (Ahlers, 2010; Narsiah, 2002; Shiva, 2002).

In both Alexandra and Soweto, citizens as community actors have been disempowered by the governance approach adopted for water service delivery. In Alexandra, this seems to have made local actors dependent on the authorities with little exercise of power themselves. In Soweto, the resistance to the pre-paid meters did not influence the outcome but community actors mobilized their resources to engage in governance. These examples indicate that even where conflict is not visible, the exercise of power is at play. Ultimately, the transition in water service delivery can be questioned based on the power imbalances between *citizen and state actors* suggesting that local residents of former townships are compelled to accept a standard of water services prescribed by the local government even if they are not satisfied with it.

5.2. Power between and within the levels

The conceptual framework offered by Avelino and Rotmans (2009) presented a useful starting point for applying a power analysis in our case studies. There are several limitations to their conceptual framework and different approaches to power analysis would introduce different nuances to the investigation.

The conceptualization of power in Avelino and Rotmans' framework revolves around the notion of a capacity that can be mainly exercised between regime and niche actors. Although it is useful for

developing an understanding of the power dynamics between the state and the citizens in Alexandra and Soweto, it provides less support to explore the interaction between and among these communities, and hence, it does not provide us with an insight on how these heterogeneous niche actors interact with each other. The framework could therefore benefit from incorporating a multi-relational analysis within levels as discussed in the theoretical framework (Shove and Walker, 2010). This is particularly crucial in studying water service delivery across the city of Johannesburg wherein the power dynamics between the state and the local citizens differ between various areas. Including an analysis of horizontal relations between the communities in Alexandra and Soweto can be valuable for improving the understanding of power dynamics as well as for finding potential entry points for structural change.

5.3. Agents of change in socio-political transition arenas

An important outcome of the power analysis, is bringing to the fore the role that actors play in determining change through the exercise of power. In the examination of water service delivery in Johannesburg, our research shows that actors at the niche and regime levels in transition arenas are pivotal to maintaining or changing a system.

In breaking a lock-in situation, *frontrunners* are essential (Rotmans and Loorbach, 2009). Frontrunners are one of the key change agents of transition processes. They are "niche players" and "change-inclined regime players" with the "capacity to generate emergent structures within the deviant structures" in a virtual network called the *transition arena* (Rotmans and Loorbach, 2009). The arena can be considered as an experimental space in which the actors use social learning processes to acquire knowledge leading to a new perspective on a transition issue and to be better equipped to exercise power against the lock-in regime. As in the case of Soweto, the transition arena does not need to be the exclusive domain of the experts but can be a space where social and legal mobilization can be initiated. Niche empowerment has a crucial role in the transition management process. It is suggested that actively communicating the shared vision and transition pathways into other networks will encourage people to join the innovation network to build joint strategic agendas (Rotmans and Loorbach, 2009). Focusing on actors with particular competencies, creative minds, strategists and visionaries, this arena is meant to empower niche actors to become a threat to the current distribution of resources, or in other words, a threat to constitutive power at the regime level (Avelino and Rotmans, 2009; Rotmans and Loorbach, 2009). In a sense, the outcome of the transition arena can stimulate the formation of new coalitions and networks to exercise innovative power and to shape transformative power.

Frontrunners and their exercise of innovative power can be observed in the case of Phiri. In building a strategic agenda to move social mobilization forward, a number of actors operating as frontrunners were involved in the court case in Soweto. The Socio-Economic Rights Institute of South Africa, Anti Privatisation Forum, Soweto Electricity Crisis Committee and other groups of political activists can be viewed as frontrunners that created a momentum together with Phiri residents to struggle against prepaid meters. It took active communication of these networks through mass meetings, over a couple of years, to stimulate new ways of resource mobilization. This case has relevance for conflicts over service delivery in many other places in South Africa. Whether a transformative power will emerge as a result of these conflicts and will succeed to break-down the existing regime's constitutive power or not, depend on future acts of frontrunners. According to Dugard, the result of proactive litigation by the Anti Privatisation Forum is too soon to be judged, but initial feedback suggests that social mobilization has not been deterred or discouraged (Dugard, 2010).

The experience of exploring the power dynamics in the transition process in the Soweto case, could be applied in relation to Alexandra. An important aspect of the Soweto case is the role of social mobilization in increasing the systemic power of citizens. There are frontrunners in Alexandra such as non-governmental organizations, community based-organizations, e.g., Wynberg Concerned Residents as niche actors and Alexandra Renewal Project as one of the main regime actors that potentially could initiate social mobilization in relation to the water service delivery transition. In the history of Alexandra, such frontrunner organizations have effected change during the apartheid struggle. These organizations played a central role for safeguarding the continued existence of the township during a

period of destruction of many townships and forced removals under the National Party apartheid government. A frontrunner organization at the time was the Alexandra Liaison Committee headed by Dr. Sam Buti who led a protest against forced removals and was able to "save Alexandra from extinction" (Mafenya, 2002). Such locally based community organizations have been powerful frontrunners in the past and could be so in the future. There is thus a role for social mobilization to be a potential cause of change in water governance in South Africa (Kolb, 2007). This is in line with work by Pithouse (2008) which shows that shack dwellers are constituting a major challenge to technocratic conceptions of democracy (Pithouse, 2008).

In safeguarding the long-term orientation and goals of a transition process, building up continuous pressure on lock-in regimes is *a* central theme and challenge in transition and power studies. Understanding social change processes as transitions can thus allow one to find trigger points for change in stalled processes. Litigation processes may give frontrunners the protected space that they need to create new coalitions and to experience human capacity to mobilize resources to reach certain goals. The continuous process of engaging niche and change-inclined regime actors can create a portfolio of transition experiments that move the struggle against unsustainable water access forward. In doing so, exploring power relations can prevent the constitutive power of the current regime from derailing the struggle.

6. Concluding remarks

Given the process of water service delivery in Alexandra and Soweto in the city of Johannesburg, we argue that the transition pathway is in the take-off phase but not near acceleration phase. Considering the ongoing struggle between niche–regime actors in Soweto and lack of any dynamic or struggle in the case of Alexandra, one could argue that the transition pathway may be closer to lock-in situation where regime actors have been able to *absorb* certain socio-political niche experiments. In our assessment we focused more on socio-political arenas than socio-technological ones. We argue that in evaluating the pathway of transition in water governance we should not only look at the water legislation and the numbers in relation to accessibility to potable water, we must also focus on the conflicts and contestations concerning the justice of the system.

Hence, the power dynamics associated with the post-apartheid development process were focused on here with particular attention to payment for water services as one of the main mechanisms for changing distribution of water across the city of Johannesburg. Understanding the power dynamics at play in water governance is crucial for interventions for strengthening the objectives of equitable and sustainable water access in the city. In relation to the role of citizens and social/legal movements, we point toward how niche-experiments can potentially be scaled up to challenge the regime practices. Delineating the concept of frontrunners and identifying key niche-actors is an attempt to communicate the future transition pathway of water provision into the social networks and build strategic agendas by encouraging people to join these networks.

Incorporation of an analysis on power was not only useful for developing a comprehensive understanding of the ongoing transition, but also beneficial to address one point of critique of the transition heuristic, namely the absence of a discussion of power in analyzing the interplay of actors at different levels. We have offered a contribution to the ongoing debates on framing power by looking at existing work in transition studies. Our research suggests that initial attempts are in the right direction but there is a great deal more room for the political dimension of transitions to be developed to fully capture the dynamics of societal change.

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