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The SAJEE aims to publish and report on a wide range of aspects relating to Environmental Education, Ethics and Action in southern Africa and elsewhere. The journal seeks to further the study and practice of environmental education, ethics and action by providing a forum for researchers, scholars, practitioners and policy makers. The journal aims to carry papers reflecting the diversity of environmental education practice in southern Africa, and includes conference reviews and keynote papers, retrospective analyses of activities or trends in a particular field, commentaries on policy issues, comparative aspects of an environmental education, environmental ethics or environmental action issue, and critical reviews of environmental education, ethics and action in a particular country or context.

The *Southern African Journal of Environmental Education* aims to provide southern African and other authors with a forum for debate, and professional development. The journal incorporates an author support programme, to encourage new authors in the field to establish themselves as professional writers.

Papers published in the Feature Article section of the journal are reviewed by two and at times three advisory editors. Keynote and Viewpoint papers are reviewed by one of the editors of the journal or an advisory editor.

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Editorial
Tracing Actors, Actants and Relational Dynamics in Environmental Education Research

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Introduction

This edition of the EEASA Journal provides insight into a range of relationships in the field of environmental education, and the complexities that exist around them, as reflected in the combination of papers. This Editorial picks up on the methodological 'note' (or is it a challenge?) provided by Godwell Nhamo in his paper in this edition of the journal. He provides a description of the possibilities that actor network theory provides for describing and explaining environmental policy processes, and recommends that environmental educators consider this methodology in their analyses. In particular, he refers environmental educators to applications of actor network theory for tracing relational dynamics between actors (i.e., environmental education practitioners) and actants which are non-human referents (e.g., the UN Decade of Education for Sustainable Development and UNESCO's (2005) International Implementation Scheme).

In response to his paper, I have chosen to 'pick up' on this methodological discussion in this Editorial, by considering aspects of this theoretical perspective in describing the 'happenings' that occur across the pages of this edition of the EEASA Journal. In doing so, I highlight (in part) the diversity of actors and actants that are influencing the field of environmental education, their subject matter and contexts, and I highlight the relational dynamics that become evident when one accepts a methodology that aims to trace such dynamics. In particular, this Editorial considers how 'The language of actors, actants and actor/actant-networks brings to the fore the relationships and complexities that exist around them' (Nhamo, this edition).

A Quasi-Object ('Token') Influencing Environmental Education Theory and Practice

Drawing on Latour (1993), Nhamo suggests that the Plastic Bags Regulations can be described as a 'quasi-object' or 'token', which is 'simultaneously real, discursive and socially constructed' (Nhamo, this edition). He explains that such quasi-objects circulate and transform, while in circulation, and in so doing, they '… form relationships between the members of the given groups'. He argues that policy frameworks can serve as non-human actants that affect relational dynamics and the practices of actors in a particular field who, in turn, affect and change the nature of the policy frameworks. In this edition of the journal, it is apparent that the UN Decade of Education for Sustainable Development (UNDESD) and its International Implementation Scheme (UNESCO, 2005) can be viewed as such a quasi-object or 'token'. Numerous papers in

this edition of the journal draw on, and make reference to, this seemingly powerful token/actant. My own paper reporting on the consultations that recently took place in southern Africa to discuss and consider the implications of the hybridised and globalising discourse of ESD in the UNDESD is a case in point (Lotz-Sisitka, this edition). Annette Gough's paper traces the history of ESD in Victoria, Australia, and deliberates the unrealistic expectations of the UNESCO policy framework for sustainable schools in an Australian context, questioning the feasibility, and desirability, of any one programme being able to incorporate all aspects of ESD as elaborated by UNESCO (2005). The paper by Le Roux and Ferreira seeks insight into the implications of ESD for educators' responses to genetically modified organisms, arguing for a need for more careful in-depth engagements with complex questions that have ethical ambiguities embedded within them. Through a phenomenological orientation to research, they explore various perspectives of environmental educators on the ethically sensitive topic of genetically modified organisms. In their analysis, sustainable development and the emerging discourse of ESD provide the referent for their arguments. In a similar vein, sustainable development appears to be providing the referent for other papers in the volume, including the papers by Ndaruga and Irwin (see below), Impey, Lawhon and Fincham, Olvitt and Hamaamba, Ingle, and Nsubungu. A reading of these papers begins to shed light on how thinking associated with the UNDESD may begin to be 'unpacked' in a sub-regional context, through engaged research in context.

Working in a different place, but on similar questions, Chen Nan, Wu Xiaoqiang and Wang Jin describe how deliberations on greening of schools in southern Africa and elsewhere around the world are influencing China's thinking on sustainable schools. They draw on an interconnected network of theory and practice associated with improving green schools/eco-schools, and illustrate how the interconnected global network of actors and actants in the green schools/eco-schools context can influence material realities of green schools construction and evaluation in China.

Place as Actant

In the paper by Ayub Macharia Ndaruga and Pat Irwin, and the paper by Angela Impey, we are able to consider how a non-human actant, wetlands, can influence educational theory and practice in completely different ways. Ndaruga, supported by Irwin, undertakes survey research to establish teachers' roles in promoting wetland conservation in Kenya through educative engagements with communities. He concludes that there is a lack of an holistic understanding and approach to responding to wetland degradation amongst teachers. He recommends culturally situated, active approaches to learning as an important dimension of building a broader, more holistic response to wetland conservation amongst teachers. This is the topic that is explored by Angela Impey in her paper. Working in the context of the Greater St Lucia Wetland Park in South Africa, she uses musical constructions of place as her opening to explore people's socio-cultural relationships with wetlands, and considers associated implications for environmental education praxis. Her paper builds upon the premise that music and associated ritual practices present rich discursive sites where local knowledge about the environment is negotiated and affirmed, and she engages high school students in a process of documenting their diverse cultural

and environmental heritages. She explicitly indicates her interest in relational dynamics associated with the (indigenous) knowledge and experience of actors and place in this statement:

> IKS, as manifest in music, body and ritual processes … seeks the recovery of meaning systems as its principle reference. In this context, its focus is on ways in which people and places are mediated through symbolic vocabularies, the premise being that it is at the level of the intangible, experiential and sensual that people most meaningfully inscribe themselves into their environments, and thus transform physical landscapes into cultural spaces. (Impey, this edition)

New and Interesting Dynamics

In this edition of the journal, we carry papers from fields/sub-fields that have previously been under-represented in environmental education theory and practice. Angela Impey's work referred to above considers music, culture and symbolic vocabularies. This has not previously been covered in an EEASA Journal.

With a completely different research orientation and focus, Lausanne Olvitt and Tyson Hamaamba introduce local government as a new context for environmental education discourse and practice. They discuss their research into establishing a framework for environmental education and training in a local government context. Powerful actants in this context are South Africa's National Qualifications Framework, the compliance frameworks that drive municipal environmental actions, and new skills development legislation which requires that all education and training be considered within a competence framework. Their paper seeks to explore the dimensioning of a competence framework that responds to these powerful actants, in an effort to strengthen capabilities of actors who have a public responsibility for service delivery and environmental management at local level.

Not only do we cover the local government context in this edition of the EEASA Journal, but through the paper provided by Mary Lawhon and Rob Fincham, we are able to consider the realm of public awareness and its construction. Lawhon and Fincham, through a critical analysis of gendered and other issues of representation in the journalism of a South African newspaper (the *Natal Witness),* raise questions around the way in which actants, such as newspapers, may influence the perceptions and responses of public actors. They argue for inclusive and critical journalism that will address what they perceive as current biased representations of environmental issues and perspectives in the contemporary media.

In his Viewpoint paper, Mark Ingle tackles the issue of gender relationships in environmental education. His interest is in exploring a few aspects of women's relations with the environment. He argues that women are seen as critical to environmental education in that they tend to exercise a formative influence over the attitudes of the very young, and that their relationship with the land they work is compromised by their poorly institutionalised property rights, particularly in developing countries. He sees a context of 'environmental injustice' and argues that actors such as development practitioners, bureaucrats and policy makers need to be sensitised to the impacts of environmental injustice on poorer women's lives.

Ethics as Shaping Influence

This edition of the EEASA Journal also brings questions of ethics to the fore. These are foregrounded in the Viewpoint paper by Leigh Price, where she deliberates the ethics of her participatory practice in the context of an industry environmental education programme in Zimbabwe; and by Le Roux and Ferreira, who deliberate the dynamics of engaging with complex ethical quandaries such as genetically modified organisms in environmental education theory and practice. Mark Ingle raises ethical issues and questions associated with gender relations in environmental education. Yvonne Nsubungu, in a Viewpoint paper, raises a deeper ethical question associated with curriculum relevance in rural areas, and she shares some of the openings into her PhD research initiative, which seeks deeper insight into how natural resource management is dealt with in curriculum processes in rural schools.

Exploring 'Thirdness'

Focusing on quasi-objects such as the UNDESD and the UNESCO Implementation Scheme, or 'wetlands' and the complex relations that exist between actors and actants, brings the notion of 'thirdness' to the fore (as described in Nhamo's paper). Thirdness denotes the space between two (or more) entities, and it is in such a space where relationships are constituted. As actors, we all occupy relative positions in a space of relations which are often complex and difficult to show empirically. In this section of the Editorial, we consider some thought provoking questions on the notion of 'thirdness' and how it might further help us to read the contributions presented in this edition of the EEASA Journal. First there is the paper produced by myself, as 'reporter' feeding back to a constituency of actors who participated in the UNDESD consultations in the southern African region. Taking up a somewhat neutral stance, the paper outlines the main findings of this consultation, but leaves the spaces open for more in-depth critical engagement with this discourse at a later date. Nhamo, in his paper, occupies the space of critical observer, tracing power relations and events associated with the introduction of new environmental legislation in South Africa. Annette Gough seeks to occupy a similar relational space in her analysis of how ESD is playing out in Victoria schools. Leigh Price, however, occupies the space of reflexive practitioner, seeking more in-depth critical engagements with the fundamental premises (e.g., how participation is conceptualised) of environmental education theory and practice in southern Africa. Angela Impey expresses some degree of frustration with the relational space she was able to occupy in her research process, wanting to strengthen and deepen the relationships that constituted the research process and outcomes in her study. Ingle on the other hand, occupies a relational space of the activist, concerned with taking up the issues of others in his representation of social injustices relating to women's society-environment relationships. We see from the vantage point of 'thirdness' that there are various ways in which the relational dynamics of the research process itself enables environmental education researchers to establish their identities as researchers. These relational dynamics also shape the nature of the research outcomes and findings in different ways.

The EEASA Journal Actor Network

The EEASA Journal provides a forum for the publication of environmental education research in southern Africa. Through the play with actor network theory in this Editorial, it is possible to identify the role of such a journal in building an 'actor network'. The Journal itself can be seen as a semiotic actor/actant, which is a hybrid, engaged in the process of creating its own actor/actant world – the world of research in environmental education. Research constitutes a powerful action resource that allows researchers to influence outcomes in certain respects and to certain degrees. Will the SADC DESD research have such an influence? Will Impey's research into music, culture and place have an influence? Will Ndaruga and Irwin's argument for a more culturally situated orientation to wetland education in Kenya have such an outcome? Will they be able to draw on Angela Impey's insights, and on insights produced in the context of the SADC DESD consultations, for example, to strengthen their argument and practice in future? Will Price re-constitute her practice, and influence the practice of others who believe passionately in participatory approaches through her research? Will the rural curriculum in the Eastern Cape be influenced by the research outcomes being generated by Nsubungu, and will China's Green Schools make a difference to resource use and pollution levels in the world's most rapidly industrialising country? Will Chen Nan and her colleagues in China be able to draw on the insights provided by Annette Gough in Australia into sustainability in schools as she further pursues her work? What translation processes will become possible across these journal articles, and how can researchers associated with the journal work together, form relationships and extend the outcomes of their research in new and unexpected ways? These remain open-ended questions for those enrolled in the EEASA Journal actor network (through publications or readings in relation to their environmental education activities) to consider in time to come.

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Post Script
While this journal was in production, we learned that Stephan le Roux tragically passed away from brain cancer in October 2006. We hope that EEASA Journal readers will value and draw on his contribution to discussions on environmental ethics in education (Le Roux & Ferreira, this edition) for many years to come. Through this journal we extend the condolences of EEASA members to his family and friends.

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Participating in the UN Decade of Education for Sustainability: Voices in a southern African consultation process

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Editor's Note

Normally the EEASA Journal opens with a keynote address from an EEASA Conference. Instead, this opening paper of the 2006 EEASA Journal reports back to EEASA members on the consultation process led by the Southern African Development Communities' Regional Environmental Education Programme (SADC REEP) on participation in the United Nations Decade on Education for Sustainable Development (UNDESD). Consultations were hosted in 14 southern African countries. Workshop consultations were also held at the EEASA Conference in Zambia in 2005 and a report on this consultation process was provided at the EEASA Conference in Zimbabwe in 2006. Over 150 EEASA Conference delegates submitted questionnaire inputs into this process, with more participating at country level in the consultations. In the end, over 600 participants in the SADC region contributed to this process which resulted in the production of four books (Lotz-Sisitka, Olvitt, Gumede & Pesanayi, 2006a; 2006b; 2006c; 2006d) published by Share-Net and the SADC REEP.

Abstract

This paper documents the outcomes of the consultation process on participating in the UNDESD which was led by the SADC Regional Environmental Education Programme in 2005/2006, assisted by the Rhodes University Environmental Education and Sustainability Unit and Environment Africa. The goals of the consultation process were to explore interpretations and meaning-making around the global discourse of ESD in a southern African context. Findings from the consultation process provide useful baseline information on the status of debate on sustainable development in educational circles; participation and partnerships; insights into environmental and sustainability education (ESD) practice and mechanisms needed for supporting this practice. The paper ends by outlining a research agenda for ESD in southern Africa, as discussed during the consultation process.

Introduction to the UNDESD

Current global discourse on Education for Sustainable Development (ESD) has its roots in the history of two distinct areas of core interest for the United Nations: (1) quality basic education and (2) sustainable development. It has a longer, more complex history which is intertwined with the emergence of environmental education, and later with the concept of sustainable development in international institutional discourse. Promoted by the Japanese government and

partners who were concerned with the role of education in furthering the global objective of sustainable development, a United Nations Decade of Education for Sustainable Development (UNDESD) (2005–2014) was proposed and endorsed at the World Summit on Sustainable Development (WSSD) in 2002.[1] In December of the same year, the United Nations Decade of Education for Sustainable Development was adopted by the UN General Assembly through resolution 57/254, with UNESCO designated as the lead agency.

Contemporary global discourse on Education for Sustainable Development has emerged as a 'hybrid' concept, which amalgamates earlier environmental education roots with UNESCO priorities. UNESCO views the Decade as an opportunity to strengthen and extend policy frameworks and action programmes undertaken within the existing framework of Education for All (EFA) and the UN Decade for Literacy (UNESCO, 2005). UNESCO sees Education for Sustainable Development as a mechanism for adding focus and relevance to these efforts, and as a means of enabling countries to achieve the Millennium Development Goals through education (*ibid*.). In Africa, the UNDESD is seen as an opportunity to strengthen the African Union's Second Decade of Education (2006–2015) and the human resource development requirements of NEPAD and its Environmental Action Plan. The Sub-Saharan Strategy for the UNDESD emphasises the importance of situating the UNDESD goals and objectives in African cultures, knowledge systems and experience (UNESCO-BREDA, 2006). There is, however, little guidance provided on what exactly this might mean, but there is a recognition that the UNDESD and concepts of Education for Sustainable Development will need to be deliberated and interpreted at sub-regional, national and local levels (UNESCO, 2005) for these to be meaningful in practice. This paper provides some insight into this deliberation and meaning-making process at a sub-regional (southern African) level, albeit at a broad level.

The overall goal of the Decade, as articulated by UNESCO is:

> To integrate the principles, values, and practices of sustainable development into all aspects of education and learning. This education effort will encourage change in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations. (UNESCO, 2005)

This statement gives the appearance of certainty surrounding the principles, values and practices of sustainable development and that, once defined, these can simply be integrated into all aspects of education and learning. The statement reflects policy discourse, which is often couched in propositional terms, with little space given to uncertainty, complexity and contextual diversity. As such, one of the primary goals for the UNDESD is laid out in the UN General Assembly Resolution 59/237 in which the General Assembly '… encourages Governments to consider the inclusion … of measures to implement the Decade in their respective education systems and strategies and, where appropriate, national development plans'.

However, to establish clarity of purpose and the measures to 'implement the Decade' into education systems, strategies and development plans requires a deeper understanding of what is meant by sustainable development in a particular context, and of how the concept of ESD is being viewed and appropriated in particular contexts. This paper aims to provide insight

into what the 600 southern Africans who participated in this consultation process have to say about sustainable development, and ESD, at the start of the UNDESD. The paper does not aim to provide in-depth critically probing or theoretically inspired analyses of this discourse, but merely aims to report on this discourse to readers. Further analyses and interpretations of the discourse are always possible, and may be the subject of further writings in future.

The Consultation Process and Methodology

The Education for Sustainable Development (ESD) consultation process involved a series of national workshops in 14 southern African countries.[2] The national workshop consultation participants included some 360 state and civil society organisations and some private sector organisations. Organisations that participated all have an interest in education and training initiatives that can help society re-orient towards poverty alleviation, food security, ecological sustainability and health. The consultation process was complemented by a contextual profile development process, and a literature review (Lotz-Sisitka *et al.*, 2006a). A further 150 individual questionnaires were received mainly from EEASA members/EEASA conference delegates in southern Africa and, in some countries, local level workshops also provided information that has informed the development of this report. In total, over 600 participants in southern Africa made contributions to the consultation process over a six-month period.

The initiative aims to contribute to implementation of the Environmental and Sustainable Development Operational Plan of the SADC Regional Indicative Strategic Development Plan (SADC RISDP) in which environmental and natural resource management is to be strengthened through environmental education, information exchange and exchange of experience amongst SADC member states. It also supports the efforts of UNESCO, who have launched an International Implementation Scheme to guide implementation of the United Nations Decade of Education for Sustainable Development (UNDESD) from 2005–2014 (UNESCO, 2005), and a Sub-Saharan Strategy for ESD (UNESCO-BREDA, 2006).

The consultation process resulted in a number of key findings (see Lotz-Sisitka *et al.*, 2006a; 2006b; 2006c; 2006d). For the purposes of this paper, only the main findings are shared, and readers are encouraged to source the more comprehensive consultation reports for more detailed insights. Findings cover the following key areas covered in the consultation process: (1) interpreting ESD discourse, (2) forming partnerships and fostering broader participation, (3) ESD practice and how it is viewed and (4) how ESD practice may be supported at institutional level; a research agenda for ESD in southern Africa is also outlined.

Finding 1: Inadequate debate on sustainable development

> There is inadequate debate on Education for Sustainable Development and Sustainable Development. (Zambian ESD Consultation Report)

> There is a lack of knowledge on sustainability issues. (Botswana ESD Consultation Report)

> There is a lack of information on key areas such as environmental health and sustainable development issues. (Swaziland ESD Consultation Report)

As can be seen in the citations above, the consultation process revealed that there is inadequate debate about sustainable development in southern Africa, and that research and policy implementation processes for sustainable development are not providing the knowledge and orientation necessary for ESD practitioners to engage in robust debate and critical review of sustainable development approaches in a southern African context.

The literature review undertaken for the purposes of informing interpretations of ESD in southern Africa (Lotz-Sisitka *et al.,* 2006a) revealed that there are a number of complex lines of debate that inform ESD discourse, none of which have been resolved in ESD discussions in a southern African context. These lines of debate are briefly outlined here, and provide a broader context for deliberations on what ESD might focus on:

- *Can the development-as-growth model be sustained?* This line of debate considers evidence at a global level that human development is not progressing as effectively as Western economic models of progress and development would have us believe. Recent human development reports show that the current economic model is leading to greater inequalities between the rich and the poor. In southern Africa, many more households are now poverty stricken, compared to 10 or 20 years ago – this is despite a massive growth in the global economy and related production and consumption patterns. Economic growth under the contemporary neo-liberal model is not solving unemployment, but is creating a global trend towards 'jobless growth'. While trans-national corporations control over 33% of the world's productive assets, they employ only about 5% of the global workforce (Rosenberg, 2004). Rosenberg (2004:230) notes that '… one of the most dangerous aspects of the current model of development is that it is so resource intensive that it cannot be multiplied on a big enough scale to benefit all people'. Human beings are already consuming more resources than the Earth can renew, and are overshooting its capacity by an estimated 30%. 'The bulk of this over-consumption is enjoyed by only 20% of the world's population, who consume 80% of its resources' (*ibid*.). These 20% of the world's population also hold the most power in terms of global decision-making, which makes it more difficult to change the dominant patterns and *status quo* (Rosenberg, 2004).
- *How to change this development-as-growth trajectory?* The environmental movement has been at the forefront of calling for the development-as-growth model to be scaled down, for more equitable sharing of the Earth's resources, and for development that takes place within the limits of the Earth's capacity to renew its resources that sustain both life and development. This has led to a complex and protracted debate on how this should be done, leading to the introduction of the idea of 'sustainable development' in the 1980s in the World Conservation Strategy (IUCN *et al.*, 1980), and then in the Brundtland Report (WCED, 1987), produced by the World Commission on Environment and Development in 1987. There appears to be wide-ranging consensus at a global level in the powerful institution-media-academic matrix that sustainable

development is a preferred approach to changing humanities' development path, but this is not without problems. Some have described it as a 'salvation narrative' (see Lotz-Sisitka 2004 for a critique of this salvation narrative).

- *How should sustainable development be understood and implemented?* The last 15–20 years have seen vociferous debate in international circles on how sustainable development should be conceptualised, and how it should be implemented. Rosenberg (2004) explains that one argument that has been widely supported by capitalists around the globe is the notion that more development is needed to pay for environmental protection and to reduce poverty. This view has been widely supported by many of the international institutions such as the World Bank and the International Monetary Fund, who have also played a significant role in convincing governments in southern Africa that this is the best approach to address environmental and poverty-related problems. The problem with this dominant view is that some have interpreted it to mean 'more of the same kind of development'. The argument is that poverty and suffering occur because there is not enough economic growth. This has led to a shift in focus from the original discussions on sustainable development which were about sustaining *living resources*, to sustaining *development*, which is why there is so much contestation about sustainable development today.
- *Sustainable development as an ambiguous guiding framework for education*. As a result of these debates, sustainable development provides a complex and ambiguous guiding concept for education, and can easily be mis-interpreted and appropriated to serve a variety of interests (including those who wish to sustain *business-as-usual* approaches to development). Because of its flexibility of use in a variety of contexts, and its contemporary political currency, sustainable development has become part of a common vocabulary among those who are concerned about the impact of human activity on the ecological basis of human existence (the environment). Sustainable development has also become strongly associated with a moral imperative to change the way that human development is taking place (Hattingh 2002:5). However, as Hattingh (2002:5) indicates 'while the *term* sustainable development has become widespread in recent times, there is little indication that a clear global consensus has also emerged about the *content*, the *interpretation* and the *implementation* of this moral imperative'. For example, southern NGO critique of the World Summit on Sustainable Development pointed to an appropriation of sustainable development discourse by neo-liberal economic market forces, with vociferous and critical perspectives on the implications of this for social justice and ecological sustainability (Lotz-Sisitka, 2004).

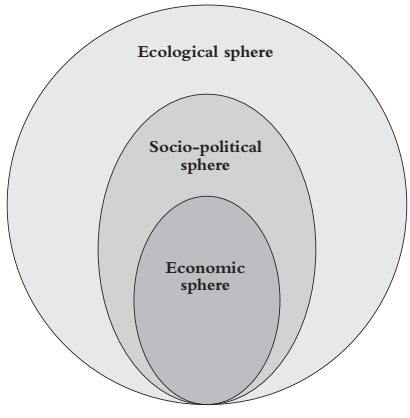
From the above discussion, we see that Education for Sustainable Development is situated in a complex political economy in which the fundamental assumptions of human development and political economies are being placed at the centre of critical investigation and attention. The SADC REEP's Futures Research project (Lotz-Sisitka, 2004) argued that any ESD initiatives in southern Africa would need to incorporate a careful and critical look at the prevailing perspectives on sustainable development, and patterns of appropriation within the prevailing political economies of the day, particularly where poverty alleviation is to be a major goal

of sustainable development. The SADC REEP's Futures Research project also argued for continuity and expansion of environmental education initiatives in and as ESD in southern Africa, given the high levels of dependence on natural resources for livelihoods amongst the 75% of southern Africans that live in rural areas (Lotz-Sisitka, 2004). It also highlighted the serious crisis surrounding health risk, and drew attention to the need for a closer examination of the relationship between health risks, poverty and environmental degradation, and associated challenges for education.

One of the key aspects of Education for Sustainable Development would therefore seem to be a need to foster critical review of ways in which sustainable development is being interpreted, appropriated and applied in different contexts. If this is not done, sustainable development could become just another ideology that leaves the *status quo,* with all its risks and injustices, much as it is (Hattingh, 2002; Lotz-Sisitka, 2004). As shown in the Lotz-Sisitka (2004) research, it can also lead to a demise the environmental dimension for sustaining economic growth as a trajectory, which has potentially serious consequences in a southern African context.

Hattingh (2004) presents alternative conceptions of sustainable development. He argues for a 'strong' model of sustainable development (see Figure 1) to counter ideological interpretations of sustainable development which privilege one of the so-called three spheres of sustainable development as if it is more important or more urgent than all the others. This model, he argues, avoids, for example, an *economistic ideology* which focuses primarily on economic considerations; it avoids an *environmentalist ideology* which focuses primarily on the conservation of the bio-physical environment; and it similarly avoids a *social ideology* which sees social issues as more important than environmental or economic issues. As such, the 'strong' model of sustainable development presents a challenging context for new knowledge-creation and for educational thinking and practice in southern Africa.

Figure 1. A model of 'strong' sustainability (from Hattingh, 2004)



Sustainable development requires a new ethic, radical changes (particularly in economic systems) and long-term thinking (Rosenberg, 2004). It requires us (a) to take seriously the impact of current models of development, (b) to generate viable solutions to complex challenges at

micro- and macro-levels, and (c) to think of future generations and the opportunities that will be available to them.

The SADC REEP consultation process revealed that there are many educational initiatives in southern Africa that are attempting to take up this challenge in various ways. Educators attending the SADC REEP consultation process indicated that they were responding to a diverse range of issues and challenges through their educational practice (not everyone was responding to the same issues and challenges – this presents a 'collective picture' of what the 600 participants in the SADC region are responding to). These included (amongst others):

- *Environmental issues and risks* such as increased environmental degradation; over-exploitation of natural resources for short term benefits; land degradation – decline in productivity of the land, food insecurity; fresh water contamination; air pollution; solid and liquid waste management, including special waste such as medical waste; drought; wildlife depletion, poaching and loss of biodiversity; deforestation; desertification; water wastage, pollution and inadequate sanitation; vulnerability to environmental change (e.g., floods, droughts, global warming); coastal zone degradation and marine issues (degradation of the marine environment and marine resources); current approaches to energy provision (fossil fuel dependent, nuclear, etc.); use of toxic products and inadequate management of toxic waste; loss of natural heritage; land use conflicts and uncontrolled urban development.
- *Social issues, risks and challenges* such as HIV/AIDS – resulting in a deepening of poverty, lack of alternatives, and a lack of participation in development initiatives; other health risks such as malaria; malnutrition and health of children; gender inequality, discrimination and vulnerability of women and children to health risks and abuse; street children and orphans (children without adequate care); industrial health issues and decrease in general levels of wellness in the work place; increased vulnerability; population growth and settlement patterns; social values and moral regeneration; and the quality of education (which was seen to be too theoretical), and the valuing of education in society (in some societies education is a low priority); instability in the human resource-base due to the impact of HIV/AIDS, economic hardship and poverty.
- *Economic challenges* such as poverty and decrease in standards of living; high levels of unemployment; food security; skewed distribution of land and wealth; land tenure systems still tied to traditional systems; time constraints and other constraints imposed by donors and funders; high costs of inputs and low selling prices for products; consumerist culture and lifestyles – particularly amongst the rich and the youth (i.e. new influences on youth culture); lack of integration between private sector initiatives and public planning processes; dominance of globalisation and neo-liberal economic approaches; structural adjustment policy impacts (e.g., job losses and unemployment); lack of resources/inadequate resources for development initiatives; economic policy and management; sharing of resources equitably (regionally and globally); shortage of resources needed to provide adequate housing, facilities and capital for appropriate development; inadequate resources for social services such as health and education.

- *Political challenges* such as corruption; poor governance; lack of political commitment; lack of synergy amongst government departments, policies and implementation strategies; governments are responding to policies rather than needs on the ground – there are gaps between policies, practice and needs on the ground; short-term objectives of politicians; failure to implement policies; decentralisation of policy making (linked to lack of synergy and lack of capacity for delivery and implementation); war and lack of security.

The organisations working to address these issues are many and diverse, and all country consultations agreed that partnership approaches, and broad participation of society would be needed to responding adequately to the challenges outlined above. This is discussed in more detail in the next section.

Finding 2: Partnerships and participation in the UNDESD

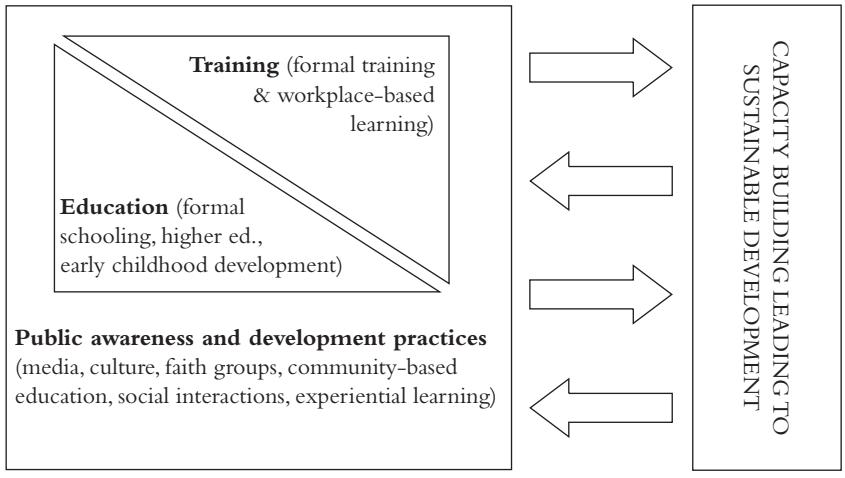
> Sharing resources between institutions and sectors can strengthen the value and quality of environmental learning/ESD. (Namibian ESD Consultation Report)

One of the most striking features of the SADC REEP consultation process was the evidence of a rich diversity of partnerships and networks that are currently operating in the southern African region to implement environmental and sustainability education objectives. It seems that southern African environmental and sustainability education practitioners have developed a range of sophisticated partnership approaches and networks to enable their practices to take place. From the evidence presented in the consultation process, it could be stated that partnerships and networking are one of the cornerstones of environmental and sustainability education practice in southern Africa.

The objectives of the UNDESD introduce an educationally inclusive framework for participation involving education (formal schooling, universities, colleges); training (vocational education and training); and public awareness and community development (informal education and training initiatives). This inter-linked relationship can best be conceptualised within a framework of life-long learning (see Figure 2 on the following page).

The profile of participants who engaged in the SADC REEP consultations included a variety of sectors and types of organisations who appear to have an interest in the objectives of the UNDESD. Educational organisations and environmental/natural resource management organisations were dominant in the consultations. Other organisations that appear to have an interest in the UNDESD include cultural and scientific organisations; health and social welfare organisations; NGO networks and associations; faith-based organisations; youth organisations; trade, industry, economic affairs and business organisations; energy production and service organisations; local government organisations; media organisations and donor funded-projects (donor organisations), although representation from these different groups was less prominent.

Figure 2. Education for Sustainable Development in a context of life-long learning (adapted from Scott & Gough, 2003)



In the education sector, groups involved in the consultations included:

- UNESCO national commissions (relatively good representation)
- Policy makers – ministries and departments of education (good representation)
- Curriculum development centres (some representation from some countries)
- Assessment and examination directorates (poor representation)
- Universities and teacher education colleges (universities appear to have been better represented than teacher education colleges)
- Community-based education programmes (some representation from NGOs, but poor representation from NGO coordinating groups)

Education stakeholders who were not present in the ESD discussions included:

- Early childhood development organisations
- Adult literacy/ABET organisations
- Textbook production organisations
- Educational associations and networks (including the Education for All networks)

The training sector has an important role to play in broadening participation in the UNDESD, and in achieving the objectives of the UNDESD. During the SADC REEP consultation process, the training sector was mostly represented by colleges of technology and polytechnics (who do vocational education and training). Absent from the consultations were agricultural colleges and training institutions; local government training organisations; business training programmes and organisations; and tourism education and training institutions. At this stage, it would seem that strategies need to be developed to further involve the vocational education and training sector in discussions on environment and sustainability education in southern Africa.

From a public awareness point of view, the participation profile indicates that there is also a need to strengthen the participation of the media, faith-based organisations, and NGO networks, as well as the rural development sector in UNDESD activities.

From a sectoral perspective, it would seem that environmental education and training organisations, and environmental policy development and natural resource management organisations are already actively contributing to the UNDESD. An interesting new development is the interest shown in sustainability issues in the energy production and services sector. The agricultural sector are also beginning to show more interest in sustainability issues. Cultural organisations, health organisations, social development and welfare organisations are also beginning to make contributions to environmental and sustainability discourse in southern Africa. The participation profile indicated that strategies need to be developed to strengthen the participation and contributions of new environmental/natural resource management sectors (e.g., energy, agriculture), while also paying attention to the inclusion and broader participation of social, cultural and economic institutions. In particular, labour unions and business associations (the private sector more broadly) need to be more centrally involved in the UNDESD debates in southern Africa. Organisations that are responding to gender issues, human rights issues and health-related issues are also important partners in the UNDESD, as are donor organisations and the local government sector.

Involving stakeholder groups and creating partnerships to respond to the diversity of challenges outlined above appears to be an important strategy for making meaning of the UNDESD in southern Africa, and a deeper understanding of why groups form partnerships could also strengthen inclusive approaches to participation in the UNDESD. The consultation process identified the following values associated with partnerships:

- Educational value (i.e., one achieves a better quality educational output/product as a result of forming a partnership)
- Impact value (i.e., the end result of your initiative is more effective as a result of a partnership)
- Cultural value (i.e., the partnership allows for cultural exchange, cultural experience and cultural knowledge)
- Efficiency value (i.e., resource sharing to maximise efficient use of available resources)
- Knowledge exchange value (i.e., sharing of cross-sectoral knowledge and experience to enrich the learning experience and learning outcome)
- Community and communication value (i.e., partnerships create a sense of community, and they also have potential to contribute to enhanced communications)
- Project sustainability value (i.e., partnerships are likely to enhance the longer term sustainability of development initiatives)
- Information exchange value (i.e., partnerships allow for the easy exchange of information and build a more knowledgeable and responsive network of ESD practitioners)
- Diversity value (i.e., partnerships allow for diversity of interest and for synergy across diversity)
- Innovation value (i.e., partnerships allow for experimentation of new approaches and ideas, and for a supportive network in which to experiment and innovate)

The UNESCO (2005) International Implementation Scheme indicates that ESD is 'fundamentally cross-sectoral' and that it engages a wide variety of institutions. It notes, further, that the effectiveness of the UNDESD will depend on the strength and inclusiveness of the

partnerships, networks and alliances that develop amongst stakeholders at all levels. The SADC REEP consultations indicate that it may be useful to not only form partnerships, but to consider the *value* of partnerships, and how this value can be maximised through careful cooperative engagements at different levels. Partnerships, it was agreed, are only useful if organisations and individuals have something to work on, which leads into a discussion on ESD practice (i.e. the focus of activity).

Finding 3: ESD³ practice and quality

The SADC REEP consultations revealed that just as there are many stakeholders and partnerships active in implementing the objectives of the UNDESD, there is also a rich variety of educational practice that is responding to environmental and other sustainability challenges in the southern African region. The consultations also revealed that environmental and sustainability education practitioners are reflexive about this practice, in the sense that they are critically reviewing its effectiveness in relation to the context in which the practice is taking place.

Different dimensions of environmental and sustainability education practice were discussed, providing insight into 'what counts' and what needs to be done to enhance ESD practice in southern Africa. These dimensions of ESD practice are discussed below.

Involving people in sustainable development actions

There was strong consensus across countries that it is important for ESD processes to involve people in sustainable development actions. There was concern that current ESD practices were not really contributing to viable development strategies or to meaningful poverty alleviation and improved quality of life. This introduces a focus on practical action into ESD discussions in a southern African context. While there was a strong support for, and motivation to include a focus on practical action in ESD, there was little guidance provided in terms of how this should be done. There were three themes that arose from this discussion:

- There is a need to encourage and further develop *participatory approaches* and methods in ways that are not superficial and token.
- Educational practices are not the only solution to poverty, environmental degradation, health risks and other sustainable development challenges, and there is a need for *integrated solutions.*
- There is a need to involve people in questioning and *critically evaluating* the appropriateness of environmental and sustainability education practices in enabling/constraining sustainable development solutions. This may also require critical evaluation of the way in which sustainable development concepts are being appropriated and used in different contexts, which requires a more sophisticated level of reflexivity.

Participatory, active and learner-centred methodologies

The consultations provided insight into the wide array of methodologies that are used by ESD practitioners in the southern African region. While different opinions were voiced about which

methodologies were useful and valuable, little evaluative evidence was available for a deeper analysis of the effectiveness and value of these methodologies. There was, however, strong consensus that participatory approaches such as Participatory Rural Appraisal, environmental action learning and action research were vitally important to the successful implementation of environmental and sustainability education programmes and objectives. Participation in learning introduces a range of associated changes to educational practice, such as inquiry-based methods, critical learning opportunities through debates and group work, and opportunities for experiential learning. In the Mozambique, Zambian, South African, Namibian, Swaziland, Tanzanian and Zimbabwean ESD Consultation Reports, participatory methodologies were cited as being most successful.

Dealing with complex issues

One of the major challenges facing ESD practitioners is to develop the skills and abilities to deal with such complex issues, given that environmental and sustainability issues are historically located, complex, contingent and different in different contexts. A number of perspectives were shared on the issue of dealing with complexity, and a strong case was made for the need to enhance capacity of professionals to deal with complex issues in context. This included the need for capacity to deal with ideological ambivalence and ideological 'blockages'; conflict, tensions and contradictions; and community expectations in the face of high levels of poverty, risk and vulnerability.

Working with values, ethics and cultural diversity

Questions of values and ethics in education were also discussed during the consultation process. Participants had various views on (a) the importance of foregrounding values and ethics in educational practice, and (b) on how this could best be done in a southern African context which is characterised by high levels of cultural diversity.

Strategies for values education – such as involving learners in useful community projects, modelling of behaviours and actions and appropriate role models, creating platforms for dialogue and debate, and engaging people in reflections on existing values, actions and alternatives – were discussed. Productive and positive relationships and the building of group values, and developing critical media, were also seen as important strategies. A more complex area identified was the need to work with the values that are embedded in modern education systems. It was noted that strategies for managing, accommodating and embracing diversity in terms of culture, religion, ability and language needed to be developed. Language diversity, in particular, presented many environmental and sustainability practitioners with different challenges, and multi-lingual and additive multi-lingual strategies were recommended. Cultural diversity was also the subject of much discussion. For example, different culturally defined conceptions of human rights issues were discussed, and it was noted that human rights issues are expressed in the SADC region at policy level and that these expressions have been influenced by international/globalising processes such as an individual human rights and global human rights culture. It was argued that ESD practitioners should be explicit about the tensions, and encourage deliberations of these issues at local levels, to allow for different cultural perspectives

to emerge and be debated, and to recognise that culture is not static, and is always both shaping and being shaped by human actions and experiences.

Creativity and critical thinking

The consultations also highlighted the importance of creativity and critical thinking in environmental and sustainability education practice. To strengthen critical and creative thinking, a wide variety of strategies is being used by environmental and sustainability education practitioners – such as the use of open-ended questions, case studies, experiments, research-based role plays and dramas. Dialogue forums and debates were also seen as important strategies to foster critical thinking along with excursions and hands-on activities, farming trials and other action-oriented approaches. Exposing learners to multiple perspectives that are also multi-disciplinary in nature was identified as being important. One of the challenges identified was the lack of appropriate teacher education programmes that promote critical and creative thinking. Acceptance of the *status quo* was also identified as a challenge, as well as dealing with resistance to change. Critical media literacy was also cited as being an important process, particularly to deal with issues such as consumerism.

Working with different ways of knowing (particularly indigenous knowledge and local knowledge)

Another significant area of discussion in the consultations centred on knowledge and its origins, its construction and how different ways of knowing (epistemologies) are to be accommodated and worked with in ESD practice. In particular, the importance of indigenous, traditional and local knowledge was foregrounded in discussions. Discussions also reflected a 'taken for granted' validity associated with scientific knowledge and information provided by scientific institutions on environmental issues and risks. The qualities of indigenous and traditional knowledge systems and educational approaches was also brought into discussion in the consultations, affirming a sense of an African cultural fabric/s of traditional and indigenous ways of knowing and learning, as described by this extract from the Zambian ESD Consultation Report:

> For the vast majority of Zambian traditional societies, education was an integral part of everyday life, long before the colonialists and western educationalists came to this part of the world (Mwanakatwe, 1968). Traditional education involved a detailed understanding of the local biological resources and helped to develop knowledge and skills that enabled people to adapt to, and manipulate their land, flora and fauna. Mwanakatwe observes that by the time a child became a teenager, he/she had been exposed to an educational process enabling the acquisition of knowledge and skills for survival and adulthood. In traditional education, conservation was often realised in a pattern of shared beliefs, cultural taboos, folklore and myths. These embodied a common interest among communities to conserve natural resources and viable social structures and practices … Since the advent of colonisation, Western education systems have influenced traditional approaches to ESD and learning.

A key challenge identified by ESD practitioners is the lack of capacity and research on mobilising indigenous knowledge in education, in the context of environment and sustainability issues. There was a strong consensus that mobilising indigenous knowledge was a very important feature of ESD practice in southern Africa. This would seem to be a key area for future research and development in the UNDESD.

Ensuring inclusivity in ESD practice

> There are certain cultural practices that hinder inclusivity … an inclusivity policy has been developed and workshops for in-service teachers have been held. (Swaziland ESD Consultation Report)

The processes and politics of inclusion and exclusion in ESD practice was also discussed during the consultation process. Particular attention was given to the inclusion of learners with disabilities, but discussion also centred on cultural and linguistic inclusion. Various practical strategies were shared as to how one can address questions of exclusion in ESD practice. What was not discussed in any depth were the historical and structural constraints that lead to, and create patterns of, inclusion and exclusion in society. This would appear to require deeper probing in future ESD practices and research.

The dimensions of ESD practice outlined above will require substantial support from institutions and individuals, particularly educational leadership. The consultations highlighted a range of dynamics that would need to be attended to if ESD practices (as outlined above) were to be strengthened.

Finding 4: Supporting ESD practice

As shown in the discussions above, ESD practice has many interesting dimensions which are both challenging and creative. These processes offer opportunities for actively contributing to societal and environmental change through education. However, these ESD practices will simply remain 'nice to have's' if adequate institutional and policy support is not provided. Similarly, good monitoring and evaluation strategies will be needed (see Lotz-Sisitka *et al.*, 2006c; 2006d). For ESD to be mainstreamed, curriculum and learning support materials will need to be developed, revised and adapted. Adequate resources will be required to support ESD initiatives. These structural and institutional factors will require as much attention during the UNDESD as processes of teaching and learning. The next section of the paper briefly discusses these vitally important processes that are required to support and extend ESD practice.

Policy review, development and use

The SADC consultations indicated that ESD practitioners in southern Africa were responding to a plethora of different policies. These policies included:

- International policies and conventions such as Agenda 21 (UNCED, 1992), the Johannesburg Implementation Plan (produced at the WSSD in Johannesburg, September

2002), the UNDESD International Implementation Scheme (UNESCO, 2005), etc.
- National policies from the environment and natural resource management sector, the social welfare sector, the education and training sectors and the health sectors (amongst others)
- Locally relevant policy frameworks such as those guiding municipalities, organisations and institutions (e.g., school policies)

This created a complex and challenging policy environment, and it was evident across the 14 country reports that environmental and sustainability education practitioners in southern Africa are grappling with 'policy complexity' and 'policy overload'. It is not surprising therefore that one of the strongest points made about policy review, development and use was the need for creating greater policy synergy. The process of enabling policy synergy may, however, be more complex than simply 'aligning' different policies and their objectives. Discussions and insights reported in the SADC REEP evaluation (Rosenberg, 2005) indicate that creating policy synergy will require a deeper understanding of the contexts of policy production and use, as well as an understanding of the premises of the policies themselves. This is clearly an area that requires further research and development during the UNDESD. The consultation process also identified inadequate attention to policy implementation and evaluation processes, and the need for professional and capacity development to enhance participation in policy processes as being important considerations (see Lotz-Sisitka *et al*. 2006d for a more comprehensive discussion on policy issues).

Advocacy and vision building

> There is generally weak advocacy and vision building. (Zambia ESD Consultation report)

Advocacy and vision building has been identified by UNESCO as an important strategy for ESD. UNESCO (2005) explains that

> … people must envision what it means to live within environmental limits, to interact in peaceable, equitable, and in just ways, and work sustainably … Beyond envisioning a sustainable future, the success of the UNDESD requires widespread advocacy to promote ESD. Advocacy should take place at all levels and involve all stakeholders. Governments and civil society should maintain a permanent dialogue in which issues are aired and where common agendas are forged through ongoing conversation, debate and mutual learning. Because of its broad and deep impact, the media has a very important role to play in advocating for a more sustainable future.

The consultations indicated that there are various examples of advocacy and vision-building processes that can be expanded and taken further in future, although this did not come through as a major area of activity for ESD practitioners in southern Africa (perhaps because of the policy overload described above!). However, as indicated by the citation above, advocacy and vision building appear generally to be weak, and this may therefore indicate a need to focus on this in the UNDESD.

Institutional capacity building

Institutional capacity building was recognised as being a key issue to consider. There were numerous calls for giving more attention to building human resource capacity (also discussed under professional development and training), strengthening leadership, and addressing financial and resourcing issues. There was, however, not much analysis of what it takes to strengthen institutional capacity. The importance of integrating into existing structures and then supporting changes within these structures was emphasised, as were whole school development approaches. Whole school development approaches were seen to be of value because they created opportunities for all stakeholders in the school-community context to learn together. This eliminates second-hand information, which tends to become distorted, and also eliminates the problem of a lack of ownership and participation in initiatives.

Fundraising, financial management and project design and management

> Donor driven projects need to be aligned with existing structures in the institutions to promote a sense of ownership and sustainability. (Lesotho ESD Consultation report)

Inadequate resources were identified as a key concern in all the ESD Consultation reports and questionnaires. It is, however, not only the availability of resources that is of concern to southern African practitioners, but also the way in which the resources are procured and managed. In particular, donor-funded initiatives drew a lot of comment in the consultations. Discussions here centred on the phenomenon of 'donor fatigue' and 'development fatigue', where certain groups are over-exposed to development initiatives, due to particular donor or government agendas. ESD practitioners identified the need for influencing project design processes in such a way that donor-funded projects were more adequately aligned with existing structures and processes in countries, and that their sustainability is attended to from the outset. Capacity for financial management and project management was also identified as an area that needed attention.

The role of governments in providing financial support and partnership funding was also discussed, and it was felt that strategies need to be found to make better use of existing government funds and resources. ESD should not be seen as a 'new thing' but should be seen as an effort to broaden and strengthen existing government policy initiatives in more coherent and synergistic ways. Partnership strategies were seen to be vitally important in this process.

Professional development and training

In the consultation process, it was noted that there is a need to broaden understanding of sustainability issues, and to strengthen and extend partnerships and networks to facilitate knowledge exchange and skills development. While there is extensive experience and expertise available for implementing ESD practice, there are still many areas of ESD practice that need enhancing and extending. There was a strong sense that there was a need for sharing, expanding and enhancing knowledge and expertise through professional development programmes. The role of regional exchange, networks and professional development programmes was mentioned

as being valuable. In particular, the point was made that greater reflexive capacity needed to be developed in and through professional development programmes.

UNESCO (2005) argues that special attention should be given to integrating ESD concerns into teacher education programmes. This was also a key issue identified in the consultations, as was the need to develop better capacity to implement workplace-based learning approaches. While much has been learned about professional development that is reflexive and context-based, there is still a need to expand and extend professional development work in the southern African region to address the capacity constraints and the broadening of ESD practices in the region.

Curriculum development work

> Curriculum should not be static, but dynamically moving to integrate global experiences and also emerging societal issues related to poverty alleviation. There is also a need to integrate issues that affect the majority of people in the region (poverty alleviation) if learning is to be meaningful to the community. Curriculum must meet needs of the people and the community. (Zambia ESD Consultation Report)

Discussions on curriculum development work centred on two main themes, notably (1) the necessary structures to enable such curriculum development work to take place, and (2) the content and approaches that were most appropriate in addressing environment and sustainability issues in curriculum contexts.

Appropriate structures. Appropriate structures need to be created for enabling the integration of environmental and other sustainability issues into national curricula. Subject panels were identified as important structures to interact with in various countries such as Lesotho, Namibia and Botswana. Specially constituted committees are also a possible way forward for dealing with environmental and sustainability issues in the curriculum. For example, in Lesotho there is also a Population, HIV/AIDS and Environmental Education Committee to coordinate initiatives aimed at integrating 'emerging issues' into the curriculum. Involving examination and assessment structures was identified as being critical to the success of incorporating environmental and sustainability issues into the national curriculum. Formalising partnerships was also identified as a possible approach for establishing appropriate structures for ESD curriculum development work. For example, in the Democratic Republic of Congo a suggestion was made to formalise the partnership between the Ministry of Primary and Secondary Schools and the Ministry of University Education to ensure appropriate elaboration of a programme for environmental education/ESD. Similarly in South Africa, a need was expressed for the Department of Education to formalise its partnerships with other government departments and ESD stakeholders.

Curriculum content and approaches. There was clear recognition that environment and sustainability issues are cross-cutting, and require multi-disciplinary responses. Questions arose as to how these cross-curricular multi-disciplinary issues should to be incorporated into existing curriculum models and frameworks. In Lesotho, for example, it was noted that 'other emerging

issues of concern need to be incorporated into already existing issues to avoid confusion and over-loading of the curriculum'. It was noted that establishing a 'unit' where those working on these different emerging issues (environmental issues, population issues, HIV/AIDS issues) could work together to ensure that similar approaches were used, and where work on these issues could be conceptualised in complementary ways, was a useful way of making sure that confusion, duplication and curriculum overload were avoided (Lesotho ESD Consultation Report). Most of the southern African countries are engaged in a variety of initiatives to integrate and infuse emerging issues (e.g., environmental issues, human rights issues, gender issues, HIV/AIDS) into the mainstream curriculum. This has led to various strategies and debates as to how this should best be done, which include *infusion approaches* (which involves infusing these issues into existing curriculum frameworks); *integrated approaches* (which involves cross-curricular strategies such as project work and local investigations, where knowledge and skills from various subjects are all used to address the same issue/set of issues); and *re-orientation of subjects* to include emergent issues (ESD issues) as integral to the subjects (this involves re-structuring subject content and outcomes to incorporate emerging social issues so that these become a key dimension of what is learned in the subject. This implies that emerging issues are valued in the same way as any other content and skills in the subjects, and that they are integrated into the assessment systems and are also dealt with in textbooks and other 'normal' curriculum processes).

There was strong consensus across all of the consultation reports that environment and sustainability education should be contextual and that one of its main educational objectives should be to develop strategies and approaches that allow for contextually relevant learning processes. This did not negate the importance of centrally defined curricula to guide national educational systems and the inclusion of these issues in the centrally defined curricula, but rather provided an argument for models of national curricula that allow for contextualisation of knowledge and skills development.

Leadership

> It is necessary to educate the leaders and build leadership. (DRC ESD Consultation Report)

Leadership in ESD and in curriculum change processes was identified as being of crucial importance to the successful transformation of curricula in southern Africa towards sustainability. The Botswana ESD Consultation report for example recommends that Heads of Institutions should be trained as structural leaders. There is a need to strengthen the capacity of educational leaders (at all levels in the system) to respond to the contemporary situation in southern Africa, where social, economic and environmental issues are affecting the lives and livelihoods of learners everywhere. There is a need for a new vision to develop around the role of schools and educational institutions in society, and this will not be possible without effective leadership. There was, however, very little insight provide as to how such leadership capacity ought to be developed.

Learning support materials development, access and use

> Good learning support materials can strengthen ESD. (Namibian ESD Consultation Report)

There was consensus that learning support materials were an important dimension of ESD, and that learning support materials should be produced for learners in all sectors of the community and for all learner groups. There was also strong support for participatory approaches to learning support materials development, as it was noted that these 'enhanced the relevance' of the learning support materials and also facilitated the use of materials as people felt some ownership of the materials. A concern for more effective use of existing learning support materials was also identified. There was also some concern about duplication of efforts when it comes to learning support materials development. It was said that different organisations produce their own materials and there is no coordinated effort to synchronise these efforts or to avoid duplication. Another issue associated with coordination was alignment of materials to the curriculum objectives or learning outcomes in formal education settings. Often ESD practitioners developed materials that were sector-priority specific (e.g., water materials or energy materials) with little cognisance of how teachers should integrate these priorities into their planning and practice in the course of the year, term or lesson. Another issue identified related to the availability of ESD materials and it was felt that although good materials are produced, they are often not produced in adequate quantities. It was also noted that there was a need for building capacity for materials development. The importance of forming partnerships between educators and scientists/researchers was identified as being key to the development of up-to-date materials that carry the latest information and perspectives, or that can create the pathways for learners to access such information. It was noted that better use could be made of the plethora of reports that are produced by the research community on sustainable development issues and that strategies should be developed to assist educators and learners to use these materials more effectively (and not re-invent the wheel).

Information Communication Technologies (ICTs)

Another striking feature of the SADC REEP consultations was the complete lack of attention given to Information Communication Technologies (ICTs). None of the groups discussed ICTs and their use in ESD programmes. The media drew more attention from ESD practitioners and mention was made of the powerful influence of television and radio, and how these media could be harnessed for strengthening ESD in southern Africa. There were, however, some discussions on the lack of systems for effective communication, and the lack of appropriate tools for managing baseline data and information.

UNESCO (2005) notes that ICTs have particular implications for ESD, most notably:

- ICTs are central to basic knowledge economies where wealth is generated by the transfer and use of information in ways that use fewer natural resources
- ICTs offer new learning modes and spaces, and can contribute the effectiveness of distance learning opportunities. The Internet, in particular, offers new avenues for

connectivity and participation in the economy and in knowledge networks
- ICTs also provide opportunities for global dialogue
- ICTs contribute to the development of essential lifeskills in modern economies

Perhaps the lack of discussion on ICTs is reflective of the context of relatively poor connectivity in southern Africa, and the predominantly rural nature of the economy and society. Innovative approaches to strengthening access to, and use of, ICTs in ESD programmes would seem to be an issue that needs attention in the southern African context in the UNDESD.

Implications for Research and Innovation

As indicated above, the consultation process has provided a rich starting point for deliberations on ESD in southern Africa. The key to these deliberations is the process of building on existing environmental and sustainability education initiatives, and a broadening of participation and knowledge about ESD in the southern African region. Given that the EEASA Journal is a research journal, the final section of this paper will focus on the insights gained from the consultations into a research agenda for ESD in the next Decade in southern Africa as a way of concluding the paper.

UNESCO (2005) indicates that traditionally there is a lag of about 10 years or more for new discoveries and new knowledge to be incorporated into school curricula and other educational programmes. UNESCO (2005) also indicates that ESD efforts in the UNDESD need to be informed by research and development work. The consultation process identified key areas where research is needed, as well as other insights useful for strengthening a research agenda in the forthcoming decade.

Areas where research is needed

The consultations revealed that research is needed to:
- advance the conceptual, theoretical and methodological development of ESD in southern Africa,
- strengthen and extend existing environment and sustainability education pedagogies, their relevance in society and their reality congruence,
- strengthen and extend the effectiveness and value of partnerships and networking processes,
- strengthen curriculum development approaches and implementation strategies for mainstreaming of ESD concerns into education systems,
- inform workplace-based learning and new approaches to training and professional development to strengthen reflexive practice,
- explore and extend the possibilities offered by the mobilisation of indigenous, traditional and local knowledge,
- develop strategies that can address complexities and value-based questions in the teaching and learning process in a context characterised by high levels of cultural and linguistic diversity,

- explore the relationship between ESD, environmental management, health promotion and poverty reduction,
- establish frameworks for conceptualising and evaluating quality in ESD practice and support mechanisms,
- explore processes of mainstreaming ESD issues and approaches into various education and training settings such as schools, higher education institutions, teacher education programmes, vocational education and training colleges, agricultural extension services, etc., and
- provide baseline information on ESD practices and create longitudinal studies to evaluate the effect of ESD programmes and initiatives, and to document existing practices.

In general, there was a strong sense that there was a need to enhance the 'reality congruence' and 'real-world contributions' of ESD research. This has implications for both: the design and conduct of research, and the dissemination of research findings. It was felt that the potential of methodologies that allow for real-world contributions to ESD practice needed to be further developed and expanded.

Scientific knowledge generation and ESD research

A distinction was also made between research on sustainable development – for example, conducting research on food-related issues and sustainable agricultural practices, and ESD research which was centred more on the applications of research knowledge through effective educational strategies and approaches. There was a general consensus that there was weak utilisation of knowledge from research to influence the direction of sustainable development, which is leading to a gap between knowledge applications and practice, and inappropriate appropriations of sustainable development discourse (as outlined in the first part of this paper).

The relationship between research that is being undertaken by scientific institutions to generate new knowledge on sustainability issues and educational (ESD) research and practice was also discussed, and it was noted that a closer partnership needs to exist between mainstream scientific research institutions and educational research institutions, so that educational practices can be informed by and also inform mainstream scientific research on sustainability issues. The 'divisions' between the social sciences and natural sciences also need to be addressed, as sustainability issues are integrated issues that require integrated and multi-disciplinary responses.

Research as a learning process

It was also noted in the consultations that ESD research should develop methodologies and approaches that allow for participation in research processes, and that research should be viewed as a learning process in itself. Research should not be seen as the product of 'ivory towers' but should actively seek to involve youth, learners, teachers, industries, communities and governments in learning more about environmental and sustainability education issues, processes and practice (for example, more effective ways of mobilizing indigenous knowledge in educational processes, or more effective ways of participating in learning support materials development programmes). In this context, a recommendation was made to strengthen classroom-based action research so that research can be broadened to include all teachers in southern Africa.

Capacity building for research

There was consensus that research issues should be prioritised, and capacity-building needs associated with those research priorities need to be assessed. Strategies to strengthen research capacity in southern Africa need to be actively pursued. It was noted that there were few research institutions for environmental and sustainability research outside of South Africa, and institutional linkages and exchanges that strengthen research capacity across southern African countries need to be actively pursued during the UNDESD. A process of broadening research capacity building institutions for ESD in southern Africa needs to be conceptualised and actively pursued at national levels, and through regional structures and institutions that facilitate research capacity building in southern African countries.

Financial support for ESD research

It was also noted that there was a need to lobby for political and financial support for environmental and sustainability issues in research funding institutions, and that southern African researchers should seek international support from scientists and scientific organisations. Cooperation between national and international levels was seen as an important strategy for enhancing the viability of ESD research, and its status in national research institutions.

Research to support information exchange on ESD practice

As indicated above, the consultation process identified that a rich array of ESD practice is taking place across southern Africa, but there little systematic documentation of these initiatives. There is therefore inadequate baseline information on how to carry out and design educational practices that respond to environmental and other sustainability issues. This lack of information also inhibits opportunities for information exchange and learning from others in a regional and national context. The annual EEASA conference and workshops and other conference opportunities were seen as an important forum for information and knowledge sharing, but it was noted that the quality of research contributions in these forums needed to be enhanced. The EEASA Journal and EEASA Bulletin also provide important forums for information exchange on ESD practice and research.

In Closing

This paper has provided an overview of what was clearly a richly textured dialogue in the southern African region. Insights gained into the 'status' and complexity of sustainable development discourse clearly require educators to engage critically and reflexively with this 'salvation narrative' that has emerged in international discourse. Discussions on partnerships and participation have indicated that there are 'core' constituencies that are already active in conceptualising the UNDESD in a southern African context, but that more effort needs to go into 'bringing in' a broader constituency. Insights into ESD practice indicated that southern Africans have a good sense of 'what counts' as good ESD practice, and this work can be taken forward into the development of guidelines for, and dialogue on, good practice, and can provide inspiration for further creative and critical work in the field of environment and sustainability

education. The insights into the support systems and processes also indicate that southern Africans have a good sense of how to further the aims of the UNDESD at a sub-regional level, and various strategies and suggestions for further work have been put forward. A policy agenda for the UNDESD has been put forward through this research (Lotz-Sisitka *et al.*, 2006d), and some very useful insights have been provided for shaping and influencing a research agenda. The paper has started to provide insight into the meaning-making processes that are possible in response to policy discourses that, instead of being appropriated as 'certainties with inbuilt clarity', are more emergent, deliberative and open-ended. As mentioned at the start of this paper, all of the data and insights provided here can be subjected to various layers of further analysis and interpretation, and researchers are invited to take up this important critical project in the UNDESD.

Notes on the Contributor

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Endnotes

1 The World Summit on Sustainable Development endorsed Chapter 36 of Agenda 21 (Rio Earth Summit, 1992) on Education, Training and Public Awareness which first proposed that education and training systems around the world need to re-orient towards sustainable development.

2 The individual ESD Consultation Reports are not available as public documents; the information in these reports has been synthesised in the four publications by Lotz-Sisitka *et al.* (2006a; 2006b; 2006c; 2006d).

3 When referring to ESD practice here, I make reference particularly to environmental and sustainability education initiatives, given the dominance of the environmental and natural resources sectors in the ESD consultations.

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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 followng: 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): *problematisation, 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*.).

Problematisation takes place when focal actors or actants define or frame a problem. The aspect of problematisation 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 problematisation, 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	• 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	*Analysis concepts* • Document analysis • Textual analysis • Script analysis • Photo interpretation *Analysis process* • Creswell's (2003) generic steps in qualitative enquiry data analysis • Determining *in-vivo* codes/nodes • Developing categories from the codes/nodes *Tools for data analysis* • N-Vivo 2.0 • Microsoft Excel	Tensions Debates & Responses
Token of data generation and analysis	• Plastic Bags Regulations	*Time frame* • Prior to the formulation of relevant key policies • During formulation • Implementation and after *Spatial scale* • Micro (local) • Macro (national) • Transnational (regional-international)	
Broad enquiry framework	Actor/actant-network theory • Actors • Actants • Actor/actant-networks	*Moments of translation* • Problematisation • Interessement • Enrolment • Mobilisation *Incorporating* • Creswell's (2003) generic steps in qualitative enquiry data analysis, determining *in-vivo* 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.

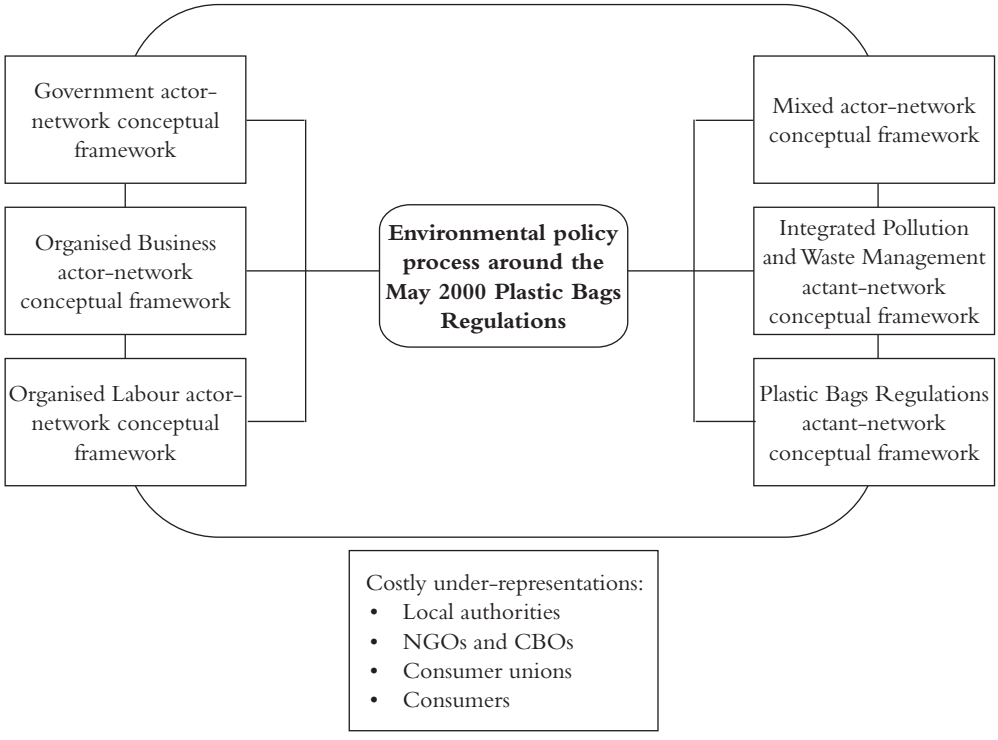
A major challenge was the difficulties in providing empirical evidence to 'measure' relationships and networks. To this end, I relied heavily on thick, rich descriptions of phenomena. This is an aspect that complements policy and qualitative research-oriented studies like this one.

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.

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Sustainable Schools in the UN Decade of Education for Sustainable Development: Meeting the challenge?

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Abstract

Within UNESCO's conception of Education for Sustainable Development (ESD), schools should be implementing approaches to teaching and learning that integrate goals for conservation, social justice, appropriate development and democracy into a vision and a mission of personal and social change. ESD also involves developing the kinds of civic virtues and skills that can empower all citizens and, through them, our social institutions, to play leading roles in the transition to a sustainable future. As such, ESD encompasses a vision for global society that is not only ecologically sustainable but also one that is socially and economically sustainable. This paper traces the history of ESD in Victorian schools and analyses the current sustainability policies and initiatives in terms of their achievement of the educational, environmental, economic and social indicators of ESD. It also problematises the feasibility, and desirability, of any one programme being able to incorporate all aspects of ESD as elaborated by UNESCO.

Introduction

Environmental education in formal education in Victoria (Australia) has a long history. Some organisations, such as the Gould League, trace their involvement in kindred movements such as bird protection and nature study back to their foundation in 1908 as the Gould League of Bird Lovers. Other organisations are perhaps more realistic and date their commitment to environmental education to the rise of the movement in the 1960s.[1] However, all have traditionally focused on education in, about and for the *natural* environment. The built environment and other aspects of the environment in its totality did not rate highly in the practice of environmental education in Victoria for much of the history, despite the guiding principle from the UNESCO-UNEP Intergovernmental Conference on Environmental Education that 'environmental education should consider the environment in its totality – natural and built, technological and social (economic, political, technological, cultural-historical, moral, aesthetic)' (UNESCO, 1978:27).

Internationally, during the 1980s and 1990s, use of the language of sustainable development and sustainability began to emerge, popularised by the World Conservation Strategy in 1980, the World Commission on Environment and Development in 1987 (the Brundtland Commission) and revisited in 1992 through the United Nations Conference on Environment and Development (the Earth Summit in Rio de Janiero). Since this time, a much stronger

emphasis has been placed upon trying to integrate thinking and action around ecological, social and economic systems.

The United Nations Decade of Education for Sustainable Development has its origins in the succession of international environmental events which culminated in the World Summit on Sustainable Development, held in Johannesburg, South Africa, in September 2002. Here, previous notions of environmental education (EE) were 'broadened to encompass social justice and the fight against poverty as key principles of development that is sustainable. The human and social aspects of sustainable development meant that solidarity, equity, partnership and cooperation were as crucial as scientific approaches to environmental protection' (UNESCO, 2004:7). This broadened notion is known as Education for Sustainable Development (ESD), or Education for Sustainability (EfS) in some places. This is not the place to debate about the differences between EE and ESD or EfS,[2] but the paper does examine the slide between EE and EfS in Australian and Victorian government statements, to the point of direct substitution.

At a simplistic level, environmental education and education for sustainable development are concerned with achieving the same ends: enabling learners to question unsustainable practices and participate in changing these practices. The difference is in the scope covered in achieving this goal, and in the focus. Environmental education has traditionally been problem-focused: its goals and objectives have usually referred to the environment and its associated problems, and resolving these. Education for sustainable development encompasses environmental education, setting it in the broader context of socio-cultural factors and the socio-political issues of equity, poverty, democracy and quality of life, as well as a development perspective on social change and evolving circumstances. It still has much in common with earlier conceptions of environmental education, including objectives encouraging critical thinking, values analysis and active citizenship in environmental contexts, but differs in that ESD is envisaged as 'ultimately about education and capacity building and only secondly about environmental problem-solving' (Fien, 2001:19).

Implementing ESD in schools involves approaches to teaching and learning that integrate goals for conservation, social justice, appropriate development and democracy into a vision and a mission of personal and social change. It also involves developing the kinds of civic virtues and skills that can empower all citizens and, through them, our social institutions, to play leading roles in the transition to a sustainable future. As such, ESD encompasses a vision for global society that is not only ecologically sustainable but also one that is socially and economically sustainable. Thus, the key areas identified with the concept of ESD, and interlinked through the dimension of culture, are society, environment and economy. In this paper I wish to problematise the possibilities that such a vision is achievable through schools, including those that would, from their rhetoric, seem to be designed to achieve such goals.

The Sustainable Schools programme in Victoria, Australia, is concerned with developing learning environments and learning experiences that will enable students to work towards having a good quality of life in a sustainable environment. The experiences of schools in the Sustainable Schools programme provide some insights into how ESD is being implemented in Victorian schools so that it achieves its goals for the development of society. Drawing on findings from a recent evaluation of the experiences of six Sustainable Schools in terms of

their achievement of educational, environmental, economic and social indicators of quality education (Gough, 2004; 2005), the paper also problematises the feasibility, and desirability, of any one programme being able to incorporate all aspects of ESD as elaborated by UNESCO (2004).

The specific research questions to be addressed firstly relate to the operation of the programme within the schools and secondly to the relationship between the Sustainable Schools programme and the UNESCO ESD agenda:

- Is the overall approach working?
- Does it meet the needs of schools?
- What outcomes have been achieved by the schools?
- What is the relationship between the Sustainable Schools programme and the UNESCO ESD agenda?

Environmental education has been marginalised within educational discourses for more than three decades, but the United Nations Decade of Education for Sustainable Development agenda could be seen as an attempt to centralise ESD in educational discourses, particularly as it interweaves a range of international initiatives, including the Millennium Development Goal process, the Education for All movement and the United Nations Literacy Decade with ESD.

History of Environmental Education in Victoria

Environmental education in schools in Victoria has been supported by the Department of Education since the 1960s (or even earlier in some instances). This support has included the Department's own activities and the secondment of teachers to various environment-related organisations to work with teachers and students. The Department formed an Environmental Education Curriculum Committee in 1983 to help guide its further work in the area, and disbanded it at the end of 1987 to focus on implementing the State Conservation Strategy.

In 1987, the Victorian government announced its full support for the establishment of environmental education in Victorian schools as part of a *State Conservation Strategy* which stated explicitly that, as government policy, environmental education should be part of the school curriculum and that schools should develop their own policies for environmental education.

As part of this policy, the government provided resources and support materials to assist and promote the implementation of environmental education in Victorian schools. For example, the Victorian Environmental Education Council (VEEC) was established in 1989 'to coordinate, monitor and advise on environmental education and assist in the development of environmental education strategies and projects across the state' (Government of Victoria, 1987:92). VEEC was disbanded in December 1993 following a change in state government.

In 1990, Victoria's Ministry of Education launched a *Ministerial Policy on Environmental Education* which encouraged schools to develop an environmental education curriculum that involves all students throughout their years of schooling, and the entire school community — students, staff and parents. The policy recognised that environmental education may be a separate subject in the curriculum or it may be incorporated in a number of areas in the curriculum. For example, Victoria has had a separate subject at senior secondary school level

since the 1970s. The 1990 policy also recognised a number of other traditional approaches to incorporating environmental education into the school curriculum through one-off events, including topics in subjects, or through electives.

This policy was replaced in 1998 by *Investing in the Future: Environmental Education for Victoria's Schools* (Education Victoria, 1998). Although the state government changed in 1999, this policy has not yet been rescinded, but a successor document is mooted for the near future to complement *The Way Forward: An Environmental Sustainability Strategy for the Department of Education and Training* (DET, 2005) and *Educating for a Sustainable Future: A National Environmental Education Statement for Australian Schools* (DEH, 2005). Current initiatives acknowledged in *The Way Forward* include:

- Schools are integrating sustainability education through implementing the Victorian Essential Learning Standards (VELS)[3]
- The Sustainable Schools initiative provides a whole school planning approach to integrate curriculum planning and facilities management to promote environmental action. Over 140 schools in metropolitan, rural and regional areas are using components of the programme
- The Strategic Partnerships programme provides funding for over 20 organisations to deliver environmental education programmes in schools, including the funding of an environmental network that has enabled the sharing of the work of organisations, the promotion of collaborative partnerships and the facilitation of professional development opportunities
- The Department's Facilities and Infrastructure Division has undertaken a range of initiatives to investigate Environmentally Sustainable Design (ESD) opportunities in schools

This Strategy differs from the previous policies in that it is taking a 'whole Department' approach, similar to the 'whole school' approach adopted in the Sustainable Schools initiative. It is also different in that the Department is accountable to the Government to achieve certain outcomes (as part of the Environmental Sustainability Framework (DSE, 2005a)), whereas schools were not accountable in the previous policies (and still are not accountable). According to the Strategy (DET, 2005:2):

> The Department is committed to achieving the Government goals and targets for environmental sustainability and developing Victorians' knowledge and skill base to appropriately respond to pressures on the environment. The Department will do this by:
>
> - improving the environmental performance of the Department's corporate, TAFE [Technical and Further Education] and school facilities,
> - increasing awareness and understanding of environmental sustainability in the Department, our stakeholders and the wider community, and
> - supporting whole school planning in education for a sustainable environment in schools through student learning.

The Transition to ESD/EfS

Developments in environmental education in Victoria have tended to follow international trends. For example, the Victorian Environmental Education Council's environmental education strategy (VEEC, 1992:7) invokes the authority of UNESCO-UNEP in noting that 'a comprehensive, widely accepted and enduring description of environmental education was adopted by the Intergovernmental Conference on Environmental Education at Tbilisi, in the former USSR, in 1977' and proceeds to use this as a framework for action. It is therefore not unexpected that the language of sustainability is beginning to permeate education policy documents to match the changes in international discourses. The most recent of these documents is the Department of Sustainability and Environment's draft *Learning to Live Sustainably* Strategy and Action Plan, which invokes the Decade of Education for Sustainable Development (DESD) as its international contextualising document (DSE, 2005b:21).

The language of sustainable development in an educational context has been around for over two decades. For example, one of the 'strategic principles' in the National Conservation Strategy for Australia (NCSA) was to 'educate the community about the interdependence of sustainable development and conservation' (DHAE, 1984:16). Similar language is used in the Environment Australia (2000) document *Environmental Education for a Sustainable Future: National Action Plan*:

> Environmental education is defined in its broadest sense to encompass raising awareness, acquiring new perspectives, values, knowledge and skills, and formal and informal processes leading to changed behaviour in support of an ecologically sustainable environment.

The extensive discussions in the literature about the differences between environmental education and education for sustainable development seem to have been overlooked by the Australian – and the Victorian – governments. At the national level there has been a shift from 'environmental education' to 'education for (environmental) sustainability' within Department of the Environment and Heritage (DEH) activities. Nationally, carriage for implementing the United Nations Decade rests solidly with the Department of the Environment and Heritage which hosts the Australian Government's home page for the Decade of Education for Sustainable Development (www.deh.gov.au/education/decade/index.html) – indeed there is no mention of the Decade on the Department of Education, Science and Training's website. Given the national level association of the Decade with the Australian Government's environment department, it is perhaps not surprising that the shift from environmental education to 'education for (environmental) sustainability' has unquestioningly occurred.

For example, even though she acknowledges that 'Education for sustainable development addresses the complexity and interconnectedness of problems such as poverty, wasteful consumption, environmental degradation, urban decay, population growth, health, conflict and the violation of human rights', in her statement on Australian Government engagement with the UN Decade of Education for Sustainable Development 2005–2014, Cornish (2005)

specifically refers to developing and expanding existing programmes, including:

- the National Environmental Education Council (NEEC) continuing its role of identifying and advising the Minister for the Environment and Heritage on key priorities in Education for Sustainability, and providing national leadership in this area;
- *Educating for a Sustainable Future: A National Environmental Education Statement for Australian Schools* (DEH, 2005), which refers to both environmental education and education for environmental sustainability, apparently accepting a broader conceptualisation – 'environmental education has now evolved in the 21st century to embody sustainability in its broadest sense' (DEH, 2005:6) – but then only focusing on environmental sustainability in the remainder of the document; and
- the Australian Sustainable Schools Initiative, which focuses on developing environmental sustainability in schools, 'is one of the leading initiatives in support of the Decade' (Smith, 2006:2): 'Through this initiative the whole school community is actively involved in making their school more sustainable, while teachers have much needed access to professional development in environmental education' (Cornish, 2005).

At both national and Victorian levels, the dominant terminology is education for sustainability (EfS) (with an emphasis on environmental sustainability) rather than education for sustainable development (ESD). Such terminology is consistent with that used by Fien (2001) and in New Zealand (PCE, 2004), but inconsistent with developments elsewhere in the world – and different from that of the United Nations Decade.

DESD as Interpreted in Victoria

The current Victorian Labor government, elected in late 1999, has a comprehensive environmental reform agenda. This includes the Victorian Greenhouse Strategy (DNRE, 2002) which sets energy consumption reduction targets to address the challenge of climate change, and the Environmental Sustainability Framework (Department of Sustainability and the Environment, 2005a) which brings together environmental sustainability and economic wellbeing. This Framework has a companion state-wide draft *Learning to Live Sustainably* Strategy and Action Plan (DSE, 2005b) which aims to 'position Victoria as a world leader in education and behaviour change for environmental sustainability' (2005b:5), and as mentioned above, the Department of Education and Training has developed *The Way Forward: An Environmental Sustainability Strategy for the Department of Education and Training* (DET, 2005) as a subsequent related strategy. However, despite all of these documents appearing in 2005, it is only the draft *Learning to Live Sustainably* Strategy document which refers to the Decade of Education for Sustainable Development (DESD). This Strategy 'coincides with and will be linked to the United Nations Decade of Education for Sustainable Development (2005–2014)' (2005b:6) and its 'objective of giving an enhanced profile to the central role of education and learning in the common pursuit of sustainable development' (2005b:21).

Overall, in both Victoria and nationally, up until the present time, the Decade has had a very low profile and has been interpreted as an environmental sustainability agenda rather than one which includes social and economic sustainability. The narrowness of this response is obvious

when compared with the 15 strategic perspectives 'and the connections between them [which] must inform education and learning for sustainable development' (UNESCO, 2004:17):

Socio-cultural perspectives

- Human rights
- Peace and human security
- Gender equality
- Cultural diversity and intercultural understanding
- Health
- HIV/AIDS
- Governance

Environmental perspectives

- Natural resources
- Climate change
- Rural transformation
- Sustainable urbanisation
- Disaster prevention and mitigation

Economic perspectives

- Poverty reduction
- Corporate responsibility and accountability
- Market economy

Sustainable Schools Initiative

The Sustainable Schools initiative is a key part of the response to the Decade both in Victoria and nationally. Australia's Sustainable Schools programmes developed contemporaneously with eco-school and green school programmes in other countries. This, in some ways unfortunately named[4] initiative, also developed differently at the same time in two Australian states.

In New South Wales, the programme employed and trained a team of facilitators to assist schools to prepare a School Environmental Management Plan, whereas in Victoria, Sustainable Schools provides a holistic education programme on sustainability for schools, building on the expertise of the many different groups already working in this field. The focus of the programme is on quadruple bottom-line outcomes – educational, environmental, social and economic. In 2004 the programme became a national one, funded by the Department of the Environment and Heritage. According to Cornish (2005:5–6):

> Through this initiative the whole school community is actively involved in making their school more sustainable, while teachers have much needed access to professional development in environmental education[5]… While the implementation of sustainable schools in each State and Territory is different and responds to the demands of local education systems as well as the roles of participating NGOs, the programme embodies a strongly collaborative approach.

> In breaking down the silo mentality and approaching environmental and educational outcomes in a holistic manner, the Sustainable Schools initiative puts into practice much of the thinking and strategies behind the Decade. The Decade represents an opportunity to continue to build this programme, and to further explore innovative partnerships.

A national Australian Sustainable Schools Initiative (AuSSI) framework is currently being developed (Smith, 2006). This framework acknowledges and draws upon similar international initiatives: ENSI Eco-Schools, FEE International Eco-Schools, China's Green Schools Project, Sweden's Green School Award Programme and New Zealand's Enviroschools programme.[6]

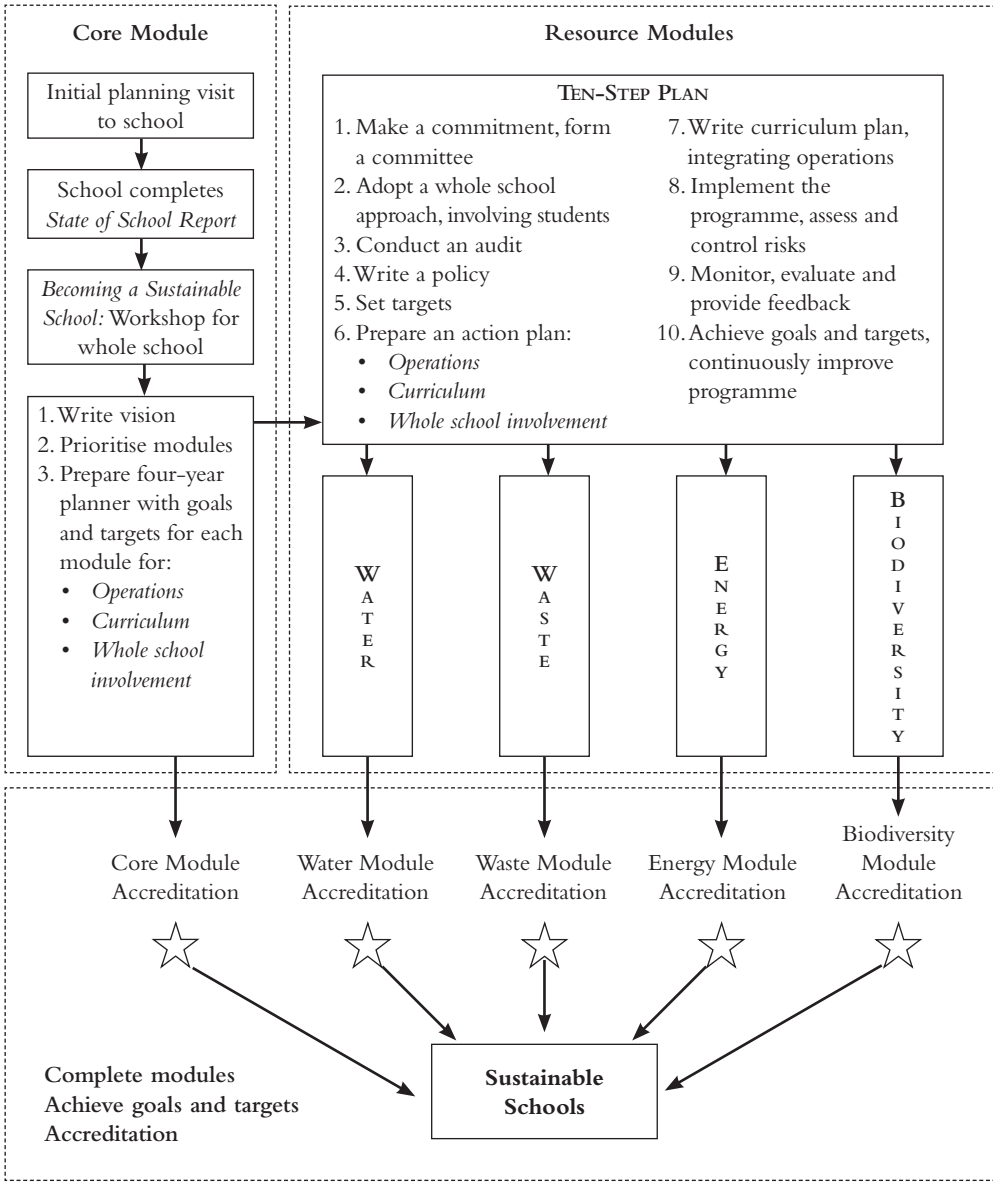
The Sustainable Schools initiative in Australia, and its equivalents in other countries, embody a different vision of education and administration of schools. School grounds development projects, such as *Learning through Landscapes* (Adams, 1990), *Learnscapes* (www.learnscapes.org) and *Bringing School Grounds Alive* (Smith, 1975), shifted the emphasis for environmental education in schools from the curriculum to also consider the educational context, but, in Australia, it was not until innovations such as the Gould League's Waste Wise Schools programme[7] that there was a focus on promoting cultural change across the whole school community (in this instance by providing teachers with a framework for the whole school community to effectively introduce and maintain a waste and litter minimisation programme in a school (Armstrong *et al.*, 2003). A recent survey of international literature in environmental education for the New Zealand Ministry of Education noted that 'whole-school approaches are advocated as best supporting the implementation of Environmental Education in a way that reflects the goals, aims, and purposes of this area … Whole school approaches also appear to be most successful when they build on the existing culture, priorities, and values of schools and their communities' (Bolstad *et al.*, 2004:95).

In Victoria, Sustainable Schools integrates changes to the practical operations of the school with sustainability issues in the curriculum, and helps to build links to local communities. It provides participating schools with:

- Customised professional development, in which schools choose the Core unit and the sequence for the four optional themes
- The Core unit ('Schools Becoming Sustainable'), which includes stimulating professional development for teachers about the direction and purpose of education for sustainability, and strategies to develop an overall long-term plan for sustainability for the school
- Coordination, guidance and support
- Specialist consultants in each of the four optional themes (Water, Waste, Energy and School Grounds/Biodiversity)[8]

Central to the Sustainable Schools process is the Ten-Step plan which is designed as an action research process to ensure commitment and ownership of the initiative by the whole school community, not just an enthusiastic individual (and so is much more likely to be sustainable). This Ten-Step plan is followed through the implementation of the core module and each of the four resource modules. When schools have completed a module and achieved their goals and targets, they apply for accreditation. This process is summarised in Figure 1.

Figure 1. The Sustainable Schools process (after Armstrong and Bottomley, 2003:14)



In 2004, I evaluated six Sustainable Schools in Victoria, all of which are working towards a sustainable future through their school operations, curriculum and whole school involvement. The focus for my evaluation was their work in the area of water management (Stormwater Action Project), but this was within the broader context of the process of them engaging with

the whole Sustainable Schools programme. The evaluation related to the schools' experiences in trialling the implementation of water/stormwater-related themes in their curriculum and operations, and retrofitting stormwater equipment to support their water/stormwater programmes. The following discussion is based on the findings from this evaluation study (the full report of the study and summary of the findings have been published elsewhere and will not be repeated here, see Gough 2004; 2005).

Their involvement in Sustainable Schools, and particularly the Stormwater Action Project, has led to each school achieving economic, educational, environmental and social outcomes (see Gough 2004; 2005), together with achievements such as:

- Embedding Sustainable Schools in their school operations and curriculum across all Key Learning Areas
- Engaging student learning
- Involving students in working towards a sustainable future
- Developing extensive links with their local (and often broader) communities
- High staff and student morale in the school
- Establishing a basis for future development as a Sustainable School and model for others

For some, these schools are achieving a quadruple bottom line and can be classified as highly successful and worthy of emulation. The schools have significant financial savings, there are improved environmental outcomes, the educational programmes are leading to improved educational outcomes, and there are social outcomes for students, teachers, parents and the community. However, while their outcomes are many, within a DESD context they have had very limited success in learning for sustainable development as their achievements are solely within the natural resources component of the environmental perspective, with no contribution towards learning in the other strategic fourteen perspectives of ESD. Indeed, the focus of the Sustainable Schools initiative is consistent with the description of environmental education contained in the UNESCO Decade implementation plan with its focus on 'humankind's relationship with the natural environment and on ways to conserve and preserve it and properly steward its resources', and without 'the broader context of socio-cultural factors and the socio-political issues of equity, poverty, democracy and quality of life' (2004:16).

This observation is not unique; Henderson and Tilbury (2004:29) note that the socio-cultural dimensions of EfS do not appear as prominent components in international examples of whole school programmes like Sustainable Schools. The six schools I evaluated are also manifesting the evolution 'from a narrow environmental management or practical greening focus to a more holistic focus of sustainability and promoting the development of participatory learning and decision-making skills associated with EFS' noted by Henderson and Tilbury (2004:29).

As well as a focus on school operations and whole school involvement, there are clear links to the curriculum contained within the Sustainable Schools model, but these links are limited to the four areas of energy, water, waste and biodiversity rather than the fifteen strategic perspectives of the DESD agenda. However, Sustainable Schools is focusing on important areas: Australia's green credentials aren't as good as we think. The recently released Environmental Performance Index reveals that Australia is lagging behind on water consumption, air quality, sustainable energy and biodiversity protection. Australia came 20th out of 133 nations – behind

New Zealand, Sweden, Finland, Czech Republic, Austria, Britain, Denmark, Canada, Malaysia and Ireland (Center for Environmental Law and Policy, 2006).

Nevertheless, this does raise questions about Sustainable Schools in the context of the DESD agenda, especially when the initiative is seen as so central to the implementation of the agenda in Australia and Victoria:

- Should the narrow focus of Sustainable Schools compared with the DESD agenda be seen as a deficiency in Sustainable Schools? That is, is it enough to turn off lights and plant native trees?
- Should Sustainable Schools broaden their agenda to take into account the other perspectives of the DESD agenda?
- Is the DESD agenda too broad to be implemented within such programmes as Sustainable Schools? If so, how should it be implemented in schools?

Working at the Margins of Sustainability and Education

In responding to the first of these questions, an important consideration is whether the Sustainable Schools initiative will become part of the core focus of all schools, or whether it will continue to be an initiative for the minority. At present, just over 140 schools out of nearly 2 000 in Victoria are part of the Sustainable Schools programme in Victoria, and currently there are no plans by the Department of Education and Training to expand the programme. The Australian Government funding is mainly focused on rolling out the programme in other States and Territories, so the growth potential for the programme in Victoria is limited to those schools who can afford to buy the delivery of the professional development programmes for their staff. This would seem to be working to keep Sustainable Schools at the margins of educational reforms, even though the initiative is given a high profile in the implementation strategy for the Decade by the Australian Department of the Environment and Heritage, and in the Victorian Department of Education and Training.

The Department of Education and Training's *The Way Forward: An Environmental Sustainability Strategy for the Department of Education and Training* (DET, 2005) also has great confidence in the *Victorian Essential Learning Standards* (VELS; VCAA, 2005) providing a framework for implementing education for sustainability. 'VELS have been designed to support students in developing a set of knowledge, skills and behaviours which will prepare them to create a future which: is sustainable – developing an understanding of the interaction between social, economic and environmental systems and how to manage them' (James, 2006:26). However, while VELS are providing a model for curriculum in Victoria which encourages different starting points for addressing the question 'What do students need to know and what should they be able to do to succeed in the future?', the implementation of the standards 'which support, and demonstrate the multidisciplinary nature of sustainability education' (James, 2006:26) is the responsibility of the individual teacher and school, and without a whole school approach to education for sustainability to underpin what students and teachers are learning, the standards will be isolated accountabilities in students' and teachers' lives. Here, I converge with Scott's concern that 'ESD has to involve more than a string of unconnected activities' (2005:4), and there is a danger that

by teaching a string of unconnected standards teachers might assume that they were doing ESD.

Thus, although sustainability is more central to the focus of VELS than in previous curriculum models, it is still marginalised through the operationalisation of the standards into learning programmes for students. In addition, teachers have struggled to implement environmental education under previous simpler curriculum Key Learning Area-based models, such as the Victorian Curriculum and Standards Framework, so it is debatable that they will be able to implement the more complex ESD perspectives within a more complex three-stranded curriculum model without considerable support, which does not seem to be forthcoming.

Statements related to environmental education or education for sustainable development/sustainability still generally come from environment agencies rather than education departments, which is an ongoing problem for moving the field from the margins as they reinforce the field as a political rather than an educational priority. Four examples stand out here:

- The lead document for Education for Sustainability in Victoria, *Learning to Live Sustainably*, is being developed by the Department of Sustainability and Environment (DSE, 2005a)
- *Educating for a Sustainable Future: A National Statement on Environmental Education for Schools* was sponsored by the Australian Department of the Environment and Heritage (DEH, 2005)
- The Australian Sustainable Schools Initiative is being funded by the Australian Department of the Environment and Heritage
- The Australian Government's website for the Decade of Education for Sustainable Development is hosted by the Department of the Environment and Heritage

Even when statements related to environmental education or education for sustainable development come from education departments they are often toothless tigers as they are generally guidelines and not mandated or accountable which again reinforces their marginal status.

Conclusion

The UNESCO Decade of Education for Sustainable Development International Implementation Scheme (2004) is very strong in distinguishing between environmental education and education for sustainable development. However, in Australia, there is much evidence that the two are being conflated with (environmental) education for sustainability and non-natural resources perspectives are being overlooked. This conflation or, in some instances, word substitution in government documents is creating some degree of confusion. Nevertheless, many of those formerly identified as environmental educators (see, for example, Fien 2001; Henderson & Tilbury 2004), and the Australian Association for Environmental Education, seem to have embraced the DESD agenda. While not embracing the new agenda might be seen as recalcitrant, the embracing of the new agenda without there being changes in practices would seem to be problematic. There is much evidence from the Sustainable Schools initiative discussed earlier in this paper that would seem to support the assertion that Sustainable Schools are working within an EE rather than an ESD framework.

The DESD agenda is very much concerned with education, learning and capacity building rather than problem solving (Fien, 2001; Scott, 2005), but it is difficult to see the agenda being achieved within formal education when the carriage for the Decade and related activities in Australia and Victoria rests with environment departments rather than education departments. Until the vision and accountabilities are forthcoming from the education departments, the agenda will remain on the margins for schools.

The vision of environmental education or education for sustainable development considering the environment in its totality (with environmental, social and economic perspectives/pillars) is a long-standing one. However, in Australia and Victoria, this is still being interpreted as an environmental sustainability agenda in terms of current strategies and frameworks, so this begs the question of when, how and by whom the social and economic pillars of sustainability are to be taken seriously in formal education within an ESD context. Who is going to develop the frameworks for government action in these perspectives? This also leads to a related question: is the DESD agenda too broad for serious consideration within formal education in schools? Experience so far in Victoria would seem to indicate it is.

Notes on the Contributor

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Endnotes

1 The Gould League website (www.gould.vic.edu.au, accessed 14 May 2006) claims that they were involved in environmental education from 1960–1990, however, the term 'environmental education' cannot be traced to earlier than 1964 (USA) and 1965 (UK) (see Gough 1997 for a discussion of this history which draws on Martin (1975), Schoenfeld (1979) and Wheeler (1975)).

2 According to Lang (2004:7), education for sustainable development and education for sustainability should not be used interchangeably 'as the concepts encode different emphases': 'education for sustainable development focuses on the learning process required to support sustainable development' whereas 'education for sustainability has its emphasis in building capacity to live more sustainably'. These subtleties in semantics seem to have escaped most writers in this area in Australia.

3 Victorian Essential Learning Standards are part of the education reform agenda contained in Blueprint for Government Schools (DET, 2003).

4 When asked if he would like to be a sustainable school one Queensland principal replied that yes, he would like to know that his budget and staffing were sustainable.

5 The first sentence in this quote from Cornish exemplifies the Australian Government's approach to Education for Sustainability where it is seen as interchangeable with environmental education, even in

Sustainable Schools.

6 There are also Eco-Schools in South Africa and Green Schools in Taiwan, to name but two similar initiatives.

7 The Waste Wise Schools programme, which began in Victoria in 1998, offers a package of support services to schools to assist them to develop and run their own waste and litter programmes, covering both curriculum and school operating practices. This support includes a comprehensive resource kit; funding towards teacher release for professional development; professional development for teachers and waste educators; ongoing access to specialist advice; a network of support schools to provide working examples of best practice approaches; a website (www.gould.edu.au/wastewise); annual Awards; and Waste Wise Schools accreditation. The aim of the programme is that all schools in Victoria will, sometime in the near future, actively engage in waste wise and other environmentally sustainable practices as part of their school programme. The Waste Wise Schools programme is seen as an important vehicle by which this can be achieved. A key part of the programme is to encourage and support schools to work directly with their local communities to achieve learning and action for a sustainable future.

8 The four optional themes are: 'Waste' (waste and litter minimisation, green purchasing, recycling and composting), 'Energy' (energy efficiency, renewable energy and reduction in greenhouse gas emissions), 'Water' (water conservation, stormwater control and freshwater ecology), and 'School Grounds/Biodiversity' (developing a whole school Masterplan which may include indigenous gardens that attract native butterflies and birds, and special theme gardens and habitats). Participating schools are able to choose all or some of the four optional themes.

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Development of National Assessment Criteria for Green Schools in China

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Abstract

In the Peoples' Republic of China, a green schools programme was initiated in 1996. It has promoted both education reform and socially sustainable development. Recently, the assessment criteria for green schools have become an obstacle to the rapid development of the green school initiative, mainly due to the cultural and social system in Mainland China. Because there are many district criteria which mainly focus on green schools construction and evaluation, it is necessary to have new criteria to replace them. However, the requirements of the existing national criteria aren't detailed, and the requirements don't satisfy evaluation needs after the provincial criteria are replaced. Hence, the new national criteria should include a more comprehensive set of indices and requirements. This paper firstly examines the experiences from other countries and areas, and then analyses weaknesses of the existing green schools assessment process in China. Finally, some understanding about green schools, and principles to establish new national criteria in China, are discussed in the paper. Since new national criteria are being established, they will be applied to the evaluation of the national green schools project in Mainland China in 2006.

Background

The development of green schools in China began in 1996. At that time, three administrations, including the Propaganda Department of the Central Committee of the Communist Party of China, the Ministry of Education and the State Environmental Protection Administration, promulgated a document, *The National Action Programme for Environmental Publicity and Education (1996–2010)*. The concept of green schools was included in the document as well as four indicators of green schools as shown in this statement:

> The main indicators of such schools must show that their students shall conscientiously learn the contents of environmental protection included in teaching materials of various courses, the teachers and students shall have intense environmental awareness, they shall take an active part in environmental supervision, publicity and education geared to the needs of society, and their campuses shall be clean and beautiful.

Since 1996, and especially after 2000, the numbers of green schools have increased rapidly. There are currently about 16 000 green schools in China (www.cgsp.cn/main/cgsop/chinags). The development of green schools promotes environmental awareness of students and

sustainable development in society. There are, however, still many problems in the present green school programme, one of them is its evaluation. Initially there was a set of national assessment criteria, but these only contained 10 core indices for assessment based on the four indicators in the document. These are:

1. Establish a committee for green schools and appoint an environmental manager. Develop a plan to guide green schools construction
2. Provide special financial support for environmental education from the schools
3. Ensure effective approaches for preventing pollution, reducing and recycling garbage, saving energy, etc.
4. Collect and keep all materials related to green school construction
5. Put the context of environment into the main school subjects
6. Encourage teachers to take part in environmental education training programmemes, and to undertake environmental education research
7. Form a school culture of environmental protection. Encourage high levels of environmental awareness amongst students and teachers and ensure active participation in various activities
8. Encourage students and teachers to show life style choices that reflect environmental protection
9. Green the campus
10. Establish a students' environmental group to foster students' participation in environmental management of schools

Although these 10 core indices help to promote green schools, some improvements are required to keep pace with current developments associated with green schools. In 2002, the State Environmental Protection Administration of China supported the *Management Models and Development Strategy of Green Schools in China* programme (Grants 2003-Z-01). The establishment of new national assessment criteria for green schools is one of the tasks of this programme.

The first group of green schools were awarded accreditation by the Guangzhou Municipal Environmental Protection Bureau and Education Commission in 1997. To promote the development of green schools, the State Environmental Protection Administration and Ministry of Education awarded a national commendation to some provincial green schools in 2000. This shows that the district criteria of green schools were established earlier than the 10 core indices at national level were established. Up to now, there are two levels of criteria operating in Mainland China: various district criteria and the 10 national core indices. The district criteria contain the provincial and civic criteria. The original district criteria were developed in Guangzhou. Their indices include four dimensions:

- school management (the green school committee, the plan for green schools, training for the teachers and green schools materials);
- the processes of environmental education (inclusion of environmental education in the main subjects, separate environmental courses, various activities, garbage reducing and recycling, and so on);
- environmental education achievements (the environmental awareness of students,

suggestions for community and awards in environmental education); and
- campus construction and management (greening and cleaning the campus, controlling the pollution).

The contents of the 10 national core indices are similar to the district criteria and are generally used as the guide for green schools construction, but not for the evaluation of green schools, because the national prize of green schools are mainly recommended by the district administration (Chen & Li, 2003).

The purpose of this paper is to establish a basis for the new national assessment criteria for green schools of China, which will replace both the old national criteria and provincial criteria. We believe that the proposed national criteria should be more detailed, and that indices should be added that can be used to evaluate green schools. At the same time, according to the present development of green schools, the contents of the proposed new criteria should be designed so that they combine both the current district criteria and the national criteria.

Methods

In developing new national assessment criteria, the authors of this paper have undertaken a series of measures. First, we collected the materials about green schools abroad and in our country by using websites, magazines and various visits. The materials that we drew on include a range of international examples of criteria from the UK (www.eco-schools.org.uk), the USA (www.dnr.state.wi.us/org/caer/ce/greenschools; www.greenschools.schoolsgogreen.org), Sweden (Zeng, 2003a; 2003b; National Agency for Education of Sweden, 2001:14-24), Japan (Liu, 2003), South Africa (Ward, 2004), the Foundation of Environmental Education (www.eco-schools.org; Zeng, 1999), as well as different districts of China. Many approaches and methods for evaluating green schools were analysed. The positive experiences from those countries and areas in the construction and assessment of green schools were carefully studied. At the same time, the weaknesses of China's green schools assessment were also analysed.

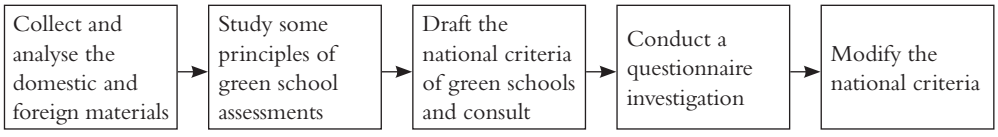
Secondly, the principles of developing and evaluating green schools in China were constructed based on the experiences and weaknesses. Thirdly, the content of new national criteria was proposed by combining the 10 national core indices with district criteria. A draft set of national criteria was developed, which include first- and second-level indices, requirements and information. The new criteria are similar to district criteria in form because the district criteria are most familiar to the schools. The content of the draft was discussed in a special meeting, involving experts from all over China who provided feedback and comments on the proposed indices and requirements. We modified the draft according to their suggestions.

Fourthly, a questionnaire-based investigation focusing on the indices was conducted. The purpose of this was to collect the opinions of managers and experts of green schools during the Green Schools Management Conference in 2003. There were two parts in the survey questionnaires. The first part provided demographic information on those who completed the questionnaires, and included information on gender, age, occupation, serving institute, location of their work, the time they began green schools construction and the prize levels they have achieved. The second part of the questionnaire contained an overview of the green schools

development and evaluation method in China, as well as the opinions about the first- and second-level indices of the proposed national assessment criteria. We disseminated 49 questionnaires. There were 46 effective questionnaires. They were calculated statistically. Some basic data were obtained from this process. The main results showed that the respondents were from 17 provinces in China. Ninety percent of the respondents were between 30–50 years old. Seventy percent of the respondents were optimistic about the development of green schools in China. The data on indices will be discussed in the section on 'findings and discussions' in this paper.

Finally, this draft was modified again, based on the questionnaire survey, and further insights were gained from this process. The research process is summarised in Figure 1 below.

Figure 1. The process of developing national assessment criteria for green schools in China



Findings Informing the Development of National Criteria

Analysis of positive experiences from other countries

We analysed materials on the green schools from various countries, and identified four positive experiences associated with criteria and assessment methods. They are as follows:

1. *Qualitative assessment is the main method of green schools and eco-schools assessment*: There are no absolute quantitative criteria for green schools in other countries. Qualitative assessments focus mainly on the *processes* of green schools construction. For example, criteria focusing on 'environmental review' in the international eco-schools programme are that '*work commences with a review or assessment of the environmental impact of the school. Pupils are involved in this work, ranging from assessing the level of litter on school grounds to checking infrastructure for inefficiencies'* (www.eco-schools.org). The requirements of the eco-schools programme are not totally different from the district criteria in China, which are also the main criteria for Chinese green schools construction. However, the district criteria also include quantitative dimensions, for example, a quantitative index is provided for the 'environmental activities' criteria in the Guangzhou district, where green schools are required to complete 14 activities each year. Quantitative criteria can, however, mask questions of quality in environmental activities in the schools, for the schools generally pay more attention to the quantity than the quality, and quantitative criteria do not therefore necessarily contribute to quality activities.
2. *Environmental issues are the important content in the construction of green schools*: There are many requirements for the construction of green schools in different countries. It was noted that some requirements focus on schools' environmental issues. The schools must adopt several approaches for attaining the objectives of environmental improvement. One of the approaches is to teach courses of study which include environmental content. In fact, in some countries, environmental issues are a main focus of green

schools. For example, there are 10 environmental issue topics that are incorporated into the requirements of green schools construction in Wisconsin State, USA.

3. *Giving courses is a major approach of green schools construction*: In some countries, the green schools criteria focus on the teaching programmeme and the courses taught in schools. In New England in the USA, there is even a requirement that such courses should be integrated. The first indicator of the criteria in South Africa is *inclusion of focus areas in curriculum*. Courses that include environment or separate environmental courses also comprise the main indices in the existing criteria for green schools in China.
4. *Environmental review is a foundational process in green schools construction*: Environmental review is the foundation of green schools construction in many countries. It is the second step in eco-schools programmeme of Europe and is also a central process in the South African eco-schools programmeme. Green schools construction in China lacks this focus on environmental review, although there is such a requirement in the Guide for China's Green Schools which was issued by the Centre of Environmental Education and Communication of State Environmental Protection Administration. The district criteria, however, don't contain the requirement. This gap will be addressed in the new national criteria.

Actually, the process of developing green schools differs from country to country, even in the same programme, such as the eco-schools programme. The process in the UK is quite different from South Africa. Unlike three-level rewards in UK, South Africa uses a process of portfolio assessment. To sum up the criteria in those countries and areas, we have observed that there are two aims of green schools: one is to raise the environmental awareness of both students and teachers. The other is to improve the school environmental situation. These two issues are also included in the concept of green schools in China.

The weakness of green schools assessment in China

There are two main weaknesses in the green schools assessment in China. On the one hand, there are too many district criteria which lack justice when evaluating the green schools, as the number of national green schools prizes are limited for different provinces. Some green schools couldn't be awarded even though they have met all the criteria and have shown evidence of great achievements. One of the reasons is that there are certain differences in the requirements in various provinces, even though the indices are almost the same. Therefore, it is necessary for the new national criteria to replace the old national and provincial criteria. On the other hand, the 10 existing national core indices aren't detailed enough, and the requirements don't satisfy evaluation needs after the provincial criteria are replaced. Hence, the new national criteria should add further indices and requirements. In addition, the evaluation process in other countries highlights a number of areas that could enhance the China green schools evaluation process, including the focus on schools' environmental management systems and continuous improvement; sustainable environment practice; and environmental review. These three aspects should be enhanced in the national criteria through assessment indices and the evaluation process. The continuous improvement of environment and environmental education is one of the main problems for green schools in China. The basic reason is that the content about continued improvement is missing in most of the district criteria.

Understanding green schools and investigating first level-indices of national criteria

As mentioned above, criteria of green schools need to be constantly updated, as green schools today are likely to be different from those of yesterday (Zhang, 2000). Therefore, a key to the establishment of the national criteria is how to understand the dynamic nature of green schools. We think modern green schools should contain three aspects: environmental management, environmental education and environmental facilities. *Environmental management* means that an environmental management system is provided based on the concept of the ISO 14000 standard, which is compiled by the International Standard Organization for protecting environment and raising the level of environmental management of any organisation. The ISO 14000 is a management system standard that is aimed at constant improvement. There are six steps to provide a school environmental management system. Providing and running the system will be helpful for environmental improvement in the schools (Chen, 2002). *Environmental education* means that the courses should contain the contexts and content needed to develop knowledge of environmental protection, and environmental activities should be developed to develop skills and values to respond to environmental issues. The schools gain achievements in environmental education through these courses and activities. *Environmental facilities* means that there are various approaches and material needs for preventing environmental pollution and saving resources.

Another important dimension is to ensure that the characteristics of green schools construction are encouraged in different schools. The characteristics show that there are different topics, approaches and achievements of green schools construction. For example, an art course containing environmental education is one of the characteristics of Guangzhou Zhixin Middle School. The goal of green schools construction is to promote both environmentally organised and managed schools, as well as social and sustainable development. Understanding green schools in this way is foundational to establishing national assessment criteria that will be broad-based, responsive and dynamic. This finding was identified in the 46 questionnaire surveys conducted amongst experts and managers of green schools in China, and through the discussion in the special meeting. The contents therefore make up the first-level indices of the proposed national assessment criteria. The goal and understanding of green schools in China are showed in Figure 2. Questionnaire survey results are shown in Table 1.

Figure 2. The goal and understanding of green schools construction in China

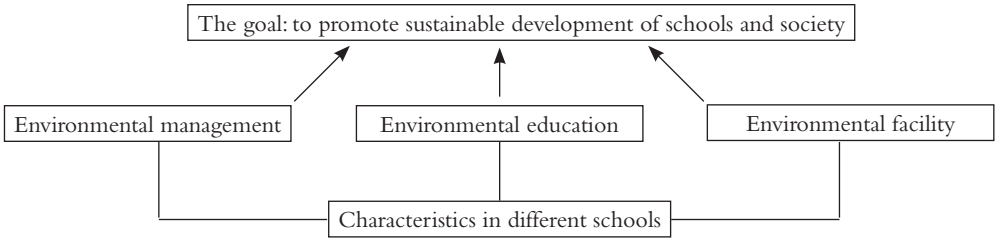


Table 1. The result of questionnaire survey focusing on first-level indices

First-Level Indices	'Green thought' about School Construction	Environmental Facility of Campus	Environmental Management	Environmental Education and Effect	Characteristics
Persons	42	32	36	44	35
Percentage	91.3	69.6	78.3	95.7	76.1

The 'characteristics' in Table 1 refer to special curriculum plans, teaching plans and methods, activities, campus culture of green school construction, etc. Table 1 shows that the majority of experts and managers agreed to the first-level indices which were designed by us. The percentages are different: 91.3% indicated that 'green thought' was important; 69.6% indicated that 'environmental facility' was important; 78.3% indicated that 'environmental management' was important; 95.7% indicated that 'environmental education and effect' was important, and 76.1% indicated that 'characteristics' were important. When the national assessment criteria were modified, the first-level indices in Table 1 were divided into six indices for the sake of enabling more effective evaluation processes.

Establishing National Assessment Criteria

Focusing on environmental improvement

The process of establishing national assessment criteria, should (as argued above) be materialised in the steps of green schools construction, such as establishing the environment committee, environmental review, compiling the plans, implementation and evaluation, etc. The steps used in green school construction are similar to the process requirements of ISO 14001. Actually, the eco-schools programme in Europe requires that the schools provide an integrated system for environmental management based on an ISO 14001/EMAS (Environmental Management Audit System) approach. The ISO 14001 management standard is useful to inform the development of national criteria of China. ISO 14001 is the main standard of the ISO 14000 series of environmental standards. It requires organizations to develop a system for environmental management, and to make it work through ongoing evaluation, review and improvement. The better the system works, the better environmental protection and management, will be carried out. In the construction of green schools, if the schools can develop an environmental management system (EMS) based on continuous evaluation, review and improvement, this could ensure continuous improvement of environment and environmental education. Using the ISO 14001 standard as outlined by the ISO, will, however, be a very complex system for schools to use. The thought or key concepts of the ISO 14001 system standard, however, can be (and has been) adapted to guide national criteria, especially the main concept of continuous improvement.

Principles guiding national assessment criteria

Based on the experiences of other countries and areas, and on the weaknesses identified in China's green schools criteria, as well as the survey and discussions, four principles to establish the national criteria are put forward. These are:

- control or guide the whole processes of green schools construction through ensuring that there are environmental policies and regulations in each department of the schools;
- encourage schools to design and develop the topics, approaches and achievements of green schools themselves;
- continuously improve the school environment and environmental education; and
- encourage the participation of all students and teachers.

The proposed national assessment criteria of green schools

These proposed national assessment criteria are set up according to our understanding about green schools, as well as the thought and principles guiding establishment of the national assessment criteria reported in this paper. There are six first-level indices:

- 'Green thought' about school construction
- Environmental management on campus
- The curriculum and environmental education
- Activities in environmental education
- The running of environmental facilities
- The characteristics of different green schools

There are 18 second-level indices in the criteria. Each of the second-level indices are related to the first-level indices, and as such they 'give effect' to the first-level indices. Each of the second-level indices contain certain requirements and information. The first- and second-level indices, requirements and information are shown in the Table 2.

Table 2. The national assessment criteria of green schools in China

First-level Indices (Criteria)	Second-Level Indices	Requirements	Information
'Green thought' about School Construction	Approaches and objectives of schools' construction	• Obvious 'Green element' contained in the construction objectives of the school. • Ideas of the green school construction are well thought through and clear • Green school construction combined with capability construction of the school	• Review all documents, the plan of school development, headmaster's speech for students and teachers, etc. • *Review the headmaster's training certificate which is certificated by State Environmental Protection Administration*

First-level Indices (Criteria)	Second-Level Indices	Requirements	Information
	Plans and policies	• Special plans guiding green school construction are in place • School has environmental policies • Regulations for recognising people active in green school construction are in place	• *Review the plans of green school construction and environmental policies* • Review prize certificates or correlative material
Environmental Management on Campus	*Organization and financial support*	• Environmental committee is formed and has regular meetings. Members of committee contain the leaders, teachers, students, community members and NGO members, etc. • Funding support is provided from different sources, including government, non-government organisations, other social organisations and persons, etc.	• *Review the list and record of committee meetings* • *Review the material pertaining to financial planning and use* • Review material pertaining to donations from organisations and persons, resource saving, etc.
	Continued improvement and actions	• An environmental review is conducted at the start of green school construction and at the end of each year • Improvement plans for environment and environmental education exist in each department of the school, and there are the approaches and methods for the plans	• *Review the assessment report and the improvement plans in environment and EE* • Review the general plans and action plans, activities plans, as well as achievements from each department
	Construction of teachers' team	• A general plan for teacher training in EE exists in the school, and the plan is implemented and gains achievements	• Review plans for the teacher training in EE • *Review certificates for green schools and EE training, as well as EE conference events. Review school-based EE training plans and correlative material* • Review EE articles and prizes for or by the teachers

First-level Indices (Criteria)	Second-Level Indices	Requirements	Information
	Communication of information and archive construction	• Staff are timely informed of relevant green school information, and staff know this information • Suggestions and comments about the green school construction made by teachers and students are adopted • All materials related to green school construction are collected and kept	• *Review the documents on establishing communicating channels and achievements* • Review suggestions and comments from the students and teachers • R*eview the archives*
Curriculum and Environmental Education	*Curriculum construction plans, teaching materials, articles, etc.*	• Environmental issues are part of the curriculum according to the requirements of Ministry of Education in China • School has a plan of curriculum integration for EE, as well as approaches and methods for the plan. It is better if there is an independent environmental course • More than 30% of the contents is about environmental issues in the research course • The teachers pay attention to EE research and publish articles • There is at least one elective course in EE (in the high schools)	• *Review curriculum plans, subject plans, special EE plans, etc.* • *Review teaching plans of the teachers, teaching materials, test papers, teaching evaluation materials, etc.* • Review the achievements of the research course
	Special topic course in environmental education	• School has a special topic course in EE based on the *General Outline of Environmental Education Special Topic Course in Primary and Middle of China*, which is issued by Ministry of Education	• *Review teaching plans, teaching materials, the materials of teaching evaluation for the special topic course in EE,* as well as the achievements
	Education resources in environmental education	• Various teaching resources are used for EE, such as school garden, the zoo and city arboretums, Internet, TV, and so on • A teaching place for EE exists outside the school. Regular activities take place	• Review the school garden and materials used for EE from the internet, TV and other sources • Review materials on the place for EE outside the school

First-level Indices (Criteria)	Second-Level Indices	Requirements	Information
	Achievements and effects in environmental education	• School and people are rewarded for EE contributions and achievements • Environmental awareness of the teachers and students is promoted	• *Review prizes and certificates* • Assess environmental awareness of the teachers and students
Activities in Environmental Education	Participation and environmental organisation of students	• More than 90% of the students participate in the construction of green school • A student's environmental organisation exists in the school. Their activities link to the community and society	• *Review materials documenting students' participation* • *Review student list and environmental organisation records, year plans and summaries, activities, etc.* • Review news about activities of the school in local newspapers, TV, magazines, etc.
	Actions of environmental propagation	• Various activities take place to commemorate environmental days • A communications publication is issued on green schools construction	• *Review the plans and evidence of EE communication* • *Review the publications*
	Supervision in environmental protection	• Students supervise the environment of the schools and society.	• Review materials pertaining to environmental supervision
	Community involvement	• Relationships between the schools and other schools, families, communities, NGOs, etc. exist • Regular activities are planned and followed	• *Review materials pertaining to activities which are with other organisations* • Review evaluation materials from the community and society
Running of Environmental Facilities	*Saving and recycling of resources*	• Facilities for saving resources exist and are effective • A system for reducing and recycling waste exists	• *Review the facilities for saving energy, water, paper and other resources* •*Review the system for reducing and recycling waste*
	Safety in food and drinking water	• Food in the school store and refectory is safe • Drinking water is safe	• Review the school store and refectory • *Review the drinking water facility*

First-level Indices (Criteria)	Second-Level Indices	Requirements	Information
	Controlling pollution	• The requirements of national and local pollution control are met • Noxious chemicals are managed according to national and local requirements	• *Review the restaurants, classrooms, laboratories, garbage station, infirmary in the schools, etc.* • *Review the management of hazardous materials*
	Building and eco-construction on campus	• Environmental protection and students' and teachers' health in are considered in the building of the school • The campus is clean • The campus is greened based on ecological principles	• *Review the classrooms, offices, libraries and laboratories* • *Review the campus*
Characteristics of Green Schools Construction	Requirements: (1) The characteristics may be in the approaches, curriculum plans, teaching plans and methods, activities, campus culture of green school construction, etc. (2) There are three conditions that underpin the characteristics: the activities last more than five years; improvements in achievement are visible; and good quality evaluations exist which involve the community, society and experts.		

Notes to the table:
1) The italic indices in second-level indices are the core indices.
2) Information on the items in italics must be supplied when the school applies for the national prize.
3) The italic indices and information are based on the existing national criteria.

It is also necessary to make the meaning of 'curriculum' clear in the context of China's education system. There are basically four course programmes that are linked to environment in China: general courses such as Chemistry, Biology and Geography in middle schools, as well as Science and Chinese in primary schools; a research course which requires students to choose research issues themselves; school courses which are developed by the school itself; and elective courses in high schools.

Conclusions

As shown in this paper, the establishment of assessment criteria is based on a diverse range of influencing factors such as the cultures, policies, management systems, educational tradition and structure, and so on. The paper has also argued that the new national criteria of green schools in China must be reflective of its own ideas, while considering international trends. We think the ideas of the national criteria of China attend to two issues that are related to two management administration factors associated with the programme: the State Environmental Protection Administration pays attention to a better environment, whereas the Ministry of Education focuses on better education. Therefore, the proposed national criteria are designed in such a way that they meet the requirements of two administrations. At the same time, the criteria have

also had to take careful account of, and have had to consider, the current district criteria to ensure continuity of assessment.

The indices associated with the six criteria are based on our understanding of the emergence of green schools in China, and of trends in the international arena. Of course, these national criteria are not likely to be 'cast in stone', nor are they likely to be the best set of criteria developed for China. Some indices and requirements will be modified according to suggestions from local managers and through engagements with pilot schools in future. For example, the index on curriculum is likely to change as it links to the process of developing guidelines for environmental education more broadly. As there is only one year to issue *Guidelines for Environmental Education in Secondary and Primary Schools of China*, the time for implementing the Guidelines is short. The requirements of the education administration will be added into the national criteria as they are developed.

Notes on the Contributors

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Teacher-Community Cooperation to Promote Sustainability of Wetlands in Kenya

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Abstract

This study was undertaken with 83 teachers from 54 primary schools in Kenya. Its purpose was to establish how teachers relate with the local community and how they harness this interaction to promote sustainability of wetlands within their locality. Data were collected using questionnaires, interviews and observation. Results of the study indicated that teachers acknowledge the value of, and threats to, their local wetlands. Some teachers reported interacting and engaging in diverse activities with members of the community to conserve the local wetlands. Forums for interaction and action mentioned by the teachers included public baraza*, women's groups, church, youth groups, local community, parents' meetings and environmental days. Use of these forums differed. The approaches used to involve the community in awareness and action ranged from theoretical arguments to visits to wetlands, use of wetland resources, eco-management and political action. The responses by teachers revealed lack of engagement with the real local wetland problems. This study demonstrated existence of a potential but under-utilised opportunity that can be harnessed by environmental education programmes to champion the sustainability of wetlands.*

Introduction

Wetlands are areas that hold water for a reasonably long time in either a flowing or stagnant state. In Kenya, wetlands are defined as 'areas that are permanently, seasonally or occasionally waterlogged with fresh, saline, brackish or marine water including both natural and man made areas that support characteristic plants and animals' (NMK, 1999:1). They include rivers, swamps, ponds, marshes, and edges of oceans, lakes and human-constructed dams. Their characteristic wet conditions, high ecological productivity and rich biodiversity make wetlands attractive to human use and interaction.

This small scale-study explored teacher interactions with members of their communities and how they, the teachers, use the available opportunities to promote sustainable use of local wetlands. The teachers themselves are perceived to interact with the wetlands and the local community, as well as developing meanings through the interaction process which define their later actions. The interventions undertaken by them to conserve wetlands could also be perceived as being as much on behalf of the community as on behalf of the schools they serve as part of the wider community (Gough & Robottom, 1993:310). The teacher and the school are perceived to initiate and sustain activities that concur with the community endeavour to

resolve local wetland problems. The activities are perceived to integrate interactive and mutually supportive liaison and communication.

These perceptions are grounded on the assumption that the teacher and the community share wetland resources, as well as responsibilities to care for them. Interaction with, and involvement of, members of the community by teachers in addressing local wetland issues, represents breakage of the walls between the school and the community (Gough & Robottom, 1993; Sinclair, Clacherty & Lotz, 1999), and is a significant step towards socially critical engagement with pertinent local environmental issues and risks (Fien, 1993). Working with the community portrays the school and the community as working together to achieve the common goal of conserving and enhancing the local environment. This interaction and action portrays teachers' perceptions of the environment as socially constructed resulting from generation of meaning, and reactions to meanings emanating from interaction with one another and with the environment. Environmental sustainability processes involve many people working individually and collectively towards seeking consensus and responsibility to nurture healthy relationships among people and with the environment (O'Donoghue & McNaught, 1989; Gough & Robottom, 1993; UNESCO, 1997). Environmental education in this respect can be viewed as a process whereby people of all ages, interests and professions work together to enhance a reconstruction of their meanings for and interactions with the environment to improve the environment.

Research Methodology

The study is situated broadly within an interpretive paradigm, a complex term that embraces many research approaches which share a similar objective, *viz*., to 'understand and interpret social structures as well as the meaning people give to phenomena' (Cantrell, 1993:83). The interpretive paradigm underscores that human behaviour is 'context specific' (Fien & Hillcoat, 1996:27), and that knowledge is only generated through interaction with the people being researched to understand how they create their social reality through their personal interpretations and actions (Guba & Lincoln, 1989). This paper considers teachers as active agents who continually interact with local wetlands and the community and actively respond to the emergent meanings.

Participants in this research were sampled from 242 teachers who had participated in an in-service course on wetlands conservation in January 1999 (Ndaruga, 1999). Sampling and data collection were done in two phases in 2001 and 2002. Non-probability sampling design (Sanders & Pinhey, 1983:119, Cohen & Manion, 1994:88) was used in both phases to select 83 teachers representing different regional contexts covering seven of Kenya's provinces. Both context (urban and rural) and gender (male and female) categories were considered. The disparities in teacher representation in the nine teacher in-service training workshops influenced the sampling design. For instance, out of 49 female teachers, 39 were selected using purposive sampling. The rural male teachers were numerous (130), and 20 teachers were selected using a quota-sampling technique (Cohen, Manion & Robertson, 2000:103). There were 63 urban male teachers and 22 were purposively sampled. Sampling was done on a per workshop basis to give equal opportunity to every venue, representing different regional contexts.

A postal questionnaire was used in Phase 1 (Cohen *et al.*, 2000:129) after pilot testing. Fifty-four teachers (24 females and 30 males – 67% of the sample) returned the questionnaire. The questionnaire data were then used to guide a process of selection of 10 teachers through an 'intensity sampling technique' (Patton, 1990:172) to participate in Phase 2 of the study. The intensity sampling technique involves selecting cases in terms of their potential to provide rich information that manifests the phenomenon of interest intensely (but not extreme unusual cases). The key factors that guided the sampling activity were the context and gender of teachers, and wetland-related activities done by the teachers. Those selected had reported having carried out varied levels of wetland education activities in school and community contexts. Semi-structured interviews and observation were used after being pilot tested with three teachers who had earlier responded to the questionnaire. The questions were expressed in English, the language of instruction in Kenyan schools.

Twenty-nine other teachers (three from each of the 10 schools (except one)) who did not attend the wetland workshops were also interviewed. The purpose of these interviews was to gather more data, especially from those teachers who had never participated in the in-service training programme on wetland issues. This was expected to shed more light on aspects of teamwork building to address local wetland issues and risks at schools.

Results

The findings of this study are presented in a sequence beginning with the role of teachers as members of the local community and their perceptions of the interactions between people and wetlands. These findings are expected to build a case to justify why addressing wetland issues should be a priority for teachers. The way teachers engage members of the community to participate in wetlands sustainability using diverse forums and activities is then reported in greater detail. These findings are then critically analysed and discussed leading to the concluding recommendations.

Teachers' responsibilities at community level

Teachers were asked, using a questionnaire, whether they were entrusted with any responsibilities at the community level. The question intended to establish teacher interaction and appreciation at community level. Interaction is important because it enhances meaning making and exchange on various aspects of wetlands. In this study, 33 out of 54 teachers reported being involved with community activities. The involvement fell under four key areas as shown in Table 1 on the following page.

Interesting patterns occurred within this distribution – for instance, with respect to the 'church', 14 out of 16 teachers involved were from the rural areas. These findings concur with the Ministry of Environment and Natural Resources (MENR, 1994) report that the rural suffer from migration of educated young people who move to urban areas in search of jobs and better amenities. The teachers left behind in the rural areas are often the most educated members of the community, and it would seem that they are being entrusted to coordinate some administrative aspects of the church and other social activities. This could be a good opportunity for teachers

to champion wetland conservation in rural contexts. In urban areas, the situation is the opposite. Educated people migrate to urban areas and the chances of a teacher being noted and incorporated into the church administration and other social responsibilities among the many well-educated and employed people could be lower. The other levels of involvement within the community did not seem to vary much. Involvement in community activities portrays the teacher as a member of the local civil society and in a position to initiate and participate in matters of wetland conservation.

Table 1. Teacher responsibilities at community level

Key Area	Responsibility	No. of Teachers
Community development	Local water projects	2
	Community groupings – being an official or a member in a local NGO, local CBO, the district development committee, local welfare groups, local clan, women's groups, youth organisation, local agricultural group and being a parents' representative in a local school	23
Local church	Local church members, officials, teaching children on Sunday	16
Community education	Education advisors at church and community level	3
Persuasion/ negotiation	Informal wetland conservation lobbying	2

During the interviews with the 10 teachers, some teachers complained that their interaction with the community was hampered by diverse problems. These included community hostility to the teacher, negative attitudes especially where financial implications crop up, bureaucracy whereby only the head teacher or the local administration are mandated to convene a community meeting, and lack of support from the head teacher. Some of these complaints portray the school as having a neo-classical top-down authoritative system and suggest the need for teachers to foster local goodwill with the head teacher and with members of the community. This would require breaking down these barriers through engaging the community structures and processes (Wals & Heymann, 2004; O'Donoghue & Lotz-Sisitka, 2006).

These findings underscore the need for teacher educators to realise that training to foster environmental sustainability requires being conversant with local contextual issues. As *Agenda 21* emphasised, 'One of the major challenges facing the world community as it seeks to replace unsustainable development patterns with environmentally sound and sustainable development, is the need to activate a sense of common purpose on behalf of all sectors of society' (UNESCO, 1992:197). *Agenda 21* challenges all sectors of society (including schools) to participate in and establish meaningful partnerships, in order to achieve social change and sustainable development. The teacher responses in Table 1 point to the need to recognise partnerships that are possible among teachers and the local community. Teachers, as partners participating in sustainable development, should therefore be assisted to clarify and recognise their independent roles, responsibilities and special capacities so as to enhance mutualistic relationships with their

local partners for sustainable development. Working more closely with them could allow them to share their experiences, especially on appropriate strategies to overcome contextually specific social barriers.

Teacher perceptions about community interactions with wetlands

The 10 teachers interviewed were asked to comment on what they admired about community interaction with local wetlands. The question was aimed at exploring whether the teachers understood what happened in the local wetlands. According to the Millennium Assessment Synthesis Report (MEA, 2005), ecosystems (including wetlands) provide diverse services to humans. These include *provisioning services* such as food, water, timber and fibre; *regulating services* that affect climate, floods, disease, wastes and water quality; *cultural services* that provide recreational, aesthetic and spiritual benefits; and *supporting services* such as soil formation, photosynthesis, and nutrient cycling. In this study, teachers suggested that the community get fish, employment, relaxation sites, and water for domestic use and for livestock from local wetlands. These direct-use values of wetlands fall within the provisioning and recreational services of the MEA (2005) model, suggesting that teachers recognise the intimate dependence of human beings on the natural environment. Provision of these services needs to be sustained – hence the need to address sustainability aspects of these resources which include ensuring that the benefits are shared amongst all people across generations without any injustices in access and use of the resources (UNESCO, 1992). Teachers are expected to address these issues with the community.

The same 10 teachers were asked to comment on what they disliked about community interaction with the local wetlands. They highlighted diverse concerns such as cultivating close to the wetland causing soil erosion (n=2), cutting down trees in catchment areas (n=1), plastic bags from other places can get to the ocean and kill sea animals if eaten (n=1), over-harvesting of water (n=2), bringing too many animals into the river to drink water which trample the banks (n=1), pollution by industries, solid wastes and by washing clothes (n=3), the disappearance of some species from wetlands, e.g., papyrus, (n=1), infringing the law that requires the leaving of 20 feet from the river to the farmed area (n=1), and misuse of the little water available (n=1).

The teachers also suggested some efforts undertaken by the community to take care of wetlands. These included fencing to keep cattle away (n=1), vehicle owners washing their cars in car wash and not in the river (n=1), using sewage for farming (n=1), some people getting water from taps and so not going to the wetlands (n=1), and an observation that a wetland sandwiched between privately owned farms was well taken care of (n=1).

The results suggest that teachers acknowledge why people use wetlands, the potential threats to them and the activities that people engage in to conserve them. Their responses suggest use of different wetland conservation methods, some of which are geared towards physical blockages, use of alternatives, changes of attitude towards sewage, as well as noticing of well-managed wetlands. Nevertheless, the wetland conservation measures mentioned above seem inadequate, since the teachers failed to mention the processes of engagement with local wetland problems in a way that portrays the community as proactive and seriously concerned and determined to improve their relationship with each other and with wetlands (IUCN *et al.*,

1991). These approaches, though commendable, seem weak in ensuring sustainability of local wetlands since, as Tilbury (1995) writes, sustainability integrates recognition of the relevance of local environmental problems and formulation of context specific interventions. This process seems to be lacking in the conservation measures mentioned by the teachers. The discussion in the later sections of this paper focuses on teacher involvement in addressing the local wetland problems mentioned above with members of the community.

Involving the community in knowing about wise use of wetlands

In the questionnaires, teachers were asked to explain how they enlightened the local community on the wise use of their wetlands. Twenty (13 males and 7 females) out of 54 teachers reported having involved their local community. Those who did not comprised of 17 males and females respectively. In terms of context, 11 rural and nine urban teachers involved the community while 21 rural and 13 urban teachers did not. The responses did not suggest differences between the genders and urban and rural groups.

The teachers were then asked to outline the forums they used to reach out to the community, the aim of this question being to explore the strategies available to teachers when involving the community. They reported using strategies such as *baraza* (public meetings), women's groups, church, youth groups, local community, parents' meetings and environmental days. The frequency of mention of use of these strategies is summarised in Figure 1.

Figure 1. Forums used by teachers in involving members of the community in wetlands conservation

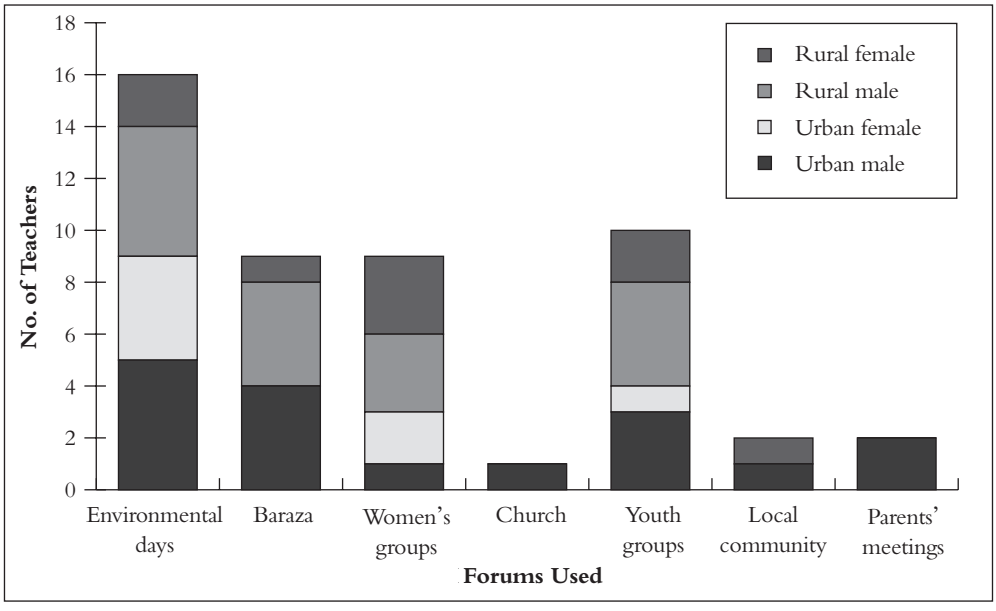

Figure 1 suggests that the most popular forums used by teachers are environmental days, youth groups, public *baraza* and women's groups. Sixteen out of 54 teachers marked environmental days (seven rural and nine urban teachers; six women and 10 men). The environmental days celebrated were local, national and international and were reported by nine, one and four teachers respectively. The local days celebrated included tree planting day (n=4), some days of the week (n=2), water conservation day (n=1), clean-up day (n=1) and school environment day. Only one national environmental day was celebrated, namely national tree planting day (n=1). International environmental days celebrated included World Environment Day (n=1), World Water Day (n=1) and Labour Day (n=1). According to Share-Net (2000) and Ndaruga (2003), there are numerous special days important at international, national and local level. The data indicate that many environmental days were not marked. Some of the reasons cited by teachers for not marking these days included lack of awareness of the exact dates, not knowing what to do and how to go about it. The findings strongly suggest the need for teacher training programmes on environmental education to address and enhance the potential value and use of environmental days.

The *baraza* were common to men in both rural and urban contexts. Only one female teacher used the *baraza* to champion for wetland conservation, as compared to eight men. This could be attributed to the few number of female teachers who reported involving the community (refer to Figure 1), as well as due to discouragements from men. Some women indicated that it was difficult to be heard by men and that any major initiative at local level requires leadership by men. These discouraging factors could be attributed to contemporary gender relations in Kenya. According to Mama (2001), women are more pervasively governed by dictates of custom and community and correspondingly less able to realise the rights afforded to citizens in general. Youth groups were also reportedly used by the male teachers to champion for wetlands conservation for instance in environmental clean-ups. Some men also reported working with women's groups in activities geared towards wetland sustainability such as environmental clean-ups and cleaning of water sources. Differences are also evident in teachers' use of various forums – especially the church, local community and the parents' meetings. The non-use of parents' meetings is alarming because the members of the community are frequently invited to the school to decide on education issues of their children. Involving parents and children in wetland sustainability activities would help expand the niche served by the school and open up a new dimension of social learning at home and community level (Payne, 2005).

In summary, the data suggest that numerous forums exist at community level for promoting conservation of wetlands. The recognition of these forums by some teachers is significant in that they represent additional opportunities that can be used by environmental educators to foster wetlands conservation. Nevertheless, since only a few teachers utilise these forums, there is need for increased effort to mobilise more teachers to recognise and use these valuable opportunities to enhance conservation of the local wetlands.

Activities with members of the community

Teachers were asked to provide details of the activities they undertake with the local community using the various forums identified above. This question was aimed at exploring the processes of

engagement with local wetland issues mentioned earlier in this paper. From the questionnaire and interview responses, the activities suggested can be grouped into 'theoretical', 'visits to wetlands', 'use of wetland resources', 'eco-management activities' and 'political action'. The number of teachers for each activity described below is indicated in parenthesis.

Theoretical activities done away from wetlands included demonstration of wise use of water and keeping it clean (n=1), passing information through the local chief (n=1), teaching the community members, encouraging the community to dig local dams to trap water during rainy season (n=1), getting pupils to recite poems and songs on environment and wetlands (n=1), a wetland football tournament (n=1), hiring of people to clean the environment (n=1), addressing parents during a parents' day (n=2), talking to a few people during a meeting of a catchment group (n=1), informing members of a women's group (n=1), telling people not to wash in the river (n=1), encouraging people to plant trees (n=1) and listening to songs and poems (n=1).

Activities involving visits to wetlands included a visit to the nearest wetland to demonstrate its importance (n=1), using the school fishpond to inform visitors about wetlands (n=1) explaining about the fishpond (n=1), opening a road leading to a wetland (n=1) and warning those washing clothes in a swamp to stop the practice (n=1). Activities involving use of wetland resources included making bricks (n=1), weaving baskets (n=1), planting vegetables and pineapples using water from a wetland (n=2), preparing mud for moulding (n=1) and making pots, mats and improved *jikos* (charcoal brazier) (n=1).

Eco-management activities are defined by Tilbury (1995:203) as maintaining and improving the landscape through physical action. Activities of this nature in this study included planting trees and cover crops (n=16), cleaning up the environment and a local dispensary and town (n=9), establishing a nursery for trees, passion fruits and pyrethrum for selling and planting (n=3), terracing of sloping areas (n=3), building gabians (n=3), fencing off to protect water points (n=2), carrying stone and digging trenches to protect water (n=2), removing of eucalyptus trees from water sources (n=1), participating in protection of catchments (n=1), collecting garbage (n=1), people coming from near wetland cared for it (n=1), collecting stones to build channel for a borehole (n=1), removing water weeds and silt from a dam (n=1), conserving environment (n=1), dramatisation on environmental conservation (n=1) and constructing of water tanks for conservation of water (n=2). It is noted that eco-management approaches mentioned above are dominated by activities that mainly addressed improvement of the biophysical aspects of the local environment. Only one teacher mentioned the use of political action in this question – in the form of participating in a street procession. The teacher did not, however, state the local wetland issue they were addressing in the demonstration.

During the interviews, the 29 teachers who were not trained about wetlands were also asked to explain how they addressed local wetland issues with members of the community. This question aimed at gathering views from those not trained about wetlands conservation. Only seven teachers reported having involved the community in some conservation activities which were categorised as either theoretical or eco-management. Activities involving theoretical approaches included teacher talks about cleanliness of homes, building toilets, planting trees, how to keep rivers clean, and how to use water properly (n=5); making school posters for

everybody to see (n=1); explaining in a parents' meeting about the need to fence the school and to plant trees, the uses of trees and the need to plant them in their residences, and the need to boil water (n=2); and the teacher talking to the chief (n=1). Activities with some practical eco-management activities included community members going to rivers to conserve the soil (n=1); draining out polluted water and cleaning dams used by cattle (n=1); using river water to irrigate trees and vegetable nurseries in a women's group (n=1); using sewage water to irrigate vegetables and providing explanations to those who inquire (n=1).

The results from both groups of teachers suggest that the schools seem not to be responsive to local wetland issues and threats in practical ways. The activities presented by the teachers seem to be very apolitical and do not challenge the *status quo* in the community that is responsible for wetlands degradation. According to McKeown and Hopkins (2003:201), learning activities geared towards sustainable development should integrate developing strategies to teach awareness, skills, perspectives and values that will guide and motivate people to pursue sustainable livelihoods, participate in a democratic society, and live in a sustainable manner.

The theoretical approaches are mainly prescriptive, transmitting information to the members of the community without giving them an opportunity to contribute their reality in the process of learning and addressing the problem (Fien, 1993). An approach such as hiring of people to clean the environment is commendable but it portrays some detachment from the activity and the teacher's failure to use the opportunity to promote learning and action to address waste management.

The visits to wetlands were few and the teachers still seemed to dominate with little opportunity for community members to generate and express their knowledge. These approaches may fail to secure interest from members of the community since the knowledge transmitted may fail to be relevant to them (Babikwa, 2002). Even warning people not to wash clothes in the river does not seem to be an educational activity but rather some coercive intervention. These visits do not show features of bringing the community together for dialogue to explore the problem and to generate ideas and interventions to address pressing local issues as well as to reflect on the actions taken.

Use of wetland resources did not portray attempts to address conservation of the resource being extracted to ensure its sustainability. Some of the activities – such as getting bricks, making mats and pots – can lead to wetland degradation. The process of extraction of wetland resources could provide a good opportunity for teachers to bring up education issues of wetland values and sustainable-use levels, as well as individual responsibilities to conserve them. These aspects were not mentioned in this case.

The eco-management activities are commendable and address some of the threats to local wetlands identified earlier in this paper. Nevertheless, most of these activities do not challenge the *status quo* responsible for economic, social and political underpinnings of the wetland problems. They do not portray engagement with the wetland issues and risks as a process of dialogue, exploration, action and reflection (Gough & Robottom, 1993; O'Donoghue & Janse van Rensburg, 1995). The activities are mentioned as one-off and not as a proactive, focused and locally knowledge-driven process to address the local wetland issues and risks and to alleviate them.

Discussion of the Results

A closer analysis of the data indicates that some teachers are entrusted with positions of influence, and that teachers are able to take note of the value and threats to local wetlands. The teachers also reported having participated in diverse activities to champion for wetlands sustainability.

Nevertheless, this study did not reveal the use of methods that enhance learning about the holistic aspects of wetlands, i.e., those that integrate the interaction between the biophysical, economic, social and political aspects of the environment (O'Donoghue & Janse Van Rensburg, 1995). These holistic aspects entail learning about the broad array of wetland ecosystem services (supporting, provisioning, regulating and cultural), and how they influence human wellbeing attributes (security, as basic material for good life, health, good social relations and freedom of choice and action) (MEA, 2005). The activities facilitated by the teachers failed to show these interactions and could, therefore, be regarded as inadequate in contributing to community understanding of their relationship with wetlands.

The study found that the teachers used a narrow range of methods to engage in wetlands sustainability education with members of the community. This narrow range of methods seems to be inadequate since they lack features of a proactive engagement with local wetland issues and risks, as well as the *status quo* as a form of social praxis, i.e., socially-based locally informed action. The responses failed to show deliberate and sustained engagements that address local social and socio-economic issues, particularly as these pertain to the ecological dimensions of wetland ecosystems and ecosystem services, as well as their relationship with human wellbeing.

It was also notable that the activities undertaken seem to be weak in ensuring sustained concern and action to conserve the local wetlands since they seem faintly related to the local wetland problems. In this study, teachers prioritised the provisioning and recreational services as their prime indicator of mutual relationships between the community and wetlands, in terms of providing fish, employment, relaxation sites, and water for domestic use and for livestock from local wetlands. They also indicated a diversity of problems and dislikes associated with local wetlands. According to McKeown and Hopkins (2003:19), learning activities geared towards sustainability should always be implemented in a *locally relevant* and *culturally appropriate* fashion. This study expected these features to be prominent in setting the agenda for engagement with the local community. Most of the activities reported by teachers seemed, however, to have drifted away from perceived local challenges. Following Stapp and Wals (1994:57), '… the surest way for a group to fail in solving a community problem is to accept a palliative – an action that is not a real solution and address only the surface problem and not the underlying causes.' Although eco-management activities show an attempt to address the local wetland problems practically, they seem unrelated to the real problems mentioned earlier by teachers. Hence, they appear to be inadequate in discouraging the recurrence of further wetlands degradation. The inadequacy could be traced to weak or non-integration of a holistic outlook of wetlands that recognises and practically addresses the social, economic and political underpinnings responsible for wetland degradation, and the relationship between human wellbeing and ecosystems (see MEA, 2005) as discussed earlier.

The response to wetland problems also failed to show a process of dialogue, encounter and reflection to generate appropriate action. If we accept Jensen and Schnack's (1997:164) contention that, '... environmental problems are structurally anchored in society and our ways of living. For this reason, it is necessary to find solutions to these problems at both the societal and individual level', there is still some way to go. Teachers were expected to involve members of the community in dialogue on aspects that illuminate issues of values, ethics, justice and equity regarding the local wetland resources, but activities presented by teachers tended to be dominated by transmission, experiential field trips and some action taking. These activities fall under what O'Donoghue and Lotz-Sisitka (2006) categorise as experiential learning. They argue that such experiential approaches do not reflect ideals of democratic agency and activism which, this study argues, are needed for sustained engagement with emergent wetland threats. This suggests the need for training programmes for teachers that involve what Le Roux (2000) calls 'the process approach' to solving environmental problems that are grounded in local contextual relevance. O'Donoghue and Lotz-Sisitka (2006) argue that a process approach involves processes of guided deliberation in order to allow communities to make decisions on what is to be done. In such an approach, the teacher would become an active participant in, and facilitator of, a process which involves communities in learning actions that require them to make informed decisions and implement chosen solutions and strategies.

Conclusions

The data generated from teachers in this study portray them as having local knowledge about the values of and threats to wetlands, and about some appropriate activities that can be deployed to address wetland problems. The teachers also acknowledge being strategically placed in terms of having diverse partners and responsibilities at community level. They also identified diverse forums that could be used to engage members of the community in wetlands conservation. This study recognises that reflection on utilisation of these valuable opportunities by various players in environmental education is necessary in order to identify gaps and address them. There is need for popularisation of these opportunities and the appropriate activities that could be done.

Since teachers acknowledged existence of local wetland problems, this study expected them to be actively engaged in addressing these problems through diverse approaches. Only a few teachers, however, engaged the members of the community in wetland conservation activities. The approaches used were dominated by theoretical approaches. Where outdoor visits were used, the community members were not given adequate opportunity to freely contribute to the environmental learning and action process. Practical eco-management activities also seemed inadequate in addressing local problems identified by teachers.

Some policy issues were noted – such as lack of harmony and reciprocation between the school and the community when dealing with local environmental issues. It would seem advisable that schools, as institutions serving the local community, should collaborate more closely to maximise use of every available opportunity. Harnessing, prioritisation and harmonisation of local policies to recognise the school as a major partner in addressing

local environmental issues is important. This suggests the need for environmental education programmes to harness and enhance local policies to illuminate the need for all institutions to work together to address local environmental problems. This also calls for partners and schools to accord each other the time, resources and necessary support.

Most significantly, however, would appear to be the finding that there is a lack of an holistic understanding and approach to responding to wetland degradation amongst teachers. Knowledge of culturally situated active approaches to learning would seem to be an important dimension of building a broader, more holistic response to wetland conservation amongst teachers.

Notes on the Contributors

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Musical Constructions of Place: Linking music to environmental action in the St Lucia wetlands

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Abstract

This paper reflects on a documentation project in the Greater St Lucia Wetland Park Authority that explored the operational interface between music, cultural knowledge and environmental stewardship. Building upon the premise that music and associated ritual practices present rich discursive sites where local knowledge about the environment are negotiated and affirmed, the project aimed to engage high school students with broader environmental concerns through the documentation of their diverse cultural and environmental heritages. In so doing, it explored ways in which the active recovery of deep-rooted cultural wisdoms about land, natural resources and senses of place may contribute towards a more integrated paradigm for environmental conservation in the area.[1]

Introduction

> It has been argued that 'promoting conservation in the context of local culture would endow protected areas with a significance that emphasis on biological diversity, landscapes or economies does not'. This is especially relevant in a country such as South Africa, where people can ill-afford the luxury of a species-focused conservation ethic but recognize the importance of cultural diversity. We therefore need to reintroduce the concept of culture into our analyses of the environment and not simply portray wild harvested material as being only of economic value to users. (Cocks, Dold & Sizane, 2004:4)

Ethnomusicology is the study of music in its cultural context. It is an inherently inter-disciplinary study embracing, through the examination of sound and music-making, analytical concerns relevant to anthropology, history, geography, religion and gender studies, to mention a few.

An ethnomusicologist might approach the study of music-making in any number of ways: s/he might be interested in the sound and structure of a piece of music; in its melodic contour, rhythmic configurations, textures and musical form. S/he might focus on the study of musical instruments; on the natural resources used in their manufacture and their principles of sound production. S/he may analyse lyrics and the use or delivery of language, or may focus on performance itself, and the role played by music in communicating social, religious or political experiences.

Music is a particularly potent expression of South African social life. It expresses what may have been forgotten as a result of social change, and communicates concerns that may not be expressed verbally as a consequence of repressive social circumstances or cultural conventions. Music transmits experiences and provides a cognitive map of histories, people and places. While offering an immediate, embodied and highly adaptive expressive outlet for the negotiation of individual and social identities, it also preserves and sustains collective memories. In its many forms and manifestations, music functions as a primary symbolic landscape of a people.

As an ethnomusicologist, I have attempted to take a step beyond musical description and analysis and explore ways in which music may operate as a discursive site where information about land, locality and belonging are reflected upon and memorialised in symbolic form. Further, in seeking the interface between musical expression and environment, I have sought ways to promote its conservation as a cultural resource, positing that community-driven environmental management may be more actively embraced when nature is understood as an essential signifier of cultural histories and social identities.

In this paper, I will reflect on a youth research project conducted in the Dukuduku forests of the Greater St Lucia Wetland Park Authority, that focused specifically on the operational link between music, cultural meaning and environmental action.

The project was motivated by two broad concerns. The first pertains to the politics of land and locality, which are key to the development discourse in post-apartheid South Africa. Fostering a sense of belonging and place attachment is essential to the social reconstruction process, and is central to countering the widespread physical, social, political and cultural dispossession experienced by a large number of South Africans under apartheid. 'Finding one's place' under the new dispensation, however, involves a complex process of disentangling from the hegemonies of the past, and a conscious re-valuation of self, past cultural practices, local knowledge(s) and senses of place.

The recovery of local knowledge in South Africa is currently addressed under the banner of Indigenous Knowledge Systems (IKS). IKS is motivated by an attempt to open new moral and cognitive spaces within which constructive dialogue and engagement for sustainable development may begin. Essential to IKS is consideration of how knowledge(s) may be 'recovered and re-appropriated in real time to advance the survival and growth of local communities' (Odoro-Hoppers, 1998:3). IKS in South Africa focuses predominantly on biodiversity and the role of indigenous communities in the protection and utilisation of natural resources. Within this frame, attention has been paid largely to medicinal plants and indigenous medical practices: these are tangible products that can be measured, understood scientifically, and offer the possibility of profit-making.[2] IKS, as manifest in music, body and ritual processes, on the other hand, seeks the recovery of meaning systems as its principle reference. In this context, its focus is on ways in which people and places are mediated through symbolic vocabularies, the premise being that it is at the level of the intangible, experiential and sensual that people most meaningfully inscribe themselves into their environments, and thus transform physical landscapes into cultural spaces.[3]

The second impetus for the project focuses on the application of the conservation-with-development paradigm, as advanced by the UNESCO World Heritage Convention

(relevant to the St Lucia wetlands) and by community-based natural resource management (CBNRM).[4] Both the UNESCO convention and CBNRM aim to involve local people in sustainable conservation by drawing on indigenous knowledge and technologies as the basis of an integrated management system. However, the people-and-parks alliance remains politically fractious in South Africa. One of the contributing factors for this may be that culture and local knowledge systems generally remain outside the expertise of environmental managers, and interdisciplinary partnerships that link cultural conceptualisations of landscapes with natural resource management remain relatively unexplored (Murphree, 1991; Murombedzi, 1998; Griggs, 1999).

The objective of the Dukuduku project was, therefore, to examine the interdependencies between symbolic practices (music and associated ritual activities) and perceptions of place, and to explore ways in which deep-rooted cultural wisdoms may be recast to contribute towards a more holistic paradigm for sustainable conservation.

Musical Constructions of Place

In the following section, I will offer a brief musical case study to demonstrate ways in which musical meanings are 'intimately and inextricably bound into the spatial formations, practices and processes by which music is performed' (Revill, 2000:605). The case study focuses on a song entitled *Uthando Luphelile* (Our Love is Finished), composed and performed by Mrs Ndabesehlele Myeza, an elderly Zulu woman whom I encountered in the hills of Nongoma in the 1980s.[5]

Ndabesehlele is of the last generation of Zulu women in northern KwaZulu-Natal to perform the *umakhweyana* gourd-bow. This bow was customarily played by young women prior to marriage to accompany love songs. Today, songs composed or remembered by elderly women often reveal, through narratives about love or lost love, a subtext about loss of identity, social fragmentation and loss of place.

The *umakhweyana* gourd-bow is a simple instrument comprising an arched stick made from the pliable wood of the *Acacia ataxacantha (umthathawe)*,[6] a single string, which is attached to both ends of the stick, and a gourd, which is positioned near the centre of the stick and used to amplify the harmonics. The bow is constructed to resonate inward, played into the body; literally using the 'embodiment' of sound as a means through which the musician is able to meditate aloud about her experiences.

Far away mountains where the sun sets
Be on my side
Talk on my behalf
He dances even when it is closed
And the elders stand up
Cry for me
Johannesburg has taken him away
Be on my side

I married a shebeen man
And people are celebrating

Isibongo self-praise

I, the snake who gets killed whenever people see me
I, the spear that stings the hearts of men and women
I, the bird who spreads its wings over the homestead of Sebokeng

The song brings together the experiential and the political. It is a lament of an abandoned wife whose husband has left his rural home to seek work in Johannesburg. In so doing, he has taken to alcohol, forsaken his family, and deserted his traditions. What is pertinent about the song in this context is the way in which the singer transforms the landscape into a place of human action, and how she imbues nature with meaning.

Clearly the composer is rural. To her, Johannesburg, the city, represents the object, the 'other'. On one hand, Johannesburg is material: it is where the largest proportion of migrant workers congregated in the past and has thus become a symbol of the migrant labour project. On the other hand, the city is metaphorical and is represented in the song as an agent of social change. To the musician, the city is a feckless, rootless place; a modern symbol of personal fragmentation.

The countryside, by contrast, represents the known; 'tradition'. It is in this context that the singer seeks epistemological mooring in natural symbols: in the mountains and the sun. However, there is an ambiguity in the way the singer references these images. The mountains are far away; the sun is setting. Through these images she appears to imply that everything is slipping out of control, and not even the elders, in their wisdom and authority are able to restore order.

But nature is also perceived as solid and timeless, and in her moment of impotence, she appeals to it for moral support:

Be on my side
Cry for me
Talk on my behalf

In the second section of the song, Ndabesehlele breaks into *isibongo* self-praise. *Izibongo* praises are an ancient genre of isiZulu oral poetry that are generally associated with a chiefly clan or with royalty. They are a powerful, metaphorical and highly refined rhetorical practice. Their delivery is rapid, intense, defiant and authoritative.

By resorting to this poetic genre, the singer appears to reclaim power from traditional form and from mutually understood symbols. Again, she uses natural iconography to index personal identity, but rather than appealing to natural imagery, she *becomes* the snake; she *is* the bird. By inhabiting these references, her attitude becomes retaliatory. In Zulu culture, the snake is both feared and revered, and by referring to it, she appears to be saying: you may try to destroy me,

but I can be dangerous to you too. By identifying with a bird – conceivably imagined as an eagle or a bird of comparable totemic significance – she reminds the protagonist that she has the capacity to hover above him and observe his every move. As a bearer of witchcraft or ancestral power, she may threaten his home and bring him misfortune.

This song is a particularly vivid example of the use of topography as both physical backdrop and personal identification. In so doing, it reveals how nature may be understood differently if considered against the background of human experience. Through it, we see how nature becomes instrumental in shaping discourses about social relations, how it serves to shape consciousness about emplacement and displacement, and how it provides a reflection against which imagery of the self, at individual and social levels, may be mapped and experienced (Lovell, 1998:9).

Linking Music To Environmental Action in Dukuduku

The St Lucia Wetland Park Authority is approximately a quarter of a million hectares in size and is located on the northeastern coast of the KwaZulu-Natal Province. Its boundaries extend from Mapelane and the St Lucia estuary in the south, to Kosi Bay on the Mozambican border in the north. The Park comprises a variety of habitats, including grassland savannah, coastal dune forests, wetlands, beaches and mangroves, and is sanctuary to a wide variety of animal, bird, marine and plant species. Lake St Lucia is the largest estuary in Africa; it is the oldest proclaimed National Park in southern Africa, and it is the first area in South Africa to be registered a UNESCO World Heritage Site.

The Dukuduku forests are located in the southern region of the Greater St Lucia Wetland Park, some 250km north of the city of Durban. Khula Village, which is situated on the northern periphery of the Dukuduku forests, comprises a fragmented people from many 'elsewheres' who have recently been resettled on land reclaimed from commercial plantation. Some Khula residents were expelled from their ancestral homes on the eastern shores of Lake St Lucia in the 1950s and returned in the late 1980s to claim ancestral ownership of the land. Some have sought refuge there from violence or poverty in other areas of the province, the country, or even the region. Common to almost all of its residents is the experience of displacement.

Dukuduku has been, and continues to be, a highly contested space. Here, the notion of community is based on shared spatial and economic interests, but cannot be predicated upon any sense of collective identity or cultural commensality. As the village has been in existence for some 15 years only, my preliminary research revealed that people appeared to have little knowledge of one another's cultural histories.[7] Their absence of cultural anchorage appeared to link directly with their apparent lack of buy-in with regard to stewardship of the forests. While many residents will argue that their original motivation for settling in Dukuduku was because they could 'live naturally' and could seek protection under the thick canopy of the forests, the indigenous trees are being felled at an alarming rate and rapidly being replaced with *Eucalyptus* woodlots and sugar cane.

Khula Village is situated on the key access route to the tourist town of St Lucia, and the community and is well positioned to capitalise on the increasing numbers of local and

international visitors to the estuary. With additional exposure gained by its accession to World Heritage status, so eco- and cultural tourism feature as the principal foci for income-generation in the area. As has been demonstrated elsewhere (Cohen, 1984; Crick, 1989; MacCannell, 1989; Smith, 1989; Urry, 1990; amongst others), cultural tourism has the tendency to reduce identity to a singular, generic 'other'. In KwaZulu-Natal, cultural tourism tends to capitalise on the global imagination of the Zulu as the quintessential African warrior; an image that is framed in an idealised, historic moment, and that perpetuates their representation as authentic, potent and uncontaminated.[8] In as much as cultural tourism feeds on mediated images of the 'noble savage', so ecotourism trades on the recurrent tropes of the African landscape based on images of a pristine wilderness teaming with wildlife, into which are inserted 'natural' but endangered cultures (Bruner & Kirshenblatt-Gimblett, 1994). However, while offering an obvious route to poverty alleviation, tourism would not necessarily assist in nurturing a sense of community and cultural diversity; nor would it necessarily address the ongoing conflict in Dukuduku between people, land and forest conservation.

With these concerns in mind, I began to think of ways in which participatory documentation of the diverse cultural and environmental heritages in Dukuduku might contribute towards the mobilisation of a sense of community – *a recreation of place* – and in so doing, nurture a greater level of investment in the forests as a valuable cultural resource.

Azibuye Emasisweni: The documentary process

Mapping self in place

Basing my premise on the notion that music is a powerfully emplacing medium, and that sound and the affect of music-making operate as potent activating modalities for memories about self in place and time, I established a documentation project at the Silethukukhanya High School in Khula Village, that attempted to utilise music as a primary means through which to engage young people in discussion about the relevance of natural resources to the cultures and identities of the community.

Referred to as *Azibuye Emasisweni: Remembering our Stories/Heritages*, the project was conceptualised as a 'club' and functionally located within the school's innovative 'living library' project. Its expressed aim was to systematically build a community archive of local knowledge about the people, their cultures and their senses of place. In the absence of books about Dukuduku, it sought also to make these stories available to teachers, learners, environmental NGOs, and community-based cultural or ecotourism operators in the vicinity.

A team of 20 student volunteers (between the ages of 16–19 years) and the school librarian were invited to participate in the archiving initiative. The research team focused initially on mapping the village and its environs. The construction of a range of different maps helped to raise awareness amongst the students of the layout of their own community, and to analyse spatial arrangements in terms of amenities and infrastructure, as well as in relation to significant cultural and environmental features. The latter included sites of personal, social and ceremonial significance, places of ecological importance, and fences, roads and boundaries that identify spaces of inclusion and exclusion.

Part of this exercise included 'sound mapping': the identification of sounds that make up the broader Dukuduku soundscape. These included birds, insects, frogs and hippopotamuses, and well as the various genres of songs and instrumental performances that are heard on various days of the week and times of the year: the *mqangala* mouth bow and jew's harp, the *umakhweyana* gourd bow, *ingoma* dance songs; wedding, healing and funerary songs (accompanied by *isighubu* (military-style drum) and *ingulule* (friction drum)); songs of the Shembe, Zionist and Apostolic churches; radio or recorded music that is broadcast from speakers in shebeens and shops, etc.

Biographical mapping

The next task was to conduct a training programme for the students in documentation, concentrating on project conceptualisation, interview techniques, recording strategies and research ethics, amongst a range of other issues. With these rudimentary techniques at hand, the students proceeded to trace the biographical pathways of Dukuduku residents, focusing specifically on the elderly and important culture bearers such as *izangoma* (healers). Our aim in collecting life histories was motivated by an attempt to better understand the personal journeys people had made to Dukuduku, and how they had made attachments to it as a social, economic, political, ecological, and spiritual space. The objective of the exercise was premised upon the notion of 'home' as a dynamic and relational concept; one that is intimately linked with socio-spiritual practices and cultural systems which serve to ritually mark and affirm them.

Biographical knowledge is also geographical knowledge, and many of the biographies included ritual narratives that referred to places and natural resources as 'culturally situating' markers. An often quoted example of such a ritual process is *ukubuyisa indlosi* or *umlahlankosi*. In it, a branch of the *Ziziphus mucranata (*Zulu – *umphafa),* a tree that is imbued with exceptional spiritual significance in Zulu culture*,* is used to symbolically relocate the spirit of one's ancestors to a new place of residence. The following quote is taken from an interview conducted by one of the student researchers:

> Though their physical graves are left behind, we have to collect the souls of our ancestors to our new home. When a new home is completed, you collect them by taking a branch of a tree called umlahlankosi.[9] If it is a female ancestor, you have to collect her with a branch called umganu.[10] You go to their graves and you tell them: 'Now my ancestors, I have come to collect you from this abandoned home to a new place.' When you collect them using a car, this is what happens: You will go with a few older members of your family and at the graves you will tell each of your ancestors that you are there to collect them to a new home. From there you tell them that they must get into the car and go. Inside the car you don't talk to anyone. If the car stops in town and it happens that your relative comes and talks to you, you just keep your mouth shut. He will see you carrying umcansi (a small reed mat) and the branches of this tree, and he will understand. (Baba Thethwayo interviewed by Mduduzi Mcambi, Khula Village, April 2001)

Umlahlankosi is a poignant example of how ritual processes, when conceptualised as a discursive space, provide dynamic opportunities for the creation and transportation of meaning through

time and in changing social circumstances. It also highlights the way in which natural resources continue to carry profound symbolic meaning in Nguni cultures. As with the *umakhweyana* bow song discussed earlier in the paper, the branch in *umlahlankosi* is used to shape discourses about the self and familial relations; it assists in articulating social and spiritual disharmony/discomfort, and it provides a medium through which individual and social balance may be restored.

Inherent in *umlahlankosi* is the notion of displacement and emplacement/re-rooting. The process of re-establishing familial stability by physically traversing a prescribed pathway is not dissimilar to Australian Aboriginal 'songlines' in which rivers, mountains, rocks, forests and birds are ritually performed in order to reposition one in the geographic, genealogical and political present. As with many Aboriginal people, despite the pervasive influences of westernisation and Christianity, these rituals continue to depend upon natural resources, water and sacred sites as signifying materials through which humanness, identity and value are affirmed in Dukuduku.

Umlahlankosi is an especially significant ritual for Dukuduku residents, many of whom have recently relocated away from the graves of their ancestors. Situating self in a new locality for most has necessitated both the ritual restoration of past familial relations and the establishment of new social and economic associations. Similarly, resettlement has demanded the re-alignment of cultural landscapes; the renegotiation (conscious or unconscious) of cultural histories, identities and localities as a response to new social, cultural and geographic contexts. Making meaning of, and nurturing a sense of belonging in the present, is thus dependent upon the re-contextualisation of past contexts. Lovell's (1989:5) insights may have particular relevance to Dukuduku:

> Displacement and the experiential narratives which derive from such a condition are not intermediary statements. The lived experience of migration, exile or other forms of dislocation may uproot settled locality, but it is not in itself a condition in between, since meaning is derived *in situ* from dislocation itself. In addition, memories of settlement, of particular belonging to a highly localised place, may act to counterbalance the dislocation and displacement felt at particular junctures in history. Locality in this sense becomes multivocal, and belonging itself can be viewed as a multifaceted, multilayered process which mobilises loyalty to different communities simultaneously.

Sound and place in Dukuduku

In the following section, I will examine a number of songs that were collected by student researchers in Dukuduku. All of these songs originated elsewhere. However, while their meanings may be rooted in other places and times, their performance in Dukuduku gives them new relevance in the present. For the most part, old songs are performed with little conscious examination of their meanings and references. The experience of actively collecting them from community elders (often grandparents and neighbours) provided the young students with an opportunity to appraise their inherited practices anew, and to discuss the relevance of the cultural and environmental knowledge contained within them to their own experiences and contexts.

The first two songs refer to a quintessential social institution in all Dukuduku cultures: marriage. While the ritual processes may have changed significantly, certain songs continue to be sung within the context of courting and marriage today, retaining the memories of social/gender mores and practices of earlier times.

The following song is performed by women on the mouth bow or the Jew's harp. The Austrian jew's harp was introduced into South Africa by European travellers and explorers, possibly as early as the late-1700s. It became widely performed by young Nguni women, who added it to their repertoire of traditional mouth bows: the *umqangala*, made from river reed, and the *isizenze*, constructed with a deeper wooden stave and played by rasping corrugations carved into the outer stave with a small stick. Today, these instruments are generally remembered by elderly women only, and are performed in Dukuduku by basket weavers and market traders from the Maputaland area.

Mouth bows were customarily played by young women to accompany walking; their short repetitive phrases used to provide rhythmic impetus to the act of walking and to alleviate the boredom of traversing long distances across the mountains. The melody, which is created by placing the instrument against the mouth, and using the mouth cavity and epiglottis to manipulate and amplify pitches and their harmonics, follows the contour of a spoken phrase:

Deda endleleni, Nkolombela
Move off the pathway, Nkolombela

This song is said to have been composed by a young woman while walking to the river to fetch water. On her way, she encountered Nkolombela, a young suitor who confronted her on the pathway and declared his love for her. Rather than rejecting his affections outright, she expressed her lack of interest by asking him to move off the pathway so that she may continue on her way.

The song is significant in the way it uses spatial representation – i.e. the pathway – as a metaphor for social relations. Pathways are a significant symbol of social interconnectedness. However, while their places of origin and destination may be determined, they are in themselves intermediary spaces; spaces of social liminality and negotiation. In the past, pathways were spaces where young women and men could associate with one another away from the restrictions imposed on them by parents and older siblings in the household. The pathway to the river, in particular, is often referred to as the site where young men would wait for women in order to talk to, and proposition them.

While many Khula residents have embraced Christianity, certain traditional practices such as *lobola* (the giving of cattle by the groom to the bride's family) remain central to the marriage transaction. The following song is sung by women (many of whom have relocated to Dukuduku from the Maputaland borderlands) to the accompaniment of the *umakhweyana* bow:

Aayi imbombosha
Wemaganazonke
Wemalanda nkomo
Lisheshe lashona imbombosha

Hey, little cattle egret
You who has married everyone
You who fetches cows
The sun sets early, little egret

This song uses the inter-relationship between the cattle and the cattle egret as a metaphor for the practice of *lobola*. In it, the cattle egret symbolises a young woman. The song suggests that where there are young women, there will always be cattle given in marriage. A woman who is able to marry early in life will complete the *lobola* transaction with alacrity – the ritual transaction manifest in the image of the setting sun – and will thus bring prosperity to her family.

The following song, which is sung by women in a mixture of siSwati and isiZulu, is a commentary on the disintegration of the family due to labour migrancy:

Kulomuzi kaBaba noMama
Kukhanyis'ubani lomlilo ovutha entabeni?
Kukhanyis'ubani?
In the house of my father and mother
Who is burning a fire on the other side of the mountain?
Who is burning?

This song, which is reminiscent of the *umakhweyana* song discussed earlier in the paper, but is sung by elderly women who relocated to Dukuduku from the north-west of KwaZulu-Natal, expresses anxiety about social change brought about by the prolonged absence of family members from the household. It was originally performed (conceivably in the 1940-50s) by young women who would have remained at their rural homes while their men travelled to the cities to work. The city was a distant and unknown place for most women, and the mountain is consequently constructed as both a symbolic and a literal barrier beyond which the singer cannot see and does not understand. The fire burning on the other side of the mountain is personified as an agent of social change; that which may be dangerous, may not be controlled, and may potentially destroy the home.

The final song explores the use of natural imagery to express political protest. It was sung by men in the Ndumo area who were demonstrating against land dispossession in the 1950s:

Baleka mfana, lashona ilanga
Gijima mfana, awekho amanzi
Awekho amanzi asemfuleni
Run boy, the sun is setting
Run boy, there is no water
There is no water; it is in the river

The narrative of the song centres on the daily collection of water from the river for household consumption, a task normally associated with women and symbolising a necessary life-sustaining activity. The image of the setting sun is used as a pronouncement that time (and the tolerance of the protesters) is running out. The lack of water refers to the land and natural resources that have been denied them by the divisive legislations of the apartheid system. The singers rally support by suggesting that while there may not have these resources, they may be claimed back if the appropriate and timely action is taken.

In the above, we see how songs serve as repositories of information about the cultural histories and practices of the Dukuduku people. While they may be known to different people in the community, and thus reflect different cultural and geographic heritages, these histories and practices constitute the essence of identity in the Dukuduku community. It is in recognition of the multifacetedness of their heritages (as highlighted by Lovell), that loyalty to new locality may be mobilised.

Common to these songs is the poetic association between natural imagery and culture, each highlighting the ways in which trees, birds or conditions of the landscape are intimately interwoven with conceptualisations of self, human relations and cultural meanings. Viewed in this light, we see how nature may transcend locality, may be repositioned in the present, and may be understood more generally as a vital and ongoing cultural asset.

Project Reflection and Action

In the final section of the essay, I will briefly focus on some of the ways that we attempted to link cultural knowledge to environmental agency.

Our first exercise in reflection and evaluation occurred through a series of Participatory Rural Appraisal (PRA) workshops comprising youth researchers, community elders (who had been particularly supportive of the project initiative), school teachers and local Ezemvelo KZN Wildlife community conservation officers. During these workshops, it became evident that the students had begun to move from a position of discomfort with their traditions and practices, to appreciate how much they already knew, and to better understand the value of cultural and environmental knowing as both personally and socially meaningful. It also became clearer to them that the reckless felling of trees for the establishment of a *Eucalyptus* woodlot, or to plant sugar cane, would not only lead to the loss of indigenous flora and fauna, but also to the loss of resources that support and nurture their very cultural identities. Although the value of the trees as an immediate economic resource cannot be disputed, they began to understand that this was a short-term solution only. Without the trees and plants, they would not be able to perform vital ancestral ceremonies or procure medicines (practices which are still widely followed by most residents), and they would no longer be able to associate with the sounds, smells and sensual landmarks that are intrinsic to their subjective knowledge of place. For some of the teachers and wildlife officers, these workshops provided an important forum for the development of a more inclusive conceptualisation of environmental education.

Secondly, we used various creative media to display our findings to the public and to hereby stimulate broader discussion about the culture-environment interface. The entire project had

been documented photographically, and an exhibition featuring people, cultural practices and the natural locality was mounted at the school. The exhibition was open to the public, and the students used the opportunity to discuss what had been revealed to them through the documentation process. These informal interactions encouraged the Dukuduku people to talk more candidly about the forests in relation to their own senses of cultural place. Importantly, they did not need to be reactive, as has been the tendency of public forums which deal with land, natural resources and management rights in the area. Rather, these discussions focused on the value of land, trees and natural resources in relation to identities, histories and what it means to belong to place.

Finally, an archive was established in the school library for public use. This consisted of a custom-made cupboard that housed a television/video player, copies of the many hundreds of hours of video- and audio-recorded interviews, hardcopy transcriptions and translations of all interviews and related discussions, as well as books related to local environmental and cultural issues.

Methodological Challenges

In advocating participatory research, so too am I mindful of the restrictions of this approach. Processes can be frustratingly slow, time-consuming, and often difficult to sustain. Chambers' analogy of 'handing over the stick' (1997) herein deeply challenges the inclination of the project coordinator to shape research priorities and, for the sake of expediency, steer the processes.

As with any community development project, the most pressing challenge is to achieve local buy-in in order to ensure that the process will develop a momentum of its own. This was not always my experience, one of the reasons being that high school learners are busy and participate in a range of extra-curricula activities. In addition, teachers' schedules are often over-extended, and while they may support the educational value of activities initiated by outsiders, such projects may represent yet another responsibility on their part. To an extent, these obstacles may be overcome by careful scheduling, by consistent and open communication, and by constantly revisiting project goals and outcomes.

Such an initiative also requires resources in order to establish a functioning public facility. After the initial purchase of tape recorders, cassette and video tapes, video camera equipment, batteries, a lock-up cupboard and computers for data storage, additional funds are required to ensure that the documentation process is sustained, that materials are duplicated and transcribed, and that they are transferred onto an accessible format for use by teachers or interested others. Once start-up resources for the archive have been depleted, it is unlikely that a school would be able to assume financial responsibility for its upkeep.

Having managed the project for three years, we decided to resolve the issue of sustainability and funding by merging the project with another school project that was directed by a local community conservation NGO.[11] The focus of this project was to clear the school premises of alien invader plants and to construct a 'Sacred Forest' walk. While orientated more directly towards environmental education, our respective project objectives were essentially complementary. As this NGO had a long-term vision for its project at the school and was

in the financial position to employ a full-time project manager, the projects were eventually combined under their direction.

Conclusion

Focusing on music and associated rituals as repositories of both cultural and environmental meaning, the *Azibuye Emasisweni* documentation project in Dukuduku employed participatory methodologies in order to set in motion a conscious repositioning of self and locale. Promoting dialogue through the recovery and public dissemination of cultural and environmental heritages may be an empowering process, may encourage community building, and may challenge the reductionist global gaze that is typically advanced by eco- and cultural tourism. Through active reflection of self, community and senses of place, the project sought to raise awareness about the value of the environment as a cultural asset, and in so doing, to support broader initiatives in the region to achieve a more integrated, community-driven paradigm for the custodianship of the environment.

Notes on the Contributor

Angela Impey received her doctorate in anthropology/ethnomusicology from Indiana University, USA. For many years she worked as a senior lecturer in ethnomusicology at the University of KwaZulu-Natal, and is presently working as a freelance social development specialist in Ethiopia and Sudan. Email: ai244@cam.ac.uk.

Endnotes

1 The project was conducted under the auspices of the School of Music, University of KwaZulu-Natal, and made possible with funding from MMINO (South African-Norwegian Fund for Music Education and Research) and the South African National Research Foundation (Indigenous Knowledge Systems Focus Area).

2 See Cocks, Dold and Sizane (2004), and Sunderland and Ndoye (2004), amongst others.

3 For further discussion regarding the educational applications of IKS (referred to also as 'indigenous knowing systems' or a 'knowing-in-context perspective'), see O'Donoghue and Neluvhalani (2002).

4 According to the 'Convention Concerning the Protection of the World Cultural and Natural Heritage' adopted by UNESCO in 1974, a World Heritage Site relates to an area in which the natural and cultural assets are considered of outstanding universal conservation and aesthetic value. Once granted this status, UNESCO helps to protect and manage the Site, and encourages participation of local communities in the preservation of its cultural landscapes. See: www.unesco.org.

Community-based natural resource management (CBNRM) is broadly defined as a development approach that promotes the sustainable use and conservation of natural resources, and supports rural development through community participation and the creation of economic incentives. Its aim is to alleviate rural poverty and promote conservation by building rural economies and empowering communities to manage resources for their long-term social, economic and ecological benefits. See:

Shackleton and Campbell (2000).

5 Most *umakhweyana* bow players that I have encountered in Dukuduku originate from Nongoma. This example is therefore considered pertinent to the discussion.

6 *-thathawe* also refers to a person who walks with a stoop.

7 This assessment was made during the first months of research, during which numerous conversations held with Dukuduku residents revealed a surprising lack of knowledge of the musical practices of the area. When asked about what musical genres or instruments were played, I was consistently told that the only music performed these days was religious music associated with the many churches in Khula village. My later findings revealed that there is in fact a great diversity of music in the area which is performed for a variety of occasions and in a various locations. When this was subsequently pointed out to residents such as the school headmaster, their response was one of incredulity and dismay.

8 For further discussion on the constructions of 'Zuluness' through cultural tourism, see Hamilton (1998).

9 *Ziziphus mucronata* (buffalo thorn; Zulu *mphafa*)

10 *Sclerocarya birrea* (marula)

11 The Wildlands Trust in association with the Living Lakes Foundation.

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Environmental Issues in the South African Media: A case study of the *Natal Witness*

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Abstract

Environmental reporting in South Africa has been criticised for its focus on 'green' environmental issues. This criticism is rooted in the traditionally elite nature of both the media and environmentalists. However, both, it has been noted, are undergoing transformation. This paper tests the veracity of this assumption of representativeness in the contemporary South African press through a content analysis of key issues and themes and the race and gender of actors in environmental stories in the Natal Witness.

The research shows that this assertion of representativeness does not accurately describe reporting in the Natal Witness. 'Green' themes are found in almost half (48%) of the stories, as compared to 'brown' themes (17%), ecological disasters (16%), resource use (5%), environmental ethics (6%) and other themes (8%). Sources and actors tend to be white (72.9%) and men (79.9%). It is outside the parameters of the study to determine whether or not this is representative of the 'real world' which is being reported on; the results are intended to be used to raise questions about the perceptions which such stories present to the public.

Introduction

Individuals throughout the world have a growing awareness of environmental problems. Although formal environmental education is increasing, most of this awareness comes from informal sources. The abstract, interrelated and often technical nature of environmental issues, however, makes the association of cause and effect difficult for the lay person. Individuals, therefore, rarely rely solely on their own personal experiences or scientific skills to construct their ideas about environment. They seek external sources to create, extrapolate upon and confirm opinions. The media is one of these external sources, and is a key factor in the formation of individual perceptions about the environment (Kwansah-Aidoo, 2001).

It may be reasonably assumed that, as in countries like Ghana (Kwansah-Aidoo, 2001) and Sweden (Gooch, 1996), South Africans receive much of their environmental information from the media. Material in the media may be considered as either representative of, or a major influence upon, public opinion (Gingras & Carrier, 1996). However, news reports are, arguably, neither impartial nor objective, and the manner in which issues are portrayed is highly subjective (Anderson, 1997). Therefore, the selection of environmental articles and the way in which they are presented is subjective, but influences and is influenced by public opinion.

This research, a description and analysis of environmental reporting in the daily provincial paper *Natal Witness* (*Witness*), is a step towards understanding of environmental messages

portrayed to the South African public through the press. The research illuminates which environmental issues are being placed on the public agenda by the press and which race and gender are most frequently articulated in environmental news. It draws attention to topics which are covered less frequently and to the sources and actors which are not representatively included. Together, these issues describe the picture of the environment as it is represented by the *Witness*.

Critiques of Media Coverage of the Environment in South Africa

The South African environmental movement has been criticised for its elite nature and 'green' focus (Hallowes, 1993). Berger (2002) questions whether or not 'bunny-hugging' environmentalists gain media attention while less attractive issues – which are more relevant to the average South African – are not framed as environmental problems and are not covered by the media. McDonald (1997:329) succinctly poses the problem:

> Unfortunately, mainstream media coverage of the environment in South Africa continues to be dominated by conventional, green issues. Relatively little is said or written about environmental problems in the townships so it comes as little surprise that people who get all of their environmental education from the media would develop similarly narrow perspectives.

However, neither of these academics cites empirical studies to support their suppositions. Although speculations have been made, uncertainty remains as to what is actually put forth in the South African media and how it is interpreted. Further, none of the research found by the authors in the African context or internationally notes the race of the sources and actors in order to test the assumption that environmental issues are portrayed as primarily elite concerns.

The Impact of 'Elite' Coverage

What if these suppositions are true? According to media theorists, the impact is far greater than that only the 'elite' get to cut their articles out of the newspaper. Contemporary research recognises the dual relationship between the media and society, arguing that the media both influences and reflects the priorities of society and that it is often impossible to separate the cause and effect in this relationship (Hansen, 1991; Fairclough, 1995; Thompson, 1996; Anderson, 1997). The agenda-setting model attempts to explain this relationship: the media may not determine *how* people think, but effects *what* they think about (Gooch, 1996). Thus, if only elite environmental perspectives are put forward, this in part represents the primary concerns of the society. But it also has an impact of how a society views environmental issues, and what issues get public attention.

The recent transition to democracy in South Africa has given the public new roles and responsibilities with regards to environmental decision-making. Participation in governance is a critical element of the new constitution, and communities now have a greater responsibility for

influencing decisions which relate to the sustainability of their own environments. Therefore, public opinion should have a critical impact on the future of South African environmental management. Since the media has a significant influence upon public opinion, understanding the messages of the media will help to construct both an understanding of how the public views and values the environment, and an understanding of what messages are being put forward to the public through the media.

International Studies of Environmental Issues in the Media

A range of diverse studies has been conducted on the reporting of environmental issues, however, there remain a number of critical gaps in the research. Key research indicates that in Western countries during the 1960s and 70s, the media typically followed social interest in environmental problems rather than instigating concern (Anderson, 1997). Studies also show that the quantity of environmental stories is cyclical, and tends to be highest when the economy is stable and other major global events, such as wars and political instability, are not occurring (Anderson, 1997). Existing social and news values impact which issues gain coverage. Sensational events, famous names and controversial opinions receive attention, whereas chronic problems are rarely covered unless there is an event around which a story can be structured (Anderson, 1997). Hannigan (1995) composed a list of criteria which led to the construction of environmental problems, including backing by authorities, scientific 'popularisers' and construction of the issue in terms of 'morality plays' with caricatures of 'good' and 'bad' actors.

Despite these findings which indicate a general understanding of how environmental news rose in the global North, there remains a notable deficit of studies both on the details of current coverage and the history and current coverage of environmental issues in the media of the South.

The two studies which offered the most insight into assessing the coverage of environmental issues in the press were undertaken in India and Brazil. Chapman, Kumar, Fraser and Graber (1997) highlight the underlying difference in environmental perspectives between the United Kingdom (UK) and India, and between different media institutions in each country. A critical distinction noted by Chapman *et al.* (1997) is that between 'green' and 'brown' issues. Although the terms are somewhat imprecise, and many authors note the linkage between the two, they are used commonly in environmental literature. 'Green' issues are generally of a long-term focus, concerned with natural resource conservation, and associated with white and/or elite groups, whereas 'brown' issues are related to short-term impacts, human health, pollution, and the urban environment. Using this distinction, Chapman *et al.* (1997) found that the debate between environment and development and coverage of 'brown' issues was more prevalent in India, and coverage typically focused on local issues. The emphasis in the UK was on 'green' issues and environmental problems were typically portrayed as occurring in other parts of the world. Interestingly, environmental news stories in the urban English papers in India in many ways resembled such stories in papers from the UK.

Guedes' (2000) research 'Environmental issues in the Brazilian press' offered insights into content analysis and sources. 'International meetings' and 'pollution' were the most common

themes identified, and persons of authority are the sources and actors much more often than workers or those who suffered from environmental problems. Like Northern studies, this shows that environmental issues tend to gain prominence when endorsed by individuals seen as legitimate sources of news. Guedes (2000) also reviews the texts and determined that debates are generally explained in terms of cost-benefit analysis and that scientific, technological solutions are offered without questioning the system in which the problems arose. The typical stance on responsibility for environmental problems is to attribute responsibility to humanity as a whole, rather than corporations or capitalism.

These insights into themes and sources informed the content analysis performed for this study. The authors sought to support these ideas with data regarding the race, gender and role of the sources and actors of the news articles. However, few examples were found on which to base this work. The authors acknowledge that there may have been limitations due to the difficulty of searching for a somewhat obscure topic, however, they were able to source only a single article which briefly discussed the issue of gender representation. Boateng and Akosua (1993) report on a brief examination of the portrayal of women in stories on the environment in Ghana, indicating that women appear infrequently in stories on the environment.

The reasons for this lack of studies are beyond the scope of the study, but likely indicate the need for cooperation between disciplines. Assumptions about the environmental field which need to be tested may not be known by students of the mass media. Many studies which the researchers encountered indicated the position of environmental articles within the newspapers, whether stories are local or foreign, or question abstractly the role of the media (see, for example, various studies in Boafo 1993). While these issues may be important, they indicate a background in media studies rather than a strong awareness of the critical questions facing environmentalists.

Methodology

Newspapers were selected as focus for this study, because they are commonly assumed to cover a greater number of environmental stories, and back issues are easily accessible. The audiences of South African newspapers are highly differentiated by race and class (Steenveld, 2002), and it is likely they also differ by environmental content and discourse. Although using a wider range of papers would have resulted in broadened conclusions, the purpose of this study is better achieved by gaining more precise results through a detailed analysis of a single paper than by studying fewer issues in a wider range of papers.

In order to give a detailed picture of the environmental reporting in the *Witness,* textual analysis was performed based on the methodology of Hansen, Cottle, Negrine and Newbold (1998) and the examples provided by Guedes (2000) and Chapman *et al.* (1997). A one-year period from August 2003 to July 2004 was selected to avoid seasonal variations in coverage. A nine-day cycle was selected so that a reasonable number of newspapers were examined, although every two months an eleven-day time lapse was necessary so that days of the week were equally represented (Hansen *et al.*, 1998). Advertisements and sports pages are not included in the content analysis. Headlines were used to indicate environmental stories, and all potential

stories were skimmed to ensure that environmental articles were not missed. External events such as those highlighted above by Anderson (1997), which may have impacted the quantity of coverage, were not taken into consideration in the analysis. Environmental stories are defined as those mainly concerned with the interaction between biophysical and socio-economic systems, and the values and decisions which determine the nature of this interaction.

Content analysis

The first method employed in the study is a content analysis. Stories were classified by the issues addressed as in Guedes (2000) and then grouped into larger themes as in Chapman *et al*. (1997). Both issue and theme categories were significantly adapted to the South African context. Stories which discussed multiple issues were placed into multiple categories, thus the total number of issues is greater than the number of stories. However, each story was placed into a single theme category. Organising the issues into themes presented significant challenges, particularly when determining a label. The delineation of 'green' and 'brown' environmentalisms is commonly used and accepted, but with varying meanings. For this research, narrow definitions of 'brown' and 'green' were applied; 'green' themes included conservation and wildlife and 'brown' stories included those related to human health and pollution. Other themes were added for issues which do not neatly fall into these groups, as determined by the researchers, since no more appropriate model could be determined from the literature reviewed. The other themes which arose were natural resources (considered as a separate theme to other 'green' stories), ethics, ecological disasters, and 'other'. All labels are noted to be subjective and applied simply because more appropriate terms could not be readily determined.

Classification of race and gender of sources and actors was also performed to show which social groups are portrayed most often. Although recognising that racial classification is a highly sensitive subject and is itself a social construct, the goal of this component of the research is to test the veracity of existing social perceptions, such as those highlighted by Berger (2002) and McDonald (1997) above. The terms used for classification are those most commonly used in South African society: black, white and Indian. Because there is no way of differentiating coloured individuals based solely on a text unless the race is explicitly referenced, this group has not received a unique category. In line with the social constructionist ideology, the important factor is not the *actual* race or gender, but that which would be *assumed* by a 'reasonable' reader.

The data were collected and analysed so as to highlight which gender and races are portrayed most often in particular roles. The term 'disproportionate' is used in the results to indicate that a race or gender is portrayed in a certain role more or less often than if there was statistical equality. The reasons behind this are outside of the scope of the study, although it is acknowledged that it is likely to be partially attributable to disproportional representation in various roles in the 'real world'. Again, the concern of this study is not to determine whether or not the articles represent reality but to draw a picture of environmental concerns as they are presented to the public through the *Witness*.

Interviews

Interviews were also held with Craig Bishop, senior reporter in environment, land and agriculture, and deputy editor Yves van der Haeghen in November 2004. Information from journalists and environmentalists was also obtained at an environmental journalism conference held in Johannesburg in October 2004.

Results

The 158 articles categorised below must be seen as indicative not of the 'real world' but as illuminating the picture created for the audience by the newspaper.

Table 1. Frequency of environmental issues

Issues	Frequency	Percentage
Agriculture/Biotechnology	9	3.5
Apartheid	2	0.8
Climate Change	3	1.2
Consumption	2	0.8
Deforestation	4	1.5
Ecological Disaster	44	17.0
Economic Development	5	1.9
Energy	3	1.2
Equity	5	1.9
Fishing	3	1.2
Gardening	6	2.3
Industry	8	3.1
Legal	6	2.3
Local Community Impacts	5	1.9
Meeting/Declaration	5	1.9
Morals	8	3.1
Natural Resources	2	0.8
Other	16	6.2
Pollution	7	2.7
Protected Areas	20	7.7
Species Protection	20	7.7
Tour/Recreation	22	8.5
Urban Issues	4	1.5
Waste	10	3.9
Wildlife	40	15.4
Total	259	100.0

Issues

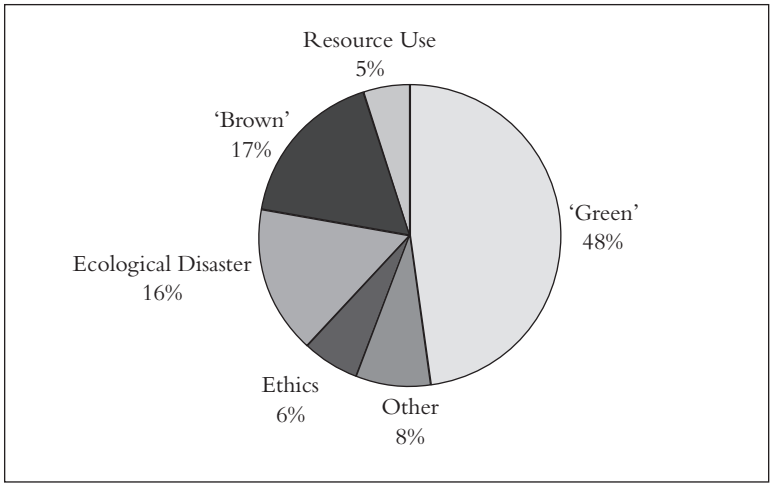
A wide range of issues were found in the identified stories, as evident from Table 1 on the previous page. The most frequent issues are ecological disasters, wildlife and tourism/recreation. The most common issue in the stories listed is 'Ecological Disaster', 17.0% of the total number of calculated issues. (This issue is also considered to be a theme, since the stories labelled under this issue were presented as unrelated to other environmental issues.) Most stories in this theme were small in size and of international location. Most local news is about drought, but the range of international disasters includes storms, hurricanes, wild fires and earthquakes.

The second most common issue is Wildlife (15.4%). Wildlife stories predominantly covered birds and charismatic mammals (bears, leopard, monkeys and whales). The next most common issue was 'Tourism and Recreation' (8.5%). The majority of the stories under this theme were provincially focused and rarely written as hard news. 'Species Protection' and 'Protected Areas' tied as the next most common issues (7.7%). Those which reference economic development offer diverse perspectives on the 'environment *versus* development' debate, but are only 1.9% of total issues.

Themes

Stories were then grouped into themes based on the main topic discussed in the article. Key themes identified through the research are: 'Green', 'Brown', Ecological Disaster, Resource Use, Ethics and Other. 'Green' themes are found most frequently in the *Witness* articles (see Figure 1).

Figure 1. Theme percentages



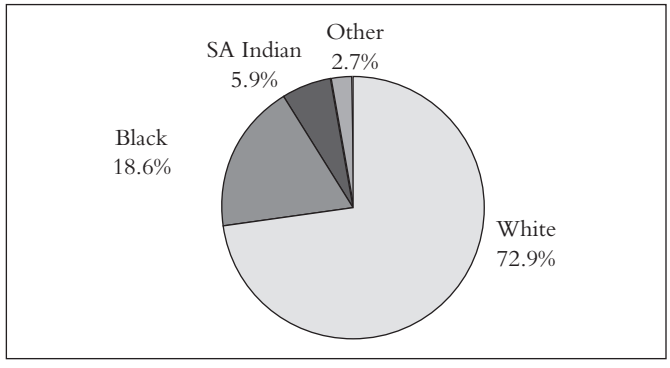
The number of stories with 'Green' themes is 77 out of 158 total stories, or 48% of the total. This far exceeded the next most common themes, 'Brown' and Ecological Disaster, which contained 17% and 16% of the stories respectively. Ethical questions raised in the stories include a wide range of topics, such as financial access to environmental areas, treatment of animals, rights to permits for limited natural resources, and where to place the blame for environmental

problems. Articles were placed in this theme when the ethics of the situation were the focal point, rather than the issue itself. Ethical themes arose through diverse issues, such as air pollution (apartheid planning resulted in some communities being more affected than others) or fishing (permits being unequally distributed).

Race and gender

The majority of individuals were able to be classified by both race and gender. A total of 4.1% were unable to be classified by race. In the single instance in which a photograph indicated a coloured individual, the tally was placed in the 'Other' category. This category otherwise applied to individuals in international stories, such as coverage of events in Brazil and Bengal. Figure 2 shows the percentages of the individuals which were able to be classified according to race. Of the sample, 3.6% were unable to be classified by gender. Of those able to be classified, 79.9% were male, 20.1% female.

Figure 2. Percentage of source and actor races



Tables 2 and 3 give further detail, showing the roles in which individuals of different races and genders are most frequently portrayed, and highlighting in which role the percentage of a certain race or gender is most disproportionately represented.

Race: The vast majority of sources and actors were white. The percentage of black individuals was highest in the classification of workers, followed by government representatives. It was lowest in environmental groups, followed by business and industry. The highest percentage of white representation occurred in the 'Scientist/Expert' category, followed by both 'University' and 'Industry/Business'. South African Indians were infrequently referenced. Their percentage representation is highest as 'Government: Environment or Conservation' (however, all four are references to the Indian minister) and in environmental groups (see Table 2).

Table 2. Racial categorisation of sources and actors by role

	Black		White		SA Indian		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Government	12	32.4	21	56.8	3	8.1	1	2.7	37	19.7
Government: Environment or Conservation	6	24.0	14	56.0	4	16.0	1	4.0	25	13.3
Scientist/Expert	2	10.5	17	89.5	0	0.0	0	0.0	19	10.1
University	2	15.4	11	84.6	0	0.0	0	0.0	13	6.9
Environmental Group	1	6.3	13	81.3	2	12.5	0	0.0	16	8.5
Industry/ Business	2	7.7	22	84.6	0	0.0	2	7.7	26	13.8
Public	4	12.1	26	78.8	2	6.1	1	3.0	33	17.6
Worker	2	66.7	1	33.3	0	0.0	0	0.0	3	1.6
Famous Names	1	20.0	4	80.0	0	0.0	0	0.0	5	2.7
Other	3	27.3	8	72.7	0	0.0	0	0.0	11	5.9
Total	**35**	**18.6**	**137**	**72.9**	**11**	**5.9**	**5**	**2.7**	**188**	**100.0**

Gender: Discounting the category of 'Other', the percentage of men is highest in the roles of 'University' and 'Government: Environment or Conservation'. It is lowest in the category of 'Environmental Groups' and 'Scientist/Expert' (see Table 3).

Table 3. Gender categorisation of sources and actors by role

	Male		Female		Total	
	No.	%	No.	%	No.	%
Government	31	83.8	6	16.2	37	19.6
Government: Environment or Conservation	21	95.5	1	4.5	22	11.6
Scientist/Expert	13	68.4	6	31.6	19	10.1
University	11	84.6	2	15.4	13	6.9
Environmental Group	10	58.8	7	41.2	17	9.0
Industry/Business	21	84.0	4	16.0	25	13.2
Public	24	75.0	8	25.0	32	16.9
Worker	4	80.0	1	20.0	5	2.6
Famous Names	4	80.0	1	20.0	5	2.6
Other	12	85.7	2	14.3	14	7.4
Total	**151**	**79.9**	**38**	**79.9**	**189**	**100.0**

Discussion

A range of observations can be made from these results. The results which are discussed in the following section are emphasised because they help to illustrate social concerns rather than media constraints. Contrary to traditional news values, few of the articles show contrasting opinions or discourses. This is particularly evident in 'Green' stories, and least frequent in stories with a 'Brown' theme. Although different opinions are expressed in different articles, there is little comparison or synthesis of these ideas provided by the journalists.

'Green' themes

One of the most noteworthy findings supports both Berger (2002) and McDonald's (1997) suppositions that environmental reporting primarily has 'Green' themes. The number of stories in this group of themes far exceeds others, paralleling the results found by Chapman *et al.* (1997) for the British papers and the Indian papers printed in English. According to the agenda-setting hypothesis (Kwansah-Aidoo, 2001), it is these 'Green' environmental issues which are put onto the public agenda by the media. Most of the stories with 'Green' themes coincide with what Hannigan (1995) terms 'morality plays', characterised by unambiguous 'good' and 'bad' actors. The word 'save', highly evocative and with strong positive moral connotations, is frequently used to describe the actions of the conservationists. Despite Bishop's comment (pers. comm., November 2004) that a classically 'Green' environmental story must include a community voice, none of the stories found include perspectives of individuals from local communities (although occasionally abstractly mentioning tourism benefits to them), and few cite non-environmental opinions. Poachers are unequivocally portrayed as the wrong-doers, and the rationale for their actions is never explicated. One article linking a traditional African church to poachers does quote a churchman who claims it is God's intention for them to use the animals. However, it is not clear whether or not the poachers themselves sought payment from the church or acted on religious motives. Regardless, the churchman's words are woven in the body of the text and the preceding and succeeding paragraphs strongly praise the apprehension of the poachers. This vilification of poachers and the unquestioningly positive portrayal of the benefits communities receive from wildlife and protected areas presents only one simplified and polarised side of what remains a very complex dynamic in South African society. Somewhat contrasting to this, individuals who protect others from threatening animals are portrayed as heroes, whereas the errant animals are themselves outside the realm of morality.

Stories with 'Green' themes as defined in this analysis, arguably, bear little or no direct relevance to the everyday lives of most South Africans. The indirect linkage such as human dependence on natural resources, and on the ecological services provided by protected areas, are rarely mentioned and never a focal point. Further, there is little that an individual South African can do to impact the situation aside from political activism or financial support to a green organisation.

Ecological disaster themes

The second most commonly found theme is 'Ecological Disaster'. Reporting in the *Witness* generally emphasises sensational incidents, often with high death rates or physical damage. These tend to be uncontroversial events, for the direct cause is non-human. Thus, there is little need for attributing blame and no chance for offending corporate entities. A key word used in the majority of articles is 'victim', implying that innocent individuals were hurt by an oppressive external entity. This phrasing implicitly denies human accountability for living in areas known to be prone to flooding, earthquakes, and other naturally occurring ecological disasters. Only one of the articles refers to the fact that natural disasters have a significantly larger impact on the poor, and this reference is indirect.

Most articles report ecological disasters in isolation. Occasionally, events are compared to previous disasters. No reference was made as to whether or not such events were becoming more frequent. Further, despite Bishop noting that a single phone call could likely produce a quote linking anthropogenic climate change to an increase in environmental disasters, none of the articles referred to the possibility that erratic weather patterns might have anthropogenic roots (Bishop, pers. comm., November 2004).

This trend is also evident in the articles which mention climate change. Interestingly, the texts discuss the impacts of climate change without explicitly linking it to anthropogenic industrial activities, and only one notes any possible solution. This can be positively interpreted to indicate acceptance of the phenomena and awareness amongst the audience of its causes. Alternatively, this framing frees the writer from attributing blame or discussing the controversial aspects of solutions or mitigations.

Neither are the climate change articles linked to energy stories. Of the three environmental stories mentioning energy, two were about nuclear power and the third simply mentioned high energy consumption as an urban problem. Despite South Africa being an energy intensive country highly dependent upon coal with strong potential for renewable energy, no local stories discussed the theme of energy.

'Brown' themes

The articles with 'Brown' environmental themes did not follow the patterns noted for 'Green' themes. Rather than unambiguous 'morality plays', both sides of the debates regarding air quality, South Durban industry and plastic bags are given space. Interestingly, only a single text strongly opposed to the Wild Coast development was found. This article was categorised as 'Brown' because it explicitly mentions effects of the road on the 'trucking industry' and 'impoverished people' and makes no reference to ecological impacts. However, despite the wording of this particular text, the issue of the N2 Toll Road is often considered a 'Green' rather than 'Brown' theme.

Gender and race

The results regarding gender and race show that environmental issues are portrayed as predominantly the concern of white individuals and men. However, one of the limitations of this study is that there are no control data to which these statistics can be compared; it may

simply be that white and male individuals are disproportionately represented in all news types. Although formal data collection was outside the scope of this study, the impression gained by the researchers while performing the research was that the racial and gender disproportional representation was more significant in the environmental stories than in other texts.

Two key statistics from the gender data confirm common social perceptions. First, the majority of the 'Government: Environment and Conservation' sources and actors represent conservation, not environmental, concerns. The disproportionate representation of men in this role supports the perception that conservation is predominantly a masculine concern. Further, a large number of the environmental groups are based around proper treatment of animals. Humanitarian non-profit organisations, particularly those emphasising concerns like animal welfare, are often considered to be dominated by women. Although still represented less often, the proportion of women is highest in this category.

The results of the gender study – which show high frequency in the scientist role and low frequency in the university role – are likely due to the fact that individuals were often cited as members of both categories. However, in order to not inaccurately represent the totals, individuals were classified according the organisation with which they were most strongly affiliated in the article. Therefore, it is doubtful that the calculated statistic indicated significant over- and under-representation.

The results of the racial data support the social perception that the environment in South Africa is predominantly a concern of the white population. The presence of black individuals most frequently as workers further supports the perceptions. However, the total number of workers is low, and when mentioned are often nameless entities. Therefore, these results are based on a very low sample size. Nonetheless, the infrequency of worker representation may itself be cause for concern.

Conclusion

This research is intended to raise questions, create debate surrounding the portrayal of environmental news in the South African media, and lay the groundwork for future research in a number of key areas. Similar research for other newspapers, radio and television – as well as research which analyses strategies of environmentalists, the relationship between the quantity/type of environmental coverage and the audience, and the impact of coverage on public opinion – is critical to fully understanding the media's portrayal of environmental issues, as well as our understanding of public perceptions of the environment.

The lack of racial and gender diversity found in the *Witness* should be highly disconcerting to all South Africans concerned about their environment. Whether or not these statistics are representative of actual differentiation in concerns, *Witness* readers are likely to perceive this dichotomy. The predominance of 'Green' themes, which are portrayed so as to be of remote interest to much of the population, is likely to create a feeling of distance between people and environmental concerns. This alienation is enhanced by the representation of white individuals and men as the most common sources and actors, creating the impression that only such individuals show concern for the environment.

Pressure on the government for increased development has brought into question the merit of environmental regulations. Limited government resources and the high costs of environmental measures have placed environmental management in a precarious position in South Africa. Environmentalists are being called to justify their cause and make it relevant to the nation as a whole. It is the perspective of these authors that presenting the issues through the media as white and male concerns, explicitly or implicitly, only enhances this challenge.

Rather than addressing what should or should not be done differently, this paper recognises enduring controversy over the role of the media and has instead focused on a description of environmental coverage. It is hoped that the description itself will raise the awareness of those in the environmental field, including journalists, environmental educators, activists and academics, of the picture that is being created. Whether or not these concerns should be addressed from within the media industry or through changed practices of environmentalists depends on how one views the role of the media. But if the goal of protecting the environment is to be achieved in a democratic South Africa, it is critical that environmentalism gains broader support. The media can either hinder this through limited portrayal of environmental concerns, or enhance it by making environmental concerns more inclusive.

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Identifying Needs and Opportunities for Local Government Environmental Education and Training in South Africa

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Abstract

Effective environmental management and public engagement with environmental concerns are needed for the attainment of sustainable development goals and socio-ecological balance in local government contexts. This vision is clearly articulated in international environmental policy frameworks and in South Africa's national and regional legislation. However, policy and legislation fall short of identifying the range of a priori *competences required by local government officials and environmental managers before well intended policy can be translated into effective practice. This paper reports on recent research into identifying the underlying competences required for better environmental management and the establishment of education and training processes for local government managers. The research draws on the notion of 'applied competence' put forward by South Africa's National Qualifications Framework, and argues that greater attention needs to be paid to competence-based capacity building processes within local government departments if environmental sustainability and development goals are to be met. The paper draws on the researchers' experiences of formulating a national level generic competence framework for environmental management, and conducting an education and training needs analysis for the Makana Municipality in the Eastern Cape province of South Africa. Early findings suggest that a broad range of competences all have a role in ensuring the capacity and effectiveness of local governments to better manage their local environment. The paper argues that these are significant for the development of environmental education and training programmes in local government contexts.*

Introduction

The role of education and training processes in supporting local governments to fulfil their daunting and significant mandate of environmental management service delivery has been under-researched (and often overlooked) in the field of environmental education in southern Africa (Lotz-Sisitka, 2003). This paper reports on early stages of research and intervention in the sector of local governance in South Africa, and draws attention to axes of tension and new opportunities with the intention of stimulating wider research and responses. In this paper, our interest lies in finding ways, through education and training research, to support local governments to translate their policy frameworks into practice. We suggest that part of the solution might lie in supporting the development of 'Applied Competence' amongst those employed as environmental managers and local government officials (DEAT, 2004), as proposed by South Africa's National Qualifications Framework. Drawing on experiences of working with the Makana Municipality in the Eastern Cape province of South Africa, we describe

how contextually situated education and training processes across *all* levels and sections of local government might begin to generate substantial change at the interface of people and environment. We put forward our experiences not as a completed case study of a 'winning formula', but rather as a tentative 'work in progress' whose orientation and design may prove useful in other research and development programmes focusing on environmental management in local government contexts.

An International Policy Background

It is the general mandate of local governments in South Africa to remediate historically created environmental problems, respond to present-day challenges and proactively manage change towards more socially and ecologically sustainable futures. This close connection between environmental wellbeing and the functioning of local governments first received wide recognition through *Local Agenda 21*, an output of *Agenda 21* of the Rio Summit in 1992. Agenda 21's *Programme for Action for Sustainable Development* set in place policies and programmes to achieve a balance between the primary driving forces of environmental change (resource consumption, pollution and population growth) and the world's natural resource base on which sustainable development depends (MEA, 2005). Chapter 28 of *Agenda 21* recognises that, '… the participation and cooperation of local authorities will be a determining factor in fulfilling its objectives' (UNCED, 1992). By adopting a *Local Agenda 21* strategy, local authorities pursue the wider goals of *Agenda 21* through community consultation processes, partnership programmes and the extension of '… existing institutions working in the field of local authority capacity building and local environmental management' (UNCED, 1992).

A decade after the introduction of *Local Agenda 21,* the *Millennium Development Goals* (UNCED, 2002) prioritised poverty, hunger, illiteracy, disease, discrimination and environmental degradation as the focal points of humanity's plight. Although not explicitly stated, the *Millennium Development Goals* set an international agenda for the content and focus of education and training programmes that should be '… more relevant and responsive to contemporary socio-ecological and socio-economic challenges at local, national and international levels' (Lotz-Sisitka, Hamaamba, Kachilonda, Zondani, Kula, Olvitt & Timmermans, 2005:16).

Proceedings of the 2002 World Summit on Sustainable Development (WSSD) conceded that too little had been achieved at global, national and local levels in mobilising policy visions into practice (Keeley & Scoones, 2003). Beyond the WSSD, hopes for future municipal successes were once again invested in policy, this time in the *Local Government Declaration* (IULA, 2002), in which leaders recommitted themselves to the targets of *Agenda 21*, and the *Declaration of Sustainable Development by African Mayors* (Thale, 2002). The latter reaffirmed commitment to the goals of sustainable development and to building on progress already made (although it should be noted that public and politicised commitments such as these do not necessarily demand rigorous and critical engagement with the complex discourse of sustainable development nor its implications). In this Declaration, a priority commitment was to empower and reinforce the capacity of local government to become efficient and effective managers and play a pivotal role in creating a more sustainable future (ICLEI, 2001).

Most recently, the draft implementation plan of the *United Nations Decade of Education for Sustainable Development* makes the connection between the goals of sustainable development and the functioning of local government. It explains how local governments, as '… the closest level of government to the people, tasked with the delivery of public programmes and services, have a key role in improving the quality of people's lives and achieving the goal of sustainable development' (UNESCO, 2004:42).

In the light of such international policies, it is surprising to note the scarcity of research over the past decade into environmental education and training in local government contexts in southern Africa. The research reported here developed from a concern that insufficient attention to environmentally-oriented education and training processes within local governments in South Africa could jeopardise the country's progress towards long-term socio-ecological balance and sustainability.

Post-1994 transformations in the national education and training system in South Africa introduced the concept of 'lifelong learning' within a 'competence-based system'. In line with international trends, critics argued for a broadening of the conception of competences to something more than discrete skills isolated from their context or underpinning knowledge and understanding (Kraak, 1999). Broad competences are thus those which:

> … prepare workers to face the challenges posed by the new global economic context – adaptability in the face of change, understanding and participation in the management of work roles and production systems, taking responsibility for contingencies, quality control, innovation and flexible responses … competencies which are impossible to develop in narrow training systems. (Kraak, 1999:52)

The most recent broadening initiative has been the development of the idea of Applied Competence which involves a combination of three distinct categories of competence – foundational, practical and reflexive.

Applied Competence as a Guiding Framework

The notion of Applied Competence was first presented in the *Green Paper on a Skills Development Strategy for Economic and Employment Growth in South Africa* (DoL, 1997) and also appears in the *Norms and Standards for Educators* (DoE, 2000). In these documents, Applied Competence is upheld as a mechanism for enabling transformation in an outcomes-based education system.

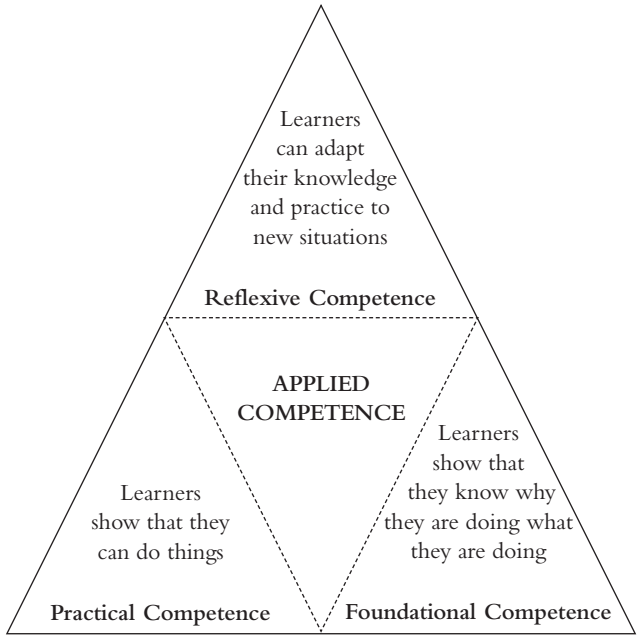
The Education and Training Practices Project (NTB, 1998) identified important links between Applied Competence and successful policy implementation. The project reports that although policy is centrally made, it is 're-made' during implementation as the people tasked with realising the policy into practice give it identity and form.

> If this is the reality of how transformation happens, the evidence points to the importance of equipping those who will be responsible for turning policy into practice with the skills

> to do so. Improving the 'professional judgement' of users has become an important focus in achieving transformation. (NTB, 1998:31)

Applied Competence, which arises from the combined application of a person's practical, foundational and reflexive competence, is regarded as particularly useful because (in an environmental management context for example) it helps to clarify what an environmental manager needs to know and should be able to do. *Practical Competence* is the demonstrated ability to perform a set of tasks. This may include contributing to the development of an Integrated Management Plan, implementing public participation and community involvement mechanisms, or managing ecosystems in ways that promote biodiversity. This is seen as the 'practical' dimension of effective environmental management practice. *Foundational Competence* is the demonstrated understanding of what a practitioner is doing, and why. It includes, for example, practitioners' knowledge of relevant environmental legislation, their understanding of the significance of educational processes, the effects of air pollution or concepts such as 'biodiversity' and 'sustainable development', etc. *Reflexive Competence* is the demonstrated ability to connect what is *known* with what is *done* so that practitioners can learn from their actions and make adaptations for improved practice. Although easily overlooked, this dimension of reflexive competence is of significance to environment and sustainability-focused education because it requires practitioners to reflect critically on the work they do, possibly even challenge the *status quo*, and proactively seek ways of improving practice within their areas of responsibility.

Figure 1. The balanced interaction of practical, foundational and reflexive competences combine to constitute Applied Competence



(Source: Le Roux, 2001:11)

Initiating a Small-Scale Research Project

In considering the scope and significance of local governments' mandate in South Africa, two separate but related questions are raised. Firstly, what types of competences are required of environmental managers? Secondly, what types of education and training interventions would support and enable the development of such competences? Insights towards answering the first question came through a small research project commissioned by the national Department of Environmental Affairs and Tourism (DEAT) in 2004, which was conducted by researchers from Rhodes University (lead author included) (DEAT, 2004).

The commission called for an analytical study of the education and training needs implied in current national environmental legislation. These needs are described as 'implied' because legislation does not refer to them explicitly; rather, they are implied through the mandatory activities of environmental managers, as stipulated in the legislation. For instance, the Protected Areas Act of 2003 requires that the development of a management plan for a protected area '… must contain at least … procedures for public participation' (RSA, 2003a:32). Similarly, the Biodiversity Act requires that the authority, before exercising power in terms of this Act must '… allow public participation in the process' (RSA, 2004:80). It is explicit here that governmental communication strategies should enable and promote participation from all sectors of society around these environmental concerns. However, the *underlying* skills and competences needed by government authorities or environmental managers in order to develop and implement such participatory communication strategies are *not* made explicit, only implied or assumed to be in place.

In consultation with DEAT, the following pieces of environmental legislation were selected for analysis in the study: the National Environmental Management Act (NEMA; RSA, 1998a); the Environmental Impact Assessment (EIA) Regulations under Section 24(5) of NEMA (RSA, 1998b), as amended; the Marine Living Resources Act (RSA, 1998c); the World Heritage Convention Act (RSA, 1999); the White Paper on Integrated Pollution and Waste Management for South Africa (RSA, 2000a); the NEMA: Air Quality Bill (RSA, 2003b); the NEMA: Protected Areas Act (RSA,2003a); and the NEMA: Biodiversity Act (RSA, 2004).

Individual interviews were conducted with senior staff of five management sections of DEAT: Air Quality; Chemical and Hazardous Waste; Environmental Impact Assessment; State of Environment; and Protected Areas. The purpose of these semi-structured interviews was to learn directly from departmental staff what education and training needs they identified with regard to environmental management in their directorate, and what capacity building programmes, if any, were already in place or planned. Information from these interviews was used in combination with the detailed desktop study of legislation to identify (i) key legislation steering practice in the various directorates, (ii) education and training needs, priorities and trends, and (iii) opportunities for building on existing skills development programmes or qualifications, or for initiating future programmes.

In order to have a consistent framework within which the environmental legislation could be analysed, categories were generated into which extracts of legislation could be categorised. The broad applicability of the National Environmental Management Act (NEMA; RSA,

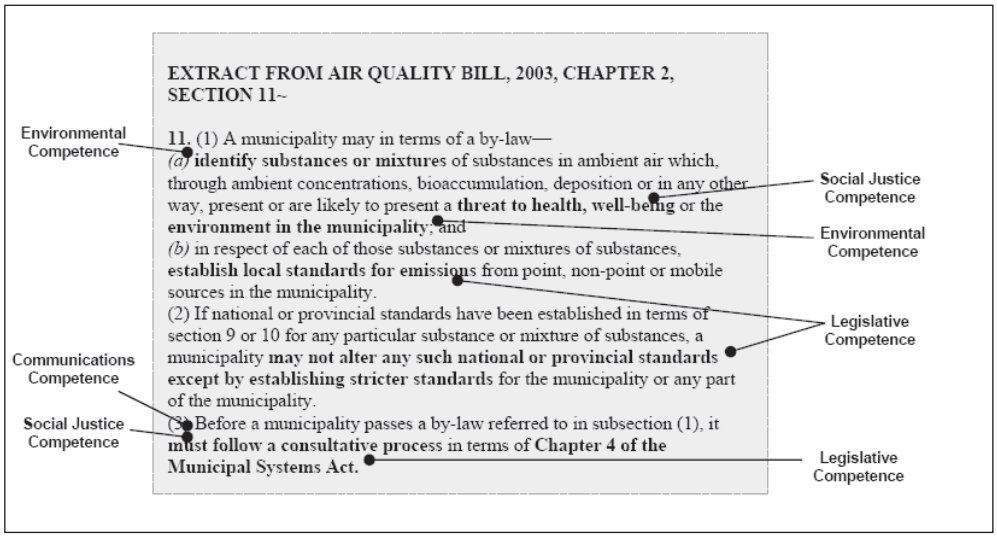
1998a) and its over-arching legislative imperatives made the act an appropriate document from which broad categories of implied competence could be generated. A carefully focused reading of NEMA generated the following broad categories of competence:

- Environmental Competence
- Education & Training Competence
- Management/Planning/Administrative Competence
- Legislative Competence
- Communications Competence
- Social Justice/Ethical Competence
- Monitoring/Evaluation/Research Competence

These categories provided a well-structured framework to organise and then analyse the various dimensions of the other selected environmental management legislation. Each piece of legislation was carefully read and extracts referring to an imperative or deliverable were allocated to one or more of the above-mentioned categories. This process generated a detailed summary of the various competences associated with the selected legislation. Many legislative extracts were found to apply to more than one category. This overlap was not regarded as problematic and in fact emphasised the prevalence of cross-cutting, interrelated competences and activities associated with effective environmental management.

Figure 2 illustrates, through using a sample from the NEMA: Air Quality Bill of 2003 (RSA, 2003b), how one small piece of environmental management legislation pertaining to local municipalities can be analysed to identify what categories of competence are required to support effective environmental management.

Figure 2. Analysis of an extract of the Air Quality Bill of 2003, showing how extracts were analysed in terms of the categories of implied competence



The tabulated summaries produced from this first level of analysis needed to be restructured for a second level of more detailed analysis. Extracts were regrouped according to the categories of competence. The significance of analysis during this second level of analysis was the inference of more specific education and training needs. Using the notion of Applied Competence, each extract was analysed in terms of its implied Foundational, Practical and Reflexive Competences. In total, 49 tables were generated to capture the types of knowledge, skills, understandings and activities called for across the seven selected pieces of environmental legislation. Table 1 below is an adaptation of one of these 49 tables. Using extracts from only the World Heritage Convention Act of 1999 (RSA, 1999), the table provides a breakdown of the three dimensions of Applied Competence in relation to a focus on Social Justice/Ethical Competence. In this way, similar tables were generated for each piece of selected legislation and for each category of implied competence (see DEAT, 2004 for more detail).

Table 1. Dimensions of Applied Competence as identified within the category of Social Justice/Ethical Competence, based on extracts from the World Heritage Convention Act of 1999

Extract from World Heritage Convention Act (RSA, 1999)	Foundational Competence	Practical Competence	Reflexive Competence
'Promote empowerment and advancement of historically disadvantaged persons in projects related to World Heritage Sites' (Section 3) *'Cultural and natural heritage management must be sensitive to the people and their needs and must equitably serve their physical, psychological, developmental, cultural and social interests' (Section 4)*	• Have knowledge and understanding of ways in which historically disadvantaged persons can be empowered • Understand the context, aspirations, capacity and needs of people associated with the World Heritage Site	• Develop and implement strategies to empower and advance historically disadvantaged persons	• Reflect critically on previous empowerment projects and identify appropriate strategies and orientations • Evaluate proposed or existing empowerment projects in relation to social, ecological and economic sustainability • Assess the extent to which people's interests are being met through their association with the World Heritage Site, and propose recommendations where necessary

Extract from World Heritage Convention Act (RSA, 1999)	Foundational Competence	Practical Competence	Reflexive Competence
'*Development must be socially, culturally, environmentally and economically sustainable'* (Section 4)	• Understand the concept of 'sustainability' in relation to social, cultural, ecological and economic development	• Plan or oversee development associated with a World Heritage Site in socially, culturally, ecologically and economically sustainable ways	• Critically reflect on planned or existing developments of a World Heritage Site in relation to their sustainability • Make recommendations for more sustainable development alternatives
'*An Authority has … the following duties in connection with a World Heritage Site under its control, namely to – (a) develop measures for the cultural and environmental protection and sustainable development of, and related activities within, World Heritage Sites …*' (Section 13)	• Understand concepts of 'sustainable development', 'cultural protection' and 'environmental protection' • Have knowledge of the World Heritage Site, in particular its cultural and environmental status • Have knowledge of activities that threaten or benefit the World Heritage Site	• Plan and conduct activities for the benefit of the ecological status of the World Heritage Site • Plan and conduct activities for the development and/or protection of cultures associated with the World Heritage Site	• Reflect on tensions and nuances associated with the concept of 'sustainable development' • Critically evaluate activities planned and undertaken towards the cultural and environmental protection and sustainable development of the World Heritage Site
'*Ensure the identification, protection, conservation, presentation, and transmission of the cultural and natural heritage to future generations*' (Section 13)	• Recognise and understand the nature and significance of cultural and natural heritage • Have basic knowledge of how to protect and conserve both cultural and natural heritage • Have knowledge of ways to transmit cultural and natural heritage to future generations	• Identify cultural heritage • Identify natural heritage • Protect and conserve cultural heritage • Protect and conserve natural heritage • Present and transmit cultural heritage to future generations • Present and transmit natural heritage to future generations	• Reflect on the status and significance of cultural and natural heritage in the context of a World Heritage Site • Consider and evaluate alternative ways of presenting and transmitting cultural and natural heritage

(Adapted from DEAT, 2004)

The 49 tables were analysed as a complete set so that emerging trends could be identified. It was during this phase of analysis that significant factors such as the recurrence or predominance of certain competences, or the apparent absence of others, came to the fore. Analysis revealed that effective environmental management hinges upon a wide range of cross-cutting knowledge, skills and values: interpreting policy and legislation, contributing to the development of integrated management plans, compiling annual reports, working according to financial plans, liaising with interested and affected parties, initiating projects/programmes, responding to ethical tensions and social justice issues, etc. The findings made it clear that, beyond efficient managerial skills, local government managers at all levels also require sound knowledge and understanding of social and environmental concepts and processes, for example the functioning of ecological systems, tensions around sustainability and sustainable development, application of the precautionary principle, risk identification, risk management and stakeholder participation (DEAT, 2004).

From these findings, a generic competence framework was developed to guide future development of qualifications, skills programmes and learnerships (Table 2). This generic framework was developed with the intention of strengthening existing environmental management practices, and supporting the translation of environmental legislation from policy into practice.

Table 2. A generic framework to guide the development of environmental management qualifications, skills development programmes and learnerships

Categories of Competence	Practical Competence	Foundational Competence	Reflexive Competence
Environmental Competence			
Education & Training Competence			
Management/Planning & Admin. Competence			
Legislative Competence			
Communications Competence			
Social Justice & Ethical Competence			
Monitoring/Evaluation & Research Competence			
Implications for National Qualification Framework (NQF) Levels 5–7	*At these levels, the scale of operation is broader (international, national or provincial), with more managerial responsibility, and more reflexive skills being required.*		
Implications for NQF Levels 2–4	*At these levels, there is a stronger focus on practical and foundational competences; work is conducted with guidance and support, and reflexivity is limited to locally situated practice.*		

Developing the Study in the Context of the Makana Municipality

The Makana Municipality continues to experience rapid population growth due to migration from nearby farms as land-use patterns change from labour-intensive commercial farming to less labour intensive and more profitable game farming (Hamaamba, 2004). A housing survey conducted in 2003 estimates the population of the Makana municipal area to be approximately 124 000 people (Rudolecky, 2004, in Hamaamba, 2005). This rapid population movement has resulted in the establishment of large informal settlements without basic amenities, a situation which is exacerbated by the apartheid-linked backlogs in service provision.

The Makana Municipality employs about 586 employees. It also has 24 councillors from 12 community wards and 12 proportional representatives from different political parties. From these 24 councillors, six are elected to chair six different portfolio committees and six serve in the Environment, Disaster Management and Heritage portfolio within Makana Municipality (Hamaamba, 2004).

The Reviewed Integrated Development Plan of 2004 identified some of the development priorities as: access to potable water, improved sanitation, health care and environmental health, more opportunities for education and training, job creation, poverty alleviation, housing provision, land distribution and community safety (Makana Municipality, 2004). In response to these and other environmental issues, the Makana Municipality committed itself to Agenda 21, the National Environmental Management Act (NEMA) and the Johannesburg Declaration on Sustainable Development, by initiating a project called the Local Environmental Action Plan (LEAP) in January 2004 (ARC, 2003). One of the key deliverables for LEAP is the establishment of an environmental education and training strategy for municipal employees in line with the Reviewed Integrated Development Plan for 2004.

DEAT's generic competence framework and its associated recommendations were taken forward in the development of the Makana Municipality's Environmental Education and Training Strategy (Lotz-Sistika *et al.*, 2005). This was the first opportunity to combine a generic competence planning framework (developed in a national context) with the specific characteristics and challenges of a local municipal government to develop an accessible and multi-levelled environmental education and training strategy. The scope of this paper does not allow for a detailed account of the final strategy document, but focuses instead on the preceding contextual profiling and needs analysis that, in combination with the DEAT findings, informed the strategy's development (Hamaamba, 2005).

A small-scale needs analysis of education and training needs in the Makana Municipality

The small-scale research project was designed as an interpretive case study within the Makana Municipality to investigate the education and training needs of municipal employees. Findings were used to inform the development of a broader Environmental Education and Training Strategy as part of the LEAP, described above.

To establish a sound understanding of the context and background of local environmental issues and the perspectives of municipal employees, four profiles were developed: a profile of environmental issues in the Makana Municipality, a profile of organisational needs, a learner

profile and a profile of community perceptions of local environmental management issues. A group of municipal employees was identified, consisting of senior and middle management officials, technicians/professionals, manual workers and municipal councillors. With this selected group of employees, a sequence of individual questionnaires, focus group discussions and individual interviews generated detailed information about employees' experiences, descriptions of environmental issues faced in their work, their current levels of education, and further education and training needs.

The profile of community perceptions of local environmental management issues was developed by reviewing articles in two local newspapers between January 2003 and June 2004, identifying the major environmental themes and recording their frequency. Reviews of both newspapers indicated that issues of sanitation, waste management, livestock management and fire risk were the priority environmental management concerns. These issues resonated exactly with those identified by municipal employees in the questionnaires, focus groups and interviews (Hamaamba, 2004).

Analysis of diverse responses to these issues indicated that there was a need for improved environmental management capacity in the Makana Municipality. Three key areas of capacity building needs were identified, the first of which is improved capacity for interacting with residents of the Makana community. Respondents to the questionnaires indicated that greater attention needed to be given to 'community-based planning', and that municipal officials should be equipped with the '… skills to address and interact with communities' (Hamaamba, 2005:73). Data revealed that education and training programmes need to be initiated more broadly than with municipal officials only. Some respondents noted that training '… should focus on providing 'primary environmental education for the whole community' of the Makana Municipality, to enable municipal officials to address environmental issues and risks' (*ibid*.:74*)*. The study concluded that consideration needs to be given to how education and training can build and support improved management capacities within the municipality and also strengthen community interactions and relationships.

Legislative competence was recognised as a significant dimension of effective environmental management. The study found that education and training programmes should enable managers and officials to develop skills in interpreting, analysing and implementing relevant legislation such as ISO 14000, the Municipal Structures Act (RSA, 1998d), the Municipal Systems Act (RSA, 2000b), and the National Environmental Management Act (NEMA; RSA, 1998a) of 1998. Responding to local environmental issues identified in the contextual profile requires an understanding and ability to implement more specific legislation such as the Agriculture and Conservation Act (RSA, 1996), the Water Services Act (RSA, 1997), and various Integrated Waste Management policies.

The third desired area of capacity building was in the area of management, in particular financial planning and budgeting. Municipal employees explained that the development of skills to source funding was much needed, and some alluded to direct and indirect connections between effective planning, community involvement, fundraising and the ability to respond more efficiently to local environmental problems (Hamaamba, 2005).

Emerging insights into education and training needs for better environmental management

Findings of the study conducted in the context of the Makana Municipality resonated very strongly with those of the earlier and more generic study of competences implied in environmental legislation (DEAT, 2004). Most dominant were calls for the development of greater management competence, legislative competence and communication competence, as well as more in-depth knowledge of environmental issues and risks.

Adapting DEAT's national environmental management competence framework to the contextual needs of the Makana Municipality, Hamaamba (2005) developed a more specific competence framework. This framework (see Table 3 below) uses slightly adapted categories of competence and demonstrates how the practical, foundational and reflexive dimensions of Applied Competence can be used to scope the extent of education and training required for improved environmental management in the context of local government. The examples used (drawn from work with the Makana Municipality and the responsibilities of councillors, professionals and upper-level managers) are likely to resemble the mandates, activities and challenges of most other southern African local governments.

Table 3. Competence framework for managers, professional and councillors of the Makana Municipality

Environmental Management Competence	
Practical Competence	• Identify priority environmental management issues and risks
Foundational Competence	• Understand the causes and effects of issues (long-term causes and effects as well as short-term causes and effects) • Understand the way in which environmental issues and risks are interrelated (e.g., sanitation and illegal dumping) • Understand socio-cultural and technical aspects of environmental issues (e.g. livestock issues)
Reflexive Competence	• Ability to make and evaluate decisions, and consider the complexity of environmental issues and risks • Ability to assess alternative solutions
Legislative Competence	
Practical Competence	• Implement relevant legislation in relation to these issues, e.g., NEMA • Implement legislation and make by-laws, as required in the local government context
Foundational Competence	• Understand relevant legislation for environmental management in local government • Understand legislation in its broader socio-political context • Understand the relationships between different legislation and related implications for environmental management in local government context
Reflexive Competence	• Critically review legislation and its implementation at local government level in response to environmental management issues

Planning Competence	
Practical Competence	• Participate in integrated planning through formulation of Integrated Development Plan (IDP)
Foundational Competence	• Knowledge of how to formulate the IDP and how to identity issues that need attention, and how to develop the IDPs in such a way that they take into account other relevant policies which contribute to improved environmental management in the local municipality
Reflexive Competence	• Critically review the IDP through implementation of monitoring procedures, and other development concerns, as outlined in the IDP
Project Management Competence	
Practical Competence	• Implement the specific projects, such as the proposed LEAP implementation projects
Foundational Competence	• Develop knowledge of designing and monitoring the intervention projects
Reflexive Competence	• Critically evaluate the projects and ongoing monitoring to ensure improved environmental management in the local municipality
Financial and Budgeting Competence	
Practical Competence	• Cost and manage the funds
Foundational Competence	• Develop knowledge of how to cost projects, organise fundraising ventures and draw up budgets, which should all contribute to improved environmental management in local municipality
Reflexive Competence	• Critically review the budgets in order to allocate funding in priority areas and on time
Communication Competence	
Practical Competence	• Involve community in projects and decision-making, and strengthen interdepartmental communication, which improves environmental management
Foundational Competence	• Develop knowledge of the existing structures and strategies for working with communities, such as ward committees • Build capacity in improved community interaction through effective use of councillors, arranging community meetings, lobbying either through media or public meetings
Reflexive Competence	• Critically review and evaluate the community programmes in order to improve communication strategies and ensure community wellbeing which is also linked to social justice competence
Social Justice Competence	
Practical Competence	• Implement projects such as recycling of waste, with a view to creating jobs for the community and the alleviation of poverty
Foundational Competence	• Develop knowledge and understanding of the scope of job-creation projects linked to improved environmental management in the local municipality context
Reflexive Competence	• Critically review projects which are aimed at improving quality of life and redress, while improving environmental management projects

(Source: Hamaamba, 2005)

Openings for continuing research

Work done by the Rhodes University Environmental Education and Sustainability Unit with the Makana Municipality, as well as wider research with DEAT into the desired competences for better environmental management, has opened a challenging dimension in the field of environmental education and training. Undoubtedly, local governments have a significant role to play in the attainment of sustainable development goals and the meaningful implementation of international and national environmental legislation. Early findings suggest that education and training for municipal staff, and environmental managers in particular, can be guided by the development of a competence framework based on the three dimensions of Applied Competence. This, supported by broad-based and consultative contextual studies of environmental issues and municipal education and training needs, can inform the scope and depth of education and training activities across all levels of municipal hierarchy and responsibilities.

Early research in the local governance sector suggests a need for a break from the conventional view of environmentally-oriented education and training being limited to education staff or community extension officers. Most commonly, education and training for better environmental management is limited to those most *directly* responsible for such management. However, the recent experiences and insights outlined in this paper suggest that, due to the cross-cutting nature of environmental concerns and the network of systems that affect them, the scope of education and training should be widened to other areas, and through all levels of skills and responsibilities. In conceptualising education and training for improved environmental management, we should be thinking beyond the most obvious (and still essential) 'natural sciences' and 'environmental management' qualifications. It is the cumulative effect of synergistic relationships across *all* areas of local governance that sufficiently strengthens local environmental management for socio-ecological balance (and hence sustainability) to become realisable. Building capacity, for example, towards better financial management, public communications, law enforcement, ethical and equitable practice, research and project management within a municipality is central to improved environmental management. With a range of appropriate competences developed, and cross-cutting environmental management systems in place, local governments should be better placed to translate the ideals of international and national environmental policies into effective practice.

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Investigating an Ethical Approach to Genetically Modified Crops in Environmental Educational Processes

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Abstract

Genetically modified (GM) crops gained attention in southern Africa in the context of broader debates about the struggle for food security and poverty alleviation to achieve sustainable development. The prospects of GM crops as a technological innovation have provoked numerous debates and environmental concern groups have challenged their use. Environmental educators' concern for greater ethical practices regarding environmental issues can be applied to the subject of GM crops. This article focuses on the perceptions of environmental educators regarding the use of GM crops towards sustainable development. Interviews were conducted with a small group of environmental educators to gain some insight into their perceptions. The interviews reflected some contextual relevance of GM crops, understanding of the concepts 'GM crops' and 'sustainable development' as well as four unique themes. These emphasise the plurality of the GM crops issue and the importance thereof in working towards an ethical approach in environmental educational processes.

Introduction

Issues surrounding genetically modified (GM) crops have been the subject of a range of popular discussions in the media because of their complex and controversial nature. Dickson (2005) argues that this public debate has great value as long as the facts about GM crops are portrayed accurately. Biotechnology proponents promote GM crops as a solution to poverty and food security issues in southern Africa (Conko & Prakash, 2003:25). Articles distributed by *Green Clippings*[1] in the public media suggest that environmentalists question the benefits and emphasise the threats GM crops pose to the environment. *Green Clippings* distributed about 50 articles in South Africa, addressing issues related to GM crops during 2002 to 2005.

The controversy surrounding GM crops poses a challenge to its governance. Beck (1991, cited in Webster, 1999:414) states that political institutions find themselves unable to keep up with this new technological development. As a result, these institutions become disempowered and have to administer a development they neither planned nor are able to structure, but somehow have to justify. This has implications for environmental management legislation and information dissemination practices. Such practices should ultimately challenge people to adopt an ideal of human behaviour – an environmental ethic (UNESCO, 1991:1).

In 2002, the United Nations (UN) declared the period from 2005 to 2014 as the Decade of Education for Sustainable Development (ESD). Fien and Tilbury (2002:5) reiterate that

sustainable development has to promote a greater consideration for social justice in an ecologically sustainable way when dealing with environmental problems and issues, implying an environmental ethic. This environmental ethic should be integral to environmental educators' functions. The Environmental Education Association of Southern Africa (EEASA) calls for the promotion of interdisciplinary and multidisciplinary studies of the environment, and the dissemination of information regarding environmental education, as expressed in some of the aims of the *EEASA Constitution* (EEASA, 2001:1) that will be instrumental in achieving the goals of the Decade of ESD.

The use of GM crops has a potential environmental, social, political and economical impact on southern Africa. For this reason, GM crops should be addressed in environmental education. According to Lotz-Sisitka (2002:4), environmental education processes can establish opportunities for a new or stronger environmental ethic to emerge, thus contributing towards the establishment of practices, structures and institutions with stronger environmental values to achieve the goals of ESD. By determining the perceptions of environmental educators on the use of GM crops, a valuable starting point in the creation of frameworks towards such processes could be established. The perceptions of environmental educators regarding the use of GM crops can contribute to the role environmental education may play in future towards establishing an environmental ethic.

The study reported in this paper attempted to determine the perceptions of environmental educators regarding the use of GM crops towards sustainable development (Le Roux, 2004).

Interviews were conducted to determine these using open-ended semi-structured questions. The interviews were conducted during the EEASA annual conference in April 2004. A very small sample of environmental educators was interviewed and therefore the data cannot be extrapolated. The interviews did, however, yield a rich source of data sufficient to place the spotlight on the importance of an ethical approach to GM crops in environmental education. Only the unique themes revealed from the data and the interpretation of the concepts 'GM crops' and 'sustainable development' will be discussed in this paper.

The next section provides background information regarding GM crops. Other perception studies regarding GM crops carried out elsewhere in the world are discussed, as well as a few studies conducted in South Africa. The perceptions of southern African environmental educators could be used in conjunction with information from other perception studies. Together they may contribute towards the establishment of a stronger ethical approach to complex and controversial issues such as GM crops.

Background Relating to Perception Studies of GM Technology

Genetic modification (GM) entails the transfer of selected individual genes from one organism to another, including genes from unrelated species. This technology has been used to promote a desired crop character or to suppress an undesirable trait (Nuffield Council on Bioethics, 2004:3). GM foods are the products of GM crops that are processed for human or animal consumption.

Proponents of GM crops view GM crops as instrumental in poverty alleviation and as a means to increase food security. It is said that by addressing problems such as poor soil quality, and the production of insect-resistant crops and crops that are herbicide tolerant (Thompson, 2002:2, Conko & Prakash, 2003:25), the food production ability of rural farmers who are almost entirely dependent upon the land for their livelihood, can improve. It is argued that insect-resistant crops will reduce the use of insecticides, which will result in decreased environmental poisoning. Although proponents consider GM crops as part of a strategy to ensure food security, it is met with strong opposition from environmental and social justice groups like Biowatch[2] and SAFeAGE[3] who are active in southern Africa. Egziabher and Shiva (1998), Altieri and Rosset (1999:4) and the Nuffield Council on Bioethics (2004:60) all seem to agree on the environmental concerns regarding GM crops. These concerns include gene flow to other plants and organisms, and the possible effect of GM crops on insects and other herbivores. This especially applies where modified crops contain components that their wild relatives would not contain. Unanswered ecological questions that refer to the indirect effects GM crops may have on plants, soil and non-target organisms are also raised as a concern. Other issues, which raise more general concern, deal with intellectual property rights, monopoly by the gene giants and involvement of civil society in the decisions regarding GM legislation (Nuffield Council on Bioethics, 2004:44).

Five international regulations are concerned with research on the trade and use of GM crops (Nuffield Council on Bioethics, 2003:65). Of these, the Cartagena Protocol on Biosafety under the Convention of Biological Diversity (the Protocol) relates most to environmental concerns. The Protocol covers the movement across national boundaries of living modified organisms that may have an adverse effect on biological diversity. The Protocol also contains procedures relating to the provision of information and carrying out of tests to assess the safety of living modified organisms such as GM crops (Nuffield Council on Bioethics, 2003:65). In addition, it encourages governments to take a precautionary approach to the domestic regulation of transgenic organisms (Conko, 2003:1). The precautionary principle is open to a variety of interpretations and much disagreement exists over whether the precautionary approach is a useful tool for managing the risks of technologies and products like GM crops (Conko, 2003:8).

The precautionary principle as an information and risk management tool is particularly problematic in contemporary society (Conko, 2003:1). GM crops are perceived as a contemporary risk issue (Beck, 2000:218). Modern risk issues are different from conventional thinking about risk. Contemporary risks become de-linked from geophysical boundaries and are intrinsically about the politics of knowledge and expertise (Goldblatt, 1996:158). Weber, Hair and Fowler (2000:29) elicited that an individual's perceptions regarding environmental problems (risks) are socially constructed, especially when the risk is not experienced first hand. Perceptions are partially derived from information presented in the mass media and environmental curricula rather than from immediate sensory contact with the issue. As a result, many perception studies regarding GM crops have been conducted around the world in an attempt to determine how to address the controversy and complexities of GM crops.

There have been numerous efforts to understand the public's perceptions with regards to GM crops and foods around the world (see Table 1). Only a few such surveys have been conducted recently in southern Africa by organisations like Public Understanding of Biotechnology (PUB),[4] Africabio (2002) and the National Consumer Forum (NCF, 2003) of South Africa. These were primarily done to ascertain public opinion, attitude and knowledge of GM issues. Some objectives in the PUB Business Plan (Joubert, 2003:7,10) express the need for perception (knowledge and opinion) studies of key audiences. A Human Sciences Research Council client survey on controversial topics in biotechnology (including GM crops) was conducted in 2004 and the report made public in 2005 (Rule & Ianga, 2005). It is hoped that the results will provide guidance in developing an optimum communication strategy for the PUB programme.

Table 1. Summary of previous perception studies and the resulting perception indicators

Indicators of Perceptions	References to Perceptions Studies
1. Knowledge	Murch (1976:277); Weber *et al.* (2000:29); AFIC & ISAAA (2001:9); Sittenfeld & Espinoza (2002:469); Kelley (1994); Morris & Adley 2001:47)
2. Values, culture, belief (ethical considerations)	Murch (1976:279); Cothern (1996:43); AFIC & ISAAA (2001:9); Kelley (1994); Gaskell *et al.* (2004:186)
3. Trust	Mucci *et al.* (2004:4); Gaskell *et al.* (2004:186); Chen Ng *et al.* (2000:110)
4. Scientific world-view (knowledge system)	Kelley (1994); Gaskell *et al.* (2004:186); Chen Ng *et al.* (2000:107)
5. Uncertainty	Cothern (1996:43); Gaskell *et al.* (2004:186)
6. Information and information sources	Weber *et al.* (2000:29); Sittenfeld & Espinoza (2002:469); Morris & Adley (2001:47); Chen Ng *et al.* (2000:112)
7. Benefit-risk analysis	AFIC & ISAAA (2001:9); Sittenfeld & Espinoza (2002:469); Mucci *et al.* (2004:4); Kelley (1994); Gaskell *et al.* (2004:186); Chen Ng *et al.* (2000:109)

AFIC – Asia Food Information Centre
ISAAA – (AFIC) and International Services for Acquisition of Agri-biotech Applications

The indicators of perceptions, which the various studies revealed, appear in Table 1. Knowledge, unawareness and uncertainty, normative belief systems, culture and trust can be regarded as dimensions of an ethical approach to environmental issues. This will be discussed with regard to GM crops in the subsequent paragraphs.

Knowledge, unawareness and uncertainty

As indicated in Table 1, knowledge, knowledge systems, information and benefit-risk analysis of a perceived risk, are integral to the perceptions thereof. Goldblatt's (1996:158) analysis of Beck's *Risk Society* (1992) elaborates on this contention by claiming that modern risk is purported to be intrinsically associated with a politics of knowledge, expertise and counter-expertise. This means that risks are socially invisible and must clearly be brought to consciousness, only then can it be said that they constitute an actual threat.

Drawing on the work of Beck and Bauman, Ward (2002:28) discusses the theories of knowledge that may underpin expert decisions in risk analysis. Beck makes a distinction between linear and non-linear theories of knowledge (Ward, 2002:28). A linear theory of knowledge emphasises one coherent knowledge system that underpins assumptions of universality, foundation, homogeneity, monotony and clarity, whereas unknowns or conflicting knowns are played down. An application of this linear theory of knowledge is explained by Shiva (1993:9) who highlights the fact that local knowledge has disappeared through its interactions with the dominant Western knowledge at many levels and through many steps. She states that Western scientific knowledge has generally been viewed as universal. This has often led to the prefix of 'scientific' being given to modern knowledge systems, and 'unscientific' for the traditional knowledge systems. Through this, more power has been granted to modern scientific knowledge that encouraged the perception that science is given a specific epistemological status. The fact that modern science is determined through social mediation is ignored. Proponents of GM crops often invoke the power of scientific knowledge when they argue that concerns with the GM crop risks are fundamentally irrational and anti-scientific (Millstone & Van Zwanenberg, 2003:656).

The need for scientifically accurate knowledge (and information) has been emphasised by several perceptions studies. A lack of knowledge is seen as the main reason for negative public perception about GM crops. Joubert (2003:5) states that a lack of understanding about biotechnology (of which GM crops is part) is providing a vacuum for unbalanced and often non-factual information, which has led to the confusion of the general public. Cockburn (2002:79) is of the opinion that consumers need to be more informed and Uzogara (2000:179) argues that public awareness needs to be increased. Perceptions due to a lack of knowledge raise the issue of unawareness, which Beck (1999:127) defines as both an inability to know and unwillingness to know. Unawareness may also lead to a marginalisation of certain communities within populations, where access to relevant knowledge is a problem. This may also result in a new source of inequality and thus social injustice (Rivera-Lopez, 2002:11). An inability to bring balanced information to rural communities about modern technologies like GM crops is likely to widen the gap between the 'have's' and the 'have-nots' which Sharma (2004:10) describes as a knowledge divide.

Knowledge and unawareness are realised in conflicts of cognition (Beck, 2000:217). More and more accurate knowledge is required, but more knowledge is also becoming a new source of risk. As people learn more about GM crops, they can question the issue with greater insight. Unawareness on the other hand makes deciding, in a context where the outcomes are uncertain, very difficult. As Beck (2000:217) suggests, this scenario can be applied to GM

crops, where neither the optimism of the proponents nor the pessimism of their critics is based on certain knowledge. Beck continues that there is no better breeding ground for risks than denying them. In other words, by making a lack of knowledge the foundation for action against risk, gates of fear can be opened and everything would then be perceived as risk.

Closely linked to certainty is the absence of doubt about a universal grounding of knowledge (Ward, 2002:28). Anti-GM groups raise two key environmental concerns related to uncertainty regarding GM crops. The first is the fear of the unknown, like the possibility of deadly micro-organisms or super-plants that might be released. The unintentional effects of gene transfer, for example, unintentional gene transfer that may create hard-to-eradicate super-weeds, is the second concern (Uzogara, 2000:188). These uncertainties about what we may be doing to the planet have made the implementation of a regulatory framework, such as the precautionary approach under the Protocol, problematic. Conko (2003:1) argues that the precautionary approach is open to a variety of interpretations, and much disagreement exists over whether the precautionary approach is a useful tool for managing the risks of technologies and products like GM crops.

Debates amongst proponents and opponents of GM crops often fuel confusion and uncertainty among, for example, farmers and consumers of agricultural products (Russo, 2004:9). As a result, neither the layperson nor the expert can predict with any certainty what the consequences may be (Lacy, 2002:45). Uncertainty, or a threatening future, is a parameter of influence for current action that Beck (2000:214) views as '… believed risks used as whips to keep the present-day concerns moving along at a gallop'.

Consequently, both knowledge issues (lack of credible knowledge) and uncertainty lead to manufactured uncertainty, where not only the knowledge base is incomplete, but more and better knowledge often means more uncertainty (Beck, 1999). Manufactured uncertainty is expressed by Beck (2000:217) as control and lack of control. At the one pole of risk is the attempt to calculate unpredictable consequences through a repertoire of methods, i.e., more control. At the other pole, risk remains inherently undetermined and uncertain in its diagnosis. In other words, the more we try to confine and control risk, the more it broadens the uncertainties and dangers, giving rise to manufactured uncertainty, as is the case with GM crops. This could be described as the dilemma that would be created if the linear theory of knowledge underpins the understanding of knowledge issues in relation to perceptions of GM crops. From previous perception studies, a conclusion can be made that knowledge as an indicator of perception is mostly based upon a linear theory of knowledge.

According to Ward's (2002:29) explanation, 'non-linear theories of knowledge accept unknowns as well as plurality, dissent and conflicting knowledge claims as central and inevitable components to understanding knowledge construction, deconstruction and reconstruction processes'. These could have several implications to making decisions and knowledge claims in the application of the Protocol. Applying a non-linear theory of knowledge will have to involve processes that make provision for 'a plurality of interest groups, none powerful enough to claim an objective superiority for the knowledge it represents, and engage in coalition formations around contested certainties and unknowns' (Ward, 2002:29). Such applications of the non-linear theory of knowledge can be found in the systems thinking or systems analysis

approach associated with interdisciplinary environmental courses, as well as in the broader arena of environmental management (Ward, 2002:31). Ward (2002:31) argues that this is particularly useful to help reduce ambiguities and miscommunications when people talk about complex issues. This may offer great value to environmental educational processes that wish to address the controversial and complex issues surrounding GM crops, particularly with regards to implementation of environmental practices stemming from the Protocol.

Normative belief systems and culture

Priest (2003) argues that cultural differences and policy priorities are particularly relevant to complex issues like GM crops. Within South Africa's heterogeneous society, food and food preferences vary. In addition, risks presented by GM crops are perceived differently because of different values that underpin culture and belief systems. For example, the opposition to GM crop technology in India is buttressed by various aspects of Hindu culture that question any 'tampering' with what it sees as spiritual links between humans and nature (Toke, 2004:183). Vegetarianism's opposition is based on concerns about animal genes being spliced onto vegetables. In southern Africa, the use of GM crops is opposed because it is feared that GM crops will transform agricultural practices and that farmers will not be able to keep or exchange harvested grain for the next season (Nuffield Council on Bioethics, 2004:51).

Toke (2004:182) states that public interest lies in the normative beliefs that underpin controversial scientific issues like GM crops. Therefore public perceptions are often primarily determined by a normative belief system. Non-scientific actors such as environmental groups are important in shaping dominant normative belief systems (Toke, 2004:182). The normative belief systems that underpin the various scientific regulatory systems and the views of critics of those systems need to be examined.

The role values play needs to be recognised as values permeate and impact on environmental risk decisions. For example, an individual or group may have certain perceptions of GM crops in an attempt to preserve the organic farming sector. Values provide a different view of the current reality and contribute to an understanding of the big picture (Cothern, 1996:63). Risk is both a factual and a value statement (Beck, 2000:215). Toke (2002:161) stresses that the values that impel people to take a pro- or anti-GM position are heavily dictated by social science rather than natural science. This means that risk statements can only be deciphered in an interdisciplinary manner where an equal measure of insight into technical know-how and familiarity with cultural perceptions and norms are applied. Making provision for these differences and where they originate from should enhance an ethical approach to the GM crops issue.

Trust

Priest (2003) summarises the GM crop debate by stating that opposition to biotechnology can be understood as a crisis of trust. This raises the question as to whom can be trusted regarding an issue like GM crops – science, industry, regulations, credible critical voices or the media? Priest (2003) claims that more knowledge of genetic science does not mean better support for biotechnology, and that trust can be a more powerful predictor to support biotechnology than

knowledge. Priest further elucidates that trust in the institutions that provide biotechnology to the public, and who oversee activities through regulations and who point out issues from consumer and environmentalist points of view, is crucially important. She explains that wise individuals make decisions on the basis of the extent to which they trust those espousing different points of view. These individuals look for various forms of expert opinion rather than trying to process all the raw data themselves.

According to Beck (2000:213), risk begins where trust in our security and belief in progress ends. Risk ceases to apply when the potential catastrophe actually occurs. Therefore, perceptions of threatening risks determine how we think and act regarding the specific risk. As long as there is trust in the progress of GM technology, GM crops will not be perceived as a risk. This trust regarding GM crops can be extended to international regulatory bodies and governments' abilities to implement regulations. The public seems to show more trust in international regulatory bodies such as the United Nations and World Health Organisation, than in government agencies (Chen Ng, Takeda, Watanabe & Maier, 2000:112).

An ethical approach

This paper argues for a stronger ethical approach regarding complex and controversial issues such as GM crops. Lotz-Sisitka (2002:2) indicates that in mainstream literature, an ethic is often described as a code of moral conduct or a set of principles by which to live. When referring to environmental concerns, environmental ethics could be seen as codes of conduct or principles which guide ways of living. UNESCO (1991:1) describes an environmental ethic as ideal human behaviour with respect to the natural and built environment. As indicated previously, GM crop issues raise several environmental and social concerns. These concerns call for responsible behaviour towards the natural environment. This ethical responsibility of human beings for the natural environment constitutes an environmental ethic. Such an ethical approach has the task to explore and enrich the world and creates new knowledge and actions (Lotz-Sisitka, 2002:3) specifically applicable to GM crops issues.

A scientific ethic in turn can be described as the ethical responsibilities of human beings for the implications of scientific issues to society (and the environment). Durso (1996) discusses scientific ethics in a context where more scientists are becoming involved in politics of knowledge creation. Foster and Sharp (2002:849) highlight scientific issues (like GM crops) that need to be understood within the social organisation of populations. A scientific ethic would therefore constitute a greater involvement of social organisations in scientific issues such as GM crops and *vice versa*. The discussion of Durso (1996) and Foster and Sharp (2002) on a scientific ethic is supported by Lotz-Sisitka (2002:2) when she argues that ethics are embedded in a larger matrix of cultural, aesthetic, religious, scientific, economic and political considerations.

An ethical approach to GM crops can be applied to environmental education processes because of environmental concerns that GM crops raise as a scientific development. This ethical approach can be expressed as an environmental ethic or a scientific ethic that requires responsible behaviour. This ethical approach can be summarised in the words of Buchanan (2000:162):

> ...our principle priority must be in supporting people to improve their own capacity for practical autonomy. Instead of behavioural modification, it is time to start helping people become more mindful about their choices, become clearer about the value of a particular course of action, become more discerning and insightful about whether their initial inclinations might have been roused by misdirected motives, and become more conscious of collective responsibilities to create a just society.

Methodology

The methods that have been used in other perceptions studies on genetically modified foods are questionnaires (Kelley, 1994; AFIC & ISAAA, 2001:9; Joubert, 2001; Sittenfeld & Espinoza, 2002:469; Cole, 2003; Mucci, Hough & Ziliani, 2004:4), focus group interviews (Kempen, Scholtz & Jerling, 2003) and perception scales used by Weber *et al.* (2000:28) to determine environmental risk perceptions. This study made use of structured open-ended interviews. These interviews were conducted at the EEASA conference during April 2004 with nine selected environmental educators who attended the conference and a presentation entitled *GM crops in developing countries: possible implications for education towards sustainable development* (Le Roux, 2004).

The interviews were used to ascertain how interviewees perceive GM crops. Closed questions were used to record demographic information. The purpose of the interviews was to obtain rich and informative explanations as offered in open-ended queries. During the interviews it was ensured that each interviewee was at ease and that he/she could talk freely. The interviews were conducted in a quiet place.

Validity was ensured by using the same set of questions with each of the selected of interviewees. The interview questions were piloted prior to application. It was observed how the pilot interviewees responded to the questions and they were asked to comment on any ambiguities and suggest adjustments to be made. An external researcher was also asked to comment on the questions to improve the objectivity and validity. The original set of 13 questions was narrowed down to six main questions, some with probing questions (Table 2).

To ensure trustworthiness a sample of environmental educators, broadly representative of the target group (in this case environmental educators and, particularly, in southern Africa) was chosen. The EEASA annual conference in 2004 was attended by approximately 350 delegates, all environmental educators from a variety of fields within southern Africa. It would be difficult to get a more representative sample of environmental educators. The sample of environmental educators interviewed in this study was very small, and rather than trying to extrapolate the data to all environmental educators, the study provided in-depth insight and a critical spotlight on the GM crops issue within environmental education.

Reliability was further improved by addressing possible interviewer bias. By ensuring that the research questions did not favour any particular bias and by recording the interviews, the information was not processed or filtered by the interviewer.

Table 2. Interview questions

1. Which organisation/company do you work for?
2. What is the nature of your work?
3. What do you understand by the term genetically modified (GM) crops?
• What do you think is the link between GM crops and modern biotechnology?
• Does the quality of your work depend on your knowledge of GM crops or biotechnology?
4. What has been your main source of information about GM crops?
• Who do you think presents more reliable information on GM crops?
5. What do you think is meant by sustainable development?
• How high do GM crops feature on your list of issues of concern with regards to sustainable development? Why?
• Do you think that GM crops have any use in sustainable development? If so what?
• Do you think that GM crops pose a threat to sustainable development? If so what?
6. How do you feel about the authorities making decisions with regards to policies on GM crops?

The data generated from the interviews were transcribed. The transcripts of interviews were analysed by means of phenomenological analysis. In order for the interviewer to understand what each interviewee said, rather than what each person was supposed to have said, bracketing was used. Subsequently, the entire tape was replayed several times by the interviewer to make sense of the whole and to provide a context for the emergence of specific units of meanings and themes.

The information was scrutinised and units of general meaning delineated. These units were noted and reduced to units of meaning relevant to the research question. The lists of relevant meanings were checked and those previously mentioned were eliminated as redundant. Units of relevant meaning were clustered together according to the codes used. From the clusters, themes were determined by examining the meanings of the clusters. A theme expresses the essence of the cluster.

General and unique themes from all the interviews were determined, i.e., what is common to most interviews and what is unique to a single or minority of interviews. Themes were contextualised and a summary of all the interviews was compiled to capture the perceptions accurately. From this information conclusions were drawn.

In the analysis of the data, the validity of the research can be enhanced through actively searching for evidence that contradicts, as well as confirms, the explanations being developed (Clarke, 1999:533). Training external researchers to verify the units of relevant meaning will contribute to the validity of the data. Attempts were made to ensure that the meaning of what each interviewee said was interpreted correctly. After the interviews were transcribed, the transcripts were checked and compared to the recordings.

Results

The analysis of the interviews provided contextual information as well as general and unique themes. The context of the environmental educators interviewed can be described in terms of the variety of environmental and social sectors in which the interviewees are involved and

their roles in this capacity. Of particular importance were the issues the interviewees indicated as environmental concerns. The interviews also revealed the interviewees' understanding of the concepts 'GM crops' and 'sustainable development'.

The phenomenological analysis of the interview data showed several general themes and some unique themes. The general themes include the following: the seriousness of the GM crops issue; the urgency to address needs in terms of food insecurity and poverty; ignorance and the lack of information; the uncertainty that exists about GM crops; the effect of information sources; trust in rational frameworks; and the bias of, and responsibility of, authorities. Unique themes are those themes that are unique to a single or minority of interviewees. In this paper, only the unique themes will be discussed.

The context of the interviewees

The environmental educators that were interviewed came from a variety of government and non-government departments where they fulfil various functions. This information appears in Table 3.

Table 3. Sector and function of interviewees

Sector (Department)	Function(s)
Formal education – Ministry of Education	Home economics inspector
Non-governmental Organisations	Botanical Gardens – education officer
National Environmental Authority	Information officer
University Environmental Education Unit	Research, policy development, community work
National Social Development Authority	Biodiversity programme supporting implementation of Convention on Biological Diversity (CBD)
Provincial Department of Agriculture and Environment	Capacity building and environmental services
US Aid for Agriculture and Land Resources	Regional programme manager dealing with plant breeding

The environmental educators that were interviewed were involved in a variety of projects and programmes dealing with many environmental and social developmental issues. The programmes and projects consisted of the following: networking and coordination at national level; public awareness programmes; programmes that support vulnerable and orphaned children; implementation of the UNICEF world food programme in schools; teaching and research; policy development; community-based programmes; the implementation of the Convention of Biodiversity; research on biodiversity; food garden and agriculture training; environmental education in schools; community programmes that encourage environmental action projects in agriculture; regional plant breeding programmes; environmental education in a nature reserve; and devising financial incentives for biodiversity.

The environmental concerns and issues in which the interviewees were involved, consisted of the following: biodiversity and its conservation; waste management; food support for vulnerable

children; biotechnology; drought; HIV and AIDS; food security; seeds and seed quality; access to indigenous crops; value of indigenous crops; variety of food crop options; purchase of seed; sustainable utilisation of resources; and breeding of crops such as sorghum, millet and maize.

Interviewees' understanding of GM crops

The concept 'GM crops' seemed to be reasonably well understood by most of the environmental educators who were interviewed. Descriptions of GM crops ranged from conceptions like '… food crops that are changed through human intervention by technology' to more scientific definitions '… where certain genes either from the same species or from species or families outside of that have been brought in or incorporated into the genome to produce a different variety'. However, there were misconceptions such as '… food with some medically scientific (*sic)* working in them' and descriptions of GM crops as 'hybrid seeds' and 'products of cloning'. No link with biotechnology in general was revealed from the interviews.

Interviewees' understanding of sustainable development

Several initial responses like 'a loaded question', 'worrying that there are many different definitions' and 'that's a good question' confirmed that sustainable development is still an ambiguous and value laden concept. However, a much clearer understanding of sustainable development exists amongst the environmental educators interviewed than of GM crops. The general understanding can be based upon the *Brundtland Report's* (1987) definition that it is a kind of development that aims to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainable development can be defined contextually differently in that '… somebody's needs in a rural community can be different from somebody's needs in an urban area'. Referring to community-based natural resource management, sustainability is viewed as '… being based upon utilisation, not just preservation, not just locking up fauna and flora in a national park, but also allowing the consumption of those with the philosophy by doing that things become more sustainable because there is more control on it'.

Several interviewees stressed that sustainable development entails 'people being empowered in their own context' and that it is 'a development that doesn't compromise the quality of life'. Concerns were raised about the strong economic approach that drives sustainable development and that 'ethics need to be looked at very closely'. These concerns were raised in the context of poverty alleviation and food security issues.

Unique themes

Four unique themes were identified. These are issues associated with language and terminology, knowledge systems, change in societal structures in southern Africa, and interest and awareness. The identification of each theme was based on actual comments and concerns raised by interviewees. Each theme is provided with the relevant comments used for identification:

Language and terminology. Responses included:

- Expressions and terminology in genetically modified organisms that are used do not exist in indigenous languages or are alien to indigenous languages.

- We ourselves are grappling with the ideas that are involved.
- Awareness of these issues is zero because there is no way to explain it.
- Some terms and concepts need clarification. These include biotechnology, hydroponics, hybrid seeds, plant breeding, food gardens, indigenous crops, organic farming, genetically modified crops (GM crops), genetically modified organisms (GMOs), living modified organisms (LMOs), genetic engineering (GE), biodiversity, bio safety, Cartagena Protocol, Convention on Biological Diversity (CBD), tampered, naturally, naturally evolved.

Knowledge systems. Responses included:

- There are different forms of reliable information depending on what you mean by reliable information.
- Scientific researchers who are working on biotechnology research would document their findings' reliability based on the methodology that they are using.
- Activist information is also reliable information.
- It is a different form of information.
- It forms more of a socially critical orientation rather than a sort of scientific method orientation.
- The two types of knowledge systems are not seen as an either/or option but as equally valid and reliable.

Change in societal structure in southern Africa. Responses included:

- Situations are unique in southern Africa.
- Thirteen to fourteen million people are on the brink of starvation in southern Africa.
- The number of imports that have to be made to sustain people is vast.
- Humanitarian aid.
- There is some sort of disaster at all time, floods or droughts, wars, famine.
- The youngest are now taking care of the oldest.
- Households are headed by children.
- The labour force to do traditional farming is just not there.

Interest and awareness. Responses included:

- Media publicity and information available contributed to a change in interest in GM crops.
- I am currently very interested in GM work done in southern Africa therefore read a lot.
- I have heard about it but didn't take much notice of it.
- Attending an information and discussion session on GM crops has encouraged me to do more reading and research on it.
- It is one of the key issues we will have to deal with in this decade.
- There are signs that authorities take biotechnology safety issues seriously and are starting to make it a priority.
- There is an infiltration in policy makers that seems to favour proponents of GM crops.
- People's views might shift considering the threats and advantages of GM crops.

Discussion of Results

The contexts in which the interviewees find themselves and their understanding of the concepts 'GM crops' and 'sustainable development', as well as the unique themes that have been identified through the data analysis, namely language and terminology, knowledge systems, societal change in southern Africa and interest and awareness, are discussed.

The context of interviewees

The environmental educators that were interviewed came from a variety of government and non-government departments where they fulfil various roles mostly related to education. They were involved in a variety of projects and programmes dealing with many environmental and social developmental issues. GM crops, as a new technological innovation, featured in some of their functions, projects, programmes or concerns, and is especially relevant to their field.

The concepts 'GM crops' and 'sustainable development'

The concept 'GM crops' was relatively new and unfamiliar to a number of interviewees. The implication is that the concept requires clarification especially in the context that environmental educators can expect to encounter it. Consequently, environmental education programmes should address the concept to ensure that educators are familiar with it. 'Sustainable development' is clearly understood by the environmental educators that were interviewed, although it was recognised as being an ambiguous concept. It is worth noting that sustainable development is value laden depending on the interest served. Ideally, all interpretations of this concept should be shared to empower environmental educators and expose them to the various trains of thought.

The unique themes

Language and terminology: The lack of available information on GM crops is a need that will have to be addressed, particularly in southern Africa. An information expansion programme looking not only at clarifying complex terminology but also making it relevant to indigenous cultural and language groups should be developed. There are several concepts related to GM crops that need clarification that will enhance the understanding of GM crops. These concepts appear in the results (see above). Programmes that disseminate information should also ensure that all information is as unbiased as possible, or that multiple vantage points are presented. This would be the starting point for environmental educational processes that could foster an ethical approach to GM crops and improve comprehension of GM crops.

Knowledge systems: There are different ways to regard GM crops and this must be acknowledged in environmental educational programmes. This can be related to the non-linear theory of knowledge discussed earlier. By making provision for a plurality of interest groups and for a deliberative approach, objective superiority can be deconstructed. Engaging with knowledge should then contribute to the development of an ethical approach to GM crops.

Change in societal structure in southern Africa: The realities of the situation in southern Africa pose a constant challenge to any environmental education process. Issues highlighted from the

data are: frequent disasters that make the region more dependent upon humanitarian aid, the impact of HIV and AIDS on the labour force, and the solutions GM crops may provide in filling a niche. These realities are expressed in the United Nations (UN) Millennium Development Goals. The Millennium Development Goals focus the effort of the world community on achieving significant and measurable improvements in people's lives (World Bank, 2002:2) and could potentially be incorporated into environmental educational processes to help decision making and deliberation on issues such as GM crops.

Interest and awareness: After the discussions on GM crops and armed with a little more information on the issues surrounding GM crops (gained from the conference presentation), the interviewees expressed a change in interest and a need to raise awareness. Arousing their interest has apparently awakened a need to know more about GM crops and to understand the various complexities and arguments surrounding their use. This reiterates the need to make information on GM crops available and accessible. It is, however, important that the general public can easily comprehend this information and that all cultures and languages understand the risks and benefits. Environmental educators can play a key role in enabling communities to engage with such information to assist with the establishment of an environmental ethic.

Conclusion

Lotz-Sisitka (2004:57) suggests that environmental education processes in southern Africa have a key role to play in both investing in human development and in protecting environments to ensure sustainable livelihoods and safe environments for all. These processes should foster an ethical approach towards issues such as GM crops.

GM crops are only beginning to be raised as an issue amongst environmental concern groups within the region. The data shed light on this, as several environmental educators interviewed are dealing with biodiversity issues related in particular to the Protocol. The data also showed some of the complexities surrounding GM crops that emphasise the plurality of perspectives on the issue. Information about the plurality of GM crops should be integral to environmental educational processes that aim to address GM crops in programmes and projects. Environmental educators as social actors concerned for the environment can stimulate greater participation, reflexivity and criticality by becoming involved in the discussions on GM crops.

An ethical approach to GM crops in environmental education processes should create room for a new or stronger environmental ethic to emerge, thus contribute towards the establishment of practices, structures and institutions with stronger environmental values. This paper has illustrated that gaining a better understanding of environmental educators' perceptions may enable a more in-depth, critical and pluralist approach to engaging with knowledge associated with GM crops in a southern African context.

Notes on the Contributors

Stephan le Roux's qualification in genetics stimulated his interest in the concerns surrounding genetically modified crops. He completed his MEd dissertation entitled 'Implications of

environmental educators' perception regarding the use of genetically modified crops towards sustainable development' at the University of South Africa (UNISA) in 2004. Tragically, Stephan passed away in October 2006 as a result of brain cancer.

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Endnotes

1 *Green Clippings* provides an environmental news analysis service which can be obtained online at http://www.greenclippings.co.za/gc_main.

2 Biowatch is a national NGO that publishes, monitors and researches issues on genetic engineering and promote biological diversity and sustainable livelihoods (available online at http://www.biowatch.org.za).

3 SAFeAGE (South African Freeze Alliance on Genetic Engineering) is committed to ensure a ban is imposed on genetic engineering in food and farming (available online at http://www.safeage.org).

4 PUB (Public Understanding of Biotechnology) was launched in 2003 by the South African Agency for Science and Technology. The overall aim of the PUB programme is to promote a clear understanding of biotechnology and to ensure broad public awareness, dialogue and debate (www.pub.ac.za).

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Viewpoint
Joking Around in Zimbabwe, Undoing and Redoing Participation

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> I insist that social relationships include non-humans as well as humans as socially … active partners. All that is unhuman is not un-kind, outside kinship … (Haraway[1] in Goodeve, 2002, page numbering absent)

> … we need something new … Something is missing. There has to be a better way of going about things. (Chambers, 2004:16)

Introduction to Our Participatory Problem

In Zimbabwe, I teach a participatory course on environmental education to trainers. The course is an adaptation of a course designed by Rhodes University, South Africa. It gives participants a background in educational theories and has a strong theoretical component built around a focus on practice.

During the time that the course was being delivered to non-industry participants, the theoretical component of the course was whole-heartedly embraced. We assumed that calling the course 'participatory' presupposed the need for this theory because within the theory were the tools for emancipation. And participation, we believed, had an emancipatory mandate.

However, when we decided to redevelop the course for industry, we were uncomfortably surprised by the request from a majority of industry participants to reduce the theory and concentrate solely on skills-based training. This paper documents how this discomfort resulted in my adjusting my view of participation.

Putting truth to the vote: our participation as it was when we began

The participatory aspect of the course was reflected in a commitment to being responsive to the needs of the participants. To do this, we ensured that participants were involved in deciding course content and structure, within certain limits, those limits being set by the topic of the course and practical details such as time available for workshops.

During the sessions designed to facilitate participation, many suggestions for improvement of the course were made and responded to. The simple rule of handing over the stick worked well. I cannot say that I agreed with all the participant requests, but none insisted that I act in ways that went against my integrity. However, this comfortable situation was overthrown when

a majority of industry participants requested a reduction of the theory in the course, to be replaced with a focus on skills-based training.

The question mark over our participatory process: why we felt we couldn't support a skills-based training programme

There are problems with seeing the discourse and practice of educators as 'skills' (Fairclough, n.d.). First, it assumes that a skill can be freely transferred from one context to the other. Second, it assumes that what we have been taught as a model (in this case, a model of how to teach) translates directly into what is actually said or done in practice. On the contrary, our action is a complex matching of models with immediate needs. What trainers actually do may be significantly different from any model, ambivalent between models, or a baffling mixture of models. Third, it assumes that what we do is a mere matter of technique. It does not acknowledge that techniques are weighted with power-relations. For example, the apparently innocuous skill of careful preparatory planning can effectively prevent participation by refusing participants the opportunity to say how they would like to spend time, and by making spontaneous discussion difficult. By maintaining that planning is mere technique, the powerful can insist on this practice and so avoid challenges to the *status quo*. The theory in our industrial participatory course draws attention to the power-implications of our methods. They are viewed not as simple skills but as choices that affect power relations.

Therefore, more skills and less theory seem contrary to participatory ethics. Yet, participatory trends in curriculum development would tend to insist that we heed the calls for skills-based training; it is what most industrial participants say they want.

Participation Undone

Currently, participation has a split personality. As one persona, it underplays the participation of the real. In its other persona, it indulges in questionable dichotomies, that is, overly strong assumptions of opposites such as wealthy and poor. An effect of this split personality is an inability to support appropriate action. Let me explain further.

Underplaying the participation of the real

When Chambers (2004:7) asks 'Whose reality counts?' he is assuming that there is no shared reality, only purely subjective realities. To avoid the resulting problem of being unable to decide between realities for the purposes of decision-making and action, Chambers implies that poor people's realities are more right than other realities. Participation practitioners are encouraged to 'hand over the stick' (Chambers, 2004:9).

In practice, 'handing over the stick' implies confusion between truth seeking and democracy. What is true, it is assumed, is that which the majority of the poor people consider true. This faces the problem that the majority of poor people may not have the best version of truth. Apart from well-debated questions such as the heterogeneity of those groups, and the possibility of silences within them, such as women's silence, there is the philosophical question that a version of truth held by a majority might be less adequate than other competing versions. This is a

separate question from democracy, which is people's right to vote to decide what happens to their communities. The place for truth is in the debates before the voting; it does not itself involve voting. Confusing truth with democracy reduces the efficacy of both.

Participation's irrealism (assumption that there is no reality beyond our language constructions of it) occurred because there was a necessary flight from positivism, the belief that the only valid knowledge is measurable replicable scientific knowledge of an objective real world. Positivism denied the importance of interpretative knowledge, knowledge of the non-empirical and the power of language to influence the real. Instead, participation, in line with much sociological thinking, assumed that: 'Words are a starting point. … To be human is to exist in language. In language we coordinate our behaviour, and together in language we bring forth our world' (Chambers, 2004:2). 'To bring forth …', implies a god-like role for humans. What we think, leading to what we say and what we do, makes the world. We 'construct our realities' (Chambers, 2004:13). When it is in this irrealist persona, participation has too little 'participation'. It forgets to facilitate the contribution of non-humans in consensus-building debates about reality and it forgets the role those non-human entities play in co-constituting reality.

Tendency towards strong dichotomies

As its other persona, participation overplays the role of 'things', going so far as to 'thingify' human beings. It assumes hard dichotomies. For example, participatory writing refers to 'them' and 'us', 'powerful' and 'weak', 'wealthy' and 'poor', 'oppressed' and 'non-oppressed', 'donors' and 'recipients' and 'farmers' and 'researchers'. The use of hard dichotomies goes against the grain of many practitioner's primary epistemological beliefs, i.e., their beliefs about how we gain knowledge, based on beliefs about what 'is'. Hard dichotomies contradict the irrealist idea, described above, that there is no reality except our language; it implies the existence of an absolute reality of objective separate things 'out-there'.

Hard dichotomies break down when scrutinised. For example, the dichotomy of 'wealthy' and 'poor' breaks down when we realise that there is no simple objective way to decide wealthy and poor. More than this, the category 'wealthy' needs the category 'poor' to make any sense. and the way that we define 'wealthy' and 'poor' in some ways actually constructs those things, as we can see if we consider how one scientist's decision to define 'wealthy' as receiving US $10 000 per annum will get significantly different figures for wealth compared to a scientist who defines 'wealthy' as receiving US$100 000 per annum. These absolute categories belie the intimately networked nature of 'things'; what is forgotten is that the different things are distinct but not separate and there is a role to play for interpretation in their formulation.

Nevertheless, despite practitioner's academic acknowledgment of the inadequacy of hard dichotomies, they often feel compelled to use them. This is because acts such as writing/speaking/decision-making and, via decision-making, acting in the sense of acting to improve our circumstances, require that we dichotomise, or name. We need to acknowledge different things in order to speak/write/decide (and thus act) at all. Therefore, such practitioners must live with contradiction, on the one hand wanting to avoid strong dichotomies but on the other hand supposedly compelled to use them to allow action.

A possible outcome of participation's propensity for dichotomising is violence. In Zimbabwe, 'thingification' of the white commercial farmers as the perpetrators of inequality, without seeing how these farmers were co-constituted with black Zimbabweans,[2] was followed by their removal from their homes. Not only did this destroy their livelihoods, and some lost their lives, but black Zimbabweans are, as a result, facing food shortages and starvation. Hurting the 'other' often results in hurting the 'us', since we are distinct, but not separate. In Chambers's (2004) work, the dichotomising tendency has resulted in a noble but simplistic request that the wealthy give some of their wealth to the poor. Ironically, Mugabe (2000) made the same noble but simplistic request of the wealthy white farmers. He felt it was regrettable, but understandable, when the war veterans gave up waiting and resorted to violence.

In the industry course case, we were asking participants to make choices about the content of a course that was supposed to transform industry practice from environmentally unfriendly to friendly. We had had years of opportunity to study theories of learning and theories of agency. Their exposure to these very real but much-debated 'things' (I'll call these 'things' cyborgs later) was minimal. The industrialists' majority 'reality' was that they needed skills training. Our 'reality' was that skills training without critical theory entrenched inequalities. By our participatory standards, their 'reality' should have dominated.

Thus, we see the split personality of participation. On the side of too little consideration of reality, the truth of transformative teaching methodologies would largely have been ignored. This would have resulted in a poorly informed view of reality being given precedence and a lost opportunity for transformation. On the side of too much dichotomising, in this case dichotomising participants (empowered with the stick) and experts (disempowered with no stick), a kind of violence would have been enacted on the experts for whom a commitment to social justice and transformation of the *status quo* was important.

Participation Redone

First, I suggest that we change our choice of words to explain participation:

- Rather than talking about how language 'creates' the world, we should perhaps consider how it 'transforms' or 'reproduces' the world. The latter two words imply a world that pre-exists us and avoid the sense that, god-like, we create our world with our words.
- I would also suggest we stop talking about people's 'realities'. This implies multiple universes existing parallel to each other, but not touching each other. I prefer the alternative of distinguishing between transitive and intransitive realities. The intransitive reality is the essential one that we all share; the transitive reality is the one that includes interpretation and depends on its relationship with us.
- We should perhaps stop using language that implies there is an absolute knowledge. Not even poor people have absolute knowledge. We are, therefore, required to listen to all knowledge claims (note the sense in which this is part of a democratic process, but not the voting part) and to assess them on their merits. We can choose between better and worse knowledge.

Secondly, I want to suggest a technique designed by Merchant (2003). She describes a partnership ethic, in which all the stakeholders, including the non-humans, are allowed to speak, 'Both nature and humans will have voices, and both voices will be heard' (Merchant, 2003:229). In a similar vein, Haraway (1991) suggests that our world is populated by cyborgs. Humans are cyborgs, co-constituted with non-humans, and non-humans are cyborgs, co-constituted with humans. The idea that we are all cyborgs, that is, mutually constituting, allows us to be conceptually distinct, yet not separate from each other, and implies an equality that requires we give the non-humans a voice. At a practical level, a partnership ethic involves allocating people to 'speak' for the non-humans, for example, trees, soil and even social structures such as institutions or mechanisms such as 'how we learn', with all the caveats of concern for trustworthiness that accompany moments when people speak for others.

Thirdly, I want to suggest that communities, after careful consideration of knowledge claims, should then put the question of how to proceed to the vote. In terms of 'participatory' processes, this implies an acknowledgment of the usefulness of expert knowledge of cyborg entities. Participants can then examine knowledge claims in an attempt to make informed decisions. In other words, rather than putting truth to the vote, we put decisions to the vote.

Fourthly, I want to suggest that we stop obsessing about action. This obsession is an artefact of participation's split personality. The action that we thought was missing will become obvious to us, it has been there all the time, once we move beyond the uneasy oscillation between irrealism and strong dichotomies. Since we are constantly reproducing society through our daily activities, we can transform our reality by not doing, that is, by not reproducing it. Sometimes the best form of action is inaction, as Ghandi showed us with his concept of non-violent non-cooperation.

Conclusion

In the case of our industrial course, we did not include the cyborg 'what we need as learners to be empowered' as a participant in our stakeholder discussions. We confused our search for truth with democracy. We also oscillated between, on the one hand, a denial that there was a difference between the tutors and the participants (we called the tutors 'stutors') and, on the other hand, a hard dichotomy between the tutors and the participants which resulted in potential violence against the one half of the dichotomy. Rather, we should have engaged in discussions amongst all the stakeholders, including the non-humans, in order to arrive at an informed place that could serve as a platform for democratic decision-making.

Notes on the Contributor

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Endnotes

1 One has to see the jokes in Haraway's work; the power of irony to make serious points that otherwise go unsaid (Goodeve, 2002). This paper is what Haraway would call a serious joke.

2 In this approach to reality, there is no such thing as racial purity.

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Viewpoint
An Exploration of How Natural Resource Management (NRM) Discourse is Integrated into Key Pedagogic Texts

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Abstract

Natural resource management (NRM) education has the potential to improve the quality and relevance of rural education in South Africa. For this potential to be realised, the various educational resources that are commonly used by teachers and learners in rural schools need to incorporate natural resource management knowledge. Using Bernstein's concepts of classification and his theories on recontextualisation, a content analysis study was carried out to compare the level of NRM integration within the Grade 10 Life Sciences syllabus, and a Grade 10 Life Sciences textbook. Results from the analysis of the syllabus showed that overall only 9% of all the knowledge statements analysed had a strong link to NRM and related issues. The highest percentage of such sentences was found in the Core Knowledge section of the syllabus (21%). For the textbook, only 8% of the analysed items had a strong link to NRM and related issues, with the highest percentage of such items occurring in the Suggested Activities section (16%). However, the level of NRM integration in both documents increased considerably when sentences that had only an implicit link to NRM and related issues were included. It was concluded that both documents provide ample opportunities for NRM learning, although the extent to which this occurs varies among their different sections. The recontextualising role of the Grade 10 Life Sciences textbook was reflected in its relatively higher level of NRM integration in the Suggested Activities category, and in the Glossary category. This study highlights the need for further strengthening of the position of NRM within the Grade 10 Life Sciences syllabus, and for more Bernstein-based research to inform South Africa's curriculum reform initiatives in environmental education.

Introduction

The wide gap between schooling in rural and urban areas of South Africa continues to be a major challenge to post-apartheid education policy makers, despite the formulation and implementation of numerous policies intended to remove such inequalities. In the Eastern Cape, there are over two million rural learners (Nelson Mandela Foundation, 2005), the majority of whom continue to receive education in conditions of deprivation and extreme neglect (*ibid*.). One of the recommendations made by the Ministerial Committee appointed by the national Department of Education to investigate challenges facing rural schooling in South Africa is the need to pay more attention to curriculum design and implementation issues. According to this committee's report (DoE, 2005) schooling in rural areas of South Africa would be better served by curricula which also draw on local community's environmental assets, knowledge and

skills. Given the great importance of natural resources to the livelihood of communities residing in rural areas of South Africa (Lotz-Sisitka, Timmermans and Ward, 2005), such curriculum initiatives would focus on local natural resources. This has the potential of not only improving the quality and relevance of education for learners in rural areas of the country, but also of contributing to environmental sustainability in those areas (*ibid*.).

It is well documented that teaching and learning materials (TLMs), of which textbooks are a key component, are crucial for effective implementation of the curriculum. Unfortunately, the availability of high quality textbooks remains a major challenge to curriculum reform in South Africa (DoE, 2000). When schools are understaffed, teachers under-qualified, and lacking support (as is the case for a high proportion of rural schools in the Eastern Cape), textbooks are likely to be the key definers of what is taught and learnt. In such contexts, teachers are more likely to follow closely what is offered in the textbook, resulting in the textbook replacing the national curriculum. Hence, efforts to incorporate natural resource management (NRM) into the curriculum of rural schools need to take into account the position and status given to NRM within the various teaching and learning resources that are commonly available in rural schools.

This article reports on a study that was conducted to analyse the integration of NRM in two types of pedagogic resources commonly available in most rural schools in the Eastern Cape: the subject syllabus and the school textbook. The analysis focuses on South Africa's Life Sciences syllabus and Life Sciences textbook, both for Grade 10. The Life Sciences syllabus for Grade 10 is part of a new curriculum, the National Curriculum Statement (NCS) which is gradually being introduced into Grades 10–12, starting with Grade 10 in 2006. This curriculum has been available to schools and the general public since 2005. Schools in the Eastern Cape are free to order any textbooks from prescribed lists provided by the various textbook publishers. The Life Sciences textbook used in this study was the only one in use at two schools sampled during an earlier pilot study conducted in the Peddie district of the Eastern Cape. The study on which this paper is based is part of a larger PhD research project which is investigating the integration of NRM into the curriculum of rural schools in the Eastern Cape, as a strategy towards improving the quality and relevance of the education they offer.

This study is based on Bernstein's concept of classification, and his theories on recontextualisation (Bernstein, 1990; 1996). Bernstein uses classification to conceptualise power in pedagogic relationships. According to him, where different categories exist, for example subjects in a curriculum or institutions in the education system, power is reflected in the ability of a particular category to insulate itself from the rest. A category which is powerful is able to maintain strong borders around itself, which gives it a particular identity and a strong voice. Such a category is described as being strongly classified. On the other hand, a category which is weakly classified has porous borders which allow for cross-exchanges between the different categories, resulting in loss of identity and voice.

According to Bernstein (1990), there are three hierarchically related fields which constitute pedagogic discourse: production, recontextualising and reproduction. Official subject syllabi or national curricula are produced in a sub-section of the recontextualising field called the Official Recontextualising Field (ORF), and represent the official recontextualisation discourse. The

ORF is under the direct influence of the government and its agents. The analysis of ORF texts and practices would reveal (for example) intended government curriculum policy, in this case towards the integration of NRM into the curriculum. School textbooks, training manuals and teaching guidelines are examples of pedagogic texts produced in the second sub-section of the recontextualising field called the Pedagogic Recontextualising Field (PRF). The analysis of these texts would help to illuminate the interpretation of this official policy by the various agents located in the PRF.

As the texts move from one field of pedagogic discourse to another, they undergo modification as a result of selective appropriation of different discourses and their relocation, and the final product no longer resembles the original discourse (*ibid*.). It is worthwhile to compare the contents of the ORF and PRF texts for their underlying messages (for this study, messages which relate to the integration of NRM). This will help improve our understanding of the recontextualising process, and hopefully contribute to effective NRM integration policy design and implementation.

Methodology

Content analysis was used to assess the classification (integration) of NRM within the Grade 10 Life Sciences syllabus and Life Sciences textbook. The analysis was both interpretive and quantitative. First, the two documents were examined to form categories under which the analysis was to be carried out. This was necessary because the two documents are structured differently. For the syllabus, these categories were: Introduction (principles, subject definition and purpose); Objectives (aims, outcomes and assessment standards); Core Knowledge (content, learning areas, themes, topics and concepts); and the Glossary. For the analysis of the textbook, in addition to the Core Knowledge and Glossary categories, the other categories were: Illustrations (diagrams and photographs) and Suggested Activities (experiments and investigations).

For the analysis of texts within each category, the sentence formed the unit of analysis, and only those sentences which referred to knowledge were considered. For the analysis of the Illustrations category, all items under one caption were counted as one item. In the Glossary category, individual words formed the unit of analysis. For each item analysed (i.e. sentence, illustration or word) a classification value was allocated to reflect the embedded degree of NRM integration, using Bernstein's 4-point classification scale (C^{++}; C^{+}; C^{-}; C^{--}). Where there was specific and direct reference to NRM or its related issues, the degree of NRM integration was judged to be very strong and the highest classification value of C^{++} was allocated. Those items which referred only to Life Sciences knowledge were seen as lacking NRM integration and were allocated the lowest classification value of C^{--} (see Table 1 below). Lastly, for each document, the total number of items under each classification value was computed, and their frequency distribution across the whole document displayed in a graph.

Table 1. Criteria used to assess the classification of NRM within analysed items (word, sentences or illustrations)

Word/Sentence/Illustration Characterisation	Classification Value
Explicitly refers to NRM and related issues	C++
Implicitly refers to NRM and related issues	C+
Link to NRM/related issues is general	C-
No link at all to NRM or related issues	C--

Results

Figure 1 shows the results of the analysis of the Life Sciences syllabus for Grade 10, while a summary of the same results is provided in Table 2.

Figure 1. Classification of NRM within the Life Sciences syllabus for Grade 10

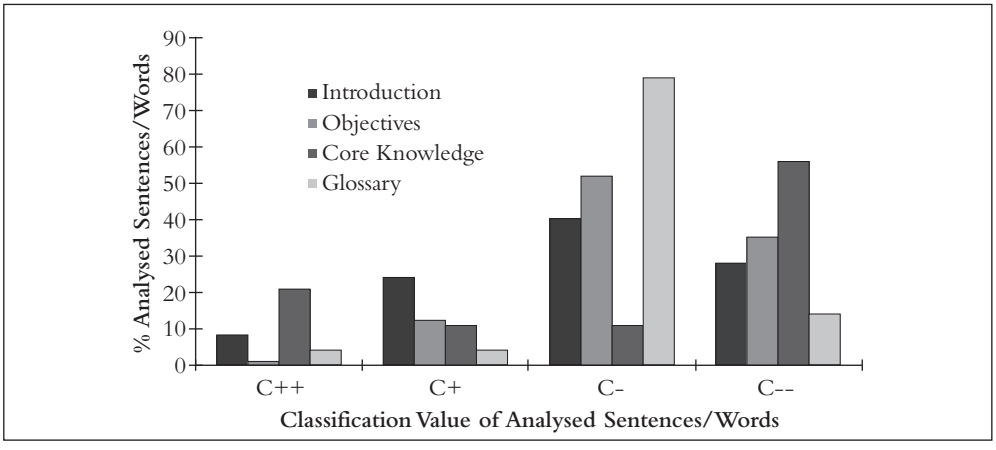

Table 2. Summary of the results from the analysis of classification of NRM within the Life Sciences syllabus for Grade 10 (n=216)

Classification Value of Sentence/ Words	Number of Sentences/ Words	% of Total Sentences/Words Analysed
C++	19	9
C+	26	12
C-	88	41
C--	83	38

The findings of the analysis reveal that the level of NRM classification varies across the different categories (sections) of the syllabus. NRM classification was strongest in the Core Knowledge category, where 21% of analysed sentences specifically referred to NRM and related issues.

However, this same category also had the highest proportion of knowledge sentences which had no link at all with NRM (56%). The classification of NRM was weakest in the Objectives and Glossary categories, where only 1% of the analysed sentences and 4% of the analysed words, respectively, had an explicit link with NRM and related issues. Overall, in only 9% of the total number of analysed items was the link to NRM and related issues explicit, while those which referred only to Life Sciences were over four times as many.

The results of the analysis of the Life Sciences textbook for Grade 10 are shown in Figure 2, and Table 3 gives a summary of those results.

Figure 2. Classification of NRM within the Life Sciences textbook for Grade 10

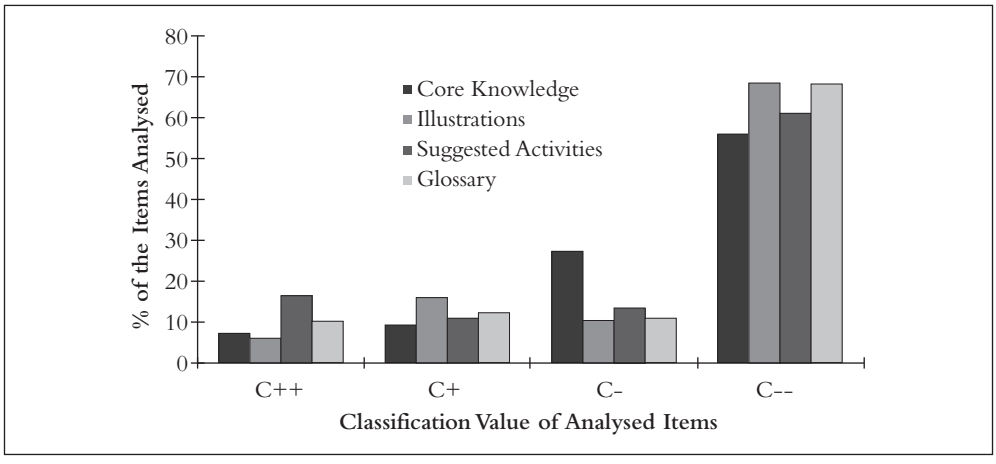

Table 3. Summary of the results from the analysis of classification of NRM within the Life Sciences textbook for Grade 10 (n=646)

Classification Value of Item	Number of Items	% of Total Items Analysed
C++	53	8
C+	89	14
C-	79	12
C--	425	66

Again, the various analysis categories of the textbook showed different levels of NRM classification. NRM classification was strongest in the Suggested Activities category, where 16% of the sentences analysed had an explicit link to NRM and related issues. The categories which showed the weakest classification for NRM were the Core Knowledge and Illustration categories, which had only 7% of the sentences and 6% of the illustrations, respectively, explicitly linked to NRM and related issues. Overall, in only 8% of the analysed items was NRM strongly classified, while the vast majority (66%) had no link at all to NRM and related issues.

Discussion

The Life Sciences syllabus for Grade 10

The principle of integration of subjects underpins curriculum reform in South Africa, and this is reflected in the Life Sciences syllabus for Grade 10. Although the analysis of the syllabus showed that overall integration of NRM was low, in some of the sections of the syllabus NRM had a distinct and unique position (for example in the Core Knowledge and Introduction categories). However, when sentences with an implicit link to NRM and related issues are also included, the integration of NRM within the whole syllabus becomes considerable. It can thus be concluded that the Life Sciences syllabus for Grade 10 provides ample opportunities for NRM learning, although the extent of these opportunities varies across its different sections. Examples of references in the Core Knowledge category that have a high level of NRM integration include:

- Management and maintenance of natural resources (DoE, 2003:36)
- Exploitation vs sustainability: exploring issues (*ibid*.:37)
- Biodiversity of plants and animals and their conservation (*ibid*.:39)
- Threats to biodiversity (*ibid*.:39)

The Life Sciences textbook for Grade 10

A similar trend regarding NRM integration was found in the Life Sciences textbook: while overall NRM integration was low, in certain sections of the textbook the position of NRM was very strong. This was especially so in the Suggested Activities category. Examples of suggested activities with a high level of NRM integration included:

- Identifying indigenous and alien plants growing in areas around the school
- Conducting a class debate on afforestation
- Conducting case studies on how to solve local environmental problems
- Finding information on local nature reserves or game parks

The syllabus and the textbook differed markedly in their contents and layout, making direct comparisons of NRM integration levels between the two difficult. However, some insight can be obtained by comparing the Glossary category since it was common to the two documents. In the syllabus, the Glossary category had among the lowest levels of NRM integration, while in the textbook the same category showed considerably more NRM integration. Bernstein (1990) speaks of powerful categories being able to develop and maintain specialist language. The relatively lower use of NRM-related specialist terms in the Life Sciences syllabus could be working against a stronger classification of NRM in that document. However, in the textbook the use of such terms increases substantially, which possibly contributes to the strengthening of the position of NRM in the textbook.

The above findings point to the important role played by the Life Sciences textbook for Grade 10 as a recontextualiser of NRM knowledge. Another example of the recontextualising role of the textbook is evident in the Suggested Activities category. While the number of suggested activities in the syllabus was too low to warrant further analysis, in the textbook this category showed the highest level of NRM integration. Thus this textbook provides its

users with further elaboration of the intended official educational policy on NRM integration within the Grade 10 Life Sciences. This is an important role in the rural education contexts, where teachers, learners, parents or other members of the community may find it difficult to access or interpret official educational policies, or where they are limited by various factors in designing NRM-related teaching and learning materials, or activities.

Conclusion

It has been argued above that rural schools in the Eastern Cape could pay more attention to NRM in their curriculum implementation activities, as a strategy towards improving educational quality, relevance and environmental sustainability. Despite concerted efforts to train teachers in the production of low-cost relevant teaching and learning materials, for the vast majority of teachers in rural schools, official subject syllabi and school textbooks will remain the major sources of educational knowledge for the foreseeable future. This highlights the need for more research into the contribution these pedagogic documents make to effective and successful curriculum reform initiatives in rural schools.

South Africa's post-apartheid educational reforms are underpinned by an integrated approach to curriculum content and implementation. This approach is especially strong in South Africa's environmental education circles. However, there is paucity of theory-informed research relating to subject integration at the various levels of the curriculum design and implementation process. Although generalised overviews of syllabi and other pedagogic texts are useful, what is even more important is theory-based research to inform, for example, the subject integration process. Bernstein's theories on curriculum structure and on pedagogic discourse provide a much needed theoretical foundation for such studies. For example, his concept of classification, and his theories on recontextualisation, can be used as a lens for analysis of intended government policy on subject integration, on the effect this has on the position and status of the integrated subject within the curriculum, and on the interpretation of the integration policy by various agents at various levels of the education system. Such studies have the potential to contribute to a deeper understanding of the macro and micro related curriculum processes associated with subject integration within a South African rural education context. Chisholm (2004) noted the paucity of research related to subject integration at the classroom level in South Africa. It is hoped that the broader PhD study that I am engaged in will contribute further to the erosion of that deficit. This paper represents a small-scale exploratory initiative in this broader project, and as such it opens some viewpoints worth pursuing in more depth.

Notes on the Contributor

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Viewpoint
When Nature Needs Nurture: The role of women in the environment

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Abstract

To the disinterested observer, the distinctive links between the environment, and women's experience of it, are not immediately obvious. Particularly in developing countries, however, this interface is both intimate and immediate. After a brief survey of the importance of reproductive rights for containing population growth, and the international environmental policy context vis-à-vis *gender, this article explores a few aspects of women's relationship with the environment. Women are seen as critical to environmental education in that they tend to exercise a formative influence over the attitudes of the very young. Women's relationship with the land they work is compromised by their poorly institutionalised property rights throughout much of the Third World, and where 'environmental injustice' is concerned, it tends to be the poorer women who experience the fallout most tangibly. Development practitioners, bureaucrats and policy makers need to be sensitised to this state of affairs.*

Introduction

> 'If you want a message to go out to the whole world there are three ways of telling it, that is TELEVISION, TELEPHONE AND TELEWOMAN!' – Kenya Water for Health Organisation (Rodda, 1991:6)

At first sight, the bracketing of 'gender' with 'environment' might strike many people as being a kind of category mistake. 'Why not gender and weather-forecasting?' they might ask. 'Or French cuisine and the environment if it comes to that?' Their perplexity is entirely understandable. Both 'gender' and 'environment' are relatively recent claimants upon the public's attention, each having been virtually unknown as a discrete discipline just 40 years ago. Even as recently as 25 years ago, feminist writing was employing 'environment' matter-of-factly in the sense of general contextual surrounds, with no reference to any ecological dimension (Richards, 1980). It takes time for new ideas to establish themselves in the public consciousness. It is not surprising then that the links between these novel issue-areas are still opaque to the casual observer. This is perhaps especially so in developing societies where, on the whole, neither the natural environment nor gender can be regarded as being fully 'mainstreamed' yet (UNDP, 2002:22–23).

After some preliminary background has been provided, this Viewpoint paper will seek to elucidate some points of contact between gender and environment in order to show how important it is that environmental concerns are rendered 'gender sensitive'.

International Conventions and Agreements

The inclusion of gendered considerations into international agreements can be dated from the United Nations (UN) landmark declaration of 1975 as 'International Women's Year'. This was when the first UN World Conference on Women was held in Mexico City. Although this was immediately followed by the 'UN Decade for Women' (1976–1985) (Rodda, 1991:4–5), it was to be some time still before the need for women's participation in *environmental* matters was overtly recognised in international deliberations. Rodda points out that even the landmark Brundtland report of 1987 (*Our Common Future*) made only passing reference to women, and that it was not until UNEP's 1988 State of the Environment report that women's role was highlighted – a mere 18 years ago. Slowly the momentum gathered. Among the principles that informed the 1992 Convention on Biological Diversity were, 'women's roles in the sustainable use and conservation of natural resources and the need for women to participate fully in policymaking and program delivery' (MacDonald & Nierenberg, 2003:40).

'Agenda 21', which emerged from the 1992 Earth Summit held in Rio de Janeiro, clearly signalled that women were to be valued partners in the environmental sphere, and the 1994 International Conference on Population and Development held in Cairo posited women as the main protagonists in the containment of population growth (MacDonald & Nierenberg, 2003:48). The following two sections will look more closely at the key policy areas of population control and Agenda 21.

Population and Reproductive Rights

It is often claimed that the rise of 'women's liberation' was a direct consequence of the 'reproductive control' the advent of the contraceptive pill, in the early 1960s, gave to women. Crucial to any discussion of gender and the environment is the question of population increase. Much of the developed world (apart from America) is experiencing shrinking populations, notwithstanding immigration. But population growth is proceeding apace in those countries that can least afford it environmentally and economically. Ethiopia, Niger, Chad, Angola, Mozambique and the Democratic Republic of Congo (DRC) still have average childbirths in excess of six per woman. Sub-Saharan Africa, with the sole exceptions of South Africa and Zimbabwe, is far and away the most affected region in this regard (Seager, 2003:32–33).

The empirical evidence for the notion that better educated women have fewer children, who are better cared for and in turn often better educated than their parents, appears to be so overwhelming that it has taken on the status of a developmental truism (Dankelman & Davidson, 1988a:123). The virtuous circle, which a sound education sets in motion, appears to be central to discussions on what effective sustainable development is all about. Although the situation has improved markedly in recent years, there is still major resistance to education for girls from the Muslim world although significantly less so from Algeria, Libya and Egypt (Seager, 2003: 76–81). One wonders at the strength of the cultural stranglehold that leads states to act against their own enlightened self-interest by effectively neutralising half of their human capital.

Amartya Sen has stressed the importance for the environment of women's having control over the number of children they really want, as follows:

> The population problem is integrally linked with justice for women in particular … Advancing gender equity, through reversing the various social and economic handicaps that make women voiceless and powerless, may also be one of the best ways of saving the environment, working against global warming and countering the dangers of overcrowding and other adversities associated with population pressure. The voice of women is critically important for the world's future – not just for women's future. (quoted in MacDonald & Nierenberg, 2003:41)

Agenda 21

Chapter 24 of Agenda 21 is given over to the relationship between women and natural resources. As Agenda 21 is the one environmental initiative that the general public might have heard of (more usually as *Local* Agenda 21 or Local *Action* 21, in the municipal sphere), it is particularly significant in the current context. Many cities in South Africa have committed themselves to giving effect to its principles. What then is Agenda 21?

Agenda 21 is a detailed plan of action to ensure a sustainable future for humanity – 'sustainable' here understood with its environmental connotations. The initiative was conceived in such a way that it could be 'cascaded down' via local authorities to each and every individual human being. Its intention is to make environmental awareness second nature. Agenda 21 is a 'gender friendly' programme in that it explicitly recognises that the role of women is critical for its success, and that women have distinctive strengths in certain areas that must be nurtured and capitalised upon.

The action plan urges greater representivity of women in decision-making structures so that distinctively female perspectives on the environment are not trampled underfoot. It advocates the elimination of illiteracy and the improvement of women's access to post-graduate science and technology studies. It pushes for the reduction of women's workload and for facilitating their 'getting out into the world' through the provision of affordable kindergartens. Agenda 21 supports the use of new labour-saving technologies (provided they are not detrimental to the environment) and encourages a much more equitable division of labour as regards household chores. It supports the direct provision of credit facilities to rural women, and equal access to land and other natural resources. The programme encourages research into the impacts, on the domestic sphere, of policy decisions regarding services, and into the actual monetary value of unpaid domestic work. It also requires that gender impact assessments make up an integral part of environmental and developmental projects (Sitarz, 1993:264–266).

Environmental Social Impact Assessments

It is within the context of gendered social impact assessments that much is made explicit concerning environmental impacts on women that might otherwise have remained implicit. For example, as Frank Vanclay (2000:128) points out (*apropos* of a natural resource-based management project with the potential for generating tourist income):

> Gender-blindness is a condition that has afflicted many development projects and impact assessments … If entrepreneurial activities are promoted to allow villagers to earn additional cash income, it is often the women who experience an increased workload to earn this income. Thus it can be argued that many development projects have worsened the position of women … Some of the biggest impacts relate to increasing the distance to collect firewood or to collect fresh water.

An extreme example of this is the system of gender quotas in certain 'job creation' projects. These place intense pressures on women to make themselves available for hard manual labour in the building of bulk infrastructure or roads. Much of the time their husbands could be doing the job, but due to the quota system, they sit idle at home and, where the gendered division of labour is absolute, get up to no good while the women have to cope with a double burden. Bureaucrats must realise that good intentions on their own, in the absence of properly *thinking through implications*, are no guarantee of equitable or satisfactory outcomes.

Mothers as Environmental Educators

Practitioners in the field of sanitation awareness training (such as Environmental Health Officers) have long realised that the most vital constituency they need to reach is that of mothers – prized for their high 'multiplier effect' in the dissemination of knowledge, and for the lasting impressions exerted by their example upon the very young.

Women have a privileged position as an instiller of values in very young children. Even with environmental imperatives as basic as the need not to litter, or to wash one's hands before meals or after using the toilet, an *informed* cohort of mothers makes a difference that information campaigns later in life can never fully emulate. As Rodda (1991:104&108) says, 'Women influence the entire family circle … in their environmental perceptions, values and attitudes, and in ethical considerations, as well as in the use of natural resources …' but they in turn need training in soil and land assessment in order to identify and remedy soil degradation and desertification.

Access to Land

At the 1995 Beijing UN World Conference, women demanded the right 'to have equal access to land and housing' (Serote, Mager & Budlender, 2001:159). According to Dankelman and Davidson (1988b:3):

> Land, particularly healthy soil, is the foundation on which life depends. If the land is healthy, then agriculture and pasturage will yield food in plenty. If it is not, the ecosystem will show signs of strain and food production will become more difficult. Because women are at the centre of world food production … any analysis of land resources must include an appreciation of their central role.

Granted that land is about as elemental a component of the environment as can be imagined, what Dankelman & Davidson say is not altogether accurate. For one thing 'healthy land' does not obligingly translate into 'food in plenty' except in rural fantasy. While women may well be central to food production in developing countries, this is hardly the case in the developed world. Be that as it may, there is a more pointed objection. While healthy land is arguably a necessary condition for 'food in plenty', it is very far from being a sufficient condition. There are many other factors at play, not the least of which is *who owns the land* and *who says what must happen on it*.

Dankelman and Davidson (1988b:5&9) go on to say that 'Women have title to only 1 per cent of the world's land … without land, women have no access to credit …'. As demonstrated by Hernando de Soto in his influential *The Mystery of Capital* (2000), not having access to credit is by no means the end of the matter. Not having title means women are denied status, security of tenure, capital appreciation and a whole host of other important determinants of what it is to a be a person with *options* in the world.

Drawing on data produced by the Food and Agriculture Organization (FAO) in 2001, Seager (2003:84–85) is especially illuminating on the matter of 'women as a percentage of agricultural landowners'. One reads of India, in Seager, that 'widespread discrimination exists against women inheriting, owning or controlling property, land and wealth; in most cases this discrimination is supported by civil, customary or religious laws'.

What obtains in India *vis-à-vis* the institutionalised subjugation of women also typifies huge swathes of the Muslim world, as well as a number of sub-Saharan states. Interestingly enough, however, Namibia has the *highest* percentage of women landowners in the world at 57 percent (ahead of Barbados at 51 percent), while South Africa comes in at a not unrespectable 34 percent (Seager, 2003). It should be borne in mind though that these figures could be misleading, being as they are a percentage of an absolute number of landowners without regard being had to the *value, size* or *productivity* of the landownings in question. Nonetheless, they do suggest significant differences in attitude between different governments.

Unfortunately, South Africa has, since these figures were produced, rather blotted its copybook insofar as extending land title to women is concerned. According to Ntsebeza (2004:59):

> After years of ambivalence and prevarication, the ANC-led government [has] passed two bills through Parliament – the Traditional Leadership and Governance Framework Act and the Communal Land Rights Bill – which make concessions to traditional authorities, effectively resuscitating the powers they enjoyed under the notorious Bantu Authorities Act of 1951 … this raises critical questions concerning citizenship and the nature of democracy in South Africa.

As Serote *et al.* (2001:165&169-172), drawing on Walker, so perceptively pointed out in 2001, there is a 'contradiction between Government's commitment to gender equality and its persistent engagement with the politics of traditionalism'.

Environmental Injustice

The poor tend to bear the brunt of the externalities occasioned by activities which stress the environment. Because, in the developing world, women engage very directly with the elements (water, soil, vegetation and so on), and lack the means to distance or insulate themselves from the effects of desertification or poisoned water, an argument can be made that such people are unjustly prejudiced by the fallout from other people's activities. Poor women are, for instance, grievously affected by waterborne diseases, not only in their own persons, but in the persons of their many children (UNDP, 1998:85).

'When land and water are depleted, much more labour – usually women's labour – is required to maintain the same output. The workload of children also rises for girls more than boys' (UNDP, 1995:92–93). The UN reports that in the Sudan the time spent gathering fuelwood has increased fourfold in a decade. What took no more than two hours in the Himalayas a generation ago now takes an entire day.

Bureaucrats and policy makers need to be educated to anticipate, and ameliorate, the ill-effects that environmental abuse and pollution visit upon vulnerable poverty stricken women. As MacDonald and Nierenberg (2003:52) point out, 'In most of the industrial world, the relationship between women and the environment is perhaps more subtle than elsewhere, partly because women tend to be more removed from the natural resources they depend on'. These women have the means to insulate themselves from the grosser manifestations of environmental abuse in a way that is not open to rural women in developing countries, and perhaps even less so to their counterparts in the sprawling Third World urban slums (Dankelman & Davidson, 1988a:87–90).

Conclusion

This short survey of gender and the natural environment has endeavoured to draw out some of the many ways in which women are affected by developments or policies that impinge on the natural environment and, more especially, to show how undesirable it is for women's perspectives not to be factored into the planning of these matters. Development practitioners need to be sensitised to the fact that their actions may have negative environmental consequences that impact directly upon those least in a position to take evasive action – namely poor women.

It has been implied here that women's equal standing with men is a *sine qua non* for genuine development. In short, and this subsumes the single aspects of gender or environment, if people cannot treat one another with the dignity, consideration and respect that the fact of their *humanity* demands, then this will manifest itself in all manner of social and environmental dysfunction.

Notes on the Contributor

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