



Actor/Actant-Network Theory as Emerging Methodology for Environmental Education Research in Southern Africa

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Abstract

This paper deliberates on actor/actant-network theory (AANT) as methodology for policy research in environmental education (EE). Insights are drawn from work that applied AANT to research environmental policy processes surrounding the formulation and implementation of South Africa's Plastic Bags Regulations of 2003. The paper reveals that the application of AANT methodology made it possible to trace relationships, actors, actants and actor/actant-networks surrounding the Plastic Bags Regulations as quasi-object (token). The methodology also enabled a focus on understanding and investigating tensions, debates and responses emerging from the policy process. The findings were that after the promulgation of the first draft of the Plastic Bags Regulations in May 2000, tensions emerged around the nature of regulation (whether to use the command and control approach – preferred by Organised Government – or self regulation – preferred by Organised Business and Organised Labour). From these findings, a series of conceptual frameworks were drawn up as identified around key actors and actor/actant-networks. The conceptual frameworks included among them, Organised Government, Organised Business and Organised Labour.

Introduction

Given the complexity and uncertainties associated with environmental issues, including environmental (education) policy processes, a hybrid enquiry framework such as the actor/actant network theory (AANT) (Frohmann, 1995) presents relevant data generation and analysis lenses for such studies. AANT is also known by other terms such as the 'actor-network theory' (Callon, 1999; Davies, 2002) or 'actant-rhizome theory' (Smith, 2003).

AANT or its elements have been used in researching the following: environmental policy processes in Ethiopia, Mali and Zimbabwe (Keeley & Scoones, 2003); power, politics and networks that shaped partnerships for sustainable communities in the United Kingdom (Davies, 2002); 'waste wars' in Ireland (Davies, 2003) and recycling in Norway (Eik & Brekke, 2003).

More recently, AANT is also being applied in analysing issues focusing on professional development through networking within the Southern African Development Environmental Education Course Development Network (Lupele, pers. comm., June 2005). The Course Development Network was established in 2002 'to share skills, experience and course materials in order to deliver effective environmental education processes in the SADC region' (<http://www.sadc-reep.org.za/highlight.htm>, 31 January 2005).

The diverse manner in which AANT is being used to research different environmental and environmental policy and environmental education phenomena, as shown above, presents it as an emerging methodology that can be applied, particularly to research (environmental) education policy processes. This paper seeks to provide insight into how this methodology can be applied in these contexts. While the paper reports mainly on how AANT has been used in environmental policy research, it offers insights that may be useful for environmental education research more broadly. The next section presents some of the basic dimensions embedded in this enquiry framework.

Plastic Bags Regulations Research and AANT Methodology

South Africa is the first country within the Southern African Development Community to have regulated plastic shopping bags waste through the imposition of both a standard on thickness and a levy. Given this scenario, the Plastic Bags Regulations of 2003 (RSA, 2003) present an illustrative case for researching complexity, uncertainty and controversies surrounding a new trend in environmental policy making, namely waste product regulation. The research focused on understanding and investigating *tensions, debates* and *responses* emerging from the policy process as *actors* and *actor-networks* put the Plastic Bags Regulations into circulation as *focal actant* (token). The research objectives included the need to: (1) analyse selected international environmental policy processes surrounding plastic shopping bags litter and waste regulation and how these influenced developments in South Africa; (2) identify actors, actants and actor/actant-networks that shaped and were being transformed by South Africa's Plastic Bags Regulations and explain the tensions, debates and responses arising in the policy processes; (3) identify environmental policy outputs and assess outcomes emerging from the formulation and implementation of South Africa's Plastic Bags Regulations; and (4) establish patterns in environmental policy process reforms around South Africa's Plastic Bags Regulations (Nhamo, 2004).

Given the complexity associated with this policy research, the hybrid enquiry framework of AANT was identified as being appropriate for this study. Some of AANT's components were conceptualised in the early work of Michael Callon and Bruno Latour in 1981 (Callon & Latour, 1981). From this early work, the author identified two fundamental terms that led to the development of AANT: *actor* (human) and *actant* (non-human artefact), as well as its process orientation to data generation and analysis. To this end, the application of AANT enables effective and efficient tracing of relational dynamics between actors and actants (at times referred to both as actors) and the emerging actor/actant-networks.

AANT as Enquiry Framework

Some of the fundamentals in AANT include the fact that (1) there exists a relational orientation within phenomena under study, (2) binaries and disciplines need to be collapsed, (3) there are actors, actants and actor/actant-networks, and (4) that data are interpreted through the use of moments of translation. These and other basics in AANT will now be considered each in more depth in turn below.

A relational orientation

The language of actors, actants and actor/actant-networks brings to the fore the relationships and complexities that exist around them. Latour (1993) maintains that such relationships and complexity can be unpacked by understanding the notion of what he calls *quasi-objects* that modernity fails to recognise. Modernity, Latour (1993:3) argues, presupposes a clear distinction between binaries such as nature and society, subject and object, human and non-human, as well as a clear separation between 'knowledge, interest, justice and power'. These are aspects that cannot be separated as they *weave* the world together creating networks as well as hybrids or quasi-objects, quasi-subjects or token (Schultz, 1998).

Quasi-objects are in between and below the two poles [nature pole and subject/society pole], at the very place around which dualism and dialectics had turned endlessly without being able to come to terms with them. Quasi-objects are much more social, much more fabricated, much more collective than the 'hard' parts of nature, but they are in no way arbitrary receptacles of a full-fledged society. On the other hand they are much more real, non-human and objective than those shapeless screens on which society – for unknown reasons – needed to be 'projected'. (Latour, 1993:55)

Frohmann (1995) argues that they are quasi-objects because they are simultaneously real, discursive and socially constructed. Quasi-objects circulate and transform while in circulation, and in so doing form relationships between the members of given groups (Boje, 2003). With regard to this paper, South Africa's Plastic Bags Regulations and their various versions that emerged since May 2000 until May 2003 qualify as quasi-objects (Schultz, 1998). Therefore, both humans and non-humans are defined relationally as arguments in the network. This leads to a relational epistemology that rejects the naïve positivist view of objects as existing in themselves before any participation in eco-social and semiotic networks of interactions (Ryder, 1999). However, only humans are able to put non-human phenomena into circulation in the network (*ibid.*).

From Brown and Lightfoot's (1999) perspective, quasi-objects or sovereigns also bring in the notion of the *third* or *thirdness*. According to these authors, thirdness denotes the space between two entities. It is in such space where relationships are constituted, a medium through which an identity related to another may be taken up. The sovereigns are defined by the passages they undergo and the effects they produce in the subjects and objects surrounding them, and at times translating into quasi-subjects (*ibid.*). Thirdness can also be likened to Bourdieu's (1998:31) concept of *social space*, which 'contains, in itself, the principle of a *relational* understanding of the social world. It affirms that every 'reality' it designates resides in the *mutual exteriority* of its composite elements'. Hence visible actors 'occupy relative positions in a space of relations which, although invisible and always difficult to show empirically, is the most real reality ... and the real principle of the behaviour of individuals and groups' (*ibid.*).

Need to collapse binaries and disciplines

The AANT enquiry framework collapses binaries, such as nature/society, structure/agency, actor/actant, micro/macro, global/local, inside/outside and subject/object, historically associated with a particular type of social theory (Latour, 1987; Latour, 1999; Law, 1999; e.g., Smith, 2003). As Keeley and Scoones (2003) maintain, these divisions eventually become blurred during environmental (education) policy making processes, especially due to the complexity, uncertainty and contested nature of policy making. AANT denies that purely technical, scientific or social relations are possible (Tatnall & Gilding, 1999), as what may be viewed on the surface as social is partially technical or scientific and *vice versa*.

Latour (1987) maintains that AANT also rejects an *a priori* distinction between science (truth) and politics (power). These are two parameters that drive environmental (education) policy making. Conflict and domination are widespread in network development. Hence the emphasis, when using AANT in research, is on examining controversies to see how certain controversies become resolved and/or appear as black boxes, i.e., taken for granted or not requiring further explanation (Fountain, 1999). It is only when certain controversies are scrutinised that the black boxes begin to open up and reveal complex webs of actor/actant-networks that are normally concealed by the black-boxing effect (Fountain, 1999). This study closely examined the acts of black-boxing by tracing power distribution, particularly the influence of Organised Business on the policy process.

Actors, actants and actor/actant-networks

An actor/actant is holistically described by Callon and Latour (1981) as any element which bends space around itself, making other elements dependent upon it and translating their will into a language of its own. Fountain (1999:344), goes further and indicates that ‘an actor or actant is not an agent in the normal sociological sense; instead, actor and actant are used as semiotic terms’. These semiotic actors and actants are hybrids that create their own actor/actant-worlds. In this regard, actors and actants ‘become products of a more or less stable relation between various effects that together form an actor/actant-network’ (*ibid.*). Some of the common actors and actants include people, groups of people, texts, graphical representations and technical aspects (Sidorova & Sarker, 2000). Additions to this list would include machines, curricula, communication networks, money and the media.

According to Scharpf (1997), actors are characterised by specific capabilities, perceptions and preferences. Capabilities describe all action resources that allow them to influence an outcome in certain respects and to a certain degree. Such capabilities therefore capture aspects like physical strength, intelligence, or human and social capital; physical resources such as money; technology; and privileged access to information. Latour (1987) similarly associates the word ‘network’ with resources. In particular, resources are said to be concentrated in a few locations that he likens to knots and nodes. These knots and nodes are linked to one another, in the process transforming the scattered resources into a net, which stretches to and influences actor-worlds (Fountain, 1999). In this study, Organised Business appeared to have been well resourced.

The concept of a *network* resembles a series of linked points and as such a network is a web rather than a hierarchical structure. Hence a network changes (it is fluid), it is non-linear and therefore has various points of entry and such points can be human or non-human (Fountain, 1999). To this end, multiple kinds of relations exist that could be ‘oppositional, associative, conditional, simple, complex, ordered, chaotic, etc’ (Fountain, 1999:348).

To enable a fair and same treatment of actants and actors, AANT is based upon three assumptions: *agnosticism* (analytical impartiality); *generalised symmetry* and *free association* (Latour, 1986). Generalised symmetry aims at explaining conflicting viewpoints of different actors (both human and non-human) in the same terms through the use of abstract and neutral vocabulary. Free association calls for the elimination and abandonment of all *a priori* distinctions between the technological/natural and the social (Singleton & Michael, 1993). These three assumptions in AANT will be re-visited under the section dealing with validity.

Moments of translation

Translation in AANT consists of four moments (Davies, 2002): *problematization*, *interessement*, *enrolment* and *mobilisation*. These moments may occur sequentially or otherwise. During translation, actors and actants’ identity and qualities are defined as negotiations take place between representatives of humans and non-humans (Ryder, 1999). Representation in this case is understood in its political dimension as a process of delegation. Translation therefore becomes a multi-dimensional interaction in which actors and actants construct common definitions and meanings and co-opt each other in the pursuit of both individual and collective objectives (*ibid.*).

Problematization takes place when focal actors or actants define or frame a problem. The aspect of problematization usually requires researchers to trace back in time the history and contextual setting of the subject under research (Gaskell & Hepburn, 1998). *Interessement* is when alliances are sought and actor/actant-networks constructed (Davies, 2002; Keeley & Scoones, 2003). It is a time for consultation and promotion, yet at the same time it is characterised by opportunities for resistance. Negotiations about proper partnership structures are articulated with policy entrepreneurs (Keeley & Scoones, 2003), taking centre stage in networking and marketing ‘preferred’ policy futures from their actor/actant-networks (Atkinson & Brooks, 2003). The focal actor or actant defines the roles of actors in the proposed new actor/actant-network. Callon and Latour (1981) outline how micro-actors (individuals) form alliances, enrol other actors and use actants to mobilise such alliances and secure their interests.

When the moment of *interessement* succeeds (Callon, 1986), the proposed actor/actant-network(s) are created and thus marks the first phase of completed *enrolment*. Actor/actant-network(s) have been found to act as if they are independent autonomous actors or actants (Sidorova & Sarker, 2000) – hence the reason they are referred to as ‘actor/actant-networks’. Such actor/actant-networks will now be made up of heterogeneous networks of aligned interests bound by common discourses. New representative actors and at times actants are selected or created. The cycle around *problematization*, *interessement* and *enrolment* can then be repeated through the moment of *mobilisation* described in the next paragraph.

Once actor/actant-networks are formed, they require continued *mobilisation* as they are always unreliable and can become unstable (Tatnall & Gilding, 1999). New actors, desertion of old ones or changes in alliances may result in the ‘black boxes’ of networked actors/actants rupturing and the need to re-structure their contents (Latour, 1987; Singleton & Michael, 1993). Therefore, it is critical to note that behind the lead actor/actant-network hides multiple webs of interwoven sub-actor/actant-networks. As such, any changes will create a chain reaction within the actor/actant-network(s) it represents (Tatnall & Gilding, 1999). The process of *inscription* (Atkinson, 2002; Atkinson & Brooks, 2003), which involves ‘stabilising’ the actor/actant-network by committing it to a shared memory of the social-scientific and social-technological system, is a core feature of the moment of mobilisation. Some of the strategies used during inscription include the creation of texts in the form of newsletters, websites, mailing lists and prescribed programmes of action (Atkinson & Brooks, 2003).

While the moments of translation often involve negotiations among a number of actors, such actors do not always participate in such processes themselves. Instead, representatives are selected to speak on behalf of actors or actor/actant-networks, and at times this is done through written submissions alone. However, the represented actors or actor/actant-networks do not necessarily always abide by the agreements negotiated on their behalf, and this constitutes what Sidorova & Sarker (2000) call betrayal.

Data Generation Using AANT

Van House (2001) maintains that methodologically the AANT can take two major approaches: (1) to ‘follow the actors’ via interviews or ethnographic research, and (2) ‘follow the non-human actants’, particularly examining inscriptions as core to knowledge construction (Latour, 1987). However, Fagan (2002) adds a third dimension, thus, ‘to follow actor/actant-networks’. This implies therefore that the researcher can choose any one of the three phenomena as token or quasi-object of analysis (Schultz, 1998). In the research reported here, the Plastic Bags Regulations, as actant, became the token of data generation and analysis. In environmental education research, documents such as the UNESCO ESD Implementation Scheme (UNESCO, 2005) could be adopted as the token of data generation and analysis. Gaskell and Hepburn (1998) maintain that the focal actant constructs an actor/actant-network and in the process simultaneously changes in response to the emerging actor/actant-network(s).

Citing from his inception work with Michael Callon in 1981, Latour (1999) says that AANT is a methodology that places emphasis on learning from the actors and actants without imposing on them an *a priori* definition of their world-building capacities. He concludes by saying AANT is simply a way for social scientists to access sites, a way to travel from one spot to the next and from one field site to the next. Latour also maintains that if AANT is to be credited with some achievement, then it is its ability to have developed science studies that entirely bypass the question of social constructivism and the realist/relativist debate.

In terms of data generation, AANT methodology calls for purposive sampling (Williams-Jones & Graham, 2003). This is a quality closely shared with theoretical sampling in grounded theory approaches (Strauss & Corbin, 1998). For policy research, AANT also emphasises

the need to identify rich sources of primary data from consultative and public submission documents (Frohmann, 1995).

This paper, therefore, sought to consider how the Plastic Bags Regulations constructed actor/actant-networks, and how the regulations simultaneously changed in response to the emerging actor/actant-networks, an aspect that can be adapted to researching environmental education issues. The broader research set a question that sought to address environmental policies, tensions, debates and responses that informed the development of South Africa's Plastic Bags Regulations.

Therefore, AANT or its components were drawn upon to assist in: (1) explaining and confirming the relationships (articulated in tensions, debates and responses) that emerged as quasi-objects, such as the Plastic Bags Regulations and how they influenced interaction with other actants, actors and actor/actant-networks; and (2) conceptualising emerging issues and initial theorising regarding environmental policy processes surrounding South Africa's Plastic Bags Regulations, as a case example of waste product regulation in South Africa.

Bearing in mind the need to generate data that would reveal the complexity, uncertainties and controversies (particularly the tensions, debates and responses) in environmental policy processes surrounding the Plastic Bags Regulations, a framework for this analysis was developed (Table 1). Since environmental policy making is a living and dynamic phenomenon, data generation took place throughout the entire research period.

The framework in Table 1 summarises the methodological framework and is divided into three broad areas that include: the parameter of data generation and analysis (i.e., methods and instruments, token of data generation and analysis, evaluation component and broad enquiry framework), data generation focus and data analysis framework. The data generation methods and sources included: documents (main source), interviews and observations.

Some Weaknesses of AANT

A significant critique of the actor/actant-network theory has been the problem associated with its naming. This aspect has been deliberated upon at length by John Law (1999) and Bruno Latour (1999). Law (1999:2) points out that the act of naming suggests that AANT's 'centre has been fixed, pinned down, rendered definite'. According to him, this implies that AANT has been converted into a specific strategy 'that we cannot turn back'. This way, many researchers think of AANT as a 'thing' out there that can be used mainly for explaining phenomena. Law reminds us that naming is a threat to productive thinking and retards the chance of making a difference intellectually and even politically. To this end, insights from AANT should also be used to come up with new conceptual frameworks and ultimately theories. Law then calls on researchers not to identify with AANT, 'not because it is "wrong", but because labelling doesn't help' (*ibid.*). Conceptual frameworks that emerged from the study leading to the production of this paper are summarised towards the end of this paper.

Table 1. Framework for data generation and analysis

Level/Parameter	Data Generation Focus	Data Analysis Framework	
Methods and instruments	<ul style="list-style-type: none"> Internet: library resources, including journals and media; World Wide Web and electronic mail Interviews: face-to-face, focus group, telephone and schedules Observations and schedules Ideas notebook and field journal 	<i>Analysis concepts</i> <ul style="list-style-type: none"> Document analysis Textual analysis Script analysis Photo interpretation <i>Analysis process</i> <ul style="list-style-type: none"> Creswell's (2003) generic steps in qualitative enquiry data analysis Determining <i>in-vivo</i> codes/nodes Developing categories from the codes/nodes <i>Tools for data analysis</i> <ul style="list-style-type: none"> N-Vivo 2.0 Microsoft Excel 	T e n s i o n s D e b a t e s & R e s p o n s e s
Token of data generation and analysis	<ul style="list-style-type: none"> Plastic Bags Regulations 	<i>Time frame</i> <ul style="list-style-type: none"> Prior to the formulation of relevant key policies During formulation Implementation and after <i>Spatial scale</i> <ul style="list-style-type: none"> Micro (local) Macro (national) Transnational (regional-international) 	
Broad enquiry framework	Actor/actant-network theory <ul style="list-style-type: none"> Actors Actants Actor/actant-networks 	<i>Moments of translation</i> <ul style="list-style-type: none"> Problematization Interessement Enrolment Mobilisation <i>Incorporating</i> <ul style="list-style-type: none"> Creswell's (2003) generic steps in qualitative enquiry data analysis, determining <i>in-vivo</i> codes/nodes, and developing categories from the codes/nodes 	

AANT, Law (1999) claims, was never as fixed as it has tended to be through processes of scholastic reasoning in research in the last decade. AANT, therefore, was about *semiotics* and *performativity*. Semiotics tells us that entities take their shape and acquire their attributes as a result of the relations in which they are located. This is what led to the collapsing of dualisms. However, Law maintains that there are not, in this semiotic reasoning, no divisions. Rather, it is that such distinctions are understood instead, as effects or outcomes. Performativity is closely linked to the former as semiotics are performed ‘in, by, and through those relations’ (Law, 1999:4). As such, in principle, everything becomes uncertain and reversible, including the methodological propositions embedded in AANT.

Writing on how AANT has become appropriated, Law (1999) suggests that the phrase ‘actor/actant-network’ is a name that embodies a *tension* that lies between the centred ‘actor/actant’ on one side and the decentred ‘network’ on the other. Latour (1999) goes further to illustrate that the term ‘network’ has metaphoric meanings. In his view, it is easy to be deceived by other forms of networks that exist in our everyday lives. For example, we live in ‘social networks’, using ‘railway networks’ and are surrounded by ‘networks of power’ (*ibid.*). Latour (1999) deliberates further on the name ‘theory’, when he (*ibid.*:19) maintains that AANT ‘was never a theory of what the social is made of’ as it looks at quasi-objects that are found midway between the natural and the social (Latour, 1993).

Lastly, AANT is silent about when data generation should stop. As such, environmental education researchers may need to seek complementary ideas from grounded theory approaches and mainstream qualitative research orientations. From a grounded theory perspective, data for a particular category are generated through the process of theoretically (purposive) sampling until a saturation point is reached (Strauss & Corbin, 1990; 1998). The saturation point is reached when issues in a particular category start recurring (Charmaz, 2000), after which any further generation of data will not add value to one’s work. When this takes place, then the researcher has a sign to stop generating more data.

Addressing Validity Threats

Throughout the research, efforts were made to be aware of the fact that AANT methodology required that actors, actants and actor/actant-networks emerging from the formulation and implementation processes of the Plastic Bags Regulations should be *traced*. In addition, drawing from AANT’s three assumptions of *agnosticism*, *generalised symmetry* and *free association*, both *actants* and *actors* were supposed to be accorded *fair* and *same* treatment. These aspects are deliberated upon further in the following paragraphs.

To accomplish the notion of *network-tracing* as opposed to *traced-networks*, this research applied Creswell’s (2003) data analysis framework. The framework, which captures significant aspects of grounded theory in analysing qualitative data, allowed coding and the categorisation of data as they emerged from the analysis. From this process, networks could be traced as they emerged, resulting in the construction of several conceptual frameworks leading to theory building.

A fair treatment of both actants and actors was achieved by the realisation that these had a complementary role to play in the process, with the Plastic Bags Regulations having been identified as token actant. The fact that the token actant and other related minor actants could not put themselves into circulation, constantly reminded the researcher of the intimacy between actants and actor-networks such as those that were put into motion by actants like the Department of Environmental Affairs and Tourism, Organised Business and Organised Labour. In addition, AANT’s three major assumptions spelt out above (i.e., *agnosticism*, *generalised symmetry* and *free association*) were carefully integrated into the research. Impartiality (agnosticism) was key to analysing issues emerging from the key actors, actants and their networks. Conflicting viewpoints of both actors and actants were explained. Such conflicting viewpoints were explained through the use of abstract and neutral vocabulary (generalised

symmetry) and, where necessary, quoting the exact words and avoiding biased commentary. In addition, through an analysis of power relations in the context of the AANT, key actors, actants and actor/actant-networks, including those disempowered through marginalisation, such as community and consumer groups and local authorities, were identified. AANT's four moments of translation were also helpful in analysing what we might term 'petty' narratives or story lines that helped to build the 'grand' narrative that unfolded around the whole environmental policy process surrounding the Plastic Bags Regulations. To permit free association, all *a priori* distinctions between the technological/natural and the social were avoided.

Levels of engagement in the research process were also guided by the realisation that environmental policy research involved touching on complex phenomena. The research was guided by the realisation that AANT is an open process enquiry framework that could not be restricted to theory verification alone but also included theory building. As such I, as researcher, constantly reminded myself of the obligation not only to verify and apply AANT's components as they emerged during the research process, but also to have time to let data and the analysis process 'talk to me' as I interrogated findings and made conclusions. This process resulted in a number of conceptual frameworks being constructed. These frameworks contributed to understanding and explaining environmental policy processes around South Africa's Plastic Bags Regulations and similar contexts both within and outside the country.

Creswell (2003:195) also addresses other generic validity threats. He maintains that researchers, particularly those engaged in predominantly qualitative studies like this one, need to 'convey the steps' taken to 'check for the accuracy and credibility of their findings' – the notion of validity (Arksey & Knight, 1999). Creswell (2003:195) emphasises that validity should not be taken as a 'companion of reliability (examining stability or consistency of responses) or generalisability (the external validity of applying results to new settings, people or samples)'. In qualitative research, the accuracy and credibility of findings need to be considered from the standpoint of the researcher, participants and readers of the work. To this end, a number of validity indicators were adapted from Creswell (2003:196–197) and Arksey and Knight (1999:49–55). Different data sources were *triangulated* by scrutinising evidence from these sources and constructing coherent justification for codes and categories. *Rich, thick* descriptions of datasets were used to articulate findings in the form of narratives and where necessary *discrepant information* was revealed.

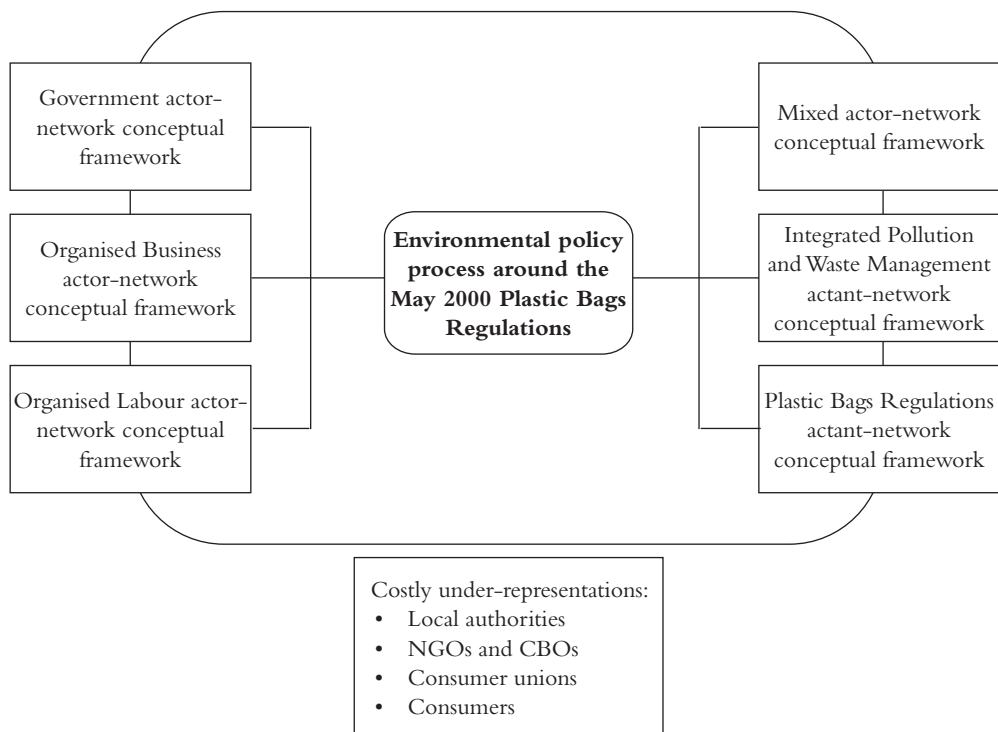
A major challenge was the difficulties in providing empirical evidence to 'measure' relationships and networks. To this end, I relied heavily on thick, rich descriptions of phenomena. This is an aspect that complements policy and qualitative research-oriented studies like this one.

Findings Regarding Emerging Conceptual Frameworks

A series of conceptual frameworks were drawn up to clarify the nature of tensions, debates and responses surrounding certain lead actors, actants and actor/actant-networks. Some of the conceptual frameworks that emerged around the actors and actor-networks include *Organised Government* (led by the Department of Environmental Affairs and Tourism), *Organised Business*

(led by the Plastics Federation of South Africa) and *Organised Labour* (led by the Congress of South African Trade Unions). Conceptual frameworks that emerged around key actants and actant-networks include those around the *Integrated Pollution and Waste Management and Plastic Bags Regulations*, as well as the discourses surrounding the ‘green’ bag and *biodegradable plastic bags*. These *petty* actor/actant conceptual frameworks were harmonised into a *grand* actor/actant-network conceptual framework represented in Figure 1 below. The grand conceptual framework ties the diverse processes and networks together as they emerged around the Plastic Bags Regulations since they were first promulgated on 19 May 2000. Furthermore, the conceptual framework also presents actors, actants and their networks that were either marginalised or under-represented in the process.

Figure 1. Emerging actor/actant-network conceptual framework



The overall actor/actant-network conceptual framework reveals costly omissions, especially in terms of actors and actor-networks that were under-represented. These include (Figure 1) local authorities and civil society organisations such as non-governmental organisations (NGOs), community-based organisations (CBOs) and consumer organisations. The role of local authorities in implementing government policy is significant because of the complementary nature of their operations. The voice of the South African Consumer Organisation appears to have been one of one of the weakest links and it was sidelined in the policy process, and yet the

majority of people affected by the regulations (the poor, women and children) have their voices represented by such organisations.

Conclusion

This paper presented AANT as an emerging methodology that can be applied in researching environmental (education) policy in South Africa. Basics in AANT such as the concepts actor, actant and actor/actant-network were presented, as well as its relational orientation. In terms of validity in AANT, the need to be aware of the fact that AANT is not about *traced networks* but a *network-tracing* activity was explained. The need to accord *fair* and *same* treatment to *actants* and *actors* based on AANT's three assumptions of *agnosticism*, *generalised symmetry* and *free association* were also explained. Lastly, I briefly discussed the petty and grand conceptual frameworks that emerged from the broader study resulting in the publication of this paper. The methodological framework may prove useful to those wishing to probe the power of the UNESCO Decade of Education for Sustainable Development Implementation Scheme (UNESCO, 2005) (an actant) or other environmental (education) policies. It may prove useful to identify actor/actant networks that are participating in the UNDESD, and may illuminate the stabilities and instabilities of these networks, along with significant omissions and power relations. As argued in this paper, it provides a useful methodology for tracing relational processes, interests, tensions, debates and responses in policy processes.

Notes on the Contributor

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