Abstract

This article considers the resistance potential of Environmental Impact Assessments (EIAs) and their effects upon existing power relationships. It focuses upon the blocking of Eskom's proposed new test nuclear reactor by the environmental NGO Earthlife Africa, at Koeberg, South Africa, the site of Africa's only existing nuclear power plant. This was achieved through their engagement with, and contestation of, the South African EIA process. It occurred within a context of a globally uncertain future for the nuclear industry, and broader questions over the possible role of nuclear power in sustainable development. Whilst initially appearing as an example of environmental resistance against a big development project, by approaching the case through the lens of Michel Foucault's concept of governmentality the article suggests that Earthlife Africa's challenge reinforced existing power relationships and legitimised an essentially pro-development EIA process. This is particularly evident when considering the relationship between EIAs and established scientific authorities, and the problematic role of public participation. However, by regarding the EIA as an example of 'bearing witness' some sense of its resistance potential can be reclaimed. The article concludes by suggesting that a broader debate on nuclear power in South Africa is desirable, and that environmental NGOs should seriously consider the degree to which they accept and participate in the EIA process.

Resisting (nuclear) Power? Environmental Regulation and Eco-Governmentality in South Africa

Environmentalists are commonly regarded as presenting a counter-cultural critique in all sorts of ways: in their rejection of a modernist domination of nature, their questioning of capitalist wealth and growth, their exposure of the inability of sovereign nation-states to deal unilaterally with global environmental problems, and their enthusiasm for environmental regulation of the free market (Hajer and Fischer, 1999; Mason, 2005). Since their introduction in the USA in the 1970s, environmental impact assessments (EIAs) have emerged as a significant form of environmental regulation in numerous countries, and as such are frequently presumed to act as a constraint upon economic expansion or development, and thus as a tool of resistance against neo-liberal capitalist hegemony (Annandale and Taplin, 2003; Lawrence, 1997). Furthermore, their stress upon popular participation also implies an element of radical democracy, and a potential challenge to the power of entrenched elites (Eden, 1996). At first sight the case examined in this article seems to confirm the status of EIA as a potential technique of resistance. The environmental NGO Earthlife Africa used the EIA process to block the development of a new nuclear Pebble Bed Modular Reactor (PBMR) by Eskom, South Africa's energy giant, at the existing Koeberg nuclear site, 30km north of Cape Town. A straightforward good versus bad, David versus Goliath story seems self-evident here. In the context of South African environmentalism however, and the broader nuclear debate, the issues become more complicated. Furthermore, by approaching this case from a Foucauldian perspective, I argue that EIAs are a technique of *eco-governmentality*, and as such are fundamentally compatible with, rather than opposed to, the development process. By showing how their reliance upon scientific experts and public participation can both challenge and reinforce existing power relationships, this article complicates a simplistic identification of EIAs as a technique of resistance. It concludes by considering the notion of *bearing witness*, and through this reassesses the potential resistance capacity of the EIA process.

Earthlife Africa versus Eskom

The African continent's first and only nuclear power plant was built at Koeberg in the 1970s by a French-led consortium, and began operation in 1984. In March 1993 President de Klerk admitted that South Africa had built six nuclear weapons during the 1980s (Fig, 2004). It seemed that both nuclear power and atomic weapons were closely identified with the apartheid regime, and the ANC stated in 1994 that 'the nuclear industry should be phased out in the shortest possible time' (quoted by Lakhani, 2002: 2; and Worthington, 2000: 5). In the late 1990s however nuclear development programmes were back on the agenda, with Eskom's plans to test the new PBMR technology at Koeberg, for eventual industrial export. Environmentalists have been dismayed by this possibility, and have voiced suspicions that South Africa is being 'asked to support the international revival of the nuclear industry through a costly experiment with public money' (Fig, 2004: 6). This also seemed to contradict hopes that South Africa would become a leading example of environmentally friendly sustainable development in the global South.

In 1994 there was much optimism that democracy would lead to a racially harmonious, economically prosperous and environmentally sustainable Rainbow Nation (Cock, 1991). The new constitution enshrined citizens' right to a healthy environment, and EIAs, as set out in the 1998 National Environmental Management Act (NEMA), became mandatory for most major developments. However, in the context of continued massive inequality and poverty, the environmental agenda has often lost out. Trade unions, for example, have been beset by a long-standing 'jobs versus environment' dispute, in which environmental gains are typically set against job losses (Lukey, 2002). The team responsible for devising EIA procedures for South Africa noted that the specific form of assessment adopted was heavily influenced by the fact that 'as in most developing countries, the promotion of economic growth and development are essential national goals in South Africa' (Sawman, Fuggle and Preston, 1995: 53). When combined with a perceived historical continuity between racist apartheid conservationists, and the largely white, middle-class environmental lobby in South Africa, environmentalism occupies a controversial and contested terrain (Khan, 2002).

It was in this context that an EIA was conducted on Eskom's proposal to build a new test reactor at Koeberg. EIAs are conducted by consultants employed by the developer, who present their report to the South African Department for

Environmental Affairs and Tourism (DEAT) for final approval. In this case Eskom appointed a panel of 13 consultants, including representatives from Poltech, Netrisk, Afrosearch, Nuclear Consulting International, Andersen, and Africon, to work on the scoping phase during 2000 and 2001, and the Environmental Impact Report (EIR) phase, which was completed in June 2003 when the Report was approved by the Director-General of DEAT (Poltech, 2002: xvii). The scoping phase sets out the nature and extent of the proposed development, considers possible alternatives, gathers background information on the local area, identifies and provides information to interested and affected parties (I&APs), and records their comments and concerns (Wood, 1995: 5 – 6). When the scoping report was approved by DEAT the consultants began the EIR phase, which involved studies of the social, economic, biophysical impacts and technical aspects of the development, and also incorporated comments by the I&APs.

The final 435-page Report concluded overall that it 'identified no significant environmental risk(s) or adverse impact(s) in part or on the whole that cannot be adequately managed and mitigated over the life of the Plant' (Poltech, 2002: xxvii). Specifically, it concluded that the information provided by the test PBMR would help guide future strategic decisions on the use of the technology, and would potentially help broaden the national energy mix for electricity supply (xx). It noted that the development did not necessarily conflict with local and regional energy policy, but that these policies needed clarification (xxi). There was a 'pressing' need for 'a national policy on management of radiological waste', but the Report concluded that its absence 'does not represent a fatal flaw' (xxi – xxii). The consultants asserted that 'no radiological impacts exceeding the standards stipulated by the NNR [National Nuclear Regulator] have been found', and that the greatest potential adverse impacts would occur during the construction phase, necessitating a construction Environmental Management Plan (EMP) (xxii). There was also a need for an operational EMP, to cover radiological surveillance programmes, disaster management systems and Eskom's HIV/Aids policies (xxii – xxiii). The Social Impact Assessment, conducted by Afrosearch, highlighted the importance of risk assessment and perception, and concluded that the absence of 'a coherent national nuclear energy policy', or particularly a 'national policy regarding the disposal of nuclear waste', contributed to a 'dread risk perception' (xxiv). There was therefore a need for better and non-biased information from both the pro- and anti-nuclear lobbies,

and better communication between Eskom, the government and the public (xxv). The EIR also noted the need to maintain and upgrade Tygerberg Hospital's ability to cope with nuclear incidents and disasters (xxv). Economically, it concluded that the PBMR would provide 1,400 local jobs during construction and 40 permanent jobs, would support the national goals on science and technology, and would 'have limited transient negative impact upon tourism' (xxvi). The cumulative impacts would mainly concern the nuclear High Level Waste being stored on-site, but in general these impacts would fit into Koeberg's existing nuclear footprint. The EIR therefore recommended that, subject to authorisation from the NNR, the implementation of the EMP, and financial provision for waste storage and plant decommissioning, DEAT should approve the development (xxvii).

In June 2003 DEAT issued its formal Record of Decision (ROD), which fully endorsed the EIA process, the conclusions of the EIR, and approved the development (Olver, 2003). However, there was opposition from NGOs and individuals to both the PBMR proposal and the way the EIA process itself had been conducted. Leading the opposition was Earthlife Africa, a non-profit, voluntary environmental organisation. In September 2003 their Cape Town branch formally challenged Eskom and the PBMR development through the law courts, beginning a High Court application to overturn the ROD, primarily on procedural grounds. In November 2004 the judge found in favour of Earthlife Africa, and set aside the ROD, ruling that the EIA process was 'procedurally unfair' (Griesel, 2005: #58 and #76). Despite losing a subsequent court case over access to Eskom's board minutes, and the initiation of a new EIA by Eskom for an expanded PBMR in 2005, Earthlife Africa have, at least temporarily, halted the PBMR development. The delays to the development, and the wider challenge to the project, have had considerable economic costs, both in terms of operational delays and in discouraging potential investors (Thomas, 2004: 11).

This legalistic challenge was the tactical form of Earthlife Africa's opposition to Eskom, but it was within the context of an attempted broader debate over nuclear power in South Africa. Opposition to the PBMR has drawn upon the strength of the environmental justice discourse in South Africa, which unites environmental concerns with social justice goals, and engages enthusiastically with the participatory opportunities offered by the EIA process (McDonald, 2002). Earthlife Africa describe themselves as 'environmental and social justice activists', and their approach stresses that environmentalism is more about people's lives, than it is about nature and

wildlife in isolation.[1] The environment, as expressed by the founder of South Africa's Environmental Justice Networking Forum (EJNF):

> includes our workplace, home, hostel, town, village and city as well as areas of natural beauty. Thinking of the environment in these broad terms makes it clear that South Africa's high infant mortality rates, industrial accidents, road and mining accident deaths, violence and township pollution are all environmental issues (quoted in Cock, 2004: 7).

This discourse draws attention to the many ways in which the risks and damages associated with environmental degradation disproportionately impact upon the economically and socially disadvantaged – for example during debates over the location of the dump for Koeberg's nuclear waste in 1979, consultants looking at Namaqualand ruled out areas less than 50km removed from white settlements, although there are indigenous villages (such as Paulshoek) located within 24km of the Vaalputs site they eventually selected (Fig, 1991: 124). As with civil rights movements, this discourse has often campaigned through legal-activist attempts to uphold constitutional rights. In South Africa, the Bill of Rights enshrines the right of people 'to an environment that is not harmful to their health or well-being', and it is this, together with the legal requirement to conduct EIAs and consult those affected by developments, that has encouraged environmental justice groups like Earthlife Africa to contest developments like the PBMR (Glazewski, 2002). Groups drawing upon this discourse have expressed their opposition to the PBMR most prominently in terms of safety concerns and over the dubious economic benefits of the technology.

Eskom proudly states that 'the PBMR does not require any of the traditional nuclear safety systems that actively guard older generation reactors against radiation release', and that it is 'inherently safe'.[2] However, this assurance has been publicly questioned, especially given that the last operational reactor of this type, in Germany, was 'closed on the orders of the safety regulator' (Worthington, 2000: 10). Earthlife Africa have called for 'a full independent review of the plant's status and safety' based on 'grave concerns' highlighted by their own technical review (Earthlife, 2004). This was in part prompted by several incidents at the existing Koeberg nuclear plant which have raised doubts about Eskom's safety record, and company policy on liability and disclosure of accidents. In 1998 *The Cape Times* uncovered a radiation

accident in 1997 that had been concealed (Worthington, 2000: 14). The case of Ron Lockwood also reached the national media. He is a former worker at Koeberg who was diagnosed with advanced lymphatic leukaemia several years after being persuaded to take early retirement. He subsequently uncovered evidence that, as early as 1986 (ten years before retiring), Koeberg medical officers had known of his condition, and had falsified official medical records (EJNF, 2004b). Most recently, damage caused by a loose bolt to one of the reactor turbine blades in December 2005 led to the enforced shutdown of one of the two Koeberg reactors, contributing to power shortages and blackouts in the Western Cape (Mining Weekly, 2006). This incident encouraged questioning of not only the safety but also the economic and technological reliability of nuclear power.

The profitability of the nuclear power industry has been in doubt ever since its emergence, and many environmentalists have expressed frustration with the way nuclear energy continues to absorb disproportionate amounts of state funding. In South Africa, nuclear development programmes consumed two thirds of the Department of Minerals and Energy's annual budget in 1997, but only generated about 5% of the national electricity supply. This is in a country where, by the end of 2000, only 70% of households were connected to the grid (Bond, 2002: 310 – 333). Despite this, the PBMR is designed for its eventual industrial export potential, rather than for domestic power generation. Eskom have defended the development claiming 'tens of thousand of permanent jobs will be created through the multiplier effect if the export potential of the PBMR is realised', but the permanent workforce at the module will only be 40 – 50 people.[3] Furthermore, foreign investors seem reluctant to provide funding for the project. The EIR referred to British Nuclear Fuels Ltd, even after they had effectively pulled out of the project due to their own insolvency (Poltech, 2002: 2). The American giant Exelon withdrew funding for the project, arguing that the PBMR was three years behind schedule 'and that the whole project was too speculative', and other US investors have been almost impossible to attract after the US Nuclear Regulatory Commission refused to approve the PBMR, stating in 2001 that its design was 'seriously flawed' (Fig, 2004: 60 – 61). This means that the bulk of the risk is being borne by the South African tax-payer. Independent academic research concludes that the current PBMR demonstration module 'will inevitably be a heavily loss-making project', and emphasizes the significant risks of the project, given the doubtful world market for PBMR technology (Thomas, 2004: 4 – 5 and 29 – 33).

Whilst Earthlife Africa tried to raise these issues, it was made clear by the judges during the court case that 'our decision does not express any opinion as to the merits or demerits of the proposed PBMR, in particular, nor of nuclear power in general' (Griesel, 2005: #79). Environmental groups in South Africa who have called for a parliamentary 'nuclear summit' to debate these broader questions have not been successful.[4] The court case therefore rested upon particular bureaucratic arguments regarding EIA procedure, with Earthlife Africa arguing that EIA law had not been properly followed. The broader challenges posed by the environmental justice discourse were not addressed. Whilst this form of resistance was successful in halting the reactor, at least for the time being, it becomes more problematic when considered in the light of its implications for existing power relationships, and when the relationship between power and freedom is re-theorized.

Eco-governmentality

Michel Foucault's concept of 'governmentality' has been influential in re-theorising the links between political power, domination and resistance (Foucault, 2000a; Gordon, 1991; Rose, 1999). It takes as its starting point the assertion that political power defines the extent to which 'some men can more or less entirely determine other men's conduct – but never exhaustively or coercively' (Foucault, 2000b: 324). For Foucault, power is everywhere, and constitutes relationships between individuals. Power produces society, forms of knowledge, institutions and even our own identities. Power is thus not merely repressive, nor is it a normatively good or bad concept. Yet there are various types of power relationships – ranging from the fluid, shifting relationships that exist between individuals, to the sedimented, coercive relationships that characterise domination. In between these extremes are forms of power Foucault describes as techniques of government, established systems for regulating the conduct of conduct (Foucault, 1997a: 298 – 299). These techniques of government have been referred to as manifestations of governmentality, or the rationality of government.

This concept draws attention to the numerous ways in which conduct is regulated – through our internalization of certain roles (such as the economically rational individual, or the responsible citizen) and the advice of authoritative experts,

in order to render society efficient, safe and productive. Therefore, for Nikolas Rose, freedom and government are mutually dependant within traditional Liberal political thought, since 'to dominate is to ignore or to attempt to crush the capacity for action of the dominated. But to govern is to recognize that capacity for action and adjust oneself to it' (Rose, 1999: 4). This view of power, freedom and government has implications for the way we conceive of resistance, in particular rendering concepts like emancipation and liberation problematic. Since power is productive and everywhere, and government works through freedom, a power-free utopia is clearly impossible. Thus resistance in this article implies simply an unsettling or challenging of existing power relations (Darier, 1999).

Foucault's exposition of the concept of governmentality was primarily concerned with the way the government of a population – its security, reproduction, productivity and stability – became a concern of the nation state (Foucault, 2000a). However, the concept has been extended both spatially and in terms of scope (Larner and Walters, 2004). The concept of 'eco-governmentality' has been used by both Timothy Luke and Michael Goldman to describe the ways in which nature and the environment is governed by techniques of ruling from a distance (Luke, 1995, 1999b; Goldman, 2001). Here I will use the term eco-governmentality to describe the ways in which nature is managed, regulated and governed in order to guarantee its security, reproduction, productivity and stability. This rationality can be seen in John Locke's modernist assumption that 'land that is left wholly to nature, that hath no improvement of pasturage, tillage, or planting, is called, as indeed it is, waste' (quoted by Kuehls, 1996: xii).

Eco-governmentality works through identifiable techniques and tactics, such as EIAs. These forms of power are productive in that they discursively articulate 'the environment' through acts of measurement, regulation, valuing, and control. For example, EIAs seek to define a particular, bounded 'environment', analyse its 'baseline' characteristics, and predict and control changes to it (Wood, 1995: 6; Poltech, 2002: 204 and 213). As Paul Rutherford asserts, 'regulatory ecological science does not so much describe the environment as actively constitute it as an object of knowledge and, through various modes of positive intervention, manage and police it' (Rutherford, 1999: 56). Furthermore, EIAs rely heavily upon governmentalising strategies such as scientific consultants who frame the study, and by eliciting public participation. They are not therefore repressive, since they seek to

elicit citizen involvement in order to manage nature more efficiently and rationally, but they do seek to regulate conduct through expert knowledge. The mutual interdependence of the expert and public participation is characteristic of a governmental rationality, since to be free is 'to be bound to those *engineers of the human soul* who will define the norm and tutor individuals as to the ways of living that will accomplish normality' (Rose, 1999: 76).

When considered as a form of eco-governmentality therefore, EIAs seem less obviously a tool of resistance against a modernist, economic development mindset, than a key technique of modern methods of regulating the conduct of conduct, notably through their reliance upon authoritative experts and the internalization of government. The following sections will investigate the ways in which the Koeberg EIA process both reinforced and unsettled existing power relationships.

The scientific expert

The science of environmental management is increasingly pervasive in the global development industry, and most obvious in the worldwide proliferation of EIAs.[5] An EIA is carried out by environmental management consultants, 'members of private professional firms who are hired to look after the EIA process and report its findings', using scientific, technological, geographical and risk assessment methods (EJNF, 2004a: 9). In this case a consortium of consultancy firms were involved, who investigated the development's predicted economic, social, biophysical impacts and technical aspects, and formulated an Environmental Management Plan to control and mitigate impacts (Poltech, 2002: xv – xvii and 396). The process is often championed as an example of objective scientific enquiry that can independently report upon the impact of a development. The EIR noted that it operated on the principle that 'the truth is told at all times even where this involves bad news' (xxv).

However, during the November 2004 court case, the judge agreed with Earthlife Africa's claim that:

> although Eskom's consultants were notionally 'independent' in the sense that they were not institutionally part of Eskom, they were employed by Eskom to act as its agent and the purpose of their engagement was to obtain the authorisation Eskom

> sought ... The consultants were, in other words, clearly aligned on Eskom's side and were not independent consultants employed by the decision-maker to assist him in making his decision (Griesel, 2005: #70).

This judgement casts doubt on the objectivity of almost all EIAs worldwide, since it is normal procedure for the developer to hire the consultant. EJNF advise government and local communities that they should 'not rely unquestioningly on the independence of the consultant' (EJNF, 2004a: 11), and an Earthlife Africa activist, Muna Lakhani, observed that the 'statistically impossible zero *no-go* recommendations' that EIAs return in South Africa suggests that consultants are not really independent (Lakhani, 2001: #4). The structural difficulties of achieving an objective and independent process when the consultants are being paid by the developers are considerable, as Michael Goldman concludes based on his analysis of World Bank environmental assessments, where there is 'an enduring and comfortable relationship between the loan managers and the project's reviewers', and 'it is never easy to get support for a long-term study unless investors are certain there will be a project at the other end' (Goldman, 2001: 196 – 200). Perhaps even more surprising is the fact that Maurice Magugumela, the Chief Executive Officer of the South African NNR (the body responsible for setting industry nuclear safety standards), has been a long-term employee of Eskom and the PBMR's safety and licensing manager.

Arguably even more significant than the close institutional relationship between particular consultants, developers and government, are the scientific assumptions at the heart of the EIA process which condition the scope, framework and nature of the assessment. This can be seen in the Koeberg EIA's failure to seriously discuss the role of nuclear power in South Africa's energy policy, the broader economic context, alternative technologies, or the disposal of radioactive waste.[6] One of Earthlife Africa's contentions against the Director-General of DEAT, Crispian Olver, in the November 2004 court case was that 'he failed to properly address the problems posed by nuclear waste and he abdicated responsibility to properly consider safety issues by deferring to the national nuclear regulator' (Griesel, 2005: #77). Olver had previously defended this restricted scope, claiming 'it is not the job of an impact assessment to deal with the question of whether South Africa should pursue nuclear energy, nor is it in my ambit to decide on matters of nuclear safety' (quoted by Gosling, 2003). The health impacts of the development were based upon a

survey of international literature, and safety and security information submitted by Eskom to the NNR was not made available in the EIR (Poltech, 2002: 57 and 126 – 133). Approval for the Eskom development was given despite the absence of a national policy on the management of radioactive waste – a startling example of scientific hubris and blind faith in progress (Olver, 2003: 1). Furthermore, it was alleged that alternatives such as renewable energy were not actively considered, and that their viability was 'misrepresented' by senior Eskom representatives in public meetings (Worthington, 2000: 27; Fig, 2004: 65). Even more surprisingly, attempts to independently assess the economic viability of the development were frustrated by Eskom, who 'continually refuse to answer questions on the programme', stating that the EIA covered only the PBMR demonstration phase, not the long-term economic prospects (Thomas, 2004: 4, 8 – 10, 14).

In general, the overly technocratic scope of EIAs is a frequent weakness, with Peter Ngobese and Jacklyn Cock targeting the South African process in particular for 'a serious neglect of social impacts' (Ngobese and Cock, 1995: 265). Lakhani alleges that 'socio-economic issues, health and attendant costs, etc, are generally ignored' by EIAs in South Africa, and only a narrow definition of 'the environment' is applied (Lakhani, 2001: #26). Many criticisms of EIAs address their project-specific focus, and their inability to consider the effects of cumulative developments (Burns and Canter, 1997).

This is hardly surprising since, particularly in the context of the South African development priorities noted above, EIAs are designed to facilitate rather than block projects. Those responsible for the South African form of EIA state that rather than 'focussing on the negative aspects associated with the proposal' the process should emphasize 'the positive aspects of the proposal, identifying appropriate mitigatory measures … Furthermore, only key issues should be investigated to avoid costly delays required to investigate and prepare lengthy reports' (Sawman, Fuggle and Preston, 1995: 53 – 54). This view, of EIAs serving to facilitate development, was evident in the South African Government's reaction to the court decision delaying the PBMR: 'the result of which is that the country's development programme will be hamstrung, in a manner that could undermine good intentions of ensuring that environmental concerns are taken into account' (DEAT, 2005). There is a thinly veiled threat here, warning against any environmental obstruction of the PBMR nuclear development.

These institutional and structural factors clearly pose significant limitations to scientific objectivity. However, they do not necessarily compromise the basic principles of EIA – since presumably the process could always be improved. However, Foucault's notion of eco-governmentality draws attention to the way knowledge is *always* implicated in power relations, indeed 'there is no knowledge without a particular discursive practice; and any discursive practice may be defined by the knowledge it forms' (Foucault, 2002: 210). The science of environmental management is at the heart of the EIA process, and like all forms of knowledge it works to exclude and diminish alternative knowledges, and reinforces established power relationships between 'experts' and 'non-experts' (Wynne, 1996: 45). Those involved with the South African EIA process have criticized the overly technical language of documents, and note that the responsibility rests with the public to ask for more time, find and pay for their own consultant if they cannot understand the information submitted by the developer's consultants (Lakhani, 2001: #9; EJNF, 2004a: 7). During the Koeberg EIA it was alleged that 'communities in the vicinity of nuclear installations were never fully informed of proposed developments in their own languages and in a manner appropriate to their levels of literacy' (Fig, 2004: 65).

Moreover, especially when considering complex situations and risks that evade normal sensory perception (such as dangerous radiation levels or the risk of nuclear meltdown), we become entirely dependant upon scientific measurement (Beck, 1992: 162). In the Koeberg EIA the refusal to consider the possible health impacts of the development on local communities was based upon Eskom's assertion that 'no credible scientific correlation has been established between health effects and the routine operation of commercial nuclear facilities anywhere in the world' – which Earthlife Africa disputed with their own scientific evidence and expert testimony (Earthlife, 2004). The EIR concluded that 'epidemiological study and health monitoring of the public for the proposed Plan is not recommended or required' (Poltech, 2002: xiii – xiv). Despite some serious qualms, local health authorities have relied upon Eskom's scientific testimony and no epidemiological studies on the local population have ever been carried out (Fig, 2004: 34). For the sociologist Ulrich Beck, being forced to accept science's premises in order to contest scientifically induced hazards leads to a 'Kafkaesque experience of protest' which is like arm-wrestling oneself (Beck, 1995: 60). The hegemony of modern science is such that there is a 'political and cultural demand for scientific rationality' in decision-making, and

alternative forms of rationality are frequently ignored or devalued (Eden, 1996: 190). Brian Wynne draws attention to the ways in which 'lay knowledge' is 'inadvertently but still systematically suppressed' by expert knowledge – and uses as his example public concerns over health risks arising from living adjacent to the Sellafield nuclear plant in the UK (Wynne, 1996: 46 – 49). Similarly, in the Koeberg case, safety concerns brought forward by Earthlife Africa and EJNF were discredited as anecdotal and *unscientific* when compared to the lack of a universally and scientifically established causal relationship between nuclear facilities and health effects (Earthlife, 2004; EJNF, 2004b). The EIR starkly characterises positive reactions to the proposed development as 'responses that show a strong leaning to logic (as opposed to emotion) and a pragmatic acceptance of statistical and calculated risk assessment based on historic real risk', implicitly devaluing negative reactions to the development by labelling them as irrational (Poltech, 2002: 89). Beck argues that 'non-acceptance of the scientific definition of risks is not something to be reproached as *irrationality* in the population; but quite to the contrary, it indicates that the cultural premises of acceptability contained in scientific and technical statements on risk are wrong' (Beck, 1992: 58). Rejection of alternative knowledge-systems is what Goldman terms 'epistemic violence', or the 'subjugation of subaltern knowledges' (Goldman, 2001: 203), and Lakhani criticizes the EIA process in South Africa on exactly these grounds:

> There is an almost total lack of incorporating indigenous knowledge – even today, indigenous knowledge seems to be seen as only that relating to herbal remedies and plants and possibly some cultural information … The preponderance of importance placed on Northern / Western scientific knowledge, to the exclusion of all other knowledge, is a kind of scientific imperialism, which needs to change. We need to challenge the basic philosophical principles that guide Western capitalist thinking (Lakhani, 2001: #10).

This fundamental reliance upon scientific expertise limits the resistance potential of techniques like EIA since, as Eden observes: 'extended scientific knowledge may increase the number of players in the environmental policy debate but it will not change how the game is played' (Eden, 1996: 195). However, through processes like EIA which specifically create space for public comment on, and criticism of, the premises and values underlying scientific expert conclusions, some undermining of dominant power relations is possible. The once-unquestioned

authority of the 'demigods in lab coats' can be substantially eroded (Beck, 1992: 164). A healthy scepticism towards the expert should not, however, become a simplistic valorisation of greater public participation.

Public Participation

The internalization of governance through the creation of responsible eco-citizens is a primary technique of eco-governmentality, and works through the discourse of public participation. NEMA states that 'the participation of all interested and affected parties in environmental governance must be promoted' (NEMA, 1998: 2-4-f), and it is noted that the public participation part of the EIA process is the only part for which no exemptions can be applied (Olver, 2004: 8). In the Koeberg EIA over 2,600 I&APs were registered and involved in the programme, including NGOs, residents, businesses, various government levels and professional institutions (Poltech, 2002: 4). The authorities were satisfied that 'the public participation process followed as part of the EIA process conformed to the requirement of the regulations' (Olver, 2003: 9). It was this point that was contested by Earthlife Africa through the courts, with the charge that 'insufficient information was put forward by Eskom to enable any meaningful participation'.[7]

Earthlife Africa's central claim in the High Court was that their efforts to obtain access to relevant documents were repeatedly denied, and they were not allowed a proper hearing from the decision-maker, the Director-General of DEAT. According to the judge, the Director-General did not consider the extensive submissions made by Earthlife Africa on the draft EIR when reaching his decision (Griesel, 2005: #12, #15 and #18). The final EIR was not made available to I&APs for comment on, despite being 'substantially different' from the draft, with the Director-General unambiguously stating that Earthlife Africa 'cannot comment on the final EIR as they had an opportunity to previously comment on the draft'. The judge found this to be in contradiction to the spirit of the EIA regulations, which 'provide for full public participation in all the relevant procedures contemplated in these regulations' (#56, #58 and #59). Others involved with the process also criticized Eskom's openness and provision of information (Thomas, 2004: 8 – 9 and 38; Fig, 2004: 65).

In this case Earthlife Africa won in the High Court because insufficient public participation was permitted by Eskom. However, a Foucauldian approach cautions against the simplistic belief that more participation equals a greater resistance potential. In particular we must consider who participates, what sort of participation is occurring, and the effects upon power relations.

Consultants hired by the developer are required to advertise public meetings, invite groups to register themselves as I&APs, and disseminate information to these groups (Poltech, 2002: 375 – 384). In this case Earthlife Africa were the most prominent I&AP, but other environmental groups also participated in public meetings, including the Endangered Wildlife Trust, and the Wildlife and Environment Society of South Africa (Kupka, 2001). Local community involvement was more patchy – the original protesters against the Koeberg nuclear facility in the late 1970s were apparently estate agents concerned about impacts on property values in the upper middle class white suburb of Duynefontein, and far better able to represent themselves than residents of nearby Atlantis, 'a bleak dormitory settlement on the West coast, established by the apartheid government to house working class Coloured people employed in low paid government-subsidised industries' (Fig, 2004: 30). Since then, however, engagements with and protests against Eskom's nuclear developments have mushroomed:

> The proposal to develop the PBMR has regalvanised the anti-nuclear movement in South Africa as never before. The focus of the movement has spread rapidly from Koeberg to a critique of all aspects of the nuclear fuel chain. Its epicentre has extended from the Western Cape to embrace campaigns in Gauteng, North-West, Northern Cape and KwaZulu-Natal. Residents of Atteridgeville, Mamelodi, Diepsloot, Brits, Pelindaba, Atlantis, Table View, and various Namaqualand communities have begun to mobilise more actively. The campaign has also been taken to the port of Durban, entry point for future imports of enriched uranium, and communities all along the N3 highway to Pelindaba (66).

Whilst this is encouraging from the point of view of environmental resistance, there were problems with the participatory process. Lakhani notes that the National Union of Mineworkers (an Eskom union) was not invited to the EIA focus group stage, and alleges that the overall number of registered I&APs was relatively small, the same as that for a powerline in Gauteng province (Lakhani, 2001: #2 and #5).

Perhaps more significantly, the whole notion of participation as advanced in some 'social learning' perspectives is theoretically underdeveloped, and tends to posit a monolithic, homogenous state against a relatively unified 'civil society' consisting of discrete but homogenous, static and harmonious 'communities' (Wilkins, 2003: 402; O'Riordan, 1996: 145). This understanding of communities is simplistic, and straightforward appeals for community participation tend to conceal the power relationships and diversity of interests within communities (Cooke and Kothari, 2001: 6). In the Koeberg process it was noted that 'no provision has been made for balanced input at the workshops, or for effective access for (previously) disadvantaged communities' (Worthington, 2000: 27). Thus 'opportunities to engage with a decision-making process enable relatively privileged groups to defend their position against the interests of less articulate communities' (Connelly and Richardson, 2005: 404). The identification and involvement of I&APs in the EIA process is usually an unproblematised, under-theorised, bureaucratic process of groups identifying and submitting themselves in response to media announcements of an upcoming assessment, and the democratic accountability of these groups is highly questionable (Poltech, 2002: 377; Mason, 2005: 59 – 65).

Even when involved in the process, an equal voice for all participants is impossible. According to the South African Government, public participation means 'furnishing interested and affected parties and the public with an opportunity to comment on, or raise issues relevant to' environmental policies (Olver, 2004: 8). This provision makes no promises that public comments will be listened to or even considered in the decision-making stage. There have been allegations that some voices are being ignored or stifled in the process, for example in the power relationships between local and national government:

> Until recently a number of Cape Town city councillors have expressed disquiet about the PBMR plans. The city council was highly critical of the EIA report's conclusion that the PBMR would have 'no significant environmental risks or adverse impacts'. However, following DEAT's conditional approval of the EIA, and the summoning to Pretoria of some critical councillors, the city has been much quieter on this question, and there has been speculation that the national government has instructed it to accept the project, or at least defer criticism until after the April 2004 elections (Fig, 2004: 66).

Thus EIAs can draw upon certain opinions, thereby legitimating the process by invoking 'public' participation, only to then stifle or ignore those views at the decision-making stage. EJNF warn I&APs to be aware of 'planning decisions happening behind closed doors and EIAs being used to justify projects' (EJNF, 2004a: 14). Despite opposition from the environmental groups involved in the EIA, the Koeberg development was approved by DEAT. By participating in the EIA at all, Earthlife Africa and others were legitimating a process that may have anyway had a pre-determined outcome. This is suggested by the fact that by mid-2000 over 120 million Rand had been directly spent on the project in 'a history of intensive state subsidy' (Worthington, 2000: 5 – 7). Eskom state on their website that the South African Government committed 'a significant amount' of funding to the project in the 2004 mid-term budget, and that 'the Minister of Public Enterprises, Mr Alec Erwin, stated an intent to eventually produce 4000 MW to 5000 MW of power from pebble bed reactors in South Africa'.[8] In the aftermath of Earthlife Africa's court victory, Eskom have scaled up the PBMR development and begun a new EIA process (Mawatsan, 2006). Without a broader debate on nuclear power, the result of Earthlife Africa's resistance may have only been to delay rather than block the development, and in so doing legitimate the EIA process.

Theorists warn that 'bureaucratic agencies can turn participation techniques into *tools for citizen co-optation*' (Bartlett and Kurian, 1999: 423), and that 'the very act of inclusion, of being drawn in as a participant, can symbolize the exercise of power and control over an individual' (Kothari, 2001: 142). By implication therefore, a refusal to participate becomes an act of irresponsibility, and there is 'an implicit notion of deviancy for those who choose not to participate' (148). Furthermore, the extension of participation also implies some shifting of responsibility from the state-national-structural level to the community-individual level, and thus 'an emphasis on the micro level of intervention can obscure, and indeed sustain, broader macro level inequalities and injustice' (Cooke and Kothari, 2001: 14). Whilst this in one context can be (rightly) seen as empowering, it also works to absolve institutions of responsibility, as well as excuse them from inaction on larger scale problems such as global warming or the disposal of radioactive waste, which cannot be solely dealt with on an individual level.

The manifold power relationships and vested interests involved in EIA processes tend to undermine the optimism of EIA practitioners and theorists that

'through the use of reason and understanding, compromises on plans and work towards solutions which all sides can accept may be achieved' (Wilkins, 2003: 408; see also Bartlett and Kurian, 1999: 422; and Kakonge, 1998: 297). Whilst there may be a procedural value to greater participation, this is not a sufficient condition for consensus on political issues. For Adams, the stress on participation is evidence of a naïve failure to 'address the political economy of the development process' and consider concrete issues of the inequality of resource distribution (Adams, 2001: 115).

Such arguments are frequently and forcefully stated by opponents of participatory or reformist resistance, such as Patrick Bond who concludes that 'militancy pays, it seems, because mild-mannered lobbying and project- or policy-wonk inputs by experts are, simply, incapable of raising the costs of business as usual', and that 'reformist and technicist critiques … are clearly insufficient to foster momentum for change' (Bond, 2002: 415 and 420). These critiques tend to polarise tactics as either radical, where 'militant environmentalists present sweeping critiques of contemporary society, live lives which challenge widespread assumptions about meaningful experience, and undertake actions which concretely enfeeble forces which harm the Earth'; or reformist, which involve 'compromising principles in an effort to gain political legitimacy and to be pragmatic within a context of plausible policy options' (Wapner, 1995: 301 – 304). From this perspective, Earthlife Africa's reformist opposition did more harm than good.

Despite this, there is still a sense that a stated commitment to participation may well open up some sort of political space for resistance: even Uma Kothari remains hopeful that 'there is a possibility of resistance or subversion through people's performances in participatory exercises' (Kothari, 2001: 151). There is the possibility that the discursive spaces which participatory processes open up can be used in ways that are unexpected, and that undermine existing power relations. The openness of liberal governmentality to internal critique is both its greatest strength and greatest weakness.

Bearing Witness

Despite the inadequacies of the EIA processes, their reliance upon established scientific discourses and experts, and the inability of participatory techniques to

overcome established power relationships, it remains clear that Earthlife Africa did significantly disrupt Eskom's nuclear programme, and has introduced alternative dimensions (environmental, social, and health) to the nuclear debate that may threaten the project's overall future (Thomas, 2004: 11). The November 2004 court case was highly visible, as was recognised by the judge: 'the very sensitive and controversial issue of nuclear power, which potentially affects the safety and environmental rights of vast numbers of people … has generated considerable local and national interest' (Griesel, 2005: #32). Furthermore, the EIR acknowledged that:

> a proportion of the public have little faith in the ability of regulatory mechanisms or Eskom's assurances that members of the public are at no significant risk to radioactivity. For this reason, Eskom's visible compliance with the measures for ensuring that the public is at no significant risk is deemed to be of utmost importance. It is required that such compliance is made 'visible' to surrounding communities on a participative basis through the development of a community-based environmental indicators project (Poltech, 2002: 74).

Through this demand for *visibility*, EIAs do potentially provide an opportunity for various groups to contest developments on different grounds from those usually debated. This is a form of *bearing witness*, the strategic approach of environmental groups like Greenpeace.[9] It rests on the assumption that 'having observed a morally objectionable act, one cannot turn away in avoidance. One must either take action to prevent further injustice or stand by and attest to its occurrence' (Wapner, 1995: 307). Bearing witness is a central part of the discourse of environmental justice, which seeks to introduce considerations of justice and morality into the technical and instrumental discourse of the scientist and environmental manager.

By the act of assessing and measuring environmental (and social) impacts of developments, developers and the state implicitly take responsibility for those impacts. It is possible for them to cover-up, or not act upon the assessments they receive, but having carried out an assessment they have no justification for avoiding their conclusions. South African environmentalists stress that the 'government is not allowed to ignore what an EIA says about the negative impacts on the environment' (EJNF, 2004a: 13). Assessments may be flawed, narrow-minded and partial, but they open up the fields of environmental and social impacts as possible sites of contestation and resistance. Beck observes that what cannot be predicted cannot be

prevented, and conversely by attempting to predict impacts (through an EIA) there is an assertion of the desire to control and prevent (Beck, 1992: 34). This is certainly an extension of the modern 'will to power' whereby, according to Descartes, humans are 'lords and possessors of Nature' (quoted in Lanthier and Olivier, 1999: 67), but an assertion of such control means thereafter it is impossible to avoid action (or conversely blame for damaging consequences arising from inaction). In this sense bearing witness is itself a form of governmentality, but one which, to paraphrase Foucault, is not necessarily bad, but certainly dangerous (Foucault, 1997b: 256). One of its strengths, but also one potential danger, is specifically the moral and ethical element of the environmental justice discourse. Although this is positive in relation to the apparently amoral, technocratic and instrumentalist rationality of techniques of eco-governmentality, it can always threaten to descend into the antagonistic and absolutist language of right and wrong, or good and evil (Harvey, 1999: 175 – 176).

Arguments over the resistance potential of certain tactics and strategies tend to oscillate between those favouring reform, and those preferring revolution. The resistance potential of processes like EIA raise this question directly, since they represent a modernist desire to monitor, predict and control. Low and Gleeson ask 'if modernity is characterized by the striving for control over nature and people, and modernity, with its increased capacity for control, is also producing the ecological crisis, then how can we possibly resolve the crisis by adding more control?' (Low and Gleeson, 2001: 9) Yet an outright rejection of modernity is clearly impossible, since 'philosophers have made us aware that we cannot describe the period in which we happen to live, since it is from within its rules that we speak and think, and since it provides the basis for our descriptions and our own history' (Escobar, 1995: 215). In working through the law courts and with the government, Earthlife Africa are clearly not revolutionaries, but neither can they be described as fully co-opted. Likewise, EIAs are neither a clear-cut tool of counter-capitalist resistance, nor an ineffectual example of corporate greenwashing. As Foucault advised in response to precisely the same debate over reform versus revolution:

> We need to escape the dilemma of being either for or against. One can, after all, be face to face, and upright [*debout et en face*]. Working with a government doesn't imply either a subjection or a blanket acceptance. One can work with and be intransigent at the same time (Foucault, 2000c: 455 – 456).

Conclusion

The future role of nuclear power in global sustainable development, and particularly in the development of the industrialising countries, is contentious and the debate is often highly emotive. The World Bank's policy on nuclear energy is sceptical, refusing to fund nuclear power plants because of their costs and risks, and labelling them 'white elephants' (Worthington, 2000: 19). Yet with the mounting evidence of human-induced global climate change many governments and even environmentalists have begun to reconsider nuclear power as a potentially cleaner alternative to fossil fuels. However, the unresolved issue of radioactive waste disposal, as was highlighted by Earthlife Africa in their comments on the Koeberg EIA process, remains problematic, and environmental justice activists have warned against the exploitation of poorer countries as the dumping ground for the industrialised world's nuclear waste (18; see also Fig, 2004: chapter 6; and Lakhani, 2002: 24). Doubts over the safety record of PBMR technology, and the existing reactors at Koeberg (re-ignited by the reactor shutdown in December 2005), also stir up the recurring spectre of nuclear catastrophe, and questions over whether the benefits of nuclear power outweigh the risks of another Chernobyl or Three Mile Island. The Koeberg PBMR development could well be a focal point for the nuclear debate not only in South Africa, but also for the future role of the nuclear industry in Africa, other industrialising countries, and in global sustainable development.

Given the environmental justice discourse's antipathy to nuclear power, the blocking of the Koeberg development by Earthlife Africa can appear at first as a successful example of environmental resistance against a modernist and capitalist drive for power (quite literally). However, by re-thinking the nature of political power through an engagement with Foucault, the EIA process can be re-interpreted as an example of a modernist rationality of control and manipulation, or eco-governmentality. In the types of scientific knowledge it relied upon, and the technical scope which excluded broader policy, safety or waste disposal questions, the Koeberg EIA reinforced existing power relationships, whereby expert knowledge renders lay knowledge invalid, and political issues are reduced to technical problems. Moreover, the limits on access to information, lack of influence upon decision-making, and

potential for legitimising development through the co-opting of opposition complicate what is often simplistically presumed to be a straightforward correlation between greater public participation and resistance. Despite these caveats, Earthlife Africa's challenge has again raised the nuclear debate in South Africa, as well as setting higher standards for openness and debate during the EIA process, and thus may be seen as a form of resistance through bearing witness. The balance of achieving effective environmental resistance, whilst neither becoming co-opted by existing power relationships nor becoming irrelevant, is extremely difficult, far more so than is often assumed. Earthlife Africa's temporary and partial success can only be furthered by a broader South African national debate over the future role of nuclear power, together with some serious qualifications of the degree to which environmental organisations accept the EIA process itself.

Carl Death, Department of International Politics, University of Wales, Aberystwyth, UK; e-mail: csd04@aber.ac.uk.

Endnotes

[1] www.earthlife.org.za
[2] www.pbmr.co.za
[3] Ibid
[4] http://www.earthlife-ct.org.za/ct/article.php?story=20040603224901422, accessed 5 September 2005.
[5] Most World Bank development projects are now required to have EIAs conducted on them, and environmental science graduate degrees are widespread (Luke, 1999a).
[6] See the qualifications of, and limits to, the report's scope (Poltech, 2002: ii, vii – viii, x – xi, 2, 31 – 32, 63 – 65, 67 – 69, 191, and 350). Interestingly, the report does cover some broader issues, such as HIV/Aids and the development's impact upon tourism.
[7] http://www.earthlife-ct.org.za/ct/article.php?story=20050620002516883 accessed 31 August 2005.
[8] www.pbmr.co.za
[9] http://www.greenpeace.org/international/about/our-mission

Bibliographic Note

W M Adams, 2001, *Green Development: Environment and Sustainability in the Third World*, London: Routledge.

D Annandale and R Taplin, 2003, 'Is environmental impact assessment regulation a "burden" to private firms?' in *Environmental Impact Assessment Review*, 23(3).

R V Bartlett and P A Kurian, 1999, 'The Theory of Environmental Impact Assessment: Implicit Models of Policy Making', in *Policy and Politics*, 27(4).

U Beck, 1995, *Ecological Politics in an Age of Risk*, (tr A Weisz), Cambridge: Polity Press.

U Beck, 1992, *Risk Society: Towards a New Modernity*, (tr M Ritter), London: Sage.

P Bond, 2002, *Unsustainable South Africa: Environment, Development and Social Protest*, London: Merlin Press.

R K Burns and L W Canter, 1997, 'Cumulative impacts are not properly addressed in environmental assessments', in *Environmental Impact Assessment Review*, 17(1).

J Cock, 2004, *Connecting the Red, Brown and Green: The Environmental Justice Movement in South Africa*, Durban; School of Development Studies, University of KwaZulu-Natal.

J Cock, 1991, 'Going Green at the Grassroots: The Environment as a Political Issue', in J Cock and E Koch (eds), *Going Green: People, Politics and the Environment in South Africa*, Cape Town: OUP.

S Connelly and T Richardson, 2005, 'Value-driven SEA: time for an environmental justice perspective?' in *Environmental Impact Assessment Review*, 25(4).

B Cooke and U Kothari, 2001, 'The Case for Participation as Tyranny', in B Cooke and U Kothari (eds), *Participation: The New Tyranny*, London: Zed Books.

E Darier, 1999, 'Foucault against environmental ethics', in E Darier (ed), *Discourses of the Environment*, Oxford: Blackwell.

DEAT, 2005, *Press Release*, Pretoria: DEAT, 27 January 2005.

Earthlife, 2004, *Safety Issues in the South African Nuclear Industry: Koeberg and the PBMR*, Cape Town: Earthlife Africa.

S Eden, 1996, 'Public participation in environmental policy: considering scientific, counter-scientific and non-scientific contributions', in *Public Understanding of Science*, 5.

EJNF, 2004a, 'Cloud over Koeberg', in *EJNF Networker*, Braamfontein: EJNF, 26.

EJNF, 2004b, *Understanding EIAs: A Guide for Communities Involved in Environmental Impact Assessments*, Johannesburg: EJNF.

A Escobar, 1995, 'Imagining a Post-Development Era', in J Crush (ed), *Power of Development*, London: Routledge.

D Fig, 1991, 'Flowers in the Desert: Community Struggles in Namaqualand', in J Cock and E Koch (eds), *Going Green: People, Politics and the Environment in South Africa*, Cape Town: OUP.

D Fig, 2004, *Uranium Road: Questioning South Africa's Nuclear Direction*, Johannesburg: Heinrich Böll Foundation.

M Foucault, 2000a, 'Governmentality', in J D Faubian (ed), *Power: Essential Works of Foucault 1954 – 1984*, Volume 3, (tr R Hurley et al), New York: The New Press.

M Foucault, 2000b, 'Omnes et Singulatim: Towards a Critique of Political Reason', in J D Faubian (ed), *Power: Essential Works of Foucault 1954 – 1984*, Volume 3, (tr R Hurley et al), New York: The New Press.

M Foucault, 1997a, 'On the Ethics of Concern for Self as a Practice of Freedom', in P Rabinow (ed), *Ethics, Subjectivities and Truth: Essential Works of Foucault 1954 – 1984*, Volume 1, (tr R Hurley et al), New York: The New Press.

M Foucault, 1997b, 'On the Genealogy of Ethics: An Overview of Work in Progress', in P Rabinow (ed), *Ethics, Subjectivities and Truth: Essential Works of Foucault 1954 – 1984*, Volume 1, (tr R Hurley et al), New York: The New Press.

M Foucault, 2000c, 'So it is important to think?' in J D Faubian (ed), *Power: Essential Works of Foucault 1954 – 1984*, Volume 3, (tr R Hurley et al), New York: The New Press.

M Foucault, 2002, *The Archaeology of Knowledge*, (tr A M Sheridan Smith), London: Routledge.

J Glazewski, 2002, 'The Rule of Law: Opportunities for Environmental Justice in the New Democratic Legal Order', in D A McDonald (ed), *Environmental Justice in South Africa*, Athens: Ohio University Press.

M Goldman, 2001, 'The Birth of a Discipline: Producing Authoritative Knowledge, World Bank-style', in *Ethnography*, 2(2).

C Gordon, 1991, 'Governmental Rationality: An Introduction', in G Burchell, C Gordon and P Miller (eds), *The Foucault Effect: Studies in Governmentality*, Chicago: University of Chicago Press.

M Gosling, 2003, 'Green Light for New Nuke Plant in Cape Town', in *The Cape Times*, 27 June 2003.

B M Griesel, 2005, *Cape Town High Court Judgement in the matter between Earthlife Africa (Cape Town) and Director-General DEAT and Eskom Holding Ltd*, delivered 26 January 2005.

M Hajer and F Fischer, 1999, 'Beyond Global Discourse: The Rediscovery of Culture in Environmental Politics', in F Fischer and M Hajer (eds), *Living With Nature: Environmental Politics as Cultural Discourse*, Oxford: OUP.

D Harvey, 1999, 'The Environment of Justice', in F Fischer and M Hajer (eds), *Living With Nature: Environmental Politics as Cultural Discourse*, Oxford: OUP.

J O Kakonge, 1998, 'EIA and Good Governance: Issues and Lessons from Africa', in *Environmental Impact Assessment Review*, 18(3).

F Khan, 2002, 'The Roots of Environmental Racism and the Rise of Environmental Justice in the 1990s', in D A McDonald (ed), *Environmental Justice in South Africa*, Athens: Ohio University Press.

U Kothari, 2001, 'Power, Knowledge and Social Control in Participatory Development', in B Cooke and U Kothari (eds), *Participation: The New Tyranny*, London: Zed Books.

T Kuehls, 1996, *Beyond Sovereign Territory: The Space of Eco-Politics*, Minneapolis: University of Minnesota Press.

J Kupka, 2001, 'New Nuke Plant Raises Concerns', in *News 24*, 9 February 2001.

M Lakhani, 2001, *EIAs take a year or two – RODs are forever!* Draft Earthlife Africa (Cape Town) publication, supplied through personal communication.

M Lakhani, 2002, *What you need to know about South Africa's nuclear programme!* Johannesburg: Earthlife Africa.

I Lanthier and L Olivier, 1999, 'The construction of environmental awareness', (tr M Eloy), in E Darier (ed), *Discourses of the Environment*, Oxford: Blackwell.

W Larner and W Walters (eds), 2004, *Global Governmentality: Governing International Spaces*, London: Routledge.

D P Lawrence, 1997, 'The Need for EIA Theory Building', in *Environmental Impact Assessment Review*, 17(2).

N Low and B Gleeson, 2001, 'The challenge of ethical environmental governance', in B Gleeson and N Low (eds), *Governing for the Environment: Global Problems, Ethics and Democracy*, Basingstoke: Palgrave.

T W Luke, 1999a, 'Eco-Managerialism: Environmental Studies as a Power/Knowledge Formation', in F Fischer and M Hajer (eds), *Living With Nature: Environmental Politics as Cultural Discourse*, Oxford: OUP.

T W Luke, 1999b, 'Environmentality as Green Governmentality', in E Darier (ed), *Discourses of the Environment*, Oxford: Blackwell.

T W Luke, 1995, 'On Environmentality: Geo-Power and Eco-Knowledge in the Discourses of Contemporary Environmentalism', in *Cultural Critique*, Fall.

P Lukey, 2002, 'Workplace Environmental Justice: Trade Unions and the Struggle for an Ecological Platform', in D A McDonald (ed), *Environmental Justice in South Africa*, Athens: Ohio University Press.

M Mason, 2005, *The New Accountability: Environmental Responsibility Across Borders*, London: Earthscan.

Mawatsan, 2006, *The Final Environmental Scoping Report for a Proposed 400MW(t) Pebble Bed Modular Reactor Demonstration Power Plant at the Koeberg Power Station Site in the Western Cape*, Hatfield: Mawatsan.

Mining Weekly, 2006, 'Koeberg Nuclear Power Unit Back on Line', in *Mining Weekly*, http://www.miningweekly.co.za/min/news/today/?show=86666 22 May 2006.

National Environmental Management Act, Number 107 of 1998, Pretoria, 2-4-f.

P Ngobese and J Cock, 1995, 'Development and Environment', in P Fitzgerald, A McLennon and B Munslow (eds), *Managing Sustainable Development in South Africa*, Cape Town: OUP.

C Olver, 2004, *Proposed Regulations Under Section 24(5) of the National Environmental Management Act, 1998*, Pretoria: DEAT.

C Olver, 2003, *Record of Decision on Eskom's application for a PBMR electricity generating power station at Koeberg*, Pretoria: DEAT, 25 June 2003.

T O'Riordan, 1996, 'Democracy and the Sustainability Transition', in W M Lafferty and J Meadowcroft (eds), *Democracy and the Environment: Problems and Prospects*, Cheltenham: Edward Elgar.

Poltech, 2002, *The Final Environmental Impact Report for the proposed Pebble Bed Modular Reactor (PBMR) Demonstration Plant at the Eskom Koeberg Nuclear Power Station site in the Western Cape, South Africa*, Centurion: Poltech.

N Rose, 1999, *Powers of Freedom: Reframing Political Thought*, Cambridge: CUP.

P Rutherford, 1999, 'The Entry of Life into History', in E Darier (ed), *Discourses of the Environment*, Oxford: Blackwell.

M Sawman, R Fuggle and G Preston, 1995, 'A Review of the Evolution of Environmental Evaluation Procedures in South Africa', in *Environmental Impact Assessment Review*, 15(1).

S Thomas, 2004, *The Economic Impact of the Proposed Demonstration Plant for the Pebble Bed Modular Reactor Design*, London: University of Greenwich.

P Wapner, 1995, 'In Defence of Banner-Hangers: The Dark Green Politics of Greenpeace', in B R Taylor (ed), *Ecological Resistance Movements: The Global Emergence of Radical and Popular Environmentalism*, Albany: SUNY Press.

H Wilkins, 2003, 'The need for subjectivity in EIA: discourse as a tool for sustainable development', in *Environmental Impact Assessment Review*, 23(3).

C Wood, 1995, *Environmental Impact Assessment: A Comparative Review*, Harlow: Longman.

R Worthington, 2000, *Nuclear Energy Costs the Earth: An Introduction to the Pebble Bed Modular Reactor (PBMR)*, Johannesburg: Earthlife Africa.

B Wynne, 1996, 'May the sheep safely graze? A reflexive view of the expert-lay knowledge divide', in S Lash, B Szerszynski and B Wynne (eds), *Risk, Environment and Modernity: Towards a New Ecology*, London: Sage.