

# **The relevance of social theory in the practice of environmental management**

**By**

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## **1. Introduction**

Research on impact assessments suggests that there is considerable variance in the value added by assessments to the policy process (Noble 2009). In this paper I argue that a plausible explanation to this variance is the major role played by dominant paradigms and theories on which impact assessments are based. There is growing consensus among analysts and experts of impact assessments that valuations should be based on different types of thinking and knowledge to become more effective (Morrison-Saunders and Retief 2012) in advancing policy recommendations. My argument moves from the position that there is a direct link between different types of thinking, contained in paradigms and theories, and the practice of environmental assessments and their recommendations. I agree with Morrison-Saunders and Retief (2012) that different types of thinking (contained in paradigms and theories) need to be integrated to enhance our understanding of social phenomena. This in turn, I further argue, can have a positive influence on policy processes that follow impact assessment recommendations. I will illustrate my argument with the social impact assessment for the Olifants River Water Resources Development Project's infrastructure component, specifically the De Hoop Dam.

To advance these arguments, the paper is structured as follows. In the first part I define the concepts 'paradigm', 'theory' and 'ethics'. The purpose of this section is to show the difference between a paradigm and a theory and to lay the foundation for the rest of the article. I also illustrate the link between paradigms and theories and ethics, and by implication practice. I follow this part with Rosenau's (2003) argument that we are all theorists; the purpose of which is to highlight that environmental assessment practitioners use paradigms

and theories as a foundation for their thinking and practice. Although we all use theories, implicitly or explicitly, certain paradigms and theories dominate thinking and practices within a scientific discipline or domain of practice based on scientific knowledge. I use the example of catchment management agencies' strategies that are based on adaptive management as a dominant theory. This example relates to the De Hoop Dam case study since catchment management agencies are responses by the South African government to better manage the country's water resources at catchment level. This is the argument of the paper's third section. I then discuss the case study of the social impact assessment of the De Hoop dam at river basin level. A discussion and conclusion end the paper.

## **2. Paradigms, theories and ethics**

A paradigm is a world view that underlies the theories and methodologies of a certain scientific subject. Stated differently, and bringing the concept closer to science, a paradigm is a research tradition assisting in organising and guiding science or research. A paradigm also binds the work of a number of theorists and the sets of ontological, epistemological and methodological assumptions about practice in science (Sil 2000). For instance, the difference between the ontologies of positivism and interpretivism is that positivism sees the researcher and reality as separate, there is only one identifiable reality and the purpose of research is to control and predict. Interpretivism, on the other hand, notes that the researcher and reality are inseparable, realities are mental constructs in that they are social and experienced-based and there are multiple realities which are dependent on the interpretation of individuals (Lincoln et al 2011). By contrasting the two paradigms in this way, tells us that positivism is not the only legitimate way of doing research or base theories of reality upon. Paradigms influence how we view reality and not one paradigm is the only and legitimate research tradition (Lake

2013). Prediction, as promoted by positivism, is only one form of knowledge (Lebow 2007) and not the ultimate in scientific endeavour. Therefore, what is possibly going wrong in practice is that there is no or very little integration of theories due to the dominance of the positivist paradigm. Consequently, environmental management practices, like impact assessments, do not give deeper understandings of social phenomena, which could have an adverse effect on decision making.

The concept theory is derived from the Greek word *theōria* meaning ‘contemplation or speculation’ from the word *theōros* meaning ‘spectator’ (Oxford Dictionary 2014). Simply put, a theory is a simplified picture of reality. Put in this way, theories tell or explain to us how the world works in specific domains. Because the world is complex and difficult to understand, we make sense of it through theories. For this sense-making to happen, we need to decide which factors are more important. So, when studying something we leave those factors that are less important out and zoom in, so to speak, on those factors that are more important. In so doing, the world becomes more comprehensible (Mearsheimer and Walt 2013) as it gets broken down in abstract and easily comprehensible factors that describe reality. This is not to say that policy practitioners should start reading theory and apply them to the policy process. My argument here is to say that theories are part of the policy process and by acknowledging this policy practitioners might get a better appreciation of different theoretical perspective influencing policy. The difference between a paradigm and a theory is apparent. Nevertheless, how do paradigms and theories link with ethics?

In short ethics means ‘the application of morals to human conduct’ (Toje, 2002: 7). In this regard, morals can have a number of lexical meanings. Firstly, a moral can be ‘concerned with principles of right and wrong behaviour’ or ‘based on your own sense of what is right

and fair, not on legal rights and duties'. A moral can also mean 'following the standards of behaviour considered acceptable and right by most people' or to be 'able to understand the difference between right and wrong' (Oxford Dictionary 2014). The common denominator in these definitions is that of right, wrong, acceptable or fair behaviour towards other people and, in my opinion, the environment.

Be that as it may, Toje (2002:7) warns that '...when linking the term [ethics] to '...policy' one enters a conceptual and practical minefield' since there is a tension between paradigms, theory and practice. Regarding this tension, Herring (1999) argues that the actions and statements derived from policies have ethical implications and meaning. Since I argue that there is a direct link between policies and paradigms and theories, I deduce that there is also a link between paradigms and theories and ethics. In my view, and following Herring (1999), paradigms and theories contain and give credence to ethical standards to make policy and to criticise policy standards. Take for instance the impact of large dam projects on populations that need to make space for the rising waters behind the dam (e.g. Meissner 2004; Meissner 2005). One argument would be to say that we cannot predict the consequences of the dam on displaced populations and the environment. Nevertheless, there are studies that outline the influence of large dam projects on people and the environment. One such study is that of Isaacman and Isaacman (2014). They investigated the influence of Cahora Bassa, constructed on the Zambezi River in Mozambique between 1965 and 1975 on the populations and environment directly affected by the dam and those communities and the environment downstream from Cahora Bassa. Isaacman and Isaacman (2014) virtually debunks the myth of the project's cost-benefit analyses (i.e. positivist planning) as the only foundation for planning. They highlight the dire consequences of the dam and the devastation of ecosystems, the destruction of wildlife on which riverine communities depended for food security not to

mention the disruption of the Zambezi's flow patterns in favour of electricity generation for export to South Africa (Isaacman and Isaacman 2014). Isaacman and Isaacman (2014: 167) conclude that 'Almost fifty years after its completion, the Cahora Bassa Dam continues to impoverish the more than half a million residents of the lower Zambezi valley and to devastate the region's local ecosystems and wildlife'. The past experience contained in studies like that of Isaacman and Isaacman (2014) could become a standard against which to predetermine the influence of large dams on a population and the environment as well as the consequences of project experts', environmental assessment practitioners included, (moral) choices. I therefore argue that science and engineering can have ethical consequences through the adoption and application of paradigms and theories giving rise to a tension that can to a certain extent be forecasted.

### **3. 'We are all theorists'**

The dictum 'we are all theorists' is true not only for scientists and policy makers in government, but also for journalists (Rosenau 2003), lay persons and practitioners in the private sector that employ analytic knowledge (Rueschemeyer 2009). Even the most hardened, detail orientated, empirically grounded analyst or practitioner is a theorist (if only discreetly) with ideas about how actors behave and how the world and organisations work (Hoffmann 2003). We employ theories when we assess an issue in politics, or the affairs within a municipality (Meissner 2015), community, family or inter-personal relationships. To be theoretical is unavoidable. The situations we are confronted with are characterised by imperfect information, and even in the event of perfect information, there just would not be enough time to sort through the virtually infinite details of any situation. It is for this reason that I earlier argued against practitioners starting reading different theories. When we

observe, we mark some of the observed phenomena as significant or important and discard others as inconsequential or trivial. Theories therefore assist us to give meaning to situations and the patterns inherent in them (Rosenau 2003).

Experts might contend that they have vast experience in the observation of circumstances and situations and know what the underlying dynamics are. The knowledge or experience of experts is important. Nevertheless, experts' knowledge and expertise can lead to tunnel vision and an over confidence in the power of observation that limits recognising change or the evolution of new dynamics. A situation like this is the well-spring of political dogma (Claassen 2013) and researchers downplaying the role and importance of theory, with the result that often over optimistic advice is given to policy makers (Rosenau 2003). This is not to say that policy makers must start working with refined theories and create theoretical models, they just don't have the time. They do, however, have the time to be sensitive to the assumptions that determine the line they draw between the important and the trivial (Rosenau 2003). Even so, researchers have a moral obligation towards the policy makers to sensitise them to alternative theories to policy issues. It is after all researchers that work with theory more often than policy practitioners. It is with the drawing of this line where theory in water governance and politics starts to play an important role, especially when implicitly or explicitly (Du Plessis 2000) highlighting what is important and what is trivial.

#### **4. All theories are equal, but some are more equal than others**

A prevailing aspect of research on the water resource management, governance and politics discourse in South Africa is the dominance of the positivist paradigm. For instance, the Water Research Commission is currently funding a research project to develop a new water resource

management paradigm. According to the project's website, the research is underpinned by four concepts: complex socio-ecological systems, transdisciplinarity, resilience and strategic adaptive management (Southern African Program on Ecosystem Change and Society 2014). Except for transdisciplinarity, the other three concepts are derivatives of positivist theories like complexity thinking and adaptive management. Complexity thinking is to a large extent positivist since it is based on systems theory. In this regard, Meissner and Jacobs (2014) argue that complexity is based on the interaction of various actors of a *system* that shows variation without the relationships being random. Complexity theory has its origins in disciplines like economics, physics, genetics, ecology and computer science (Hoffmann, 2003) all of which are founded more or less on positivism. Adaptive management's origin lies in *scientific* management of the early 1900s and is linked to experimental science and systems theory as well as industrial ecology (Stankey et al. 2005). For Hoffmann (2003: 45) there is a link between complexity theory and adaptive management when he writes that: 'Complex adaptation...is a feedback process between adaptive actors and a dynamic context'. What is more, complex adaptation is another fundamental social process, according to Hoffmann (2003). A reason for the dominance of positivist theories could be the (dominant) role and involvement in water research and policy recommendations of scientists from the natural sciences and the minor role and involvement of social scientists. Natural scientists, with their knowledge largely founded on the positivist paradigm, are even dominant in conducting research on social scientific topics, such as the establishment and functioning of catchment management agencies. A literature review of research on South Africa's water resource management institutions showed that over 80% of the research on this social scientific topic was conducted by natural scientists (Meissner et al 2013). Although I argue here that positivism is strongly linked with the natural sciences, it must be remembered that



not all natural scientists are positivists, social scientists can also be positivist when conducting research.

Nevertheless, positivism, based on the scientific method, has difficulty accounting for major structural change, except for technological capacities and the influence of actors. The scientific method is, after all, seen as a well-ordered practice that helps us understand the world through the gathering of facts and data based on rules and laws (Firestein 2014). Such a view of science therefore finds fertile ground in a prevailing discourse that South Africa and the water resources management sector finds itself in (Meissner et al. 2013). The problem with this is that positivist social science theories, that also hold universally valid laws, are unsustainable (Sinclair 1996) because change is an ever-present constant in politics and governance (Zacher 1992; Rosenau 1992, Hoffmann 2003). In other words, currently all theories used for the analysis and understanding of the South African water resources management discourse are equal, but the positivist theories are more equal than all the others.

To explain this difficulty of positivism to account for major structural change further, dominant theories have the ability to engrain certain notions in the minds of academics, policy makers and, through spill-over, the general public. Dominant positivist theories influence frameworks for analysis and methodologies with which to guide problem management and amelioration. We see this in the application of environmental impact assessments, where these instruments are used by companies and government departments to comply with government regulation and not so much as a means towards sustainable development (Morrison-Saunders and Retief 2012; Partidario and Sheate 2013). This is not to say that there are other processes at play within society that can have an impact on government policy. Even so, this paper will focus on environmental impact assessments that

are not living up to expectations of fostering sustainable development and true public participation. Environmental impact assessments have the tendency to elevate the government process to supreme status, and ignore changes that can come about outside the governmental domain such as fundamental social processes. This is not to say that positivism is wrong. Anything but! We have learned a great deal from positivism. Yet, change is needed and can be attained in altering the focus on fundamental social processes (Hoffmann 2003) and psychological phenomena such as emotions (Lebow 2008) in water research. Examples of social fundamental processes include 'mutual constitution' that argues that social structures are created by actor's relationships and actions, and that social structures influence the identity of actors, their interests and actions (Hoffmann 2003). Paradigms and theories play an integral part in the explanation of fundamental social processes and psychological phenomena. That said, not one (positivist) paradigm and/or theory can explain all fundamental social processes fully since positivism in the natural sciences has a tendency not to focus on fundamental social processes and psychological phenomena. To understand fundamental social processes like mutual constitution, I argue for an integration of paradigms and theories in the practice of environmental assessment.

An example where a positivist theory like adaptive management has come to dominate is the case of the establishment of catchment management agencies (CMAs). I will briefly touch on this subject to indicate its dominance and likely outcomes before proceeding to the De Hoop Dam case study. The dominance of positivist theories has led to a situation where problem solving theories, like adaptive management, are used to smooth out the functioning of the system (Sinclair 1996) of water resource management as seen in the establishment of CMAs. For example, natural scientists (e.g. engineers, hydrologists and soil scientists) played a significant role in the drafting of the Breede-Overberg CMA's catchment management

strategy (CMS) (Meissner and Funke 2014). The involvement of natural scientists in the drafting process is a possible explanation of the incorporation of a positivist problem solving theory on which the strategy was based. It is argued in BOCMA's strategy that adaptive management '...will provide the resilience needed to sustain the economy, support livelihoods and maintain and improve the [water management area's] rich environmental heritage' (BOCMA 2011).. The main assumption of adaptive management is that actors are allowed to deal with uncertainty and complexity through reflection and social learning (Pollard and Du Toit 2011; Allan and Curtis 2005). The theory finds the world as it is (through observation), explains it (as uncertain and complex) and then recommends a way of dealing with the situation (learning and reflection) (Sinclair 1996). It is silent on how that world or reality can be changed. In other words, it does not give an alternative on how to ameliorate uncertainty and complexity by changing fundamental social and governance structures such as laws and regulations. Because adaptive management is a positivist and problem solving theory, it allows for little space to allow for a diversity of interpretations. This is the domain of interpretivist theories...

Linking a positivist theory with interpretivism brings to the fore the notion of incommensurability, which lies at the heart of any project to cross-communicate across different paradigms because '...there is no common measure among paradigms of inquiry' (Patomaki and Wight 2000: 226). If I follow the so-called incommensurability thesis, or that it is impossible to merge different paradigms, the rest of the paper would not be possible because it rests on a multi-paradigmatic inquiry (Patomaki and Wight 2000). This argument is in contrast to what Kuhn (1970 referenced in Patomaki and Wight, 2000) would have seen during normal science when problems are solved, but one paradigm dominates (Patomaki and Wight 2000). In my opinion this is unsatisfactory because it limits innovative progression of

eclectic research and by implication it inhibits a better understanding of phenomena. To explain this further and to argue against incommensurability I follow Patomaki and Wight (2000: 226) when they say that:

Given the complexity and open nature of the social world...it is hardly possible that one paradigm could ever dominate. Taking a complex social ontology seriously requires a commitment to a multi-paradigmatic approach. But if the incommensurability thesis holds then any attempt to put a multi-paradigmatic approach into practice is doomed to failure. The incommensurability thesis legitimates apartheid for paradigms where proponents of competing paradigms assume that they alone know (epistemological incommensurability) the truth of the world they have created (ontological incommensurability). Incommensurability buttresses competing approaches from criticism from alternative approaches a situation we find deplorable since we consider all claims should, at least potentially, be open to challenge.

I agree with Patomaki and Wight (2000) that as scientists we should be able to challenge scientific claims. Science is, after all, not the dogmatic insistence of the certainty of its claims, but rather a commitment to constant critique (Kurki and Wight 2013). Interpretivist theories, like social constructivism, are committed to challenging the naturalness of politics and governance orders, such as the perceived notion that government processes (i.e. cabinet decisions, new acts and regulations, pronouncements by top level government officials) are all important, and the acceptability of an order's dominant relations and practices of power (Duvall and Varadarajan 2003). Furthermore, an interpretivist theory opposite to adaptive management would rather observe the world, see how laws and regulations are making it

complex and try to reform them to bring about a more equitable situation. I will now discuss the De Hoop Dam case study to indicate the dominance in the social impact assessment.

## **5. Case study**

The De Hoop dam had been constructed on the Steelpoort River upstream from the towns of Steelpoort and Burgersfort (fig. 1) as a response to the increased demand for socio-economic development in the Olifants and Mogalakwena water management areas (Makara and Motebang 2005). Regarding the theoretical stance of the social impact assessment, the terms of reference are critical. According to the environmental impact assessment published by the Department of Water Affairs and Forestry in 2005, 'The terms of reference guided each specialist in order to provide input that would eventually ensure that issues and associated impacts were correctly understood and addressed, thereby enabling an integrated assessment of the development proposal' (DWAF, 2005: 43). The terms of reference called for a study of the potential social impacts of the project in and around the De Hoop Dam site, as well as along the proposed route of the pipeline and other infrastructure components like road alignments, pump stations, reservoirs, and construction camps. Through the assessment the assessment practitioners had to pay particular attention to vulnerable sections of the population such as the poor, women, elderly and ethnically distinct population groups (i.e. tribal peoples living in the area such as the BaPedi). In this regard, notions of equity and equality played an important role in defining the terms of reference. The positive and negative effects of the project needed to be highlighted as well as the direct and indirect socio-economic impacts. A further requirement was an assessment of the project's impact on mineral rights, the status of land claims and employment procedures for employment optimisation. A 'no-development option' also needed studying (Makara and Motebang 2005).



**Figure 1: The De Hoop Dam (©Richard Meissner)**

The terms of reference are spelt out in clear positivist terms: the likely causes or impacts of the project on the population living in and around the project area. Positivism is committed to the scientific method that sees the world as independent of the observers studying it. The observations can then be described in terms of law-like statements of universal applicability (Lebow 2011). Positivism also entails a one-to-one correspondence between theory and truth. This means that research statements and reality correspond approximately and that the data measures reality (Weber 2004).

As a data gathering method the researchers of the assessment conducted face-to-face and telephonic interviews. They argue that not all those living in the project area could be located,

and that an 'adequate sample was obtained for the study and that meetings with them would probably not have changed the outcome of the research substantially' (Makara and Motebang 2005). This is not wrong, since they only had five days to complete the study. They justify their findings in terms of a representative sample and that other team members of the study were consulted to get 'complete clarity on issues'. These are both indications of positivism's correspondence between researchers, research and reality. Through a representative sample and consulting other team members the researchers identified only one reality based on the sample and comments by other members. The sample and consultation also established the existence of an objective reality that exists beyond the human mind (Weber 2004). The researchers also did a comparative analysis with other dam building projects where social impacts were substantial, most notably the Lesotho Highlands Water Project. While they acknowledge the differences between this project and the De Hoop Dam, they also highlight their similarities and the lessons one can learn from them (Makara and Motebang 2005). This would entail that some generalisations were made. That they compared the two projects with each other indicates that the researchers compensated for the little time they had to get a fuller picture of the situation at De Hoop. They therefore did not approximate reality but through the sample, consultation and comparison got a fuller picture of reality. The objective reality they investigated is an ontological and epistemological trait of positivism. Ontologically, the researcher and reality are separate and there is also only one identifiable reality. As already indicated the epistemological trait is that of an objective reality that exists beyond the human mind (Lincoln et al. 2011; Weber 2004).

The social impact assessment, following the terms of reference outlines various profiles of the affected environment and study area. These profiles are: demographic, political and institutional structures, economic, social infrastructure, health, the Greater Sekhukhune

District Municipality's challenges and objectives and the dam basin environment (i.e. private landowners and communal land such as the Bahlakwana Ba Rantho community) (Makara and Motebang 2005). In other words, the reality as laid down by the terms of reference, is in the form of profiles representing structures for the maximisation of a population's welfare. Apart from the dam basin environment's profile, the other profiles are all presented in terms of governmental structures. The demographic profile, for instance, gives the population figures of the District Municipality's local municipalities. Governance is also defined in terms of government processes, especially local government with tribal authorities seen as supporting municipal processes (Makara and Motebang 2005). In other words, the governance structure is presented as a top-down arrangement.

The negative consequences of the dam, especially on the private and communal land owners living in the dam basin, are clearly spelt out. Here the researchers outlined the uncertainty and anxiety felt by the people, and presented their findings in terms of economic losses (Makara and Motebang 2005). For instance, the researchers made a number of recommendations regarding compensation. One of recommendations notes that the rights of farm labourers to compensation need to be recognised by the project authorities. Another recommendation states that compensation to mineral rights holders need to be extended to such rights holders where such compensation is due (Makara and Motebang 2005). It would appear as if the interpretivist paradigm was employed, but this was not the case. Interpretivism highlights fundamental social processes, such as the role of people's emotions in relationships and decision-making (Lebow 2008). The affected people are presented as passive recipients of the information they received from the authorities and the researchers did not go further to spell out the consequences of the affected people's emotions on the decisions from the authorities. The authors reported on their observed facts. They did not give



an interpretation of why the people could have felt anxiety and how the people are coping with it. The impact on land owners was defined in pure economic terms. From the research, it is also clear that access to the dam's water was seen in economic terms by the affected people. This was also the case with the land claims, the impact on farm labourers and labour tenants as well as mineral rights (Makara and Motebang 2005). This part of the study was therefore conducted using statistics, content analysis and surveys. Empirical data was gathered and a cost-benefit analysis was produced. These are methodologies typically used by positivist scholars. It is also possible that the researchers took the information as a true reflection of what is happening on the ground (Weber 2004). Positivism is also evident in the presentation of the evidence. It is as if the researchers are presenting the information in the report to the decision makers in a disinterested manner (Lincoln et al 2011).

The researchers also reported on a so-called 'institutional conflict' when the chief of one of the communities 'had declared himself as their [community's] leader and only representative in all matters and negotiations pertaining to the dam'. The community did not agree with this (Makara and Motebang 2005). This is not an example of an institutional conflict, but a communal conflict. In other words, from a positivist perspective (as is the case) it was seen as an institutional conflict, from an interpretivist perspective it would have been seen as a communal conflict. Should be seen as an institutional conflict, a likely recommendation to its amelioration would be some form of institutional intervention, like a memorandum of understanding or even external government intervention. Seen as a communal conflict, the community could, through mediation, try to resolve the conflict themselves. The one recommendation might not give better results than the other, but the point is that the recommendations differ and that there are more options open to the potential resolution of the conflict. This is not an indication of positivism, but more a case of the researchers not

knowing what the difference between an institutional and communal conflict is. Their interpretation of the role of a chief is done in terms of their experience with government departments. It is here where the anthropologist can make a valuable contribution and bring in a more interpretive mode of analysis. This will not only lead to the avoidance of such mishaps. It could also widen the project authorities' and society's understanding of the impact of large dams on rural communities.

The social impact assessment also makes a number of point predictions, in line with the positivist paradigm, regarding the increase of social ills, like crime, HIV/AIDS, noise, dust and disturbance as well as the impact on graves and cultural heritage (Makara and Motebang 2005). There is a linear cause and effect line of reasoning in these cases, where, for instance, the influx of migrant workers will increase the incidence of HIV/AIDS. The recommendations follow this cause and effect reasoning to mitigate the impacts.

Why was the report written in a predominant positivist perspective? Firstly, the Department of Water and Sanitation, a state entity, is implementing the dam. It is therefore seen as the main actor in the endeavour. Since this is the case, the positivist paradigm was appealing because of its commitment to the scientific method, which dictates that cause and effect foresight is necessary for better decision making. The social impact assessment conceptualises the 'social' in terms of a top-down arrangement with government entities at the top and private and communal land owners that are reacting to government's initiative at the bottom. Here the assessment also lists specific pieces of legislation that could have been contravened by the project authorities or that would be required to construct the dam. In terms of the fears and anxieties of the affected people, the laws can also help to 'allay' such fears and anxiety (Makara and Motebang 2005). This argument rests on the notion that the

people will always benefit from state governance processes. In other words, it is not a matter of who acts and what are the consequences of their actions, but who governs and who benefits (Hobson and Seabrooke 2007)?

Secondly, the study had to articulate the positive and negative and direct and indirect socio-economic impacts of the dam and how these impacts might influence components of the environment (Makara and Motebang 2005). This has a strong cause and effect rationale, which neatly fits the positivist paradigm where the researcher can observe 'reality', even through interviews, and can then make recommendations based on these direct observations. Emotions, such as the anxiety and fear felt by the affected people were mentioned but not interpreted. Positivism has difficulty dealing with and explaining changes emanating from fundamental social processes like emotions. As such, positivism is not, I argue, geared for the interpretation of such changes, let alone the emotions that underlie societal and inter-personal dynamics (Hoffmann 2003). In other words, a deeper focus on people's emotions could give a more thorough understanding of the negative impacts of the dam. The researchers looked at the economic impacts of the dam on people. Had they focused more on their emotions, they might have been able to give the project authority a more nuanced understanding of the impact of the dam on people. It should also be remembered that research for the impact assessment of the De Hoop Dam might have contributed to our understanding of the development of future large scale projects, as is the case with Isaacman and Isaacman's (2014) study of Cahora Bassa. I am not advocating the use of generalisation from one situation to another. What I am trying to say is that the deeper understanding brought about by investigating emotions more thoroughly could assist us in future to anticipate problems of similar projects. In this regard, theories help us to anticipate answers because theories are the repositories of previous investigations (Morgan 2003) and they focus on fundamental social

processes. The terms of reference therefore dictated that the researchers applied the positivist paradigm. Even so, some interpretivist elements are evident, but only to an extent where such elements were mentioned (e.g. the emotions). The researchers did not make these explicit and indicated what the emotions' likely impact on decision-making could be. All in all, social theory integrated with positivist theories hidden concepts, like emotions, could come to the fore and assist in the interpretation of real world problems. Integrating different styles of research could also widen our understanding of specific issues at a smaller scale that we are used to. The example of the interpretation of the institutional and communal conflict is a case in point. Each theory brings to the analysis a different set of factors and cause and effect mechanisms, just as every research paradigm brings its own research style (Sil 2009). Because of this, the integration of theories and paradigms offers a more nuanced understanding of problems and opportunities and ultimately the human condition in particular situations.

## **6. Discussion and conclusion**

What does all this mean for water governance and politics? Firstly, we should realise that we are theorists. If we do this we will have a much better appreciation of paradigms and theories and the role they play in practice through their explanation of fundamental social practices like mutual constitution, complex adaptation and emotions. It could also debunk those negative perceptions people have of theory, for instance that it belongs in the classroom and is an ivory tower exercise. It could also dispel the notion that the positivist scientific method is the only legitimate way of interpreting the world. This will be the first step in enriching our understanding of water governance and politics. That said, the social impact assessment is not

wrong, but could have been enriched with more interpretation and how power relations between the affected people and DWS could play out.

Secondly, interpretation of water governance and politics does not rest only on one theoretical interpretation (e.g. adaptive management) based on one paradigm (e.g. positivism). Multiple theoretical interpretations of a specific situation and actor relationships are possible. It is in this regard important to also highlight the interpretivist world view and the critical theories that will bring to light other and more enriched understandings. This enriched understanding will assist practitioners in better water resources management and governance as well as taking into account bottom-up approaches from ordinary individuals.

Thirdly, we need to recognise that there is an interdependent relationship between theory and practice. This interdependence does not always produce positive outcomes, especially when arguing from a dominant theoretical perspective. Theories do not always have all the answers. Even so, if seemingly incompatible theories are integrated and used the process can enrich our understanding of situations and aid considerably in policy formulation and analysis. The example of Cahora Bassa (Isaacman and Isaacman 2014) shows how decisions based on positivist cost-benefit analyses can miss the mark and have dreadful consequences for displaced persons and the environment. Interpretivist theories used together with those from positivism can have a considerable influence in this regard. It should not only be about solving problems, but also about the development of better worlds or situations to which we can aspire, something I believe interpretivist and even critical theories can teach us to avoid the loss of life and harmful destruction of the environment. This means that compensation of lost land, employment and mineral rights is not the only way of solving the problem. There are other aspects that people value such as a sense of place and the anxieties they feel when

threatened by development. How do we value these things from a positivist perspective? It is in my opinion with our knowledge of the origin of emotions quite impossible, which could change in the distant future as research on emotions and their physico-biochemical<sup>1</sup> origins processes. Measuring tangible resources rests on the notion of rational choice theory premising that people's decisions are influenced by welfare maximisation. Looking at the matter from an alternative paradigm like interpretivism can open options that were previously hidden by the positivist agenda and give practitioners more options to decision-making.

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