

**GUIDELINES FOR THE DEVELOPMENT OF
ENVIRONMENTAL TEACHER EDUCATION IN
SOUTH AFRICA**

A CONCEPTUAL AND CONTEXTUAL ANALYSIS

by

PETA ASTON

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ABSTRACT

The potential of teachers to educate for improved environments is powerful. It is urgent that this largely latent energy be translated into action in South Africa, where, despite significant political progress, the experience of the total environment for the majority of South Africans, is one of severe compromise. Environmental education for teachers is, therefore, considered to be an essential component of any strategy aimed at effecting environmental and societal reform in South Africa.

Such education requires a clear conceptual basis if it is to be successfully applied in schools. Accordingly, a conceptual framework, informed by established theory in environmental education, and within a compatible paradigm of environmentalism, is developed. The framework is, however, primarily shaped by its contextual foundation in a South African environment of non-egalitarianism.

International and local experience of environmental teacher education is evaluated against the demands of this conceptual approach. The opportunities and constraints of different types of implementation are examined, and it is concluded that to prescribe a strategy would be to contradict the fundamental aims of both environmental education and the present study.

A **process** for the development of environmental teacher education is therefore designed and tested in lieu of a rigid formula for national imposition. This process is presented in the form of guidelines which promote a policy and procedure for introducing an environmental teacher education which represents the needs and strengths of local communities in South Africa. It is believed that unless such a strategy is pursued, the current and historic forces eroding people's learning and living environments throughout South Africa, will persist.

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This thesis is because, for, and of my family.

Individually, and in formation, we have overcome.

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CHAPTER ONE

INTRODUCTION

1.1 MOTIVATION

Environmental education is pivotal to any strategy aimed at improving the experience of people in their total environments. The role of the environmentally educated teacher in this process has been stressed repeatedly as crucial (Neal, 1991; Sterling, 1987; UNESCO/UNEP 1977, 1978). Indeed, as a pre-condition for effective environmental education, the education of teachers has been identified as the "...priority of priorities..." (*Connect*, 1990:1).

Two factors prompted the instigation of the present study in 1988. Most significant, was the realisation that without serious effort being invested in environmental teacher education, the imbalance characterising many aspects of the human and non-human environments in South Africa would continue to be supported, if not promoted, by the education system. The second, more tangible, spur was the then imminent publication of a South African White Paper which was to mandate environmental education as an interdisciplinary approach throughout school curricula. The implications of this for both pre- and in-service formal teacher education were great, and it was therefore considered essential that the present and future provision of teacher environmental education be researched. The intention was to avert inappropriate planning for environmental teacher education on a massive scale, and to contribute research which would promote the design of effective strategies. Accordingly, a research proposal was submitted to the Human Sciences Research Council and funding was subsequently provided from February, 1988 to June, 1990.

The present study derives from the research conducted during this period and builds upon the findings to develop a stronger contextual and conceptual framework within which appropriate initiatives in environmental teacher education in South Africa can be encouraged. To date, little practical response has followed in the wake of the publishing of the White Paper on Environmental Education ISBN 0-621-12454-0, (Department of Environment Affairs, 1989), making additional research both timeous and necessary.

1.2 THE PROBLEM

The global environmental and societal crisis is reflected, if not amplified, in the extent of the erosion of South Africa's total human environment in terms economic, social, political, and physical (Wilson and Ramphela, 1989). If environmental education is a priority of international environmental concern (IUCN/UNEP/WWF 1980, 1990; World Commission on Environment and Development (WCED), 1987), it is a necessity in South Africa. Environmental teacher education is therefore an extremely important area for research and development if teachers are to realise even a degree of their power for effecting change. The arena of education and the environment in South Africa is volatile ground. Any improvement of the educational experience of students and teachers through the introduction of environmental education, must therefore be made in full appreciation of the theoretical and practical implications of such initiatives.

Present provision of environmental teacher education in South Africa is often inadequate, absent, or misguided (Ballantyne and Aston, 1990a). Accordingly, energy needs to be spent on both a quantitative and qualitative increase if the necessary levels are to be approached. This can only occur within a relevant conceptual framework, against considered practical parameters, and through an appropriate process.

The immediate problems relate to the history and nature of present education structures, provision, and control, which are in diametric opposition to the aims and principles of environmental education (Ballantyne and Aston, 1989). The thrust of the research, therefore, is not into the details of environmental teacher education curricula, but rather towards aspects of organisation, and the nature and impact of structural factors on the facilitation of such education. Emphasising the relevance of such a focus is the diagram in Figure 1 (Schematic Representation of the South African Education System). This illustrates the complexity of one dimension of these inherited parameters, *viz.* the structure of state primary and secondary education in South Africa. Further issues for consideration derive from careless or deliberate misinterpretation of the process of environmental education, an underdeveloped theoretical basis and, finally, from inappropriate formulation and application of environmental education policy and practice.

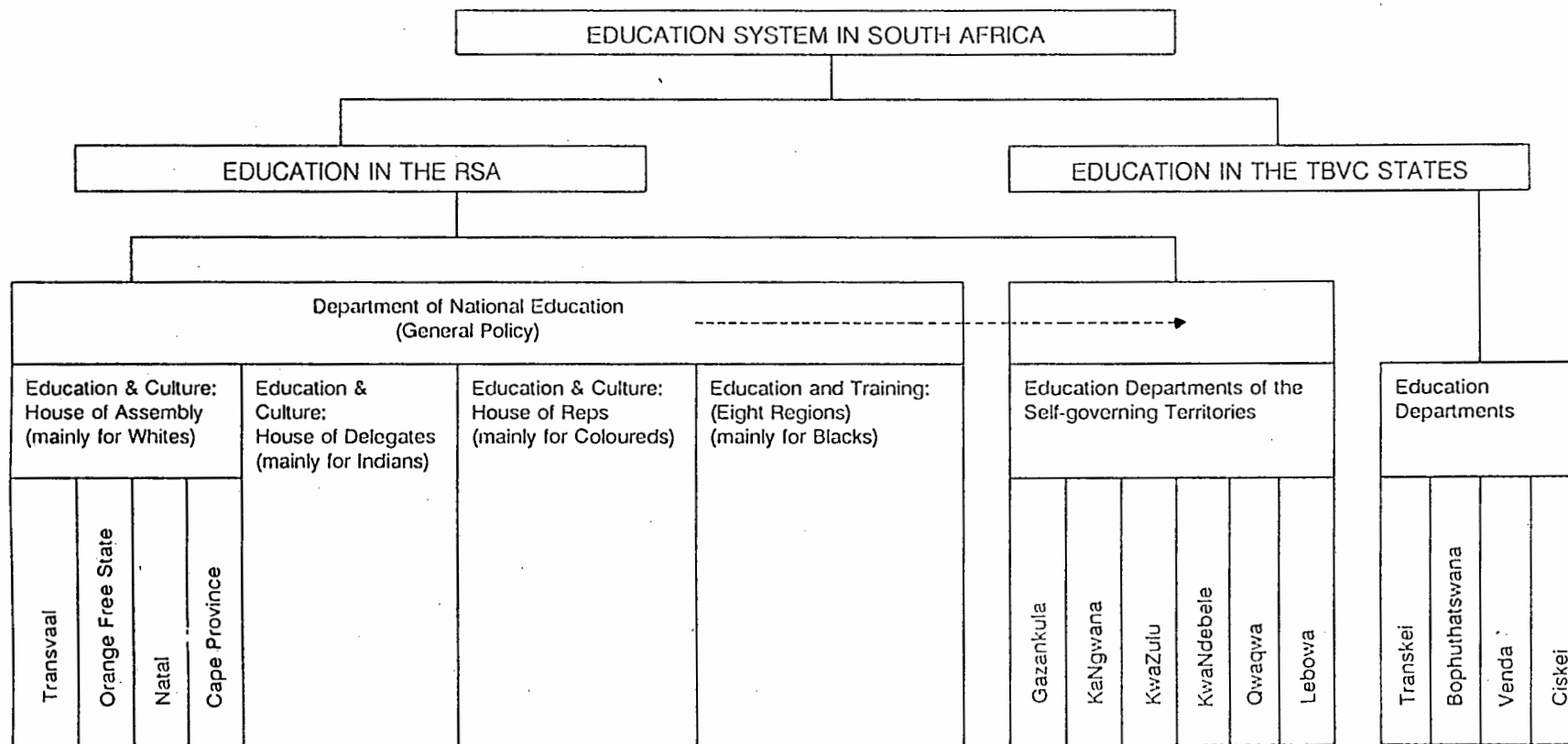


FIGURE 1: SCHEMATIC REPRESENTATION OF THE SOUTH AFRICAN EDUCATION SYSTEM (AFTER DEPARTMENT OF NATIONAL EDUCATION, 1991A)

The present study therefore aims to address such shortcomings and to suggest a more apt approach to the development of environmental teacher education in South Africa.

1.3 AIMS AND OBJECTIVES OF THE STUDY

In view of the research problem, the following aims were identified:

- to formulate a conceptual framework for environmental teacher education in South Africa;
- to identify and evaluate practical parameters for the development of environmental teacher education strategies in South Africa; and
- to recommend guidelines for the development of environmental teacher education initiatives in South Africa.

Objectives were therefore to:

- explore the concept of environmental education, its implications for environmental teacher education, and an associated pedagogy;
- promote a South African concept of environmental teacher education;
- extract relevant considerations from the international experience of environmental teacher education;
- examine local organisational opportunities and constraints; and
- to identify an appropriate process for the development of environmental teacher education in South Africa.

Research methodologies included a literature study, field research, personal communication in the form of ongoing correspondence and interviews, and participatory research using workshopping techniques. An outline of the field research undertaken is included in Appendix A. Personal communication was conducted not only with those formally referenced, but also with a range of individuals mentioned variously in the field research notes and workshop documents (Appendix Bii). These should therefore be seen in conjunction with one another for a full reflection of the consultation and exchange upon which this study is based.

1.4 PARADIGMATIC ORIENTATION AND APPROACH

1.4.1 GLOBAL CONTEXT

Environmental education demands that a global perspective is maintained as the stage-set for confronting and engaging in environmental issues at all levels (Irwin, 1990a; UNESCO/UNEP, 1977, 1978). Accordingly, a global environmental and societal context is established, with world economic and social organisation identified as the underlying cause of continually increasing environmental instability and popular inequity. This perception informs the paradigmatic orientation of the present study.

Land degradation, desertification, water, air and land pollution, the destruction of tropical forests, the extinction of plant and animal species, soil erosion, human starvation and threats to human health, environmental acidification, dumping of toxic waste, rising levels of carbon dioxide in the atmosphere, ozone layer destruction, ever increasing levels of resource utilisation, eroded levels of agricultural production and mass impoverishment, are the bitter pickings of late twentieth century environmental concern (Bunyard and Morgan-Grenville, 1987; Greig, Pike and Selby, 1987; Hildyard and Epstein, 1987; Huntley, Siegfried and Sunter, 1989). These phenomena are becoming increasingly well-documented in a myriad of sources from academic journals to the popular media and it is not the intention here to reproduce such coverage. The essence is that few would any longer deny that action is indicated if the process of destruction is to be checked, addressed or redressed. However, the nature of such action is the source of much dispute, since decisions of this kind derive from core environmental, economic, and political ideologies. It is therefore crucial to define the framework within which any related debate occurs. The following discussion is intended as a clarification of the positioning of this study.

1.4.2 TOWARDS AN APPROACH

1.4.2.1 General Orientation

Blame for the environmental problem is generally laid at the door of industrial, and usually, but not exclusively, capitalist, societies. A large number of works, including

Dinham (1987), IUCN/UNEP/WWF (1980, 1990), and Timberlake (1985, 1987), reinforce the notion that the behaviour of industrialised societies is disruptive to the functioning of both human and natural systems. Such lifestyles embody disproportionate patterns of consumption whereby affluent countries of the North, representing 25 percent of the world's population, consume approximately 80 percent of the world's resources (Greig, Pike and Selby, 1987). The associated ecological cost of such resource depletion and concomitant waste production points to the need for serious behavioural changes. Population control thus becomes as much of an issue in developed countries as is being made of it in less developed regions. The final irony is that the environmental cost of this apparently insatiable appetite for consumption is largely debited to the account of Third World¹ populations and environments (Hildyard, 1991; Peng, 1987).

The people of developing countries have been systematically marginalised by the imposition or endorsement of past and present development and economic policies (Lappe and Collins, 1988; Swift, 1988). The dependency of conquered territory upon empirical motherland, generated by colonial economic practice, has been perpetuated in the post-colonial era by the functioning of the global economy. This traps developing countries in a neo-colonial dependency upon First World economies. Forced to continue with inappropriate economic and development programmes, these countries maintain a pattern of human exploitation, environmental deterioration, and burgeoning poverty (WCED, 1987). Often mere survival forces the misuse of natural resources upon populations which might well, in other circumstances, have the knowledge and skills necessary for following sustainable agricultural and development practice (Harrison, 1988; Khan, 1990a). The implication of these terms is explored in 1.4.2.3. More recent emphasis highlights women in such environments as the principle victims (Agarwal, 1988; Dankelman and Davidson, 1988; Taylor, 1985), however, an exploration of gender in development issues is unfortunately beyond the scope of the present study.

¹ The rather simplistic identification of First and Third Worlds, developed and developing countries, and a global economy characterised by an affluent North and impoverished South, serves the purpose of this review. A more detailed examination of the implications, indeed, the validity of such blanket terms can be found in Forbes (1984). The use of these concepts is based on an acceptance that the juxtaposition of rich to poor countries serves to promote the interests and cause of the often 'incohesive solidarity' of disempowered peoples and states (Griffin, 1981).

The 'North-South divide' is manifest not only in terms of material wealth, but also in basic human rights intrinsic to an acceptable quality of life. The result is an increase, both within and between societies, in social conflict and tension. This is expressed in disproportionate levels of global military expenditure which are maintained at the cost of, for example, health, development, or education budgets, and often against a backdrop of serious human rights violations and further environmental degradation (Barnaby and Bunyard, 1987; United Nations Centre for Disarmament, 1982). Only relatively recently has it been acknowledged by international aid agencies that the direct transfer of Western values, production systems, and technology to developing countries is an inappropriate strategy for encouraging their upliftment, indeed, that it is an exercise in disempowerment.²

If development policy is to be effective, it must be informed by an appreciation of the processes at play. Development theory provides frameworks within which such analysis can occur and these are outlined briefly in the following section. An appropriate model of development is accepted into the conceptual framework of this study.

1.4.2.2 Development Theory

The dominant thinking governing patterns of international assistance derives from assumptions made within a diffusionist model of development (Forbes, 1984; Forrest, 1991). These assumptions define growth in purely economic terms with little regard for the promotion of better societal or individual qualities of life. Accordingly, such an approach, reflected in Rostow's theory of development (1960), has envisaged development in Third World countries as a linear process through stages of economic growth similar to those experienced in the evolution of First World systems (Browett, 1980). This 'modernisation' was understood as occurring within a capitalist and usually Western framework in imitation of the hegemonic societies of the global economy (Berger, 1974).

² Disempowerment is the erosion or absence of individual or community control over decisions which affect economic, social, and political affairs as they impact upon conditions of daily and future existence (Hildyard, 1991). By deduction, then, empowerment is the reclamation by communities or individuals of such power.

International development programmes were therefore designed to promote economic growth in the belief that growth impulses would diffuse or filter out to benefit the less developed and surrounding areas (Conway and Barbier, 1990; McCarthy, 1981). This would gradually lead to the modernisation and upliftment of the general economy to eradicate poverty and generate an integrated economic system. The *praxis* and application of this theory, manifest as a growth centre strategy, has led instead to increased societal inequalities both within such developing societies and between developed and developing countries with the gap in the standard of living consistently widening (Rogerson, 1988).

This situation has been explained in terms of a dependency model of development which explores such "development of underdevelopment" (Fair, 1982:20). The theory grew out of a realisation that Western financial and technological aid, though applied in vast quantities, had done little to improve the lot of the impoverished masses. It thus refutes the diffusionist claim that growth point stimulation generates trickle down (and out) benefits within an economy, pointing instead to its strengthening of inter- and intra-societal inequality.

Accordingly, dependency theory promotes a concept of development not as synonymous with economic growth, but as a concern for human well-being and the promotion of equality in terms of access to material and non-material resources. This understanding provides the basis for an extension of the concept in terms of an ecocentric worldview.

1.4.2.3 Ecocentrism and Development

The theory of development is neither static nor singular. It demands, not least of geographers, constant re-appraisal of the underdevelopment impulse (Forbes, 1984). An examination of the complexities and overlaps of different approaches as regards their economic, political, and environmental perspectives can be found in Knill (1991a). The aim here is to establish an appropriate paradigm³ within which to explore the theory and practice of environmental teacher education.

³ For the sake of this discussion, a paradigm is understood to be the "...invisible set of mutually re-inforcing assumptions..." as defined by Knill (1991b:52).

Such a paradigm derives, firstly, from a concept of development compatible with the aims of an environmental education approach. This concept is embedded somewhere in the popular notion of sustainable development which has become corrupted by careless or deliberate application to development of many kinds (Knill, 1991c; Leather, 1988; Redclift, 1987). Often regardless of the environmental, social, and economic implications of the term, it has been used, variously, to lend legitimacy to development programmes of dubious environmental or societal benefit, or as the banner of sometimes well-meaning but uninformed, environmental campaigners (Adams, 1990). In the absence of careful definition, sustainable development thus threatens to become the albatross of modern development theory. It is therefore necessary to salvage the principles of sustainable development from the emotionalism of popular usage if the concept is to contribute to a meaningful framework for discussion and action.

Contributing to the general confusion is the widespread misuse of terms such as 'sustainable growth' and 'sustainable use' as synonymous with both each other and with sustainable development. This may derive from the relatively loose definition adopted by the World Commission on Environment and Development (WCED) in 1987 which reads as follows:

"Sustainable development is development which meets the needs of the present, without compromising the ability of future generations to meet their own needs"

(WCED, 1987:23).

In an attempt to overcome the ambiguity now associated with the term 'sustainable development', a draft of a World Conservation Strategy for the 1990s outlines more specifically the meaning of sustainability and the implications of this for development (IUCN/UNEP/WWF, 1990:10). Sustainability is understood to be "...a characteristic of a process or a state that can be maintained indefinitely (for all practical purposes)...". Accordingly, sustainable development is a process for "...improving the capacity to convert a constant level of physical resource use to the increased satisfaction of human needs."

While these definitions do not refute earlier thinking, they make more explicit the distinction between growth and development. Growth in terms of sustainability is an untenable contradiction unless it is defined as the qualitative move towards improved social and physical environments. Intrinsic to this notion is a parallel acceptance of

limitations to quantitative growth as set by ecosystemic parameters (IUCN/UNEP/WWF, 1990). Also echoing previous definitions, is the implicit concern for directed development aimed at meeting human needs where they are experienced. Perhaps wisely, the document has been worded, where possible, to avoid the use of 'sustainability terms'. Similar prudence is practised in the present study, since an argument in semantics would detract from the consideration of more pressing environmental concerns. The underlying principles, however, remain fundamental to the strategy, and are expressed as such in the final document (IUCN/UNEP/WWF, 1991).

By deduction, then, a concept of development consistent with the aims of environmental education is based upon a principle of non-exploitation of either people or their environments, is limited by the parameters of the earth's natural systems, and is informed by needs of, particularly, the world's poor (Short, 1990).

The accepted paradigm is based, secondly, upon principles and ethics commensurate with an ecocentric philosophy of environmentalism.⁴ This perspective is of people as part of, not separate from, or above, the natural order. As such, humanity must re-affirm its position within the physical and chemical environment, as indivisible from the functioning whole (Lovelock, 1986; Skolimowski, 1984). The complex set of interrelationships which governs this, has serious implications for the re-appraisal of our societal structures and systems (Knill, 1990). These have predominantly operated on the assumption that what is of use, is automatically at the disposal of those with the power to exploit, be it at the expense of the natural environment or other people. Hence have arisen the gross inequalities between people and societies and the levels of environmental degradation as experienced today (1.4.1 and 1.4.2.1).

The paradigm within which environmental education and an environmental pedagogy is studied, is therefore one which promotes, firstly, an idea of development towards equality

⁴ This is taken to be the philosophy embraced by an ecocentric worldview. Engel (1988), Knill (1991a), O'Riordan (1988), and Pepper (1984) provide detailed analysis of the roots, epistemology and dialectic of such a philosophy, as well as the finer permutations of ecocentrism.

for all in their experience of improved, and improvement of, material and non-material environments, and secondly, the behavioural ethics concomitant to a respect for all functioning organisms within a global system.

1.4.3 GLOBAL RESPONSE

Response to the environmental crisis as expressed by the international community has reflected the spectrum of environmental and developmental ideologies. Despite the efforts of well-intentioned individuals over the years, it was only in the late 1960s that the ecological banner as a hope for human survival became part of a popular movement (Southwick, 1976). The so called 'doomsday syndrome' raised public awareness, often frenetically so, but gradually lost its high-profile to new fashions of consumerism (O'Riordan, 1988). However, an enduring result of this movement has been the emergence of an established network of organisations and programmes which work towards confronting environmental problems at regional and global levels.

Internationally co-ordinated projects include those run under the aegis of, among others, the United Nations Environment Programme (UNEP), the International Union for Conservation of Nature and Natural Resources (IUCN), the World Health Organisation (WHO), the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the Worldwide Fund for Nature (WWF), the United Nations World Commission on Environment and Development (WCED) and the United Nations Development Fund for Women (UNIFEM). These programmes work alongside a host of nationally or regionally co-ordinated projects and organisations concerned with development and the environment.

With a variety of emphases, all the above organisations have highlighted education as an essential ingredient of a successful strategy in the environmental challenge.

1.5 STRUCTURE OF THE STUDY

The study is approached in accordance with the paradigm identified above.

In **Chapter Two**, the emergence of environmental education as a response to the perceived environmental crisis is traced. Consideration of established theory in conjunction with the chosen research approach, leads to the development of a consistent conceptual framework for environmental education and hence, environmental teacher education.

Chapter Three deals solely with South African concerns as regards environmental teacher education. It establishes the environmental and educational context of the South African classroom. This informs a discussion of the role of environmental teachers and environmental teacher education in South Africa. The ideology and structure of the present system of teacher education in South Africa are therefore examined against the demands of environmental education. The conceptualisation and practice of present state environmental education policy is discussed and a future direction for more appropriate development is evolved.

Chapter Four provides an identification of a variety of models followed in the provision of environmental teacher education. Strategic pointers are extracted from these models of international experience and local opportunity, and are suggested as considerations, but not limitations, to the further development of environmental teacher education initiatives in South Africa.

A process through which the development of appropriate environmental teacher education strategies could be facilitated, is suggested in **Chapter Five**. The research procedure and pilot study which allowed for the generation of a practical, yet effective process, are outlined.

Chapter Six represents the cumulative findings of the study. It provides a set of guidelines which could inform the conceptualisation, organisation, and development of

environmental teacher education programmes by, and for, all those implicated in, and affected by, the teacher education process.

Chapter Seven concludes the study with some final comments regarding immediate and future directions for environmental teacher education in South Africa, and the aims of the study are retrospectively appraised. The need for further research in areas pertinent to environmental teacher education is specified.

1.6 TERMINOLOGY

Clarification of certain terms is necessary, especially where usage derives from particularly South African circumstances.

Firstly, the terminology of racism has had to be used in order to reflect accurately the educational and environmental *status quo*. The term 'black' refers to all people in South Africa who have been disenfranchised by virtue of race, and includes those classified in apartheid nomenclature as coloured, African, Asian etc. This in no way implies that racial separatism is condoned. Indeed, the nature of the study precludes this.

Further confusion deriving from the legislation and practice of apartheid, surrounds the use of 'South Africa'. It is used by the author to denote an unfragmented Republic of South Africa. Hence, beyond the four provinces (Transvaal, Orange Free State, Natal and the Cape Province), the term includes all 'homelands', the white elephants of separate development. These are categorised under apartheid as the self-governing territories of Gazankulu, KaNgwane, KwaZulu, KwaNdebele, Qwaqwa, and Lebowa, and the independent states of Transkei, Bophuthatswana, Venda, and Ciskei (the TBVC states).

The term 'teacher training' is avoided deliberately, with 'teacher education' the preferred alternative. Important differences in the nuances of meaning are present. The former implies an imposed, unquestioned and practised efficiency in set skills, while the latter relates to an interactive process of learner involvement and contribution. Ensuing from

this usage is the term 'environmental teacher education' which denotes the process whereby practising or intending teachers experience exposure to the pedagogy and methods of environmental education. This process, if effective, leads to the development of a teacher skilled in the environmental education approach, or what this author terms an 'environmental teacher'.

Finally, the word 'student' is used to denote school goers as well as those registered at tertiary education institutions. The particular usage is made clear in the text. 'Pupil' carries implications of receptive, rote learning similar to those of 'training' or 'schooling', and thus conflicts with the author's persuasions concerning the process and function of education. (Where these terms are used, they have been deliberately chosen for their particular connotation, or are part of a quotation). These distinctions have been carefully made by those committed to educational reform in South Africa.

CHAPTER TWO

A CONCEPTUAL FRAMEWORK FOR ENVIRONMENTAL TEACHER EDUCATION

2.1 INTRODUCTION

A conceptual framework for environmental education is designed around an understanding of what is implied by the term 'environment' and by what this has come to mean for an education. This is developed to incorporate ideas in environmental philosophy towards a new definition for environmental education. The deep rooted environmental and educational ideologies which determine whether teachers realise the ideals of such an education are examined, and a preferred ideology is embraced by the study. In this regard, the need and role for environmentally educated teachers is discussed, and conclusions concerning aspects of application within state education systems are drawn.

2.2 THE ENVIRONMENT AND ENVIRONMENTAL EDUCATION

2.2.1 THE CONCEPT OF ENVIRONMENT

In a discussion of environmental education, one needs to establish precisely what is meant by the term 'environment'. For the purpose of this report, environment is conceived to mean the total human environment. The environment in its entirety thus implies the natural and built, personal and collective, economic, social and cultural, technological, ecological, and aesthetic elements (UNESCO/UNEP, 1978; WCED, 1987). An understanding of environment which is holistic in conception is stressed. Accordingly, the environment is seen as an indivisible, dynamic system of connecting and interconnecting functions and relationships which together build a complex web of mutual dependency (Braham, 1988; Lovelock, 1986). Further, one must perceive a temporal dimension to the concept of environment and consider always that it projects beyond the contemporary.

2.2.2 THE CONCEPT OF ENVIRONMENTAL EDUCATION

There is little literature to be found which traces the history of environmental education which is not itself Eurocentric in emphasis. Ancient and modern teachings of the Eastern and Third World are rooted in an environmental ethic and surely contribute an ignored dimension to the conceptualisation of environmental education (Ballantyne and Aston, 1990a; Briceño and Pitt, 1988). This shortcoming is recognised and is indicated as an area for future and ongoing research.

The intention here is to highlight landmarks in the development of international accord on environmental education and not to reproduce its entire history. This has been done elsewhere, and those interested are referred to the works of, among others, Blignaut (1991), Carson (1978), Irwin (1984), and Saveland (1976).

2.2.2.1 International Developments in Environmental Education

Environmental education, as it is understood in its predominantly First World context, developed out of a concern in nineteenth century Europe for the disruption of human-environment harmony as a result of the Industrial Revolution (Irwin, 1984). The beginnings of the modern phase in environmental education occurred after the Second World War when there was an increased concern for environmental improvement in, particularly, Europe and the United States of America. Support for environmental education has continued to grow and in so doing has incorporated, to varying degrees, an understanding of environmental concerns which include political, social, and economic perspectives (Blignaut, 1991; Gustafson, 1983; UNESCO, 1977).

Recent decades have been characterised by a systematic institutionalising of concern for the environment and environmental education. Accordingly, state and non-government organisations have been formed, with growing international co-operation leading to an ongoing series of conferences and seminars, the most significant of which are listed below:

1970 UNESCO Biosphere Conference, Paris, France;

1970 IUCN International Working Meeting on Environmental Education in the School Curriculum, Carson City, Nevada, USA;

- 1971 IUCN First European Working Conference on Environmental Education, Ruschlikon, Switzerland;
- 1972 IUCN International Workshop on Environmental Education, London, Canada;
- 1972 United Nations Conference on the Human Environment, Stockholm, Sweden;
- 1975 UNESCO/UNEP International Workshop on Environmental Education, Belgrade, Yugoslavia;
- 1977 UNESCO/UNEP Inter-governmental Conference on Environmental Education, Tbilisi, USSR; and recently of significance,
- 1987 the Moscow Congress.

The above conferences and organisations have consistently stressed the importance of environmental education. This view is based upon the belief that viable solutions to environmental problems depend upon an education at all levels for all people which will enable them to understand the fundamental interaction and interrelationships between people and their environment (Stapp, 1982). In echoing this concern, Pitt (1988:58) goes as far as saying that "...environmental education should be the most significant priority in future conservation strategies and action plans...". The strength of such conviction is similarly found in Braham (1988:26), who views such educational opportunity as neither "...a right, nor a privilege, but a matter of natural necessity...". Accordingly, this education should be the opportunity of all people, should engage with people's beliefs and attitudes at their behavioural roots, and should aim to establish a global environmental ethic consonant with an ecocentric environmental philosophy, and hence, the concept of sustainability (1.4.2.3). In striving towards this end, UNESCO has become a driving force behind the co-ordination, implementation, and monitoring of environmental education programmes in member states at international, regional, and local levels (Cowan and Stapp, 1982; UNESCO/UNEP, 1983-1987).

UNESCO's involvement is a direct result of the 1972 United Nations Conference on the Human Environment which called for an international programme in environmental education (United Nations, 1972). Such a programme would need clearly defined objectives and a sound theoretical base if international co-operation was to be successfully

achieved. The following paragraphs outline the conceptual framework of environmental education as it was consequently developed and embraced by the international community. This concept is then extended to develop a new definition of environmental education more compatible with environmental concern in the 1990s.

2.2.2.2 International Theory on Environmental Education

A Goal

In 1975 at the International Environmental Education Workshop, the Belgrade Charter was developed (UNESCO/UNEP, 1977). It suggests the following as a long term goal for environmental education:

To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current problems and the prevention of new ones.

Objectives

The Belgrade Charter also laid out **six objectives** for environmental education which are widely accepted. These are that environmental education should develop:

1. **AWARENESS** to help individuals and social groups acquire an awareness of and sensitivity to, the total environment and its allied problems;
2. **KNOWLEDGE** to help individuals and social groups acquire the basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it;
3. **ATTITUDE** to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement;
4. **SKILLS** to help individuals and social groups acquire the skills for solving environmental problems;
5. **EVALUATION ABILITY** to help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, aesthetic and educational factors; and
6. **PARTICIPATION** to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve those problems.

Principles

Underpinning the objectives mentioned above, are a set of guiding principles for environmental education which were adopted at the World Inter-governmental Conference on Environmental Education held at Tbilisi, USSR, in 1977 (UNESCO/UNEP, 1978). These principles expand upon those proposed at Belgrade two years earlier and form a solid foundation for any environmental education programme. They are that environmental education should:

1. consider the environment in its totality - natural and built, technological and social, economic, political, moral, cultural and historical, and aesthetic aspects;
2. be a continuous life-long process; it should begin at pre-school level and continue through all formal and non-formal stages;
3. be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible an holistic and balanced perspective;
4. emphasise active participation in preventing and solving environmental problems and working towards their solutions;
5. examine major environmental issues from local, national, regional, and international points of view, so that learners receive insights into environmental conditions in other geographical areas;
6. focus on current and future environmental situations;
7. emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
8. utilize diverse learning environments and a broad array of educational approaches;
9. focus on the learner's own community and relate topics being discussed to state, regional, national, and international issues and perspectives;
10. relate environmental sensitivity, knowledge, problem-solving, and values clarification at every school level; and
11. enable learners to play a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences.

2.2.2.3 A Definition: Belgrade and Beyond

An undisputed definition of environmental education remains elusive (Ballantyne and Aston, 1990a; Clacherty, 1988; Irwin, 1990a). This is, in part, due to the different emphases favoured by, for example, conservationists and sociologists. However, despite

its sexist terminology, one that enjoyed widespread acceptance was that produced by the IUCN in Nevada, 1970. It reads:

"Environmental Education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his bio-physical surroundings. Environmental Education also entails practice in decision making and the self-formulation of a code of behaviour about issues concerning environmental quality"

(in Hurry,1982:38).

In an attempt to incorporate the social aspects of environmental education more fully, the definition of the United States Environmental Education Act of 1977 was and is widely supported. It reads:

"Environmental Education is an integrated process which deals with man's interrelationships with his natural and man-made surroundings, including the relationship of population growth, pollution, resource allocation and depletion, conservation, technology and urban and rural planning in the total human environment.

Environmental Education is a study of the factors influencing ecosystems, mental and physical health, living and working conditions, decaying cities, and population pressures. Environmental Education is intended to promote among citizens the awareness and understanding of the environment, our relationship to it and the concern and responsible action necessary to assure our survival and to improve our quality of life"

(in Richards, 1985:40).

South African writers such as Hurry and Richards have provided more simple definitions.

Hurry suggests:

"Environmental Education is a process leading to the acquisition of environmental knowledge and the development of attitudes, values and patterns of behaviour which reflect a concern for the health of the total environment as well as for the quality of life of all its inhabitants"

(Hurry, 1982:39).

Richards provides an even shorter working definition:

"Environmental Education is a process by which an individual or a community develops a responsible life-style in sympathy with the total environment"

(Richards, 1985:41).

While debate has continued as to the precise definition, there has always been a common understanding within the various suggestions, viz., that environmental education:

- is a process;
- is concerned with interrelationships;
- relates to the social and bio-physical environments; and
- should promote action

The definitions arrived at by environmental educationalists over the past two decades have served their purpose into the eighties. However, they require further development if they are to convey full subscription to the ethics of the environmentalism adopted by this study (1.4.2.3). Accordingly, a definition should include:

- reference to the requirements of sustainability;
- a temporal dimension projecting concern for future environments and generations;
- a context of universality not fully conveyed by terms such as 'total environment'; and
- a foundation in the dynamic of local and community organisation.⁵

The inclusion of the above concepts provides a more replete, albeit idealistic, definition for an environmental education in the twilight of the twentieth century. The following is offered, therefore, not in contradiction of existing definitions, but as their complement:

Environmental education is a process through which individuals and societies are empowered to redefine their roles as functioning elements within the indivisible dynamic of the global environment, and thereby to adapt their behaviour relative to each other's needs and those of organic and chemical systems, both present and future.

⁵ The relevance of local organisation and popular knowledge has hitherto been relegated to the periphery of environmental 'wisdom' (Harrison, 1988; Khan, 1990a) which is characterised by reliance upon positivistic analysis in problem solving. While participatory and locally based methods have long been theoretical aims of environmental education, the full implication of applying such principles has remained largely unexplored and underapplied. Accordingly, the potential for grassroots social and ecological reform, has been blunted by top-down management of so-called participatory action and education. The call for community engagement in socio-ecological reform (Hildyard, 1991; Murphy, 1988; O'Donoghue and McNaught, 1991; Pitt, 1988) should therefore be reflected in an environmental education which empowers towards such participation.

The ideological framework within which teachers operate is decisive in determining whether the goals implicit in this definition are realised. Accordingly, the next section (2.3) is an examination of such frameworks. This leads to the development of an environmental pedagogy considered to be the most loyal expression of an ecocentric environmentalism through education.

2.3 IDEOLOGY AND PRACTICE

2.3.1 INTRODUCTION

The reality of classroom application of environmental education varies greatly in perspective, emphasis, and execution, making it often debatable as to whether environmental education objectives are being achieved (Ballantyne and Aston, 1990a; Crewe, 1985; Smythe, 1988). While the aims, objectives, and guiding principles of the environmental education defined above should inform the nature of teaching methodologies and dominant pedagogy, the ultimate determinant of chosen classroom practice is the ideological framework within which the teacher operates (Huckle, 1983; Pepper, 1987). This may be a conscious adherence to a preferred worldview or it may be latent in the educational and societal systems which shape the learning environment of both teachers and students. It is thus a multi-tiered hierarchy of structure and superstructure which impacts upon and pre-determines the prevailing learning ethos.

Regardless of the source from which the dominant ideology derives, its expression at the chalkface (or overhead projector) pre-conditions the learning experience. Since it finds ultimate manifestation in student attitudes, values, and behaviour, it is crucial to the successful or otherwise realisation of environmental education goals.

Accordingly, an examination of deep-rooted educational and environmental ideologies is necessary if an appropriate environmental pedagogy is to be identified. Boersma (1988) emphasises the importance of such discussion by pointing out the imbalance of attention paid to environmental education curriculum content over that dedicated to structural concerns and their broader impact upon the environmental education process.

2.3.2 ENVIRONMENTAL IDEOLOGY AND EDUCATIONAL PRACTICE

The work of Huckle (1983) has become standard in its correlation of chosen teaching approach to preferred environmental ideology. He extracts three such environmental philosophies and links these to their corresponding educational practice. This combination of environmental and educational beliefs leads him to an identification of environmental education approaches, either **about**, **from** or **for** the environment. Similar examination across a spectrum of environmentalisms and contingent educational approaches shows broad consensus, and is absorbed into the following review. This discussion is explored further to develop an environmental pedagogy which, in the view of the author, best represents an outworking of environmental and societal concern through education.

2.3.2.1 Conventional Environmentalism

A conservative or technocratic environmental philosophy is identified as that of conventional environmentalism which suggests that scientific solutions, managed within existing social and economic frameworks, will avoid ecological disaster (Sandbach, 1981; Simon and Kahn, 1984). In concert with liberal educational ideology, conventional environmentalism gives rise to what Huckle calls education **about** the environment. Within such a framework, both education and environmental management are treated as neutral processes (O’Riordan, 1988; Pepper, 1984). Curriculum content is therefore scientifically based and emphasises the ability of people to plan and control their environments. The environment becomes a subject of study, and inter-disciplinary approaches are rare. The school remains in isolation from its social context and if the local environment is utilised, it is as a teaching resource.

2.3.2.2 Utopian Environmentalism

Utopian environmentalism is an environmental ideology embraced by ‘deep environmentalists’ who see nature as a source of moral values, apolitical and ethical in itself, compelling economic restraint (O’Riordan and Turner, 1983; Sandbach, 1981). This group is variously accused of political naïvety, idealism, and retreatism (Huckle, 1986). Commensurate with such beliefs is an education which reflects the idealism of progressive educational and utopian environmentalism, and is identified as an education

from the environment (Huckle, 1983). The environment, often rural, is used as a medium for education which is child-centred in its emphasis, frequently to the neglect of socio-political factors and conflicts (Aston, 1990a; Smythe, 1983). The underlying belief is that experience in the outdoors develops moral and personal growth in students. Links between the school and community may be formed, but would probably emanate from activities in the natural environment rather than around community issues of a contentious nature.

The traditional environmentalism of the above philosophies (2.3.2.1 and 2.3.2.2) emphasises biological laws and preservation, with middle ground approaches touching on ideas of social morality and liberal economic reform. By not fundamentally challenging the *status quo*, the educational practice of conventional and utopian environmentalism actually works to sustain and promote environmental deterioration and socio-political injustice (Huckle, 1983, 1986; Pepper, 1987). Hence, such ideologies work counter to the aims of environmental education and are therefore considered inappropriate frameworks for an environmental classroom.

2.3.2.3 Radical Environmentalism

It is within a paradigm of radical environmentalism that the roots of a pedagogy compatible with environmental education, as developed in this study (2.3.2.4), are found.

According to the view of radical environmentalists, industrial societies embody inherent social injustices which lead to environmental and human impoverishment (Irwin, 1990a). The priority that economic needs take over human needs within such societies ensures environmental and human exploitation, with the environment being forced into the role of economic sustainer for the good of an increasingly affluent minority (Engel, 1988; Lacey and Williams, 1987). Radical social and economic change is therefore indicated if real improvement in environmental quality is to result.

Accordingly, the educational emphasis of radical environmentalists is an understanding of social constructs as they relate to economic organisation and power relations, and hence does not allow for ecological reform in isolation of social change (Huckle, 1985; O'Riordan, 1981; Robottom, 1987). This Huckle identifies as an education for the

environment, whereby the well-being or improvement of the total human environment is the goal. Emphasis is thus placed upon, initially, social reform, with ecological transformation a logical and necessary contingent (Pepper, 1987). Moral and political awareness coupled with knowledge, attitudes, and the skills to evaluate and participate in environmental politics are the objectives. Teaching methodologies are issue-based both in the immediate and global environments, while active involvement in local community issues is strongly stressed.

2.3.2.4 Ecocentrism and Environmental Pedagogy

Radical environmental education thus highlights social reform as a pre-condition to ecological change. By contrast, an ecocentric perception of environmental education, while endorsing this priority and concern for human needs, views human-environment relationships as indivisible (Capra, 1983; Irwin, 1990b). Hence, **social and ecological reform are considered concurrent processes, effectively a single dynamic.**

Learning programmes developed in accordance with this view are therefore likely to adhere strongly to cross-curricular, interdisciplinary and holistic priorities, with the learning environment, at all levels, reflecting principles of democratic and co-operative organisation (Aston, 1990a). Collaborative rather than competitive experiences will be characteristic teaching methodologies, and while a global and future-orientated perspective will be maintained, this will be generated from first hand engagement in issues of the local environment. Such primary experience in process related learning becomes an exercise in student self-determination. Involvement in local environments should be shaped by, and be an integral part of, the impulse of community concerns, needs and organisation. This implies a strong school-community relationship which facilitates on-going interaction and dialogue between educational and community representatives. Such structural integration, if not amalgamation, promotes the negotiation and expression of relevant and appropriate curricula.

For many reasons, then, this pedagogy best embodies an outworking of the definition of environmental education as developed in 2.2.2.3 and is therefore suggested as the ideal framework towards which the practice and promotion of environmental education could strive.

Consequently, all teachers should be familiar with the philosophical and ideological implications of being an environmental teacher and need confidence in appropriate methodologies for pursuing relevant goals. These aspects of environmental teacher education are therefore explored in the following discussion (2.4).

2.4 TEACHER ENVIRONMENTAL EDUCATION

This section re-iterates and examines the need for teacher environmental education and develops a role for which all teachers should be prepared. Commensurate behavioural, conceptual and practical competencies are briefly considered for the implications they have regarding the structure and organisation of environmental teacher education.

2.4.1 THE NEED FOR TEACHER ENVIRONMENTAL EDUCATION

2.4.1.1 A Concerted Call

Teachers and teacher education have long been identified as vital components of effective environmental education in schools. The realisation of environmental education aims depends upon the role, approach, behaviour, and methodology adopted by educators (Huckle, 1983, 1986; Irwin, 1982; Neal, 1991; O'Donoghue and Taylor, 1990). Even the best school facilities, resources, and curricula, Hurry (1982) suggests, would be ineffective in achieving environmental education goals in the absence of a suitably educated and motivated teaching staff. Reflecting this conviction, UNESCO publications over the years have re-iterated the need for environmental teacher education (Lahiry *et al*, 1988; UNESCO, 1977; UNESCO/UNEP 1978, 1983-1987).

Internationally, the need for environmental teacher education was recognized at the UN Conference on the Human Environment in Stockholm, 1972 (United Nations, 1972) and in the recommendations of UNESCO's Tbilisi intergovernmental Conference Report of 1977 (UNESCO/UNEP, 1978) and most recently at the Moscow Congress of 1987 (*Connect*, 1987a).

Reasons behind this particularly strong call for environmental teacher education are suggested in 2.4.1.2 below.

2.4.1.2 Organisational Roots

The impetus of the call for environmental teacher education is derived from the experience of First and Third World educators alike. Interestingly, the author has been able to trace, in nearly all statements of such need, a common expression of teacher powerlessness in the face of organisational or structural resistance. Accordingly, the root of the need for environmental teacher education is discussed at various levels of structural and societal organisation.

Firstly, those in less developed countries have recognised a pervasive resistance from parents, teachers, and communities to an education which, by definition, is based in the local environment (Crossley, 1984; Knamiller, 1985; Okot-uma and Wereko-Brobby, 1985; Vulliamy, 1987). Dominating the popular perception, is a Eurocentric attitude towards development which conflicts with the emphasis of environmental education on involvement and participation in immediate contexts. Knamiller expresses this view as follows:

"... the school should maintain its academic, abstract and urban middle-class bias. Schooling is a vehicle out of the community, not a process for improving local conditions ..."

(1985: 3).

Resulting from this perception, is a teaching practice which runs contrary to that identified as vital for successful environmental education. It is exam-orientated, teacher-centred, and text-book based (Ballantyne and Aston, 1988; Oxenham, 1984; Vulliamy, 1985, 1987). To redress such resistance, it is important that the adoption of an environmental education approach in schools (and hence communities) be accompanied by massive and community-based in-service education (Knamiller, 1985). In the absence of such efforts, teachers and communities alike may become demoralised, hostile, and confused (Vulliamy, 1987).

The second area of resistance is found embedded in the prevailing ethos of most schools, regardless of their location. This relates to the great difficulty with which educational

change, even liberal reform, is introduced and maintained in schools (Ballantyne, 1987; Blignaut, 1991; Zeichner and Tabachnick, 1981). A pedagogy of environmental education contrasts dramatically with that of traditional models, and implies a challenge to established approaches. Resistance to an environmental education within a radical or ecocentric ideology is therefore that much greater. For this reason, teacher environmental education is essential in preparing teachers to combat institutional immunity to change, through understanding and effectively confronting the power relations at play in formal education systems.

The third set of dynamics threatening to thwart environmental education aims, in the absence of effective teacher education, is to be found in the highly efficient resistance shown by broad societal organisation to reform (Freire and Shor, 1987; Sharp, 1980). Since environmental education challenges the existing organisation of society, it is at odds with the very structure within which its implementation is urged, *viz.*, the formal education system, which supports and promotes the *status quo* of prevailing economic and political organisation (Bunyard and Morgan-Grenville, 1987; Hay, 1988; Johnston, 1982). This it achieves through a largely hidden curriculum which determines an empirical approach to educational practice, design, and content, and is reflected in the overt curriculum and hierarchical structure of the learning environment and school superstructure. Accordingly, the methods and philosophy of classical science dominate the learning experience (Pepper, 1984). These emphasise the value of objective and rational investigation and associated techniques in determining what is 'true'. A knowledge of facts overrides the exploration of values and alternative philosophies, and is given final credibility by a linear progression through the examination orientated system of promotion. Passing and failing according to these undisputed 'truths', ensures that their supremacy remains intact. Education has thus consistently re-inforced the foundations of class-based and inherently unjust societies (Freire, 1985; Popkewitz, 1984).

Given the unsympathetic learning environments identified above, a strong call for environmental teacher education to prepare teachers for their role in the face of such resistance has emerged. This education must enable the democratic management of learning, and the manipulation and design of curricula towards identifying and confronting organisational and ideological forces constantly at play within the school and broader

society. Teachers, then, in discarding their role as "pedagogical civil servants" (Braham, 1988:23), should experience, and in turn facilitate, a quality of education commensurate with the gravity of the environmental crisis. The identity of the environmental teacher as a challenger of the norm therefore becomes a *collage* of roles, skills and behavioural competencies. This identity is developed in the following section (2.4.2).

2.4.2 AN IDENTITY FOR THE ENVIRONMENTAL TEACHER

Having established that environmental teacher education is undeniably necessary, one must examine the nature of the role for which teachers are to be prepared and the competencies necessary for performing this role effectively. This identity is informed by the aims, objectives, principles, and environmental pedagogy as established for environmental education in 2.2 and 2.3.

2.4.2.1 The Role of the Environmental Teacher

Theoretically and practically, the role of the environmental teacher, since environmental education is not a separate subject, must be understood as the pursuit of a teaching approach (Ballantyne and Aston, 1989; Blignaut, 1991). This implies a learner-centred teaching methodology which bridges subject boundaries through active participation in exploring and challenging issues, local and global, within a holistic framework. The educational process is to foster awareness and sensitivity, to explore and evaluate attitudes and to develop a sense of responsibility towards the environment which can be translated into appropriate action.

Early attempts to identify the role of the environmental educator by, for example, Perrot (1977), suggest that the teacher become a planner and organiser of individual or group studies. "Problem-poser" rather than "solution giver" were terms used by Carson (1978). He pointed to a flexibility which is demanded of teachers in adopting an interdisciplinary approach. This important collaboration with colleagues towards team teaching across subject boundaries is highlighted more recently by Maher (1986). The work of the eighties and into the nineties has not added significantly to our conception of the role of the environmental teacher and tends to emphasise rather than contradict what researchers were saying on the heels of Stockholm, Belgrade, and Tbilisi in the late seventies.

By identifying a role, no inference of indoctrination in the classroom is implied. The opportunity to challenge existing 'wisdoms' and to explore alternative philosophies, is primarily a facilitation of informed and evaluated choice (Christian, 1989). Heightened awareness of the moral and political dimensions of decision-making at every level of societal organisation is a promotion, not prescription, of individual ability to judge, decide, and act. Boersma (1988:60) understands this as extending the students' "behavioural repertoire". The author thus deplores the use of verbs such as 'instill' and 'inculcate' which seem to have found popular currency amongst many practitioners of environmental education, and cites this misunderstanding of environmental education aims as further evidence of the need for an environmental teacher education which explores philosophical and ideological foundations. Such narrow teaching attitudes imply that very specific values and behavioural standards have been set as schooling objectives, and associated teaching practice often approaches the realm of indoctrination in pop-ecology. The teacher as "...an authority, not in authority ..." is the goal (Pepper, 1984:223).

To assume this identity and become efficient practitioners, teachers require certain conceptual, behavioural, and practical competencies.

2.4.2.2 Environmental Teacher Competencies

Lists of competencies may be extracted from the fund of literature in the field. Pertinent works are, amongst others, those emanating from the UNESCO/UNEP International Environmental Education Programme, wherein behavioural competencies in terms of knowledge, skills, and attitudes are identified (Hungerford and Peyton, 1986; Lahiry, *et al*, 1988; Wilke, *et al*, 1980; Wilke, Peyton and Hungerford, 1987). Particular teacher competencies in this regard have been developed at length by a number of environmental educationalists, with no small contribution from South African writers (Clacherty, 1989; Opie, 1989, 1990; Schreuder, 1990). An in-depth analysis of particular teacher competencies can therefore be found in the relevant literature.

A number of the competencies outlined are basic to the requirements of any effective teacher education programme and this supports the author's view that environmental education is, in fact, merely 'good' education. Be that as it may, some competencies need particular emphasis for environmental teaching and should be continually developed

through in-service education if teachers are to remain consistently effective environmental educators.

More importantly, the teaching context will inform which competencies are most relevant, and will highlight omissions in the contextually removed literature. Indeed, such shortcomings should be the focus of local research efforts if environmental teacher education programmes are to become and remain a dynamic reflection of the needs of teaching communities. It is stressed, therefore, that local needs, as expressed through representatives of student, teacher, and community organisation, should be the determinants of environmental teacher education curricula. This principle ensues from a logical development of the environmental pedagogy envisaged in 2.3.2.4 which reflects and integrates with local organisation in identifying, meeting, and using community needs and strengths.

Accordingly, while general competencies may be suggested, it is not considered a worthwhile exercise to prescribe environmental teacher education curricula. Broad areas covered include:

- a foundation in the philosophy, ideology and psychology of different environmental and educational approaches;
- practice and familiarity with appropriate teaching methods and classroom practice;
- skills necessary to facilitate appropriate methodologies; and
- comfort with the principles and concepts underlying ecological and hence societal organisation and process.

Ultimately, environmental teacher education must enable teachers to come to terms with their changing roles, and roles for change, in classrooms, schools and communities, and motivate them to continue developing in concert with the dynamics of local and global environments.

2.4.3 DISCUSSION

The task assigned to the environmental teacher, and indeed formal education as a whole, may seem unfairly loaded. However, the total responsibility for ecological and societal transformation is not and cannot be invested solely in education structures. Firstly, formal education, in its relationship to wider societal organisation, cannot orchestrate a radical reform of the material base of society unless one envisages a process of ultimate self-destruction. Given the highly resistant nature of educational organisation, it is not likely that such nihilism could survive or would be tolerated within the system. Therefore, formal education and hence the environmental teacher, can only ever be seen as an element in the broader process of transformation. This implies that the environmental teacher, in consistently challenging and exposing the constructs of power relations within schools and communities, does so in tandem with the efforts of other progressive organisations (Huckle, 1990; Robottom, 1987; Seidman, 1990; Ward, 1986). Accordingly, the role of the environmental teacher, in pushing for an egalitarian society in harmony with the dynamics of a global environment, is one complementing a broader struggle towards the ideal.

This role indicates a certain pedagogy and teaching practice which is based on participatory enquiry and action. If environmental teacher education is to be effective in preparing teachers in such a pedagogy, the structures through which it is offered must themselves reflect and facilitate this approach. Only then can exposure to an exploratory, participatory, and critically reflective education be experienced by intending and serving teachers. Accordingly, both environmental teacher education structures and programmes must themselves reflect and incorporate the spirit behind the principles of environmental education if they are to empower teachers, in turn, to empower others.

2.5 SUMMARY AND CONCLUSIONS

The theoretical underpinnings of environmental education as embraced by the international community were traced. These were further developed to suggest a new definition for environmental education. An ideological and philosophical foundation for

the teaching of environmental education was established towards informing an appropriate environmental pedagogy. The identity that this implies for the environmental teacher was discussed in terms of a role and implied competencies.

It was concluded that:

- environmental education is
...a process through which individuals and societies are empowered to redefine their roles as functioning elements within the indivisible dynamic of the global environment, and thereby to adapt their behaviour relative to each other's needs and those of organic and chemical systems, both present and future...;
- an environmental pedagogy is best expressed within an ecocentric philosophy of environmentalism whereby societal and ecological reform are perceived as being an indivisible dynamic and hence a single process;
- forces impacting upon classrooms at micro and macro levels operate to re-inforce resistance to an environmental education approach, making massive efforts in community-based environmental teacher education fundamental to preparing teachers for effective practice of an environmental pedagogy;
- the environmental teacher operates within a broader context of reform and is not solely responsible for societal and ecological transformation;
- environmental teacher education programmes and structures within which they are effected, must themselves reflect an outworking of the principles of environmental education and hence be an experience of self-determination for teachers if they, in turn, are to empower others.

These conclusions regarding the nature of environmental education, environmental pedagogy and the environmental teacher, provide the conceptual framework within which this study has been conceived. Accordingly, the following chapter on South African teachers and environmental education is based within the same conceptual framework, adding to it considerations implicit to the South African context.

CHAPTER THREE

A CONTEXTUAL ANALYSIS : SOUTH AFRICAN TEACHERS AND ENVIRONMENTAL EDUCATION

3.1 INTRODUCTION

The environmental and educational contexts of the South African classroom are given as backdrop to a discussion of the role of environmental teachers and environmental teacher education in South Africa. The ideology and structure of the present system of teacher education are therefore examined against the demands of environmental education. The current status of state environmental education policy is discussed in terms of its past and present conceptualisation and practice in a Eurocentric, racist, and non-participatory foundation. A direction for the development of environmental teacher education both beyond and within such parameters is accordingly identified.

3.2 THE ENVIRONMENTAL CONTEXT

The South African environment reflects a range of the problems found within the broader picture of global environmental deterioration. Its particular form, however, has been shaped by South Africa's history of settlement, colonisation, and dispossession under white and subsequently apartheid rule. Together, these forces have produced a pattern of environmental exploitation at the expense of the majority, largely black, people of South Africa. This, in turn, has resulted in a mass experience of environmental alienation and degradation (Khan, 1990b; Lekgetho, 1990). Manifest in extreme levels of poverty, landlessness, unemployment, illiteracy, poor health, inadequate housing and an underlying powerlessness, environmental conditions in South Africa combine, in many instances, to erode basic human rights.

Mass urbanisation and poverty, complemented by consistently degrading rural environments, are contrasted by the patterns of consumption and economic decision making of an affluent, largely white, minority. The resulting pressure for job creation, food production, service provision, and resource utilisation on a massive scale, has made short-term development planning at the expense of people and environments the norm.

For a detailed analysis and documentation of the history and manifestation of South Africa's environmental problems, the reader is referred to the works of, amongst others, Botha and Weinronk (1990), Fuggle and Rabie (1983), Huntley, Siegfried and Sunter (1989), Khan (1990a), and Wilson and Ramphele (1989).

Common to nearly all works examining the degradation of South Africa's environment is an acceptance that poverty, with its roots in a history of oppression and exploitation, is the driving force behind continued impoverishment and environmental deterioration (Hanks, 1991). Unequal access to resources, from land to education, is therefore a fundamental issue in understanding and confronting the urgent need for environmental and human upliftment. Thus, in a context of a severely eroded natural, socio-economic, and political environment, the challenge facing South African environmental teachers is a critical and complex responsibility; not least because of the destruction of the learning environment, as detailed in 3.3 below, that this has wreaked.

3.3 THE EDUCATIONAL CONTEXT

3.3.1 A LONG PAST: OPPRESSION AND RESISTANCE

It would be naïve to understand the current crisis in South African education in terms of apartheid rule alone. Black education, as it is manifest today, has its roots in centuries of discriminatory practice. This dates back to the slave schools of seventeenth century Dutch rule and nineteenth century mission education, in which one finds the template for today's patterns of provision and resistance. However, the single most destructive force in this history of disablement through education, has been the apartheid state (Davenport, 1988; Joyce, 1988).

With the coming to power of the Nationalist Party in 1948, black education came under government control and was formalised in 1953 by the passing of the Bantu Education Act. This institutionalised and legitimised a separate education system for blacks which

would serve the ends of apartheid ideology and thus support and protect white privilege and power (Christie and Collins, 1984; Davenport, 1988; Hartshorne, 1987a).

Thus began the systematic entrenchment of educational inequality and the promotion of an unjust, class-based society organised on racial grounds (Department of National Education, 1983; Kallaway, 1987). The series of legislation promulgated to this end can be found, for example, in Kallaway (1984), Lodge (1983) and the South African Institute of Race Relations Surveys, published annually since 1948.

Running parallel to the institutionalising of racist education, has been a history of organised resistance (Cameron, 1986). Although records are often incomplete, Christie (1986) manages to document this past. Landmarks such as the 1954-1955 schools boycott, the 1961 protest to the declaration of the South African republic, the June 1976 uprisings and the on-going boycotts, strikes, and violence of the 1980's, represent a history of struggle which provides the basis for present resistance to the oppressive education system. This united action gave birth to the Education Charter Campaign in 1984 and the call for a liberating and empowering education, a People's Education, which followed in 1985-6 (Hartshorne, 1987b; Kruss, 1988; University of the Western Cape, 1987). The education crisis continues into the nineties as students, teachers, and parents launch campaigns in protest and anger at an unfair and deprived education (South African Institute of Race Relations, 1990). Piecemeal reform such as that enabling the establishment of 'open' schools (Open Schools Association, 1990) addresses neither the urgency nor the scale of needs in education and merely strengthens the conviction that the Nationalist government is not fully committed to sharing all the resources of education.

It is the present set of dynamics which moulds the role and provides a context for the environmental teacher in South Africa. This context must therefore be looked at in more detail.

3.3.2 SOUTH AFRICAN EDUCATION TODAY: AN EDUCATION IN CRISIS

3.3.2.1 Constraints

Education in South Africa reflects the structure and control of the apartheid state. This control of education has been central to the protection of white power and privilege, hallmarks of the ideology of separate development, for over four decades (Hartshorne, 1987a). (The constraints of apartheid ideology and structure are explored in more depth, with specific reference to environmental education, in 3.4). Despite evidence of major policy shifts by government, national and racial segregation is still perpetuated through the control of education by some eighteen different education departments (Department of National Education, 1991a). (This figure remains one of the great mysteries of apartheid education, with government documents themselves sometimes containing contradictory counts.)

Control is centralised via a common core curriculum and school leaving examinations, but separate departmental funding and administration has entrenched far-reaching disparities in the quality of the educational experience of different South Africans (Hofmeyr and Moulder, 1988; Hofmeyr and Spence, 1989; Integrated Marketing Research, 1990). Run by the Department of Education and Training (DET), black education is characterised by inadequate facilities, a lack of resources, low per capita spending, high pupil-teacher ratios, poorly qualified teachers, and an ever eroding relationship between the DET and its teacher, student, and parent bodies (Department of National Education, 1991b; Hartshorne, 1986; South African Institute of Race Relations, 1989, 1990).

The liberal brand of National Party politics pursued by the government in the wake of 2 February 1990⁶, has done little to defuse the volatile context of violence and conflict which has plagued the education system in South Africa for decades. Major increases in spending on black education fail to highlight the dramatic increase in student numbers

⁶ This date marks the beginning of a new approach on the part of the ruling Nationalist Party towards the process of political reform. On this day, in his opening speech to Parliament, the state president announced a commitment to a negotiated solution to the South African problem, and a number of steps designed to clear the way for such a process. These are detailed in the Race Relations Survey of the South African Institute of Race Relations (1990).

which ensures that resources, human and material, remain hopelessly inadequate (Department of National Education, 1991a). Erratic attendance, ill-conceived year plans, pitiful performance in school-leaving examinations and inept administration continue to dog the mechanism of black education in South Africa (Department of National Education, 1991b; Integrated Marketing Research, 1990; South African Institute of Race Relations, 1990). This pervasive destruction of the learning environment seriously threatens the chances of an effective education taking place. It is because of these conditions that writers such as Ballantyne and Aston (1989, 1990a, 1990b), Hartshorne (1987a), Irwin (1991), and Khan (1991a) have continued to emphasise the challenge of political, economic, and social conditions as the cornerstone to resolving the educational and hence the environmental conundrum in South Africa.

If the environmental teacher is to be instrumental in such resolution, s/he requires access to an understanding of and participation in environments beyond the school walls (barbed wire). Community and non-government organisations represent one way in which the structure and support for such involvement may be facilitated.

3.3.2.2 Opportunities

On the heels of the 1985-6 call for a People's Education, increasing numbers of communities and organisations are working towards an education which derives from and addresses economic, political, and social issues (Kruss, 1988; Muller, 1987; Sisulu, 1987). The 1986 formation of the National Education Crisis Committee, now the National Education Co-ordinating Committee (NECC), represents this perspective.

Affiliated to the NECC are a host of education organisations representing student, parent, community, and teacher bodies. The nationally co-ordinated progressive teachers' union, the South African Democratic Teachers Union (SADTU), is one such organisation of particular relevance to this study.

SADTU represents the dynamic of teachers engaging in action and debate towards a democratic and just South Africa and hence, education. Although relatively uninitiated in terms of environmental education, SADTU offers environmental teachers an appropriate forum and support structure in which to develop and pursue environmental

education aims in schools and communities (Carelse, 1991, pers. comm.). Membership of, and active participation in, such an organisation is likely to be characteristic of committed environmental teachers in South Africa.

Further, it is anticipated that environmental education will shortly be included on the agenda of SADTU in the wake of the increasingly high profile given to environmental concerns by mass-based political organisations (*Cape Times*, 1991; Cock, 1990; Khan, 1990a, 1991b; *South*, 1991; *The Star*, 1991; *Weekly Mail*, 1991a, 1991b). A relevant teacher education would help to maintain and amplify this interest.

3.3.3 WHAT FUTURE?

Expressed state intentions to address the gross disparity in the educational experience of South Africans, are not being effected with the urgency that the crisis demands (South African Institute of Race Relations, 1990). A recent investigation into the pressing problems of education was carried out by the Joint Working Group on Education which comprises government representatives and delegates from mass-based organisations such as the African National Congress (ANC) and the NECC. The results have once again proved that interim measures to address the problem are largely ineffective, with the serious conditions, as discussed in 3.3.2.1, persisting (*Weekly Mail*, 1991c). This confirms the belief that if education is to assume the legitimacy it needs for effective functioning, full participation in government, and hence in the reconstruction of education, is a priority (Aston, 1990b; Hofmeyr and Moulder, 1988). By deduction then, this also holds true for environmental teacher education.

However, the concerns of environmental education, indeed the concerns of the nation, cannot be put on 'hold' until such a time as the full transition to a democratic South Africa is made. The development of environmental teacher education must continue despite the limitations of the present. If these are to be parried, they must first be understood. Accordingly, the following section, 3.4, deals with such problems.

3.4 ENVIRONMENTAL EDUCATION AND THE IDEOLOGY AND STRUCTURE OF STATE EDUCATION IN SOUTH AFRICA

Introducing environmental education into the context discussed in 3.3 above brings with it particular constraints which derive from the ideological and structural basis of the education system in South Africa. Given the power of the learning environment to influence educational aims, these are serious considerations in the development of environmental teacher education. With due concern for such factors, these constraints are examined in more depth below.

3.4.1 IDEOLOGICAL CONFLICT

Environmental education has an inescapable political and social agenda which is overtly reflected in the objectives of the Belgrade Charter (2.2.2.2). Apartheid ideology conflicts with these at a most fundamental level. Ballantyne and Aston (1990a) systematically confirm that each and every objective has been thwarted by government legislation and actions. These have silenced and stifled the work, activities, and words of people and organisations committed to developing an awareness of, in particular, environmental problems which are social, economic, and political in nature. Such appreciation has been denied to students and the public at large via decades of state violence in the imposition of strict controls such as censorship, confiscations, bannings, and detentions. Despite a recent slackening of such controls, levels of environmental literacy remain rooted in repressive educational structures and people still cannot access with ease the very issues which are the foundation of economic and socio-political environmental problems in South Africa. An education for the environment within existing educational organisation is therefore highly problematic.

3.4.2 STRUCTURAL CONFLICT

The apparatus of apartheid education has inherent principles of inequality and discrimination. These arise from its foundations in elitist education and have found legitimisation through Christian National ideology (Davenport, 1988). Designed to preserve and promote white control, Christian National Education (CNE) embodies

contradictions of the aims of environmental education so fundamental that the introduction of environmental teacher education programmes within existing state structures would compromise the spirit of education for the environment as laid out in 2.3.2.3/4.

With the eighteen departments of education nationally and racially determined (see Figure 1), the fragmentation which is produced socially, culturally, economically and politically runs counter to the concept of a 'global community' working towards the improvement of the total environment. Any attempt to marry environmental education principles to those underpinning the apparatus of state education must lead to their negation.

It is highly important that environmental educationalists play an active role in negotiating a new education system for South Africa. Merely dismantling the apartheid apparatus will not automatically imply organisational empathy for environmental education goals. Such a learning environment can only be achieved by tackling the roots of what continues to be a Eurocentric education, serving the demands of capital and those who control it. Unless the system is challenged at this level, the 'new' education will simply be a replication, though not statutory, of the old.

Environmental educationalists have a valuable perspective to offer and should do so with some urgency.

3.5 ENVIRONMENTAL TEACHER EDUCATION IN SOUTH AFRICA

3.5.1 THE NEED FOR ENVIRONMENTAL TEACHER EDUCATION IN SOUTH AFRICA

The importance of environmental teacher education has been highlighted by many in the South African environmental education community, among them Ballantyne and Oelofse (1989), Clacherty (1988), Hurry (1982), and Schreuder, (1990). Ironically, government too reflects an acceptance of this condition for effective environmental education in its

White Paper on Environmental Education (Department of Environment Affairs, 1989). It is suggested that the full implications of adopting the environmental education philosophy were not appreciated.

3.5.2 THE ROLE OF THE SOUTH AFRICAN ENVIRONMENTAL TEACHER

The contextual realities of education in South Africa, as discussed in 3.2, point to a very specific role for the environmental teacher. Teachers are at the forefront of rapid change in South African society and need special skills to enable full and effective participation in the current dynamics of reform. The legacy of white elitist and apartheid education will be felt within educational and societal organisation for a long time to come. The challenge is to minimise this impact, qualitatively, quantitatively, and temporally.

In combatting a backlog of environmental and political alienation the task of teachers to develop student skills, attitudes, and self-determination towards socio-ecological reform is daunting. A motivated and informed teaching body should therefore be the priority of any strategy aimed at redressing the current and historical imbalance in educational, and hence life experience of the majority of South Africans.

The need for teachers to understand and confront the power relations which have determined and continue to condition the ecological, socio-political, and economic *status quo* becomes even more urgent in this particularly non-egalitarian context (Christie, 1986; Kruss, 1988). Skilled application of teaching methodologies suited to the exploration, demystification, and undermining of such relationships is vital to the generation of effective participation in society at all levels of operation. Furthermore, the research base of the theory:practice relationship in an environmental education for South Africa needs broadening if a clear role for the South African environmental teacher is to be developed. This is a logical development of the point raised in 2.4.2.2 which stresses the need for research at local levels in determining a relevant role and related competencies for teaching communities.

Ecological and social reform ultimately depends upon a population which is aware and empowered to effect change. To date, education in South Africa, even at its best, has not

gone beyond awareness raising. Teachers are therefore strongly implicated in the process towards self-determination and must themselves experience such empowerment if they are to effect it in the network of deprived classrooms which characterise formal education in South Africa (Muller, 1987: O'Donoghue and McNaught, 1991). Involvement in progressive teacher organisations, as discussed in 3.3.2.2, is one such expression of active engagement in the struggle for an acceptable environment in all its facets. Committed teaching is another.

If teachers are to assume the full implications of this role, environmental teacher education should become a national priority. The present organisation of pre- and in-service teacher education therefore requires examination.

3.5.3 THE STRUCTURE OF TEACHER EDUCATION IN SOUTH AFRICA

Official provision of teacher education in South Africa is discussed regarding both pre- and in-service preparation. In line with the research problem, emphasis is placed upon organisational, rather than curricular characteristics of the channels through which such education is offered. The potential of these structures to facilitate the aims of environmental teacher education is considered.

3.5.3.1 Pre-service Teacher Education

Pre-service teacher education occurs in universities and in some technikons, but mostly in colleges of education which fall under the racially and nationally determined departments of education. They have, therefore, been strictly governed by apartheid legislation and reflect the inequities inherent to such provision. Programmes have been planned in accordance with the demands of Christian National ideology and curricula have not, as yet shown a strong move away from the principles of Christian National Education. Although a discussion document recently published by the Department of National Education (1991b) indicates an acknowledgement that teacher education should move away from the structures and didactic of oppression, the present ideology continues as the pervasive ethos in most colleges of education. This makes them unreceptive to the introduction of a teacher education for the environment. Accordingly, an environmental

pedagogy aimed at improving the total environment for all South Africans has not found expression in the majority of colleges.

Universities in South Africa are, by comparison, relatively autonomous bodies. Therefore, where pre-service teacher education occurs in universities, it has not been subject to strict apartheid education policy. In practice, however, few universities have disregarded state restrictions in terms of the selection of their student bodies and in the design of courses which would challenge and confront the *status quo*. Universities have not, therefore, been particularly forceful in providing a progressive pre-service teacher education.

3.5.3.2 In-service Teacher Education

In-service education is the responsibility of the relevant education departments. Accordingly, the disparities between white and black provision mirror the educational inequalities described in section 3.3.1 and while very few teachers experience in-service education, it is the black teachers who are particularly poorly provided for (Ballantyne, 1987; Heese, 1991, pers. comm.; South African Institute of Race Relations, 1990).

Where in-service courses are run, they are generally designed around specialised programmes, for example, gifted child programmes, or in tandem with the introduction of major syllabus changes; the latter occurring within specific subject disciplines (James, 1991, pers. comm.). Attendance on such courses is limited by the resources available to the particular teacher education department. Such resources may include teacher centres, as is the case for both the Cape and Transvaal white education departments, but are more likely to be inadequate or lacking entirely.

Geographical and financial constraints are added obstacles to effecting sufficient provision. The combined result is that a very small percentage of the entire South African teaching body has formal exposure to further education once in service.

3.5.3.3 Discussion

Bound by the constraints of the apartheid education structure, and seriously underprovided for, the established channels of teacher education are presently

inappropriate and unprepared for the introduction of a massive in-service programme in environmental education.

As established in section 2.5.3, environmental teacher education must occur within structures which allow for the realisation of environmental education aims of action-based, interactive learning, decision-making, and empowerment. It has been shown that existing state education structures have not qualified in this regard and that, in nearly all cases, teacher education in South Africa reflects the structure, control, and inequality of apartheid education. This highlights the urgent need for restructuring the education system at all levels, not least as regards teacher education. Such restructuring must result from fully representative negotiation if it is to earn the necessary legitimacy and support. This points to unconditional participation in the government of South Africa by all South Africans.

Given this condition, the implementation of the White Paper on Environmental Education (3.6), expected by many to be a sharper spur to addressing current inadequacies in official teacher education, becomes impracticable.

A slow and complex process towards the aim of official environmental teacher education as standard in-service practice, is therefore indicated. However, there are signs that such a process has been irrevocably initiated.

3.6 THE STATE AND ENVIRONMENTAL EDUCATION IN SOUTH AFRICA: PAST, PRESENT AND FUTURE

The development of environmental teacher education in the present context of political flux, requires strong positioning on the part of initiators within a paradigm which is consistent with the wider aims of political reform. This is to ensure that programmes, firstly, are effective, and secondly, will survive the transition to a democratic South Africa. Accordingly, the foundations of past and present state environmental, and environmental education, policy and practice need exploring.

3.6.1 (omission of) THE PAST

There is a lack of recognition given to environmental education that does not derive from state or established conservation structures. This is evident in the relative dearth of literature and research available on the environmental tradition of the majority of South Africans.⁷ The value of related perspectives and knowledge has not been incorporated into what remains a Eurocentric conceptualisation of state policy and practice as regards environmental concerns (Ballantyne and Aston, 1990a).

While government, over the years, has attempted to address glaring environmental problems such as the need for soil conservation, this concern has focused on aspects of the natural environment. It is only in the past two decades that environmental education has been identified as an important component of a strategy aimed at protecting and improving South Africa's total environment.

3.6.2 POLICY TODAY

Concern for the environment beyond physical aspects began in 1972 when a Cabinet Committee on Environmental Conservation was established. As a result, the South African Committee on Environmental Conservation, now the Council for the Environment, was formed (Hurry, 1987). This body has worked towards increasing environmental awareness and co-ordinating environmental action in South Africa, and was instrumental in formulating the 1989 White Paper on a National Policy regarding Environmental Education (Department of Environment Affairs, 1989). Although the policy is based upon the principles established by the international environmental education community at Belgrade and Tbilisi, it is unlikely that government adopted these

⁷ The theory and practice of an indigenous environmental education in South Africa is only recently being highlighted as central to understanding environmental issues in South Africa, and to developing an appropriate pedagogy for their exploration (Ballantyne and Aston, 1990a; Shongwe, 1991). The need for fundamental research from such a perspective is therefore stressed.

in full support of the philosophy they imply. The major principles underpinning the policy are that environmental education should:

- consider the environment in its totality;
- be a continuous lifelong process;
- be interdisciplinary in its approach;
- encourage active participation in learners;
- examine major environmental issues; and
- stress individual responsibility towards the environment

The White Paper has been greeted by many environmental educationalists as the beginning of an exciting new era in the provision of environmental education for students and teachers (Taylor, 1989; Viljoen, 1990). Others, however, do not share this enthusiasm (Aston, 1990b). The scepticism arises out of a questioning of the foundation of the White Paper within the existing framework of state educational policy and the unrepresentative nature of the formulating body. This points to the need for its renegotiation under conditions of full participation. There is no doubt, however, that response by education departments to the White Paper will mean an immediate increase in the provision of environmental education in schools and a concomitant increase in pressure for adequate levels of pre- and in-service environmental teacher education.

3.6.3 WHAT FUTURE?

Disregard for the total environment and valuable aspects of popular organisation and tradition, together with unrepresentative procedures of policy development, have been shown to characterise the state approach to environmental issues, not least as regards environmental education. However, it would be simplistic to understand the barriers to achieving effective environmental education in terms of the apartheid state and education alone. Many of the problems experienced in other Third World countries are common to South Africa and include, for example, those of community resistance discussed in 2.4.1.2, the demographics of a developing country and contingent pressure on educational resources both material and human (South African Institute of Race Relations, 1990), and

the stark contrasts of a dual economy and concomitant needs (Department of National Education, 1991b). While the present study is concerned primarily with aspects of environmental teacher education which are often peculiar to South Africa, the author recognises the importance of other factors and regrets that the scope of the research does not allow for their full consideration.

However, the immediate reality remains that until the social, economic and political dimensions of environmental concerns are incorporated into policy formulation by a democratically elected government, it is unlikely that official environmental education practice will address the mass experience of environmental deprivation or develop a legacy of appropriate environmental management.

3.7 SUMMARY AND CONCLUSIONS

A context of environmental and educational crisis in South Africa has been established. This is characterised by gross inequality in the educational experience of black and white South Africans. The roots of this disparity lie in discriminatory education practice, begun in the seventeenth century and systematically legitimised under apartheid rule. The ongoing resistance to oppressive education can be traced to the present formation of progressive organisations. These could offer an appropriate forum and support structure for the environmental teacher in developing and pursuing the aims of environmental education beyond the classroom. The problems of introducing environmental teacher education within the ideology and structure of the present education system point to a role for environmental educationalists in ensuring that any 'new' education is not simply an unlegislated replication of the old. Given the general need for environmental teacher education, and compounded by the serious levels of environmental and political alienation in South Africa, a crucial role for the South African environmental teacher is indicated. However, the ability of the present organisation of pre- and in-service teacher education to facilitate environmental teacher education towards this role is questionable, as is the present status of state policy on environmental education. This latter derives from serious

reservations regarding the conceptualisation, application and formulation of the policy within existing structures and procedures of state.

As regards environmental teacher education, it was concluded that:

- current structures of state education and the ideology inherent to them, obstruct the realisation of environmental education aims in schools and teacher education institutions alike;
- the education system, and hence state provision of environmental teacher education, will only assume necessary legitimacy after unconditional and fully representative participation in its restructuring;
- environmental teacher education is an urgent need, given the particularly challenging role of the environmental teacher in South Africa;
- environmental teacher education needs first to empower teachers if they, in turn, are to empower others towards socio-ecological reform; and
- environmental teachers could find support and expression for the development and pursuit of environmental education aims through active involvement in progressive teacher and education organisations.

On a policy level, it was concluded that:

- state environmental policy and practice has been defective because of its conception, formulation, and application within a Western, racist and non-participatory framework. This indicates the need for renegotiation of, in this instance, the White Paper on Environmental Education, in a fully representative forum;
- environmental educationalists have a valuable perspective to offer in the reconstitution of the education system and should make such an input as a matter of urgency;

and finally, that:

- until the formulation and practice of environmental education policy:
 - a) occurs within a framework of full participation in government;
 - b) takes cognisance of the historical, social, economic and political roots of environmental deprivation in South Africa; and
 - c) derives from local needs and develops popular tradition in environmental education and organisation,state development and promotion of attitudes, values, and behaviour appropriate in a South African context, remains an academic goal.

In the meantime, however, the limitations of the present system have to be minimised. Environmental teacher education must therefore be developed as a priority in countering any further erosion of the socio-ecological rights of students, teachers and communities. Such development must ensue from clear positioning if initiatives are to be immediately effective as well as to survive the transition to a reconstituted education system.

The immediate challenge in South Africa, therefore, is to identify channels and structures which can provide for these present and future needs. Accordingly, the following chapter explores a variety of international implementation strategies and examines the opportunities afforded by South African organisation in more depth.

CHAPTER FOUR

STRATEGIES FOR IMPLEMENTING ENVIRONMENTAL TEACHER EDUCATION: MODELS OF INTERNATIONAL EXPERIENCE AND LOCAL OPPORTUNITY

4.1 INTRODUCTION

While governments may produce national guidelines for environmental education, most countries find expression for environmental education policies at a regional level, with the responsibility for providing environmental teacher education being left largely to local education authorities (Schafer, 1983). This devolution of responsibility leads to a vastly differing quality of environmental teacher education being offered within a single country and within regions of a country. Beyond the provision of state education authorities, many initiatives occur around state conservation organisations, tertiary education institutions and non-government organisations (Bowman and Disinger, 1980; Cowan and Stapp, 1982; Gustafson, 1983; Kirk, 1982; Korir-Koech, 1988; Sacks, *et al*, 1983; Whitman, 1988). In the South African context, as discussed in Chapter Three, it is the latter structures which offer the most dynamic and appropriate organisational opportunities for developing local environmental teacher education. Since the most interesting permutations are expressed locally, it is at this level that the following review is organised.

In line with the demands of the research problem, the review of international and national environmental teacher education emphasises the structural and organisational aspects of programme provision, rather than specifics of content and curricula. Accordingly, models of strategies in the implementation of environmental teacher education are identified. The opportunities and constraints inherent to such models are discussed, and strategic pointers are extracted for consideration by those promoting environmental teacher education. In summary, a final set of pointers is presented. While these factors should be a consideration, they should not be a limitation to the development of environmental teacher education initiatives. Particular emphasis is placed on factors of relevance to South Africa. Accordingly, the environmental, political and educational contexts, and the official position regarding environmental education in South African classrooms, as expounded in section 3.6.2, should be borne in mind throughout this discussion.

Ballantyne and Aston (1990a) provide a comprehensive review of particular programmes in environmental teacher education, both internationally and nationally. A similar survey is not, therefore, conducted here and examples are used only in emphasis, or to highlight exceptional provision.

A note on South African provision:

For obvious reasons, South African opportunities for developing environmental teacher education are explored in more detail than are international strategies. An idea of available resources and organisational potential is thus gained, as well as an insight into current trends and future possibilities.⁸ An overview of environmental teacher education in South Africa can, however, only be a partial reflection, since the *status quo* of environmental teacher education and the context within which it occurs, is an ever-changing dynamic. This is for a variety of reasons:

- either courses are offered on a one-off basis, or are discontinued due to a lack of support, perceived impact, or the loss of key personnel;
- many programmes operate under a low profile with documentation incomplete or non-existent; and
- the restrictive political climate pervasive at the time of field research (February, 1988 to January, 1990), inhibited many organisations from full, or sometimes even partial, co-operation.

It is stressed that the dynamic nature of courses is not perceived in a negative light. Environmental education is and should be a developing sphere of endeavour. Indeed, it is in constantly responding to the changing needs and priorities of communities that environmental education derives its *raison d'être*.

Another factor in the equation of environmental teacher education in South Africa, lies in the dramatic increase of activity and exposure afforded many political and community organisations in the wake of 2 February, 1990 (3.3.2.1). Because education has long been a central issue to such groups, a concern for environmental education is not surprising,

⁸ Most of this information derives from personal communication with relevant individuals during field research (see Appendix B). Specifics of programmes, projects and facilities can be made available on request. However, for the purposes of this discussion, detail has been sacrificed to the extraction of general trends.

particularly since the aims, objectives and philosophy of environmental education often run in tandem with those of an education for liberation (Aston, 1990a; Naidoo, 1990; Njobe, 1990). Further, current emphasis on a popular ecology and concern that environmental quality is assured for all in a future Bill of Rights, has ensured environmental concerns a place on the political agenda (3.3.2.2). Contingent to this, are continually arising opportunities for developing environmental teacher education within progressive organisations. This potential is explored more fully in section 4.3.4.2 (ii).

Chapter Outline:

Section 4.2 deals with pre-service environmental teacher education and 4.3, with in-service provision. The latter is discussed in terms of three models of implementation, viz.: state structures; tertiary education institutions; and non-government organisations. Each of the models generates a set of strategic pointers for consideration in the development of environmental teacher education in South Africa. A summary of such pointers is provided in 4.4, with final comments made in the conclusion, 4.5. A strong South African bias is maintained throughout, since the study is intended for local application.

4.2 PRE-SERVICE ENVIRONMENTAL TEACHER EDUCATION

4.2.1 INTRODUCTION

Formal⁹ provision of pre-service teacher education occurs predominantly in colleges of education and universities. Relative to the need for large scale and comprehensive

⁹ The terms 'formal', 'non-formal' and 'informal', are used carefully. 'Formal' describes structured courses which occur over an extended, but defined, time period. Formal environmental education occurs within the established education system as well as through recognised educational institutions and courses. 'Non-formal' education also assumes a structured format, but is likely to be a one-off exposure occurring extramurally to formal education. Programmes offered to school students visiting nature conservation areas, characterise this approach. 'Informal' environmental education is experienced vicariously or subconsciously. It results from exposure to information or learning situations and, in environmental education, is commonly embraced by the field of interpretive design. The learning which occurs through the popular media is also considered informal.

environmental education for intending teachers, provision is sorely inadequate (*Connect*, 1990; Wilke, Peyton and Hungerford, 1987). Where elements of an environmental education are found in curricula, such inclusion tends to be at the discretion of individual lecturers. It remains unusual for tertiary education institutions to embrace environmental education as an underpinning policy approach to teacher preparation. It is hoped, therefore, that in the absence or sterility of official guidance, teacher educators will take the initiative themselves, either as committed individuals or in response to pressure from school and local communities.

Those strategies that have found expression in tertiary education institutions are presented below, and their various opportunities and constraints in terms of the demands of environmental education and the needs of intending teachers, particularly in South Africa, are discussed. Finally, a set of strategic pointers is extracted for consideration by developers of pre-service environmental teacher education.

4.2.2 ORGANISATION

Courses offered vary enormously from being elected options to prerequisites. They may form part of a module in one of the natural sciences, or be a specialist, independent course. In a few teacher education institutions, environmental education is adopted as an interdisciplinary approach by all lecturers. While a certain amount of co-operation between the tertiary education institutions and local conservation structures is evident, this does not usually extend beyond the use of facilities as venues for fieldwork exercises and awareness-raising experiences in the natural environment.

4.2.2.1 Model I: Within Subject Methods

By far the majority of environmental education curricula are incorporated into existing method units in the natural sciences. Consequently, this type of course organisation reflects the popular perception that environmental education is concerned, if not exclusively, then certainly predominantly, with natural environments. As a result, the social, economic and political implications of degraded urban and natural environments are left largely unexplored (Ballantyne and Aston, 1990a; Imahori, 1984). Where a holistic approach to environmental education is successfully applied through an existing

subject method course, it is exceptional. Such exceptions can be found at the Cape Town Teachers' College in the Western Cape and Edgewood College of Education in Durban, Natal. That this style of implementation persists as the dominant mode, is more an indictment against teachers in other subjects than it is of those in the natural sciences (Clayton, 1988, pers. comm.).

4.2.2.2 Model II: As a Separate Unit

More unusual course organisation is found where environmental education is offered as a separate unit. Such an arrangement is followed at the South African universities of Bophuthatswana and Rhodes (Irwin, 1987; Irwin, 1988, pers. comm., 1990, pers. comm.). In both instances, qualification in the environmental education unit is a pre-requisite for teacher certification. Furthermore, students particularly interested, can choose to specialise in environmental education (Molefe, 1988, pers. comm.). The development of teacher specialists in environmental education is important where team teaching, or co-ordination of a school's staff around environmental education as an inter-disciplinary approach, as, for instance, in South African schools (3.6.2), is envisaged (Hurry, 1989, pers. comm.; Maher, 1986).

4.2.2.3 Model III: (Not) Environmental Education

Often misguided, or perhaps only misnamed, is the environmental education offered through courses variously called environmental health, social awareness or environmental studies (Numata, 1985; Russell, 1989, pers. comm.). While student teachers may themselves grow towards environmental literacy through such courses, they will seldom have been exposed to the philosophical and ideological ramifications of adopting an environmental pedagogy (2.3). If these intending teachers are in turn to empower their future students, a separate course in the philosophy and method of environmental education is indicated. The distinction, then, should be drawn between courses in environmental studies and those in environmental pedagogics.

The bulk of pre-service environmental education taking place in South African colleges and universities represents the environmental studies model (Mohape, 1988, pers. comm.; Nightingale, 1989, pers. comm.; Stone, 1991, pers. comm.). Similarly evident in international experience, this is largely because teacher educators themselves are not

sufficiently aware of the implications of adopting an environmental education approach. A genuine commitment to effective environmental teacher education will therefore address this problem (Wilke, Peyton and Hungerford, 1987). Such teacher educator preparation should also encourage lecturers to break out of the insularity which characterises present courses, through highlighting the importance of learning in local environments. This implies that they and their students explore a co-operative relationship with local community organisations, and points to a role for non-government organisations in this regard. Further, increased lecturer awareness of the needs of environmental teachers, could encourage them to offer sustained support to their graduates, once in service. Establishing and maintaining such links with teachers in constituent schools is a key element in any strategy designed to promote effective environmental education and should be considered an unconditional responsibility in the process of pre-service teacher preparation. This is particularly important given the resistance shown by school systems to innovation (2.4.1.2).

4.2.3 DISCUSSION

The organisational character of pre-service environmental teacher education is considered vital in determining whether or not effective teaching ensues in classrooms. A strong concern therefore remains that while environmental education continues to be identified as a subject specific exercise, the powerful potential that it has for empowering towards social and ecological change, will not be realised. This is a particularly important consideration in the South African context of educational and political deprivation. The choice of course format is, in itself, an ideological choice and bears directly upon the nature of programmes offered within the selected framework (2.4). Hence, to use established subject disciplines as the vehicle for teacher environmental education, is to perpetuate a positivistic and reductionist worldview at the expense of the holism which is central to an understanding and practice of environmental education. Further, official South African policy on environmental education adopts environmental education as an interdisciplinary approach and this makes subject specific preparation obsolete (Department of Environment Affairs, 1989). Those committed to encouraging effective environmental education will therefore allow for the impact of design in course structure.

However, with exceptions, teacher colleges in South Africa continue to produce teachers rooted in an educational philosophy and practice which reflects the didactic pedagogy characteristic of the South African experience both in schools and tertiary education institutions. It is unlikely that these institutions will readily promote the innovative teaching practice required of an education for societal and ecological reform. Opportunities for using independent projects or funding should therefore be explored. Such opportunities are examined in section 4.3.4.2 (iii) with regard to in-service provision, and require further study if formal pre-service teacher education is also to fall within this ambit.

4.2.4 STRATEGIC POINTERS

PRE-SERVICE ENVIRONMENTAL TEACHER EDUCATION

1. Tertiary education institutions need to adopt environmental education as an underpinning policy if cross-curricular and holistic teacher education is to occur. Provision within specific subject methods is unlikely to realise this aim.
2. Environmental education as a separate unit can facilitate full exposure to the implications of an environmental education pedagogy and should therefore be considered a viable strategy for effecting pre-service environmental teacher education.
3. Qualification in environmental education as a pre-requisite for teacher certification is one way of promoting the diffusion of environmental education into the schools. This strategy should therefore be given due consideration, especially since environmental education in South African schools is to be adopted by all teachers, in all disciplines.
4. In such instances, the development of teacher specialists is necessary for the co-ordination of a school's staff around the environmental education approach. Prospective teachers should therefore be offered the opportunity to specialise.

5. Often unfamiliar skills of co-operation between the teacher educators themselves are implied by the adoption of environmental education as an underpinning policy in tertiary education institutions. Teacher educators therefore require preparation in environmental education and pedagogics if present problems in the conceptualisation and application of environmental education are to be overcome.
 6. A clear distinction between environmental studies and environmental pedagogics needs to be made if the latter is to find full expression in pre-service teacher preparation and hence facilitate effective environmental education in schools.
 7. On-going and comprehensive support for newly qualified teachers is important if pre-service teacher preparation is to find expression in classrooms. Working relationships between tertiary education institutions and their constituent schools, should therefore be developed.
 8. Tertiary education institutions need to integrate community-based learning into environmental teacher education programmes. Accordingly, the insularity which characterises formal provision needs addressing. Since environmental education courses should themselves embody the principles of the environmental education they promote, this indicates the need for interaction with constituent communities towards developing environmental teacher education programmes which respond to and reflect, local organisation and needs.
 9. Where existing tertiary education institutions are unlikely to achieve the aims of environmental education in pre-service teacher preparation, alternatives to such provision should be explored. Independent education projects are indicated in this regard (4.3.4.2,iii).
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4.3 IN-SERVICE ENVIRONMENTAL TEACHER EDUCATION

4.3.1 INTRODUCTION

In-service programmes in environmental education for teachers are offered to varying degrees through a number and combination of structures. This strongly influences the nature of provision, which differs markedly in ability to facilitate effective learning in an environmental pedagogy. Existing programmes are examined in terms of the structures through which they are implemented. Models in the following groupings are therefore identified: state implementation; implementation by tertiary education institutions; and implementation through non-government organisations. These models are presented, and inherent opportunities and constraints are discussed. This allows for the extraction of strategic pointers which should be considered in the development of in-service environmental teacher education. Naturally, these emphasise South African conditions of implementation.

4.3.2 MODEL A: STATE IMPLEMENTATION

4.3.2.1 Introduction

Internationally and locally, state progress in establishing effective and sufficient environmental education for serving teachers is slow, and suffers from a lack of both status and funding (Sterling, 1987; van den Berg, F., 1989, pers. comm.). Significantly, the impetus for more in-service environmental teacher education is often derived from the teachers themselves, with formal provision matching neither the need nor the expressed demand. Consequently, an interesting cross-pollination of structures and organisations in the provision of in-service environmental teacher education is developing. This has valuable potential for extension and is explored further in Model C (4.3.4).

Generally, state provision of in-service environmental teacher education is implemented through local education authorities. However, state conservation bodies play a contributory role, usually by offering non-formal programmes, but sometimes more

formally in collaboration with education authorities. These organisational permutations of the State Model are considered below.

4.3.2.2 Organisation

i) Local Education Authorities

With the responsibility for the implementation of national environmental education policy being devolved, in most instances, to local education authorities, the bulk of official provision of in-service environmental teacher education occurs at this level. Most local education authorities have a regionally based scheme for such education and this is usually structured around an inspectorate which operates within clearly designated subject boundaries (Gayford, 1988a; Gunther, 1989, pers. comm.; Madungwe, 1988, pers. comm.; van den Berg, F, 1989, pers. comm.). Consequently, environmental education for serving teachers has occurred largely within specific disciplines, traditionally those of the physical sciences (Parry, 1988). This promotes the bias, already established in the popular perception, that environmental education is rooted in concerns of the natural environment. Environmental education aims of cross-curricular, inter-disciplinary teaching within a holistic conceptualisation of the environment are not, therefore, often achieved.

Some local education authorities have begun to consider in-service environmental education necessary for all teachers (Palmer, 1989). This usually occurs in the wake of a national policy's embracing environmental education as an underpinning approach to the teaching of all disciplines. Special structures may therefore be established to supplement standard in-service provision. A case in point is that of the United Kingdom, where state projects have been established to develop, test and introduce cross-curricular environmental education materials and methods through in-service teacher education (Gayford, 1988a, 1988b).

The structure and responsibility of South African state education departments regarding in-service teacher education was outlined in section 3.5.3.2, as were the problems associated with the nature and inadequacy of such provision. Accordingly, the South African circumstances surrounding state in-service teacher education strongly dictate the exploration of alternative or complementary strategies.

ii) Conservation Authorities

A popular pre-occupation with natural environments might explain the, albeit unusual, spillover of formal environmental teacher education into the jurisdiction of conservation authorities. Such joint provision occurs when education authorities utilise conservation bodies as facilitators of in-service programmes. In the latter case, courses require official approval from the relevant local education authority.

Quite exceptional in South Africa is the close relationship which has been established between the Bophuthatswana National Parks Board, the local teacher education colleges, and the University of Bophuthatswana (Irwin, 1988, pers. comm.; Mputle, 1988, pers. comm.; Rammutla, 1988, pers. comm., 1990, pers. comm.). In collaboration with the Department of Education, the Parks Board has created a special unit to promote and support tertiary environmental education for both intending and serving teachers in the region (Johnson, 1988, pers. comm.; Johnson, 1991).

In the remainder of the Republic, no such official collaboration has, as yet, occurred, although state conservation bodies are involved in non-formal environmental education to varying degrees (Hallinan, 1989, pers. comm.; Hoon, 1991, pers. comm.; Viljoen, 1989, pers. comm.). The education resources which such agencies command are considerable, and should not be overlooked in the development of non-formal environmental teacher education. These bodies, each operating at different tiers of government, are the National Parks Board and the conservation departments of the Regional Services Councils and Provincial Administrations.

The National Parks Board runs a number of environmental education centres which, while not offering teacher education programmes, make their facilities available for use by sanctioned teacher groups (Rossouw, 1990, pers. comm., 1991, pers. comm.). Similarly, the centres falling under the jurisdiction of the provincial authorities are also open to teacher education groups (Marshal, 1988, pers. comm.; Snyders, 1990, pers. comm.). While attempts are made to involve teachers accompanying school groups to these facilities, particular provision for teachers is not offered. One-off teacher workshops, such as those instrumental in launching the Council for the Environment teacher resource book, "The Outdoor Classroom" (Opie, 1989), are facilitated periodically, although the

value of unsustained exposure to an environmental education is questioned (O'Donoghue, 1989, pers. comm.; Taylor, 1989, pers. comm.).

Operating at the interface of non-formal environmental teacher education, are the state conservation personnel. Such environmental education officers, as they are sometimes called, usually have a background in the natural sciences with few deriving from a formal preparation in education. This is a problem in terms of facilitating the aims of an environmental pedagogy which demands broad-based analysis and practice in teaching. Therefore, where conservation authorities are co-opted into the provision of formal in-service environmental teacher education, issues such as staffing need careful attention. Consideration for these organisational aspects has allowed effective co-operation between education and conservation authorities in, for example, Sweden, where educators and conservationists have established a dynamic relationship which draws on their respective strengths to implement official state policy on in-service environmental teacher education (Hansson and Scott, 1990; Von Hofsten, 1982).

Further problems regarding the non-formal environmental education characteristic of state conservation programmes are that they are predominantly conservation orientated, and aimed at school students, to the neglect not only of teacher groups, but of teachers accompanying their classes on visits to conservation areas. An opportunity for providing in-service teacher education is lost in this way. If exploited, however, this could provide increased teacher exposure to environmental education. Added input from state conservation bodies may take the form of the production of teaching packages. As a strategy for promoting environmental education, however, this is considered a misdirection of energy, given that such materials are not often applied appropriately, if at all (O'Donoghue and Taylor, 1988).

iii) Urban Authorities

Comparatively little in-service environmental teacher education is offered by state urban authorities, (Harrison, 1991, pers. comm.), with the museum services being the most active (Hall, 1988; van Zyl, 1988). It would seem that in decrying both the quantity and bias of programmes offered by state conservation departments, one is misapportioning responsibility and misdirecting criticism. Perhaps this derives from a recognition of their

relatively well developed educational infrastructure or from the persistent notion that environmental education 'belongs' in natural settings (Clacherty and Clacherty, 1990). Nevertheless, conservation of the natural environment is, after all, their explicit aim and education programmes will obviously reflect such concern. This in no way exonerates a disregard for the socio-economic dynamics which inform the management, indeed the conceptualisation, of natural areas, or the neglect of teachers in conservation education programmes (Hanks, 1991). However, a serious challenge must be issued to state bodies concerned with urban issues, to accept environmental education as a similar priority on their agenda.

4.3.2.3 Strategic Pointers

MODEL A: STATE IMPLEMENTATION OF IN-SERVICE ENVIRONMENTAL TEACHER EDUCATION

1. The general inadequacy of state provision for in-service environmental teacher education, points to a gap which non-government organisations and tertiary education institutions, could fill. This is particularly so in South Africa, where state education structures need renegotiation if they are to facilitate effective in-service environmental teacher education. This is therefore explored in depth in Models B and C (4.3.3 and 4.3.4).
2. Provision by state education authorities can be complemented by the initiatives of local conservation authorities where appropriate. Such initiatives may be formally recognised by local education authorities, or may be a non-formal contribution. Effective provision of this kind implies that:
 - conservation authorities do not neglect teachers in their environmental education courses for school students, particularly as regards 'captive' teachers visiting conservation facilities with their classes;
 - programmes are designed in response to environmental education and teacher needs;
 - a holistic conceptualisation of the environment informs course organisation;

- course convenors have a relevant background in pedagogics and the humanities;
 - the production of teaching 'packages' is avoided.
3. State agencies in urban and modified environments are strongly implicated in the provision of in-service environmental teacher education. To date, the contribution of conservation agencies far outweighs that of their urban counterparts.
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4.3.3 MODEL B: IMPLEMENTATION THROUGH TERTIARY EDUCATION INSTITUTIONS

4.3.3.1 Introduction

Tertiary education institutions offer in-service environmental teacher education through a variety of strategies. These include part-time, extra-mural, correspondence, certificate or post-graduate degree courses and may or may not be formally recognised by local education authorities.

While a number of such courses are offered in, for example, the United States of America, colleges of education and universities in South Africa are not characteristically concerned with providing non-degree courses for the serving teacher, either part-time or extra-murally (Nightingale, 1989, pers. comm.; Spargo, 1988, pers. comm.). Their input occurs predominantly at the level of higher degrees or post-graduate diplomas in environmental education. Until recently and certainly internationally, faculties in the natural sciences have been the major providers of such courses (Da Costa, 1989, pers. comm.; Spargo, 1989, pers. comm.; Hungerford and Peyton, 1986). Present trends, however, indicate a move away from specific disciplines towards implementation within faculties of education. It seems appropriate to this author, that such a shift has occurred, since environmental education has more to do with educational philosophy and practice, than with the acquisition or manipulation of scientific information. This may also help to erode the isolation characteristic of scientific enquiry, which works to counter the aims of participatory learning in local environments and communities (Low and Hoon, 1990).

Although not disregarded, the contribution of post-graduate specialist degrees to environmental teacher education is minimal and usually available only to a small percentage of the teaching body, either financially, practically or in terms of pre-requisite qualification. Accordingly, the following discussion concentrates more on organisational possibilities for serving teachers than on current provision of post-graduate courses.

A variety of relevant organisational permutations is presented and discussed below. Points of strategic interest for the development of effective environmental teacher education in South Africa are extracted.

4.3.3.2 Organisation

i) Part-time, Extra-mural Courses

A number of universities offer courses in environmental education to serving teachers in the form of part-time programmes, offered extra-murally (Bowman and Disinger, 1980; *Connect*, 1987b, 1989). The main advantages are that sessions can be scheduled to suit the practical constraints of full-time teaching and that, being non-degree related, such courses can be accessed by all teachers. Further opportunities include the possibility for teams of teachers from a particular school to explore inter-disciplinary and co-operative methodologies together (Maher, 1986). Completion of part-time courses may be recognised by the education authorities either in terms of state requirements regarding in-service teacher education, or as regards professional development (Wilke, 1983). Such recognition is often significant in motivating teachers to attend courses (Brighouse, 1990; Heese, 1991, pers. comm.).

Examples of non-degree related environmental education for serving teachers at South African tertiary education institutions are rare. One such instance is found in the non-formal programmes run at the University of the Western Cape, Cape Town, through their recently established Environmental Education and Resources Unit (Low, 1989, pers. comm.). Workshops and on-going programmes involve local teachers in community environmental concerns and relevant resource generation (Klein, 1991, pers. comm.; Low and Hoon, 1990). Such provision could well be emulated at other tertiary education institutions in South Africa and would expose greater numbers of serving teachers to an appropriate and contextually relevant environmental education.

ii) University Certificate Courses

It is unusual for universities to award certificates for in-service programmes. As previously indicated, the advantage is that professional development is thereby related to a qualification and this promotes the appeal of such courses. Further, this type of certification allows for the development of recognised environmental education specialists who have an important role to play in co-ordinating and motivating school curricula and staffs around environmental education as a teaching approach. Again, this is relevant in South Africa (4.2.2.2). Official recognition of such certification by state education bodies may provide further encouragement to teachers to pursue special environmental education interests.

Examples of certificate related courses found in the international experience, are at the Poulton-le-Fylde College of Education in the United Kingdom and the Trent Polytechnic in Nottingham, U.K. (Smith, 1988). Of interest, is that the latter was designed in response to expressed teacher needs in dealing with local environmental issues. Other education faculties would do well to identify and respond to teacher requirements in a similar way. It implies a sensitivity to concerns of constituent communities which is, characteristically, a neglected or underdeveloped agenda.

iii) Post-graduate Qualification

Post-graduate degrees in environmental teacher education follow a standard format. They usually require a number of core courses to be supplemented by an in-depth, independent study in the chosen area of specialisation. The various permutations and emphases favoured by one university over another are well documented, particularly those found in the United States. The works of Bowman and Disinger (1980) and Wilke, Peyton and Hungerford (1987) are indicated in this regard. In South Africa, the Faculty of Education at Rhodes University, Grahamstown, incorporates environmental education into higher degree programmes, such as the B.Ed course, and the opportunity for specialisation is offered to serving teachers through the part-time, correspondence M.Ed degree in environmental education (Environmental Education Association of Southern Africa, 1990; Irwin, 1990, pers. comm.). Also facilitating specialisation in environmental education through correspondence, is the Natal College of Education (van den Berg, I., 1989, pers. comm.). However, as mentioned earlier, the contribution of post-graduate degrees to in-

service environmental teacher education is limited. As a method of large-scale, in-service preparation, it is obviously inappropriate, particularly in educational contexts characterised by an under-qualified teaching body such as that of South Africa (Hofmeyr and Spence, 1989).

4.3.3.3 Discussion

Teacher colleges and universities, especially their faculties of education, should be challenged to play a stronger role in the provision of in-service environmental teacher education. Where alternatives to state provision are at a premium, this role demands full acknowledgement. In South Africa, therefore, beyond higher degrees, the universities should be involved in formal and non-formal, part-time and extra-mural courses to answer the practical and environmental education needs of serving teachers. Correspondence courses should also be carefully considered where, as in South Africa, many teachers are geographically remote. While tertiary education institutions are often best placed in terms of facilities and personnel to offer such programmes, more important is their relative independence from what may be an oppressive or restrictive state education system. This makes universities valuable structures for realising an in-service environmental teacher education which empowers teachers, in turn, to educate for student self-determination. The importance of this to South African provision need not be stressed again.

4.3.3.4 Strategic Pointers

**MODEL B: IN-SERVICE ENVIRONMENTAL TEACHER EDUCATION
AT TERTIARY EDUCATION INSTITUTIONS**

1. Present constraints inherent to the existing organisation of state education, strongly implicate the relatively autonomous universities of South Africa in the provision of an appropriate environmental teacher education for serving teachers.
2. Courses offered in the form of part-time, extra-mural and correspondence programmes, provide the serving teacher with practical options for pursuing an interest in environmental education teaching. Accordingly, where present

provision occurs mainly at a post-graduate level, the emphasis should be shifted to a non-degree pattern of provision.

3. The ideal is for such courses to be recognised by state education authorities, however, the issue of certification or accreditation in South Africa would need careful thought. While the opportunity for extending university input to assume partial responsibility for formal requirements in in-service environmental teacher education is an interesting option, it implies formalised collaboration between state education and tertiary education institutions. If state regulation of courses is contingent to official recognition, the implications of such control require thorough exploration. Collaborative provision of in-service environmental teacher education must not be allowed to compromise the freedom of tertiary education institutions to offer appropriate environmental education programmes.
4. University certificate courses offer the serving teacher a practical opportunity and sufficient motivation to specialise in environmental education. Such specialists are crucial to school staffs attempting to follow environmental education as a cross-curricula approach in their schools.
5. The opportunity for post-graduate specialisation should continue to be offered, since such specialists are valuable members of the environmental education and, potentially, teacher education community.
6. Workshop programmes of shorter duration, while not offering continuity in education, can expose a group of teachers from a particular school to ideas in team and theme teaching in accordance with environmental education demands of holism, integration and cross-curricular practice.
7. Faculties of education, as opposed to departments in specific academic disciplines, are suggested as suitable facilitators of in-service environmental teacher education.

8. The need for university provision to extend beyond isolated, academic endeavour, to incorporate action-based learning in local environments and community structures, is stressed.
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The need to include non-government organisations in in-service environmental teacher education has been mentioned in both Models A and B. Accordingly, such integration is explored in the following discussion of a third Model, (C).

4.3.4 MODEL C: NON-GOVERNMENT IMPLEMENTATION

4.3.4.1 Introduction

Presently, the in-service environmental teacher education undertaken by non-government organisations and programmes, occurs largely through established environmental organisations. Efforts tend to be of an informal or non-formal, and isolated nature, with implementation finding expression at the local level. Where the large non-government environmental organisations have become involved in environmental teacher education, projects of a comprehensive and extensive nature have been initiated. For example, the Worldwide Fund for Nature sponsors numerous research and education projects internationally, and in recent years has extended support to issues such as teacher education and curriculum planning (Worldwide Fund for Nature, 1987). Characteristic of such efforts, is the development of teaching resources. This type of project, however, is considered to be misguided and studies have shown that even the most carefully conceived packages do not guarantee effective application in classrooms (Clacherty, 1989; O'Donoghue and Taylor, 1988).

Non-government organisations, particularly voluntary groups, usually operate within practical constraints of finance, facilities and resources, and this has limited their impact. A further parameter derives from their position *a propos* state education authorities. These do not readily integrate with independent structures and hence non-government organisations have had limited sanctioned access to teaching bodies (Gayford, 1987).

In South Africa, the experiences offered by organisations outside of state structures account for the majority of non-formal teacher exposure to an environmental approach.

These organisations are accessing teachers in numbers which neither tertiary education institutions nor state education departments are (Botha, 1990). This demands careful evaluation in the development of both non-formal and formal in-service teacher education in South Africa, since such bodies are relatively independent of the oppressive ideology of state education. The facilities, materials, expertise or networks of such organisations and projects are therefore an invaluable resource.

Interestingly, inadequate levels of state provision have often forced teachers to turn to non-government organisations for guidance and support in implementing environmental education policy in their schools (Neal, 1987). This represents opportunities for structural linking which are becoming more and more prevalent in teacher education, and points to the value which could be derived from developing such a dynamic. Positive aspects are, amongst others, that:

- levels of provision of in-service environmental teacher education could be increased;
- the quality of provision could be improved by contact with issue-based organisations. This is because such groups can offer a contextually relevant experience due to their foundation in community concerns; and that
- non-government organisations can contrast or guide state provision by dint of their immediacy to current issues and needs.

It would therefore be optimal to integrate non-government education initiatives and resources towards the goal of quantitatively and qualitatively improved in-service environmental teacher education. Beyond merely supplementing or guiding state provision, non-government programmes could become recognised contributors to formal teacher education. The beginnings of such collaboration are evident in the United Kingdom, where several local education authorities have begun to consult with voluntary organisations for help with their in-service programmes (Gayford, 1987, 1988b; Neal, 1987). For practical reasons, however, non-government organisations cannot assume the task of massive in-service teacher education alone, and community efforts must be matched by government support (Sterling, 1987).

In South Africa, non-government opportunities for developing in-service environmental teacher education are an increasingly real option. The climate conducive to such integration derives, firstly, from progressive non-government organisations showing a growing interest in incorporating environmental education into campaigns, projects and community action programmes. This reflects not only the recent relaxation of state control in the wake of February, 1990 (3.3.2.1), but also the rising profile of environmental issues in national politics (3.3.2.2). These organisations are more likely to confront the economic, social and political dimensions of environmental education than are established non-government environmental organisations, which are predominantly founded in concerns of the natural environment (Lekgetho, 1990). For example, the Soweto based National Environmental Awareness Campaign (NEAC) emphasises environmental issues such as housing, human rights, and education over those of conservation and preservation (National Environmental Awareness Campaign, 1990). Similarly, Natsoc, a community based environmental organisation in the Cape Flats, facilitates non-formal environmental education for teachers within a local context (Khan, 1990a). However, increasing pressure on established environmental groups, such as the Wildlife Society of Southern Africa, to change their priorities, has led a number of them towards discarding their elitist, preservationist labels (Gubb, 1991, pers. comm.).

The second, and more significant, factor relates to the large number of independently funded, alternative education projects and programmes which have been, and continue to be, established in reaction to the oppressive education provided by the state. These are discussed more fully in 4.3.4.2,iii. Together, then, non-government organisations represent a viable and dynamic infrastructure for the development of formal and non-formal environmental teacher education in South Africa.

Underlining the call for such contribution, is a veiled criticism of the well-intentioned initiatives of some non-government organisations. While a number of their projects, publications, and competitions have successfully raised levels of public and individual awareness (Gamble, 1990), it is felt that such efforts have promoted a perception of environmental issues and concern as something extra-curricular or fun (Farmer, 1991). Instead of acting in high-profile isolation, non-government organisations could direct their resources towards practical support of local education authorities, schools, and teachers,

in a more sustained and practical investment in environmental education. This then is the challenge to non-government organisations. It remains for education authorities to respond accordingly and ensure, by the same token, that formal involvement does not restrict the freedom and activities of non-government organisations.

While the ideal, therefore, is a reciprocal relationship between state education and non-government bodies with the aim of facilitating appropriate and sufficient environmental teacher education, this may be unrealistic in certain countries where conflicting political agenda prohibit collaboration. This has been the case in South Africa where co-operative action between state authorities and non-government organisations has been ideologically and practically problematic (Ballantyne and Aston, 1989). This derives from the mutual suspicion, even enmity, between the state and, specifically, progressive non-government organisations and education projects, which is based in a history of oppressive and strictly regulated state education and control (3.3). As a strategy for implementing in-service environmental teacher education in South Africa, therefore, it is unlikely, initially, to find strong support from either authorities, non-government organisations or teachers. The role of non-government organisations in such instances becomes even more critical if teachers are to be offered an alternative to the prescribed education.

Accordingly, the following review explores opportunities in the South African experience and organisation of non-government organisations. For convenience, these are divided into three, not mutually exclusive, groups, viz.: established environmental organisations; progressive organisations; and independent education projects. Where the use of these terms is not self explanatory, it is clarified in the relevant discussion.

4.3.4.2 Organisation

i) Established Environmental Organisations

Non-formal environmental teacher education has been undertaken by established non-government environmental organisations for many years, with growing levels of provision over the past decade (Eco-Link, 1991; Hurry, 1989, pers. comm.; Paxton, 1990; Raimondo, 1989, pers. comm.; Sinclair, 1991, pers. comm.; Soutter, 1990, pers. comm.). The most striking examples occur under the auspices of environmental organisations such as the Wildlife Society of Southern Africa (WLS), the South African affiliate of the World

Wide Fund for Nature viz. the Southern African Nature Foundation (SANF), Eco-Link, local equivalents of the Keep South Africa Beautiful Campaign, such as the Fairest Cape Association, and under the auspices of the Environmental Education Association of Southern Africa (EEASA). The initiatives most relevant to this study are discussed in some detail below. If past or current efforts in environmental education are ignored in this discussion, it in no way detracts from the significance of such contributions. However, the research problem implies a concentration on, firstly, teacher education and secondly, organisational opportunities and constraints for its present and future development.

THE WILDLIFE SOCIETY OF SOUTHERN AFRICA (WLS)

The WLS currently funds four permanent environmental education centres which are concerned largely with environmental education for school students (Botha, 1990). The emphasis of programmes has shifted over the years from promoting an education based only in natural environments, to embracing a more holistic approach in the provision of educational experiences (Baruti, 1989, pers. comm.). Where teacher education is concerned, levels of provision are much lower, with the Umgeni Valley project providing an outstanding exception (Taylor, 1989, pers. comm.). Education officers at regional branches, for example, the Western Cape, have, to different degrees, initiated contact with teachers, largely through the wildlife club scheme (Kelly, 1990, pers. comm.). A dramatic improvement in levels of teacher contact is anticipated in the Western Cape with the launching of their first mobile environmental education unit. This approach has been chosen over a centre as the preferred way of reaching teachers and students throughout the region and particularly in deprived communities. The programme will include teachers in all stages of its design, preparation, facilitation and consolidation, thus incurring indirect teacher education benefits (Kelly, 1991, pers. comm.). The idea of using mobile units for in-service environmental teacher education needs pursuing: Given the geography of South Africa, such a strategy could allow teacher exposure to environmental education in even the most remote locations (Muir, 1986; Painter, Evans and Nimick, 1979).

The mobile project of the WLS indicates a recognition of significant principles in environmental education, such as working within local environments in response to felt needs, and represents a move away from its middle-class bias towards conservation. The

potential of the WLS infra-structure and resources to offer increasing levels of in-service environmental teacher education should not be ignored.

THE ENVIRONMENTAL EDUCATION ASSOCIATION OF SOUTHERN AFRICA (EEASA)

EEASA is a voluntary association which is concerned with the promotion of the aims of environmental education. Accordingly, its mission is to consult, co-ordinate and spread information on environmental education research and activities (EEASA, 1987).

The teacher support, evident in membership and attendance figures at the annual workshops, which is given both by and to EEASA is significant (EEASA, 1988, 1989; Ellis, 1990; Irwin, 1988) and should be carefully considered in the development of in-service environmental education for South African teachers. There are indications that EEASA's role as a co-ordinating body is being increasingly recognised and developed by the rapidly expanding environmental education community (an example is discussed below). This is important, since to duplicate its functions would be a sorry waste of past and present energies. There is, therefore, a responsibility implied for the present membership and executive to ensure a growing and appropriate profile for EEASA if it is to meet the present and future environmental education needs of South Africa.

An illustration of EEASA's more recent development is the nationally co-ordinated resource network called Share-Net. Initially a Wildlife Society service, based at Umgeni Valley, the Share-Net initiative now falls under the auspices of EEASA (EEASA, 1991). The informal and collaborative nature of the Share-Net structure allows individuals and organisations to benefit from the expanding range of material and non-material environmental education resources found throughout Southern Africa. Nationally held workshops to launch Share-Net have attracted, amongst others, large numbers of teachers. Of particular interest to teacher education, are the groups which are being formed at such meetings. For example, the recent workshop held at De Hoop in the Western Cape, led to the formation of the Teacher Training Group which represents Cape universities and colleges of education and intends designing an environmental education course for Hewat Training College (Share-Net, 1991). This involvement of a non-government organisation in the formal provision of environmental teacher education is an interesting interface

between official provision and grassroots dynamics, and may represent a viable opportunity for developing a negotiated and relevant programme in pre-service environmental teacher education.

Accordingly, the Environmental Education Association of Southern Africa should be encouraged in its development of Share-Net and an environmental teacher education which derives from and represents local community needs, resources and organisation in education.

ECO-LINK

Another community-based programme with strong concern for environmental teacher education is the Eco-Link project, White River, Transvaal. The emphasis of this grassroots project has been on the local development and application of cross-curricular teaching resources (Eco-Link, 1991). Of significance, is the launch of Eco-Link as an Environmental Education Curriculum Development centre for the Kangwane Government. The centre is to involve teachers in curriculum development and in-service education. This provides an interesting example of state recognition and incorporation of community-based non-formal initiatives into official provision.

The combined infra-structure commanded by established non-government environmental groups is far-reaching. While it is not a coherent organisation, the opportunities for developing co-operative arrangements regarding formal in-service environmental teacher education should be explored. The co-ordinating role of the Environmental Education Association of Southern Africa and the associated Share-Net, are indicated in this regard.

ii) Progressive Non-Government Organisations¹⁰

Despite the efforts of established non-government environmental groups to facilitate in-service environmental teacher education, there remains an infinite need for further

¹⁰ The blanket term, 'progressive organisations', is used to denote a host of democratic, broad-based and hence extra-parliamentary organisations in South Africa. Sometimes called 'alternative' organisations, due to their juxtaposition to state and establishment structure and ideology, such groups may be nationally or locally organised and represent a range of political and social concerns.

teacher support. With environmental issues earning an increasingly high profile on the agenda of progressive non-government organisations (3.3.2.2), new inter-organisational dialogue around shared environmental concern and action has been generated (Khan, 1991b, 1991c). The potential of this impulse for facilitating non-formal, action-based environmental teacher education, represents a dynamic of significance to the development of environmental teacher education in South Africa.

An example of such inter-organisational dialogue is that pioneered in the Western Cape by the Botanical Society of Southern Africa (BotSoc). Initial workshopping between environmental and political organisations has led to the beginnings of a loosely aligned 'green coalition'. To date, participants have represented the African National Congress (ANC), the ANC Youth League, the Pan Africanist Congress, BotSoc, the Cape Town Ecology Group, the Eco Programme, Earthlife Africa, the Wildlife Society and the Azanian Peoples Organisation (Khan, 1991b). Importantly, participants have stressed community-based informal environmental education as a key element of any such action.

Further collaborative action between community based organisations with an interest in the environment is being initiated under the aegis of the National Botanical Institute (NBI) (Khan, 1991c). An aim of the NBI is to play a re-active role in addressing the educational and resource needs of communities, especially those less privileged. Accordingly, NBI facilitates a forum comprising a range of community and environmental groups. Participants represent greening and gardening projects, civic associations and school, university and college groups, with teachers and teacher educators being a strong presence. Importantly, first meetings have stressed links with teacher education organisations, and input towards non-formal in-service teacher education as part of strategies in community-based greening projects. This forum illustrates the type of structure which can be arranged around existing community organisation to effect dynamic, appropriate and relevant environmental action, such as issue-based teacher education. This type of organisational opportunity should therefore be identified and developed if non-formal environmental teacher education in South Africa is to extend beyond the bounds of establishment provision.

iii) Independent Education Projects

Particularly important to the development of formal in-service environmental teacher education in South Africa, are the growing number of independently funded education projects. The term 'independent education projects' is used to denote various forms of organised education provided by non-government agencies in reaction to the restrictive and prescriptive education provided by the state. These may include private schools such as the New Era Schools Trust (NEST) and Leadership, Education and Advancement Foundation (LEAF) schools, community colleges such as the South African Committee for Higher Education's (Sached) Khanya College, or academic support programmes such as the Programme for Technological Careers (PROTEC) which is funded by sponsorship from the private sector (Foord, 1991, pers. comm.). With regard to teacher education, and not quite so structured, are numerous projects and programmes operating parallel to the formal school system (Ainslie, 1991, pers. comm.; Lloyd, 1989, pers. comm.). Some of these have established relationships with education departments, while others maintain total independence from the state schooling system (Bot, 1986; Hartshorne, 1987a; Pickerill, 1987; Teacher Opportunity Programmes, 1991a). The projects are variously concerned with curriculum development, subject specific in-service teacher education, teacher-upgrade and staff enrichment programmes, and professional development (Holderness, 1988, pers. comm.; Morrisson, 1991, pers. comm.; Schollar, 1986). Sponsorship is largely derived from foreign governments, church or political organisations and the local and overseas private sector (Catholic Institute of Education, 1990; Hobden, 1989, pers. comm.; Urban Foundation, 1991).

The attraction of such projects lies in their autonomy and freedom from the pedagogically and ideologically restrictive structures of state education. Furthermore, many of these projects, facilitated for and by, serving teachers, have developed remarkably penetrating networks of teacher support and involvement (Keogh, 1989, pers. comm.; Pickerill, 1989, pers. comm.; Primary Science Project, 1988; Teacher Opportunity Programmes, 1991b). Accordingly, such projects, with their broad resource base and structural freedom, could represent valuable organisational opportunities for the development of environmental teacher education initiatives.

Examples of such programmes include the Primary Science Project (PSP) of the Urban Foundation, the Catholic Institute of Education (CIE), the Teacher Opportunity Programmes (TOPS), the Shell Science and Mathematics Resource Centre Educational Trust, Natal, and the Science Education Project (SEP).

Increasing interest in incorporating an environmental approach is evidenced in the involvement of individuals from these organisations in environmental education initiatives such as those undertaken by the Environmental Education Association of Southern Africa, the Botanical Society of Southern Africa and the National Botanical Institute. It would seem, therefore, that the opportunity for extending existing projects, or motivating for similar programmes in environmental teacher education, would be compatible with the educational ethos informing their organisation. The potential of such an approach to effect environmental teacher education should not be overlooked. It would be preferable for completion of such courses to be related in some way to professional development and hence, recognition by education authorities. This would help to encourage an often, not surprisingly, demotivated teaching body who have had their professional status systematically reduced by the excessive control of state education (Foord, pers. comm., 1991). Given current pressure on the resources of state education, it is likely that such contribution to in-service environmental teacher education will become the norm.

Certainly, in the interim, the cause of educational innovation and societal change is best served from outside of the state education system. Locked as it is in a self-perpetuating cycle of didactic control and underprovision, a long and slow process can be expected before schools become an effective site of reform, even after democratic restructuring. Appropriate curriculum development and teacher preparation are among the pre-conditions for developing an empowering education system, and it is such aspects of the transition that independent projects can and are addressing. There is an important place for environmental education indicated in this process.

4.3.4.3 Strategic Pointers

MODEL C: IN-SERVICE ENVIRONMENTAL TEACHER EDUCATION THROUGH NON-GOVERNMENT ORGANISATIONS

1. In response to inadequate or inappropriate state provision of in-service environmental teacher education, many teachers are turning to non-government organisations and projects for support and guidance. This points to a vital role for such groups, and the opportunities that they represent for collaborative or complementary provision need developing. There are many advantages in shifting the foundation of programmes in environmental teacher education away from the arena of the formal education system. These are that non-government organisations and projects:
 - can operate relatively independently of repressive state education ideology and structure;
 - have their foundation in environmental, educational and community concerns which are central to an environmental education approach;
 - command a valuable infra-structure of material and non-material resources;
 - have an established commitment to education; and
 - are generally willing to collaborate around environmental issues.
2. Accordingly, non-government organisations should be encouraged to direct their environmental education resources and efforts into practical support of teachers, schools and students, rather than into projects designed in isolation of the broader school community.
3. Ideally, state education authorities would respond to contribution from non-government organisations and projects in a receptive, not restrictive manner. In this way, state provision could be guided by input from non-government organisations, while the freedom and activities of such organisations would not be compromised.

4. The role of non-government organisations and projects in offering alternatives to the prescribed teacher education, is particularly important in South Africa.
 5. Inter-organisational collaboration on environmental issues represents one such opportunity for incorporating non-formal environmental teacher education into programmes.
 6. The growing number of independent education projects represents significant organisational opportunities for developing formal in-service environmental teacher education. Such programmes already pursue many of the aims of environmental education and offer an empathetic ethos in which to develop these further. Independent of the strictures of state education, these projects have established their legitimacy with teachers, as evidenced by the levels of support and teacher networks which have developed. Extending existing projects, or motivating for similar programmes in environmental teacher education could therefore represent the most appropriate site for such education in South Africa.
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4.4 IN SUMMARY

International and national strategies in the provision of pre- and in-service environmental teacher education were examined. This allowed for models of implementation to be identified. The opportunities and constraints inherent to such models were encapsulated in strategic pointers. It is recognised that not all obstacles to the effective introduction of environmental teacher education have been covered. Major problems regarding the financing and ultimate responsibility for such an undertaking remain. At the risk of appearing naïve, the author envisages their resolution occurring as a result of the process developed in subsequent chapters and is not inclined to pre-empt the outcome.

For the convenience of the reader, a single set of pointers is extracted in summary. These are specifically geared towards South African concerns, and while such indications

should inform, they are not intended to dictate, the nature of initiatives in the development of environmental teacher education:

- ideally, environmental education courses should be mandatory for all pre- and in-service teachers;
- courses, and the structures through which they are implemented, should themselves reflect an outworking of the principles of environmental education. For example, courses should be devised in a participatory process which involves implementors, users, teacher and community representatives;
- courses should be interdisciplinary and cross-curricular;
- courses should adopt an holistic approach in understanding or challenging environmental issues. These should derive from needs and experiences in local environments and communities. Such engagement should encompass the structure and dynamic of local organisation;
- colleges and universities should extend their traditional role of providing pre-service teacher education and post-graduate degree courses, to catering for the practical needs of serving teachers through part-time, extra-mural, non-degree and correspondence courses;
- state education authorities need to consider the logistics of in-service provision in terms of teacher needs such as time, certification and remuneration. For example, authorised absence from school duties to attend courses would encourage and facilitate teacher support of environmental education;
- ideally, formal courses for the serving teacher are recognised by the state education authorities in terms of official environmental education requirements, and professional development. This ensures that courses have the necessary legitimacy for teacher support. However, where official sanction might compromise the freedom of institutions or organisations to offer an effective environmental education in terms of its implicit and explicit aims, formal recognition should be carefully evaluated to ensure that state involvement is not synonymous with state control;
- colleges and universities should also cater for those wishing to specialise in environmental education through both pre- and in-service courses. Such specialists are vital in the co-ordination of the team teaching demanded by an environmental education approach;
- courses should be sustained, not one-off. Establishing, or utilising existing teacher networks to facilitate ongoing and mutual support for teachers is therefore an important aspect to in-service environmental teacher education;
- teacher education institutions should also provide support for serving and, particularly, newly qualified teachers, by establishing and maintaining structural links with the schools and teacher organisations of their constituent communities;

- education authorities should be encouraged to develop school environments more conducive to environmental teaching in terms of resources, curricula and key personnel;
- where possible, education, conservation and relevant urban state agencies should co-operate to combine expertise, resources and facilities. Where non-government organisations are also involved, maximum effectivity of environmental teacher education programmes can be approached. Where there are problems with such integration, as in South Africa, non-government environmental and progressive organisations are urged to play a complementary and where necessary, contrasting role, in providing an alternative to the formal experience;
- of particular value to the development of formal in-service (and possibly pre-service) environmental teacher education, are the independent education projects which characterise teacher education outside of official provision. Their support networks and resources, established legitimacy, ideological and practical independence of state education, and their approach to teacher education and enrichment, represent exciting potential for extension, or similar development, in programmes of environmental teacher education.

4.5 CONCLUSION

In evaluating present and future opportunities for the provision of environmental teacher education in South Africa, one finds the specifics of local political, educational and organisational contexts, to be the strikingly dominant factors. This is as it should be, and reflects well the principle that environmental education should occur in response to local needs.

Addressing the inadequacies of environmental teacher education in South Africa demands examination of available resources and organisational opportunities, not only logistically, but, more importantly, in terms ideological. In this regard, the role of state education departments in the provision or recognition of environmental teacher education programmes, needs clarifying. Present conditions suggest that the structures of state education are in no position, financially, practically or ideologically, to offer either sufficient or appropriate levels of provision. This has two implications: Firstly, that non-government organisations and the private sector will have to contribute significantly to such provision; and secondly, that in allaying the pressure on government, the latter is in

a far weaker position to control or dictate the nature of independent programmes. Official recognition of such courses may ensue, thus providing much needed motivation to teachers to join upgrade and enrichment projects. However, if state recognition means state manipulation, the independence of such projects should be fiercely maintained. In either instance, it appears that, given present educational and political circumstances, the most appropriate site for introducing what is, by definition, a radical teacher education, is outside of the formal education system. Accordingly, non-government organisations and projects have been highlighted for the organisational opportunities that they represent in the development of both non-formal and formal teacher education. Largely based in the private sector, those responsible for the allocation of resources and funding are encouraged to support such projects towards an appropriate and liberating education.

The implementation of environmental teacher education should result from negotiation between all those implied in the process. Hence, appropriate organisational and curriculum design can only be identified in response to the needs and perceptions of those concerned at all stages of the process. Such dialogue needs expression in effective and representative forums. Accordingly, the following chapter develops a process for facilitating this kind of engagement.

CHAPTER FIVE

**A PROCESS FOR THE DEVELOPMENT
OF ENVIRONMENTAL TEACHER EDUCATION
IN SOUTH AFRICA**

5.1 INTRODUCTION

The strategic pointers extracted in the previous chapter have value as considerations in the development of environmental teacher education initiatives. They do not, however, replace the development process, and themselves incorporate the principle that environmental teacher education programmes must be devised as the result of full representation and participation by all those indicated in their facilitation and experience. A process for developing environmental teacher education strategies and programmes in response to the needs of all concerned, is therefore indicated. Accordingly, such a process is evolved for application in South Africa.

The process is informed by the conceptualisation of environmental education as discussed in Chapter Two, the contextual considerations of South African implementation as examined in Chapter Three, and the strategic parameters as identified in Chapter Four. Finally, the process is moulded by the principles generated through a pilot study run in the South-Western Cape. These principles are suggested as underlying tenets informing any future application of the process for the development of environmental teacher education in South Africa.

Chapter Outline

A major concern is to facilitate the indicated participation. A workshop is chosen as the most appropriate vehicle, and the *rationale* behind this is explained in section 5.2. The initial process design was tested and further developed through a pilot study in the South-Western Cape. This is presented, and the results of the study are evaluated in section 5.3. Informed by these findings, and in summary, section 5.4 is an outline of a procedure for future application in the development of environmental teacher education. Some concluding observations are offered in section 5.5.

5.2 A WORKSHOP: VEHICLE FOR PARTICIPATION

The *rationale* behind choosing a workshop as the most appropriate methodology for the development of environmental teacher education in South Africa, lies in its capacity to reflect the principles and demands of the environmental teacher education which it is, in this instance, designed to promote. That the frameworks within which such education is developed or experienced, must themselves embody an outworking of environmental education principles, has often been stressed (Ballantyne and Aston, 1988, 1989, 1990a). Unless this principle is applied, it is unlikely that effective strategies will ensue. Therefore, the chosen process should:

- be participatory;
- facilitate fully representative dialogue;
- be informed by issues in the local environment;
- identify, recognise and respond to people's needs; and
- incorporate the impulse and structure of local organisation (2.3.2.2; 3.5.3.3; 4.4).

These priorities are supported by the research experience of O'Donoghue, who emphasises the importance of local reconstructive action as opposed to centre-to-periphery orientation in facilitating effective and enduring reform (O'Donoghue and McNaught, 1991). Briceño and Pitt (1988) also highlight the importance of incorporating local organisation into environmental action, as does Khan (1990a). Ballantyne and Aston (1988) see such engagement as critical in ensuring that the process of teacher education is 'owned' by all who are implicated in the educational experience. Without such involvement, therefore, environmental teacher education programmes could be inappropriately developed in terms of organisational and curricular design, and are likely to suffer from a lack of legitimacy and support. To avoid being met by such insecurity or resistance, priorities of the development process must remain those of immediacy and participation (Kemmis, 1982). A workshop provides a suitable framework in which to

realise these priorities, and is therefore chosen as the most appropriate vehicle for initiating the development of environmental teacher education.¹¹

Further advantages to using a workshop are, firstly, that it allows for immediate sharing of and response to ideas amongst a range of participants. This is not only logistically convenient, but also adds to the number and depth of ideas which are generated. One moves, therefore, beyond individual output, towards the development of group concepts and goals. Put mundanely, the sum of the whole is greater than its constituent parts. A second advantage lies in the informal experience of learning and growth that is implicit to the process for all participants.

The process for the development of environmental teacher education needed testing and shaping through participatory evaluation. Accordingly, a pilot study was run.

5.3 THE PILOT STUDY

5.3.1 INTRODUCTION

Local programmes, organisation, facilities and needs are best accounted for in local development processes which can optimise on strengths and target specific needs. Since a locally based initiative is, therefore, implied, workshops on a national scale are considered inappropriate. Accordingly, as the research was based in the South-Western Cape, it was decided that the pilot study should be run in that area.

The pilot study had two clear aims:

- Firstly, it was to test and refine the process for the development of local environmental teacher education. This was in order that a similar process could be successfully repeated elsewhere in South Africa. This meant that both the researcher and the participants had the opportunity to evaluate the experience against its expressed aims. Such evaluation is incorporated into the final suggestions regarding the development procedure;

¹¹ Preliminary discussions on the techniques of facilitating a workshop were held with Fowkes, Grindley, Sowman, and Raimondo (1989, pers. comm.).

- Secondly, the pilot study was to represent a South-Western Cape initiative in developing local strategies for environmental teacher education.

As with all tools, it is their use and application that determines whether aims are effectively realised. While it is vital that broad goals be set, these should not pre-empt the spontaneous generation of group ideas or the way in which these are approached. Although the present study determined aims and objectives prior to the workshop, these embodied a flexibility which allowed for their redirection during the workshop experience. This experience is outlined in 5.3.2 below, in which the procedure, workshop results and evaluation are discussed.¹²

5.3.2 A SOUTH-WESTERN CAPE INITIATIVE

5.3.2.1 Workshop Aims and Objectives

The aims of the workshop were to:

- test the process for the development of local initiatives in environmental teacher education. Problems with the concept, design or implementation were therefore to be identified, and suggestions for improving the process were to be made;
- generate a set of guiding principles which would inform future application of the process;
- facilitate expression of the needs and perceptions of all those potentially or currently involved in the process of environmental teacher education in the South-Western Cape; and to
- generate communication and dialogue between such groups, individuals and organisations, with the longer term aim of seeing such negotiation translated into action.

¹² The political context of South Africa at the time of the pilot study, provides the backdrop to the South-Western Cape initiative. It informed the perception of many of the workshop delegates regarding co-operative relationships with each other and specifically, state education departments. This derives from a history of antagonism as discussed in section 4.3.4.1. Similar scepticism is evident in the wary endorsement of utilising South African private sector capital, perceived by some participants to be part of the system of oppression. Emphasis on the non-racial and non-discriminatory nature of participation, course design and programme implementation is an understandable (and enduring) priority.

The objectives were to:

- identify organisational and resource opportunities and constraints relevant to the development of environmental teacher education in the South-Western Cape. This included the identification of participants not represented at the initial workshop;
- identify strategies in terms of such opportunities and constraints, for the implementation of environmental teacher education in the South-Western Cape;
- identify problem areas or areas of conflict in the development and implementation of such strategies;
- address practicalities of implementation; and to
- initiate further steps in the development of environmental teacher education in the South-Western Cape.

5.3.2.2 Procedure¹³

Individuals and organisations representing state departments of education, colleges of education, universities, relevant non-government organisations, government conservation bodies, environmental education specialists, teacher organisations and independent education projects, were invited to attend the two-day workshop. These constituents were identified to represent the full spectrum of those likely to have an interest or involvement in present and future provision of environmental teacher education in the South-Western Cape.

Following confirmation of attendance, delegates were sent a package of four salient readings. Pre-preparation on the part of participants was considered to be very important. The aim was to avoid laborious introductory sessions at the workshop itself and to move directly into activities related to the problem of developing environmental teacher education. In the event, however, a certain amount of clarification of terms and issues was still necessary to ensure that all delegates worked from a similar understanding of key concepts.

¹³ A complete set of workshop documents is provided in Appendix B. It includes a i) programme ii) list of participants iii) discussion sheet iv) fact sheet v) task sheet vi) plan form and vii) evaluation card. Where allusion to such documents is made in the text, the reader is referred to the relevant appendix.

After an introductory session to clarify explicit and implicit aims, the conceptual framework, and the procedure of the workshop, participants joined one of five groups. As far as possible, each group represented a similar area of present or future involvement in environmental education. These were:

Group 1 - Colleges of education

Group 2 - Universities

Group 3 - Education departments

Group 4 - Conservation and environmental bodies

Group 5 - Teacher organisations and education projects

The first session encouraged groups to consider possible strategies for both pre- and in-service environmental teacher education. Groups were guided by questions posed in the Discussion Sheet and were asked to consider the current position of environmental teacher education in the South-Western Cape as reflected by the information provided in the Fact Sheet. The groups then filled in Plan Forms which served as a standardised summary of their models for pre- or in-service environmental teacher education. Most groups produced models for each, while two completed only the pre- or in-service model with which they would be concerned. For example, group 1, representing the colleges of education, produced only a pre-service model. The groups represented their models diagrammatically in the form of a flow chart, and evaluated their models in terms of inherent opportunities and constraints. These points were ranked and weighted in terms of their relative importance. Similarly, from photocopies of the relevant plan forms, each group evaluated the strategies developed by the other groups.

The groups then took turns in presenting their models to the forum. Using the flow charts as points of departure, they explained their respective strategies and the inherent opportunities and constraints. Participants from the forum added any further points that may have been identified, and responded to ideas either as individuals or as representatives of their organisations. In this way, a full range of organisational opportunities, participant and group perceptions, needs, and possible conflict areas, was explored. Potential participants, inadvertently neglected by the researcher, but who could have contributed to the process, were also identified.

On the second day, workshop participants joined new groupings. These groups comprised a mixture of representatives from environmental and educational backgrounds and interests. The tasks of Day One had demanded more time than was expected. The forum therefore decided that the focus of Day Two should be on group discussion in which common elements and problem areas implicit to the various strategies could be addressed, and further, that the workshop process itself could be evaluated as a vehicle for facilitating local initiatives in environmental teacher education. The results of such group discussions were expressed through a general debate. This was distilled into a set of guiding principles which were formally adopted by the forum as recommended tenets in the process of developing environmental teacher education in South Africa. On a practical level, a future meeting at which a specific plan of action would be formulated, was arranged.

To allow for delayed feedback on the workshop process, and to confirm the resolutions made on the last day, delegates were sent a report of the proceedings. Any comments on, or corrections to the report were invited, in order to ensure that the document reflected accurately the feelings and proposals put forward at the workshop. In the absence of such a response, it was understood that the principles laid out in the report were accepted and endorsed by the particular delegate.

5.3.2.3 Results

The results of the workshop are presented in three sections. The strategic pointers identified by participants as important for the development of, firstly, pre- and, secondly, in-service environmental teacher education in the South-Western Cape are noted. Second, are the guiding principles which were generated and adopted by participants as fundamental to any process for developing an environmental teacher education in tune with the needs of South African teachers, students and their communities.

WORKSHOP RESULTS

i) Pre-service environmental teacher education in the South-Western Cape: Strategic pointers and considerations

- continuous exposure to the environmental education approach should be experienced by intending teachers throughout their preparatory years;
- the opportunity for those interested in concentrating in the field should be offered through specialist courses in environmental education;
- whether courses should be offered as separate modules, within appropriate subject disciplines, for example geography, or as a cross-curricular approach bridging all teaching methods, is an area of possible contention. Although the White Paper proposes that environmental education be taught across the curriculum in schools, many practical problems can be identified in applying this approach to teacher education. Accordingly, this is highlighted as a problem needing particular attention;
- programmes should have a strong local perspective;
- theoretical and philosophical aspects of environmental education should be incorporated into courses. Examination of the implications of an environmental pedagogy is therefore indicated, as opposed to the introduction of environmental studies;
- a participatory, non-didactic methodology in teacher education should be adopted if the environmental education aims of, amongst others, developing decision-making and problem-solving skills, are to be realised;
- the standardisation of pre-service environmental teacher education courses is problematic. Those participants who support the notion of a recognised programme, feel that a standard course could be centrally

developed by an accepted body, such as a university. However, the majority of participants feel that this would compromise the ability of individual institutions to respond to the particular needs of their student bodies;

- teacher educators should themselves experience in-service courses before being made responsible for offering student teacher preparation in environmental education;
- colleges of education and universities should bear the responsibility for offering pre-service environmental teacher education through existing structures and should also be responsible for providing the necessary staffing, administration and curriculum development; the latter to occur in negotiation with representatives from local student, teacher and community organisations.

ii) **In-service environmental teacher education in the South-Western Cape: Strategic pointers and considerations**

- the first phase of implementing formal in-service environmental teacher education in the South-Western Cape should target specific teacher groups. Suggestions range from senior primary teachers, complete staffs from individual schools, teachers who accompany youth groups, to teachers who choose, voluntarily, to attend a course;
- preparing a set of 'seed' teachers in environmental education, one for every primary and secondary school, is another way of introducing formal in-service environmental teacher education in stages;
- teacher groups attending courses should be inter-departmentally, i.e. non-racially, derived. This is essential if environmental education is to be used effectively as a challenge to existing socio-economic and political barriers;

- full and comprehensive participation in curriculum design is important. This indicates the involvement of teacher and relevant community representatives, programme implementers and environmental educationalists in a negotiated process;
- programmes should allow for participatory teaching methodologies, should be open-ended and process related;
- course content and focus should primarily be in response to local needs and environments;
- subject specific and cross-curricular approaches can be used to complement one another;
- continuity in environmental teacher education should be ensured by the introduction of both orientation and refresher courses, while one-off exposures are to be avoided;
- an over-arching body representing those concerned in the process of environmental teacher education would provide a forum in which needs could be expressed and addressed, and the development of appropriate teacher education, pursued and promoted. Such a body would co-ordinate relevant material and non-material resources and motivate for further practical and popular support. This implies non-formal workshopping of environmental education amongst groups who may not be aware of the potential value of their input towards environmental education efforts. The co-ordinating body would therefore also have an informal educational function. The development of programmes for serving teachers could emanate from co-operative design within such a body, but responsibility for implementation would be devolved to non-government organisations, universities and colleges. By standardising courses in this way, completion could be related to certification or accreditation. It is suggested that the universities, as relatively

autonomous bodies, could assume responsibility for this, and that they should be encouraged to make a far greater contribution than they currently do, to in-service teacher education of a non-degree nature.¹⁴

iii) **Guiding Principles**

The guiding principles are grouped into three categories: those relating to policy; those concerned with implementation strategy; and those regarding specific issues which require particular consideration.

POLICY

- Any initiatives developing environmental teacher education must be based on an acceptance of the aims and objectives of environmental education as embraced by the global environmental education community. This implies that environmental teacher education is non-discriminatory in every way.
- Programmes and strategies must be developed in consultation with, and by all those who will be involved in the environmental teacher education process. Full participation at this stage is extremely important if both planning and implementation is to reflect the needs of local communities and environments. Unless such needs are addressed and incorporated into strategies, neither the necessary support nor legitimacy for this crucial preparation of teachers in environmental education will be generated.

A STRATEGY

- Some form of local (not national) co-ordinating body is necessary. A forum representing all those involved in, or interested in becoming involved in environmental teacher education could fulfill such a function. Mini-workshops and meetings should be held prior to the setting up of such a forum. This would help to identify the relevant players, as well as to

¹⁴ The subsequent expansion of the Share-Net initiative addresses many of these needs (see 4.3.4.2,i). Accordingly, a role for the Environmental Education Association of Southern Africa and the Share-Net project could be indicated here.

encourage an awareness of the need for broad-based involvement in environmental education and related issues.

SPECIFIC CONSIDERATIONS

- Those charged with teacher education should themselves be suitably qualified. A process for such qualification could be identified or instituted. Universities are indicated in this regard.

- The question of resources needs addressing. Existing resources need co-ordination and the careful creation of new ones is indicated. 'Resources' are understood to include those financial, physical, educational and human, for example, individual expertise and support networks. Further, resources should be easily and readily accessible. The establishment of an effective information system is a matter of great importance since information in the twentieth century has become synonymous with empowerment. This function could well be assumed by the co-ordinating body.

- Environmental teacher education requires both administration and funding. Therefore, appropriate structures at local levels need identifying or developing. Where existing structures can answer the needs of environmental education, these should be used. The potential of independent, non-government and community organisation, and the role of the co-ordinating body, should be considered in this regard. For obvious reasons, there are problems involved with the use of state structures and funds.

- The nature of courses in environmental teacher education needs negotiation or research in terms of local contexts, so as to respond to the particular needs, resources and strengths of different areas.

- The issue of accreditation should be addressed. The universities or relevant independent projects could play a role in establishing a system of course accreditation which does not compromise the freedom of such organisations

to explore and apply environmental educational practice in its full implications.

5.3.2.4 Evaluation

As an initial comment, the author finds the extent to which the ideas of local participants mirrored the tenets extracted from the review of international experience, disappointing. This reflects the Eurocentric vision that dogs education in South Africa and underlines the need for mass preparation in environmental education for teachers and teacher educators alike. More specific problems encountered during the workshop experience are identified and discussed, with contingent adjustments to the process made in 5.4 below. The workshop as a vehicle for participation and as a pilot study of an initiative in the South-Western Cape, is evaluated against the aims and objectives specified in 5.2; 5.3.1 and 5.3.2.1 respectively.

The time allotted to different tasks needs careful consideration. A problem evident in the pilot study was that certain groups needed more time than others to complete their discussions. While pressurised activity is not desirable, the momentum should be maintained by realistic deadlines. Alternative activities could be offered to those groups which finish early, although *impromptu* engagement is likely to spill over into such time. In this case, relevant literature was made available for informal browsing; participants, too, had been encouraged to bring any documentation on their organisations, activities or resources. This was one way in which the aim of inter-organisational communication, resource identification, information sharing and hence informal learning, was promoted (5.3.2.1).

It was important to have introduced flexibility into the programme. This meant that time was managed according to demand, and allowed the dynamic of the process full exploration. A non-directional approach is not implied; a non-directed approach is.

The opportunity for delegates to comment on a provisional programme would have been profitable, particularly as regards the identification of relevant participants. In the event, those organisations or individuals who had been inadvertently overlooked, were pointed out at the workshop and invited to the subsequent meeting.

No matter how thoroughly a workshop is planned, one cannot control the unexpected. In this case, a general election was announced, with the election date co-inciding with the second day of the workshop. This prompted extremes of unrest and violence in protest against the continued racist and non-democratic processes of government. Workshop planning at this stage had gone too far to negotiate changing dates, and so it was decided to continue with existing arrangements. The efforts made by some of the delegates to attend, despite ideological or logistic problems, were greatly appreciated. The election did, however, reduce the forum on the second day and this, of necessity, altered the composition of the group.

Related to the above factor, was the non-attendance by certain groups who were invited (refer footnote 1). While never pretending to be an exhaustive collection, the range of representatives and therefore input, was somewhat diminished. Whether or not this affected the overall validity of the findings is debatable. Since non-attendance was motivated by political reasons on the part of organisations on both the left and right of the political spectrum, it underlines the contentious nature of education, and hence environmental teacher education, in South Africa. It thus, ironically, adds to the credibility of the guiding principles which highlight and address this factor.

Measured against the process needs as outlined in 5.2, it is concluded that a workshop is an appropriate and effective vehicle for developing environmental teacher education initiatives in local areas. As a participatory methodology, it successfully facilitated expression of individual and group needs and perceptions through discussion and constructive engagement.

Pilot study aims (5.3.1) were met as a matter of course and the procedure suggested in 5.4 below, incorporates the learning resulting from personal and participant evaluation. Specific aims and objectives of the South-Western Cape workshop (5.3.2.1) were either wholly or partially met. The realisation of aims and objectives is largely self-evident. Where the experience fell short of such goals, relevant adjustments or caveats have been included in the recommendations below.

5.4 IN SUMMARY: A PROCESS

1. A fully representative workshop should be held at a local level to facilitate participation and dialogue between all those involved in the process of environmental teacher education. This workshop represents a first step in the process towards developing local strategies for effective, community-based, formal and non-formal environmental teacher education.

For effective application, the workshop should be conceptualised within the framework implied by the policy statements adopted at the Cape Town initiative (5.3.2.3,iii). Accordingly, the process will be representative; democratic; participatory; action-orientated; and locally-based, -derived, and -organised.

2. The workshop needs funding, administration and facilitation. With regard to the former, sponsorship from the foreign and local private sector, overseas governments, and relevant church and political organisations, is generally readily available for educational and environmental projects if proposals are well and timeously prepared. A relevant non-government agency or institution such as a local university is indicated in the administrative role, at least until the process generates its own momentum or co-ordinating structure. A suitable workshop facilitator is, preferably, someone local. S/he should not, however, have a vested interest in a particular outcome, and so, while being familiar with environmental education concerns, s/he is not likely to be directly involved in environmental teacher education.

3. Planning should occur well in advance. This ensures that sufficient time is available for the process of pre-briefing delegates and responding to the range of queries that inevitably arises. Participants themselves need plenty of warning in order to arrange personal schedules.

Pre-workshop briefing of participants serves a number of purposes. Firstly, using salient, but limited readings, a common framework and understanding of key

terms can be established. This cuts down on the time needed for such clarification at the workshop itself and gives the future participant some security, especially where the field is relatively new to her/him. This is important in creating a positive and receptive workshop environment. Occurring inbetween the initial invitation and the actual workshop date, such contact with future participants also adds a sense of familiarity, inclusion and obligation, and thus cements both the welcome and the commitment. Secondly, pre-workshop contact can be used to elicit comments on a provisional programme and to identify issues likely to need discussion. The workshop programme can thus be developed in consultation with participants. The logistics of this are likely, however, to limit such communication to one postal proposal and response. Finally, early contact with potential participants maximises on the network of contacts which can be established. This helps in the identification of relevant participants and thus in facilitating as representative a forum as possible.

4. The actual programme and tasks to be followed should be designed in response to local priorities and needs. No programme is therefore prescribed, although some organisational pointers are included for consideration:

Group activity is suggested as an appropriate methodology. Being small, groups provide a non-threatening forum in which everyone should have a chance to express needs, ideas or reservations. Experience indicates that groups should be pre-determined. People tend not to form creative mixes in unfamiliar environments. Further, groups need an initial stimulus to generate discussion. This could take the form of a structured question, problem or task. Also highly important to maintaining levels of engagement, is that groups be required to express their findings in a concrete way and that they report back on such conclusions to the forum. The opportunity both to present and to attend other presentations must be facilitated by the programme design.

The programme, although structured, should embody a flexibility so that it can capture and explore the dynamic of spontaneous engagement. Programme design should not, therefore, restrict the process of participatory interaction.

5. Some of the areas for consideration were identified at the Cape Town initiative. The list is neither complete nor prescriptive, but may provide an indication of the type of issue likely to need addressing and incorporation into the design of the workshop programme (5.3.2.3,iii).
6. It is strongly recommended that the formation of a non-government co-ordinating body be considered in terms of the strategy envisaged at the Cape Town workshop (5.3.2.3,iii).
7. It is essential that a binding arrangement for further co-operative plans be made at the workshop itself. The interest and enthusiasm which is likely to be generated on the day(s) may easily dissipate in the absence of a concrete and immediate plan. This also fosters commitment on the part of participants towards 'owning' the process for the development of local environmental teacher education.

5.5 CONCLUSION

A process for the development of environmental teacher education initiatives in local contexts has been described. This process was arrived at on the basis of the theoretical conceptualisation of environmental education developed in Chapter Two, the pervasive socio-political climate of South African education (Chapter Three), and the organisational opportunities and constraints for environmental teacher education as identified in Chapter Four. A process, rather than a prescriptive national model for environmental teacher education was developed in order that locally relevant solutions to problems and needs can be identified and accounted for by the communities concerned. Indeed, the process itself is open to development and should reflect the dynamism of a South African environment in political, social and educational flux.

The process forms a major part of the guidelines for the development of environmental teacher education in South Africa which are presented in the following chapter and are the culmination of the research behind this study.



CHAPTER SIX

**GUIDELINES FOR THE DEVELOPMENT OF
ENVIRONMENTAL TEACHER EDUCATION
IN SOUTH AFRICA**

6.1 INTRODUCTION

Guidelines for the development of environmental teacher education in South Africa are proposed in the light of the insights and experiences gained during the course of the research. Founded in the theory and pedagogy of environmental education, and against a national backdrop of environmental and educational crisis, attempts to overcome the problems of introducing environmental teacher education within the ideology and structure of the present education system are made. This is done through suggestions for independent, non-government and broad-based organisations to facilitate the development and implementation of environmental teacher education in South Africa. Such suggestions are made in the belief that the limitations of the present system should not be allowed to stunt the growth of relevant environmental teacher education which is a priority in countering further deterioration of the socio-ecological environments of students, teachers and communities. Such development must, however, ensue from clear positioning if initiatives are to be immediately effective as well as to survive the transition to a reconstituted education system. The following guidelines are proposed accordingly.

At the risk of repetition, but for the convenience of the reader, the guidelines draw together the findings which have been presented in stages throughout this document. They are presented in three sections: Section I incorporates contextualising statements and outlines a policy for the development of environmental teacher education in South Africa; Section II offers organisational recommendations; and Section III describes a process whereby the realisation of effective environmental teacher education can be initiated.

6.2 GUIDELINES FOR THE DEVELOPMENT OF ENVIRONMENTAL TEACHER EDUCATION IN SOUTH AFRICA

SECTION I: POLICY STATEMENTS

1. Any initiatives developing environmental teacher education must be based on an acceptance of the theory and practice of an environmental pedagogy as implied by the aims and objectives of environmental education. Accordingly, initiatives will be participatory, fully representative, locally based and will reflect the needs, strengths and organisational dynamic of such siting.

Unless these principles are adopted, the crucial preparation of teachers in environmental education will generate neither the necessary support nor legitimacy.

2. Socio-political forces impact upon classrooms at micro and macro levels to reinforce societal and educational resistance to an environmental education teaching approach. Massive efforts in community-based environmental teacher education are therefore essential if teachers are to realise effective environmental education in schools and thereby promote societal and ecological reform as one and the same dynamic.
3. Although the environmental teacher operates within a broader context of reform and is not solely responsible for societal and ecological transformation, teachers remain powerful agents for change and deserve appropriate and adequate preparation for assuming such a role. This is particularly the case in South Africa where, in the wake of political reform, the major responsibility for effecting change in education will lie with the teachers in their application and interpretation of new policy and curricula. Furthermore, given the challenge facing environmental teachers of confronting South Africa's socio-political environment, such environmental teacher education is an urgent need.

4. Environmental teacher education programmes and structures within which they are effected, must themselves reflect an outworking of the principles of environmental education and hence be an experience of self-determination for teachers if they, in turn, are to empower others towards socio-ecological reform. Current structures of state education and the ideology they sustain, obstruct the realisation of environmental education aims in schools and teacher education institutions alike. Accordingly, the present education system and hence state provision of environmental teacher education, will only be effective after unconditional and fully representative restructuring.
 5. Accordingly, until the formulation and practice of environmental education policy:
 - a) occurs within a framework of full participation in government;
 - b) takes cognisance of the historical, social, economic and political roots of environmental deprivation in South Africa; and
 - c) derives from local needs and develops popular tradition in environmental education and organisation, the development and promotion, through the apparatus of state education, of attitudes, values and behaviour appropriate in a South African context, remains an academic goal.
 6. Environmental educationalists have a valuable perspective to offer in the redevelopment of the education system with regard to both structural and curricular aspects. This they should do as a matter of urgency.
-

SECTION II: ORGANISATIONAL RECOMMENDATIONS

Recommendation One

Environmental education courses should, ultimately, be mandatory and sustained for all pre- and in-service teachers.

Without a suitably skilled and confident teaching body, the chances of an environmental education approach being successfully adopted in schools, are reduced. Accordingly, continuous exposure to the environmental education approach should be experienced by intending teachers throughout their

preparatory years, while serving teachers should experience both orientation and refresher courses. Isolated programmes are therefore to be avoided.

Colleges of education and universities should offer pre-service environmental teacher education through existing structures and should also be responsible for providing the necessary staffing, administration and curriculum development. It is strongly suggested that the latter occur in negotiation with representatives from local student, teacher and community organisations (see Recommendation Two).

The provision of formal in-service environmental teacher education is covered in Recommendations Five and Six.

Recommendation Two

Curriculum design should be negotiated locally and should be the result of full and comprehensive participation.

This is to ensure that programmes are in response to, and hence address and incorporate, the particular needs and strengths of different areas. Such dialogue indicates the involvement of local student, teacher and community organisations, programme facilitators, and environmental education specialists, in a process of constructive and ongoing engagement and evaluation.

Recommendation Three

Although curriculum and course design should occur in local contexts, certain basic tenets can be identified.

The principles of environmental education determine that courses should reflect an holistic approach, be interdisciplinary and cross-curricular. Theoretical and philosophical aspects of environmental education and pedagogy should be incorporated into courses which themselves are participatory, non-didactic and process related.

Although course structure requires negotiation, options include provision within separate modules, subject disciplines, a cross-curricular approach bridging all teaching methods, or complementary subject specific and cross-curricular provision.

Since courses should reflect, in both structure and content, the needs of the constituent community, they will provide for experience and involvement in local environments. Such engagement will encompass the structure and dynamic of local organisation and will therefore be based on a strong relationship with non-government and community organisations.

Recommendation Four

Teacher educators should be the target of environmental education programmes.

Those charged with teacher environmental education should themselves be versed in the theory and practice of an environmental pedagogy. A process for such exposure should be identified or instituted. Universities and relevant independent education projects are indicated in this regard.

Recommendation Five

Formal in-service environmental teacher education is best facilitated by independent education projects and programmes.

Independent education projects have support networks and resources; established legitimacy; ideological and practical independence; and an approach to teacher education and enrichment, that make them highly appropriate organisations for the promotion of environmental teacher education in South Africa. Accordingly, the extension of existing programmes or the development of similar structures for environmental teacher education, is strongly urged.

Recommendation Six

Universities should be challenged to make a far greater and more realistic contribution to in-service teacher education of a non-degree nature, and environmental teacher education in general.

While pre-service and post-graduate degree courses remain important, universities need to broaden their patterns of provision to cater for the needs of serving teachers. This could be achieved through offering part-time, extra-mural, non-degree or correspondence courses. Universities should also cater for both the intending and serving teacher wishing to specialise in environmental education. Further university involvement is indicated in Recommendations Four and Nine.

Recommendation Seven

Non-government environmental and progressive organisations are in a position to play a complementary and where necessary, contrasting role, in providing non-formal environmental teacher education.

This is for a number of reasons: They operate relatively independently of repressive state educational ideology and structure; they have, as their foundation, environmental, educational and community concerns which are central to an environmental education approach; they command a valuable infra-structure of material and non-material resources; they have an established commitment to education; and they are generally willing to collaborate around environmental issues. Such organisational opportunities should not be overlooked in the development of non-formal environmental teacher education.

Recommendation Eight

Urban agencies should be urged to combine their expertise, resources and facilities with those of education and conservation.

The educational infrastructure and commitment to non-formal education shown by such bodies is relatively poorly developed. This lends to the characteristic bias towards natural environments which is evident in most environmental teacher education. Since the majority of teachers serve in urban environments, such agencies could offer appropriate non-formal educational experiences in relevant issues.

Recommendation Nine

Ideally, formal courses for the serving teacher are certified, and such certification is recognised by state education authorities in terms of official requirements or professional development.

This helps to provide the necessary motivation for teacher support. However, where official sanction compromises the freedom of institutions or organisations to offer an effective environmental teacher education, state recognition should be carefully evaluated to ensure that it is not synonymous with state control. Accordingly, universities or relevant independent projects could play a role in establishing a system of course accreditation which would not be restrictive.

Recommendation Ten

State education authorities should consider the logistics of in-service provision in terms of teacher needs.

For example, authorised absence from school duties to attend relevant courses would encourage and facilitate teacher support of environmental education. The identification of such needs should occur during the processes of organisational and curriculum design (Recommendations Two, Twelve and Thirteen).

Recommendation Eleven

Sustained support for the newly qualified, as well as the established, environmental teacher, should be ensured.

This could be promoted or sought through a number and combination of channels: Establishing, or utilising existing teacher networks to facilitate the ongoing and mutual support that is so important for teachers, is one such opportunity. Teacher education institutions should also provide support for serving and, particularly, newly qualified teachers, by establishing and maintaining structural links with the schools and teacher organisations in their constituent communities. Furthermore, education authorities should be encouraged to develop school environments more conducive to environmental teaching in terms of resources, curricula and key personnel. This may imply the introduction of targeted courses in environmental education for specific groups, such as subject heads, principals and the inspectorate. Environmental teachers, themselves, could find support and expression for the development and pursuit of environmental education aims through active involvement in progressive teacher and education organisations. Relationships of the kind mentioned above, provide the opportunity for informal feedback on programmes, and ideas for their redevelopment as part of the evaluation process indicated in Recommendation Two.

Recommendation Twelve

Locally organised, co-ordinating bodies representing the full range of those concerned in environmental teacher education should be identified or developed where the need is expressed.

A co-ordinating body of this nature represents a forum through which local needs can be expressed and addressed. The promotion and development of

appropriate, perhaps collaborative, environmental teacher education programmes, and teacher support are also major areas of concern. Functions include the identification and co-ordination of material and non-material resources in order that they are readily accessible to the teaching community, and the motivation and generation of further practical and popular support.

Recommendation Thirteen

Initial workshops should be held to negotiate and co-ordinate the development of local organisation and programme design in environmental teacher education.

Workshops are an effective strategy for facilitating locally representative participation in the identification of needs and strengths as regards human, organisational, and material resources relevant to the development of environmental teacher education. A rigid formula for nation-wide imposition would not facilitate this dynamic, and is therefore considered an inappropriate response to the problem.

Accordingly, as an initial step towards developing environmental teacher education, the following process is proposed. Indeed, the process itself, remains open to redevelopment in reflection of the changing needs of South African environments in political, social and educational flux.

SECTION III: A PROCESS

Procedure

- 1. A fully representative workshop should be held at a local level to facilitate participation and dialogue between all those involved in the process of environmental teacher education.**

The workshop is an effective first step in the process towards developing local strategies for community-based, formal and non-formal environmental teacher education. It should be conceptualised and applied within the framework implied by the policy statements in I above.

2. Careful consideration of the funding, administration and facilitation of the workshop must be made.

With regard to the former, sponsorship from the foreign and local private sector, overseas governments, and relevant church and political organisations is indicated. A suitable non-government agency or independent educational institution provides an appropriate administrative and facilitatory structure until the environmental teacher education process generates its own momentum or co-ordinating body.

3. Planning should take a number of factors into account.

It should occur well in advance to allow sufficient time for the process of pre-briefing participants, while delegates themselves need timeous warning to arrange personal schedules.

Pre-workshop briefing of participants should be used to serve a number of purposes: It establishes a common framework and understanding of key terms, thus saving time at the workshop itself and also, where necessary, giving participants some confidence in the field; it adds a sense of obligation, thus cementing the commitment; it can elicit comments on a provisional programme; discover issues likely to need discussion; and it can be used to identify relevant participants, thus facilitating as representative a forum as possible.

4. The workshop programme should be designed in response to local priorities and needs.

Since each area will have its own set and hierarchy of needs, no agenda is prescribed. However, it is suggested that the programme, although structured, should embody a flexibility which allows it to capture and explore the dynamic of spontaneous engagement. Programme design should not, therefore, restrict the process of participatory interaction. Accordingly, group activity is considered an appropriate methodology if effectively facilitated (see section 5.4).

5. Areas and ideas for consideration are included in section II above.

The list is neither complete nor prescriptive, but may provide an indication of the type of issue likely to need addressing and incorporation into the design of the workshop programme. Local priorities will determine and highlight specific problems, conflict areas or practical considerations. The identification of such factors should be facilitated through workshopping techniques.

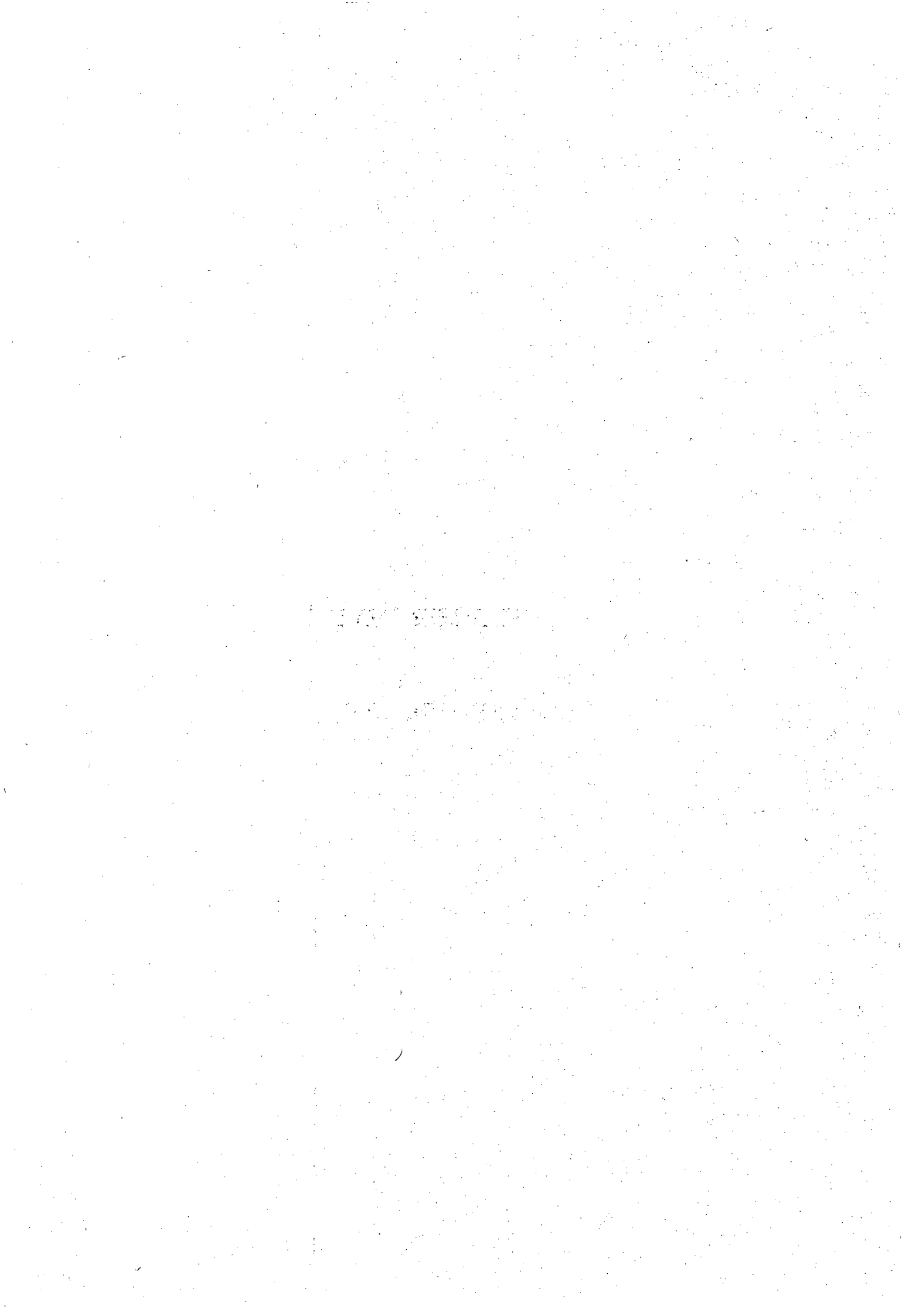
6. An arrangement for further co-operative action should be made at the workshop itself.

Such arrangement helps to encourage commitment to the process and a concomitant sense of 'ownership'. This is vital in ensuring a continued momentum that will eventually become self-sustaining. It is likely that this impulse will lead to the suggestion of forming a co-ordinating body which would facilitate future collaboration (see Recommendation Twelve, Section II). While this idea should not be imposed on the forum, it would seem to be an appropriate and practical response in the South African context of the development of environmental teacher education.

6.3 SUMMARY AND CONCLUSIONS

Guidelines for the development of environmental teacher education in South Africa have been proposed. These encompass, firstly, broad policy statements, which root the guidelines in theoretical and practical implications of environmental education and pedagogy. In terms of this foundation, South African structures and processes of state education, are found lacking. Accordingly, organisational recommendations which can withstand measurement against environmental education principles, are made. A process, similarly resistant to scrutiny, is suggested for the facilitation of such recommendations. This open-ended process is considered to be more appropriate than a rigid formula for nation-wide application. It allows initiatives to be developed at local levels, by local people and can therefore take cognisance of existing structures, strengths and needs regarding environmental education for teachers. This ensures that appropriate strategies

are designed. Having participated in the process, participants feel a sense of ownership, responsibility and loyalty to programmes, which is essential for ongoing support of the process and people involved.



CHAPTER SEVEN

CONCLUSION

7.1 OVERVIEW

The striking environmental instability and societal inequity found in South Africa needs addressing at every level of organisation. An important aspect of such action is education, more specifically, environmental education. For this to be effected successfully within the formal school system, the relevant education of teachers is a priority. Accordingly, the present study was designed to contribute to the development of appropriate strategies and programmes in environmental teacher education. Theoretically, these strategies should meet the needs of education through, and into, a South Africa beyond Nationalist rule. A clear conceptual and ideological framework is necessary if such a course is to be salvaged from the wreckage of racist and elitist educational practice, and the convulsion of organisational and ideological offshoots which it has caused. The framework, having been identified, provides a template for action and informs the process through which such action could be executed.

In accordance with this research problem, the aims of the study were:

- **to formulate a conceptual framework for environmental teacher education.** This implied the exploration of the concept of environmental education, its implications for environmental teacher education, and an associated pedagogy. These, in turn, informed the development of a South African concept of environmental teacher education;
- **to identify and evaluate practical parameters for the development of environmental teacher education strategies in South Africa.** In order to extract such parameters, it was necessary to evaluate the international experience and local organisation for structural opportunities and constraints; and finally,
- **to recommend guidelines for the development of environmental teacher education initiatives in South Africa.** The guidelines derive from the cumulative research experience and suggest a conceptual, organisational, and procedural framework for the development of environmental teacher education in South Africa.

In order to achieve these aims, research methodologies such as a literature study, field research, personal communication in the form of ongoing correspondence and interviews, and participatory research using workshopping techniques, were applied.

7.2 NEW RESEARCH DIRECTIONS

During the course of the study, certain areas were found to be lacking in relevant research. These areas highlight the direction of current and future trends in environmentalism and, hence, environmental education. An identification of gaps in the body of theoretical and practical knowledge is not, therefore, an exercise in criticising fellow environmental educationalists. On the contrary it is more likely to be an affirmation of the work currently in progress.

Relatively little documentation on environmental education which traces ancient and modern teachings of the Eastern and Third World was found. Such perspectives offer alternative philosophies and an ignored dimension to the often reductionist and positivistic conceptualisation of the environment and education found in Western theory (Ballantyne and Aston, 1990; Briceño and Pitt, 1988). The integration of alternative worldviews with the established body of theory would generate interesting and necessary debate on present environmental education practice which often fails to effect environmentally concerned behaviour. This is therefore indicated as an area of research which would contribute to the understanding of processes with which environmental educationalists wrangle.

The lack of recognition given to environmental education that does not derive from state or established structures is particularly evident in South Africa. While environmental awareness is embedded in the popular tradition of the majority of South Africans, the value of such education has been overridden by a Eurocentric conceptualisation in state and societal environmental concern. One is forced to contemplate the deliberate neglect, if not undermining, of indigenous culture which marks the history of white and, particularly, apartheid rule in South Africa. This should be addressed as a matter of urgency if a relevant environmental education is to find popular currency.

Contingent to the need for broadening the theoretical base of environmental education and environmental teacher education, is the necessity for grassroots impulses to be recognised and incorporated into the generation of environmental education programmes. This has implications for applied research in the field of environmental teacher education,

particularly as regards the design of strategies, course organisation and curricula, and the development of a relevant role for a locally identified environmental teacher. By working from and with local dynamics, environmental education can realise its potential for individual and collective empowerment. Such research is therefore a priority.

More practically, alternatives to state provision for environmental teacher education in South Africa require further exploration. Independent organisations, education projects, and resources are indicated in this regard. With the majority of present programmes geared towards support for serving teachers, provision for pre-service teachers through such agencies needs particular thought.

7.3 FINAL COMMENTS

The specific conclusions of the study are integrated into the guidelines suggested in Chapter Six. Those regarding policy (6.2, Section I), encapsulate the spirit of the study and research findings. The overriding impression is that the present South African education system, with its divisive and unequal structure, is the single largest obstacle to effecting meaningful environmental teacher education within formal education structures. Attempts to marry the demands of an environmental education approach with the educational realities of the South African *status quo* thus often mean negating the contribution of state education. Therefore, while international models rely heavily on state provision for environmental teacher education, alternative channels in South Africa offer more appropriate organisational opportunities.

Although such directions can be indicated, no dictation of a solution is offered. This derives from a commitment to the principles of environmental education, the cornerstone of the present research. In place of a rigid proposal, therefore, a participatory process for the development of a negotiated environmental teacher education is suggested. On a broader front, similarly representative participation in the formulation and restructuring of the state education system is implied. Environmental educationalists are urged to contribute their perspective on issues of organisation and curricula if new education policy and practice is to transcend the present ideological, pedagogical, and structural bonds.

In so doing, the aim is to move beyond mere non-separatism, towards equity and personal liberation through education.

In the final analysis, therefore, the author believes that until South Africa adopts a unitary education system operating within a democratic and egalitarian framework, most attempts to develop formal environmental teacher education will be compromised by current and historic forces impacting upon classroom environments throughout the nation. Ironically, it is just such forces which environmental education can and should deflect.

It is believed that this document need not remain an exercise in academicism. If it contributes to both the theoretical debate and the practical realisation of effective environmental teacher education programmes, then the personal aims of the author will have found expression.

REFERENCES

- Adams, W.M. 1990: *Green Development*. London : Routledge.
- Agarwal, A. 1988: Beyond pretty trees and tigers in India. In Pitt, D. (ed): *The future of the environment*. London : Routledge, 93-125.
- Aston, P.J. 1990a: Is environmental education green? Paper presented at the Annual National Workshop of the Environmental Education Association of Southern Africa. Jonkershoek, 17-21 September 1990.
- Aston, P.J. 1990b: The White Paper on environmental education: State(d) policy and national reality. Paper presented at the Wildlife Society Conference on the Implementation of Environmental Education. Bloemfontein, 18-19 May 1990.
- Ballantyne, R.R. 1987: Change in secondary school geography education: Teacher attitudes and practice. Cape Town : University of Cape Town, unpublished Phd. thesis.
- Ballantyne, R.R. and Aston, P.J. 1988: Environmental education teacher training: A participatory research model. *Southern African Journal of Environmental Education* 9: 3-4 and 7.
- Ballantyne, R.R. and Aston, P.J. 1989: In-service environmental education teacher training in an apartheid education system. *International Journal of Environmental Education and Information* 8(1): 1-10.
- Ballantyne, R.R. and Aston, P.J. 1990a: The provision of environmental education teacher training in South Africa. Final Report to the Human Sciences Research Council. University of Cape Town : Environmental Evaluation Unit (EEU) 7/90/52.
- Ballantyne, R.R. and Aston, P.J. 1990b: Environmental education for everyone. *Indicator South Africa: Rotating the Cube* Issue Focus April: 98-101.
- Ballantyne, R.R. and Oelofse, C.G. 1989: Implementing environmental education policy in South African schools. *The South African Journal of Education* 9(1): 7-12.
- Barnaby, G. and Bunyard, P. 1987: The nuclear arms race. In Bunyard, P. and Morgan-Grenville, F. (eds): *The green alternative*. London : Methuen London Ltd., 232-245.
- Berger, P.L. 1974: *Pyramids of sacrifice*. Hammondsworth : Penguin Books.
- Blignaut, J.B. 1991: An analysis of the prevailing awareness among senior educationalists in the Cape Education Department of the nature of environmental education and attitudes towards its implementation in schools. Cape Town : University of Cape Town, partial fulfilment of M.Sc.

- Boersma,K. 1988: The educational side of environmental education. In Briceño,S. and Pitt,D. (eds): *New ideas in environmental education*. Kent : Croom Helm/IUCN, 57-78.
- Bot,M. 1986: An overview of teacher in-service education and training (INSET) programmes in South Africa. University of Natal, Durban : Indicator Project/Urban Foundation.
- Botha,E. 1990: Learn facts through feelings. *Conserva* 5(2): 10-11.
- Botha,L. and Weinronk,E. 1990: Practical implementation of balanced and legally appropriate environmental policies by local authorities. Section 5: Synthesis and conclusions. University of Cape Town : Environmental Evaluation Unit (EEU) 8/90/53.
- Bowman,M.L. and Disinger,J.F. (eds) 1980: *Environmental education in action - iv: Case studies of teacher education programs for environmental education*. Ohio : ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Braham,M. 1988: The ecology of education. In Briceño,S. and Pitt,D. (eds): *New ideas in environmental education*. Kent : Croom Helm/IUCN, 3-32.
- Briceño,S. and Pitt,D. (eds) 1988: *New ideas in environmental education*. Kent : Croom Helm/IUCN.
- Brighouse,T. 1990: From gardening to global warming. *Annual Review of Environmental Education* 3: 3-5.
- Browett,J.G. 1980: Development and the diffusionist paradigm. *Progress in Human Geography* 4: 57-79.
- Bunyard,P. and Morgan-Grenville,F. (eds) 1987: *The green alternative*. London : Methuen London Ltd.
- Cameron,M. 1986: The introduction of Bantu education and the question of resistance - Co-operation, non-collaboration or defiance. The struggle for African schooling with special reference to Cape Town 1945-1960. Cape Town : University of Cape Town, M.Ed.
- Cape Times* 1991: ANC 'cares for environment'. 8 October 1991.
- Capra,F. 1983: *The turning point*. London : Wildwood House.
- Carson,S.McB. 1978: *Environmental education principles and practice*. London : Edward Arnold.
- Catholic Institute of Education 1990: Information document. Cape Town : CIE.

- Christian, N. 1989: Indoctrination in the geography class. Unpublished discussion paper. University of Cape Town, Department of Environmental and Geographical Science.
- Christie, P. 1986: *The right to learn: The struggle for education in South Africa*. Johannesburg : Ravan Press/Sached.
- Christie, P. and Collins, C. 1984: Bantu education - Apartheid ideology and labour reproduction. In Kallaway, P. (ed): *Apartheid education*. Johannesburg : Ravan Press, 160-183.
- Clacherty, A.J. 1988: Towards an environmental education programme for the training of primary school teachers. Cape Town : University of Cape Town, partial fulfilment of M.Sc.
- Clacherty, A.J. 1989: You can take a horse to water...Environmental education theory and practice in the context of a simple freshwater ecology. *Southern African Journal of Environmental Education* 10: 11-15.
- Clacherty, A.J. and Clacherty, G. 1990: Urban environmental education: Principles in action. *Southern African Journal of Environmental Education* 11: 18-23.
- Cock, J. 1990: Ozone-friendly politics. *Work in Progress* 66: 29-33.
- Connect* 1987a: Moscow '87 - UNESCO/UNEP International congress on environmental education and training, USSR, 17-21 August 1987. UNESCO/UNEP environmental education newsletter 12(3): 1-8.
- Connect* 1987b: Europe - North America country report on environmental education. UNESCO/UNEP environmental education newsletter 12(1): 5-7.
- Connect* 1989: National training workshop in environmental education - Bolivia. UNESCO/UNEP environmental education newsletter 14(1): 6.
- Connect* 1990: Environmentally educated teachers - The priority of priorities. UNESCO/UNEP environmental education newsletter 15(1): 1-3.
- Conway, G. and Barbier, E. 1990: *After the green revolution*. London : Earthscan Publications.
- Cowan, M.E. and Stapp, W.B. 1982 (eds): *Environmental education in action - v : International case studies in environmental education*. Ohio : ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Crewe, M. 1985: Sunny skies and total onslaught - Youth preparedness and veldschools on the Highveld. Paper read at the Kenton Conference on Environmental Education. Cape Town, October, 1985.
- Crossley, M. 1984: Strategies for curriculum change and the question of international transfer. *Journal of Curriculum Studies* 16: 75-88.

- Dankelman, I. and Davidson, J. 1988: *Women and environment in the Third World*. London : Earthscan Publications/IUCN.
- Davenport, T.R.H. 1988: *South Africa: A modern history*. Bergville : Southern Book Publishers.
- Department of Environment Affairs. 1989: White Paper on Environmental Education (ISBN 0-621-12454-0). Pretoria : Department of Environment Affairs.
- Department of National Education 1983: White Paper on the provision of education in the Republic of South Africa (ISBN 0-621-08299-6). Pretoria : Department of National Education.
- Department of National Education 1991a: Education realities in South Africa 1990. Report NATED 02-300 (91/06) ISBN: 0-7970-2303-8. Pretoria : National Education Policy Branch, Department of National Education.
- Department of National Education 1991b: Education renewal strategy: Discussion document. Pretoria : Department of National Education.
- Dinham, B. 1987: Planting poverty. *New Internationalist* 172: 24-25.
- Eco-Link 1991: Environmental update, editorial. *The Eco-link* May: 1-5.
- Ellis, S. 1990: Guest editorial. *Environmental Education Bulletin* 3: 1.
- Engel, R. 1988: Ethics. In Pitt, D. (ed): *The future of the environment*. London : Routledge, 46-59.
- Environmental Education Association of Southern Africa (EEASA) 1987: Constitution of the Environmental Education Association of Southern Africa. Grahamstown : EEASA.
- Environmental Education Association of Southern Africa 1988: Wide representation for EEASA. The Environmental Education Association of Southern Africa Newsletter, October 1988.
- Environmental Education Association of Southern Africa 1989: Workshop '89. The Environmental Education Association of Southern Africa Newsletter, October 1989.
- Environmental Education Association of Southern Africa 1990: M.Ed in environmental education. The Environmental Education Association of Southern Africa Newsletter, February 1990.
- Environmental Education Association of Southern Africa 1991: Towards a collaborative network for ee: report-back. The Environmental Education Association of Southern Africa Newsletter, March 1991.

- Fair, T.J.D. 1982: *South Africa: Spatial frameworks for development*. Johannesburg : Juta and Co, Ltd.
- Farmer, N. 1991: Ten tasks for implementing curriculum guidance seven. *Environmental Education* 37(Summer): 9.
- Forbes, D. 1984: *The geography of underdevelopment*. Kent : Croom Helm.
- Forrest, R. 1991: Japanese aid and the environment. *The Ecologist* 21(1): 24-32.
- Freire, P. 1985: *The politics of education: Culture, power and liberation*. Massachusetts : Bergin and Garvey.
- Freire, P. and Shor, I. 1987: *A pedagogy for liberation: Dialogues on transforming education*. London : Macmillan.
- Fuggle, R.F. and Rabie, M.A. 1983: *Environmental concerns in South Africa: Technical and legal perspectives*. Kenwyn : Juta and Co, Ltd.
- Gamble, F. 1990: Competitions contribute to environmental education. *Conserva* 5(2): 19.
- Gayford, C. 1987: The Local Authority Training Grants Scheme (GRIST) and the implications for environmental education. *Annual Review of Environmental Education* 1: 48-51.
- Gayford, C. 1988a: INSET and environmental education. *Annual Review of Environmental Education* 2: 10-11.
- Gayford, C. 1988b: The national curriculum and environmental education. *Annual Review of Environmental Education* 2: 32-34.
- Greig, S.; Pike, G. and Selby, D. 1987: *Earthrights: Education as if the planet really mattered*. London : WWF/Kogan Page.
- Griffin, K. 1981: Economic development in a changing world. *World Development* 9(3): 221-226.
- Gustafson, J.A. (ed) 1983: *The First National Congress for environmental education futures: Policies and Practices*. Ohio : SMEAC Information Reference Centre, Ohio State University.
- Hall, J. 1988: Museums in the service of the community. *Southern African Journal of Environmental Education* 8: 2.
- Hanks, J. 1991: Conservation and people. *Our Living World* Winter: 1.
- Hansson, B. and Scott, W. 1990: The development of environmental education in the Swedish school curriculum. *Annual Review of Environmental Education* 3: 47-48.
- Harrison, P. 1988: Stone lines or earth dikes. *New Internationalist* 183: 20-21.

- Hartshorne, K. 1986: African matric results: The disintegration of urban education. *Indicator South Africa* 4(2): 54-58.
- Hartshorne, K. 1987a: Post-apartheid education: The coming opportunities. *Critical Choices for South African Society* (4). Cape Town : Institute for the Study of Public Policy, University of Cape Town.
- Hartshorne, K. 1987b: Post-apartheid education: A concept in process. In University of the Western Cape: *People's education: A collection of articles from December 1985 - May 1987*. Cape Town : Centre for Adult and Continuing Education, University of the Western Cape, 114-135.
- Hay, I.M. 1988: A state of mind? Some thoughts on the state in capitalist society. *Progress in Human Geography* 12(1): 35-46.
- Hildyard, N. 1991: Liberation ecology. *The Ecologist* 21(1): 2-3.
- Hildyard, N. and Epstein, S. 1987: *The toxic timebomb*. Oxford : Oxford University Press.
- Hofmeyr, J. and Moulder, J. 1988: Towards scenario's for South African education: Trying to find the rules of the game. *South African Journal of Higher Education* 1(2): 9-13.
- Hofmeyr, J. and Spence, R. 1989: Education in South Africa. *Optima* 37(1): 37-48.
- Huckle, J. (ed) 1983: *Geographical education, reflection and action*. Oxford : Oxford University Press.
- Huckle, J. 1985: Values education through geography: A radical critique. In Boardman, D. (ed): *New directions in geography education*. London : The Farmer Press, 187-198.
- Huckle, J. 1986: Geographical education for environmental citizenship. *Geographical Education* 5(2): 13-20.
- Huckle, J. 1990: Green consumerism - exploring the contradictions. *Annual Review of Environmental Education* 3: 37-39.
- Hungerford, H. and Peyton, R.B. 1986: *Procedures for developing an environmental education curriculum*. *Environmental Education Series 22*. Paris : UNESCO/UNEP.
- Huntley, B.; Siegfried, R. and Sunter, C. 1989: *South African Environments into the Twenty-First Century*. Cape Town : Human and Rousseau/Tafelberg.
- Hurry, L.B. 1982: Directions in environmental education and their implication for the training of primary school teachers in the Transvaal: Towards a synthesis. Pretoria : University of South Africa, unpublished Phd. thesis.
- Hurry, L.B. (ed) 1987: Teaching for environmental conservation - a guide for teachers in all phases of education. Commissioned by the Committee for Environmental Education of the Council for the Environment.

- Imahori,K. 1984: Environmental education in Japan. *Environmental Education and Information* 3(1): 61-72.
- Integrated Marketing Research 1990: The third alternative: Summary report - People's response to the South African education crisis, August 1990. Rivonia : Integrated Marketing Research.
- Irwin,P.R. 1982: Conservation awareness amongst White adolescents in South Africa: A study of senior secondary pupils in Natal. Pietermaritzburg : University of Natal, M.Ed.
- Irwin,P.R. 1984: The origin and development of environmental education - a world perspective. *Southern African Journal of Environmental Education* 1(1): 7-9.
- Irwin,P.R. 1987: Environmental education in Bophuthatswana. *Conserva* 2(4): 16-17.
- Irwin,P.R. 1988: EEASA members opinion survey/OOGSA lede meningsopname. *Southern African Journal of Environmental Education* 9: 12-15.
- Irwin,P.R. 1990a: What is environmental education? *Conserva* 5(2): 4-5 and 22.
- Irwin,P.R. 1990b: The concept of environmental education and the development of environmental education in South Africa. *Southern African Journal of Environmental Education* 11: 3-7.
- Irwin,P.R. 1991: What have we done with our land? *Our Living World* Spring: 19.
- IUCN/UNEP/WWF 1980: World conservation strategy: Living resource conservation for sustainable development. Morges : IUCN.
- IUCN/UNEP/WWF 1990: Caring for the world: A strategy for sustainability (Second draft). Gland : IUCN/UNEP/WWF.
- IUCN/UNEP/WWF 1991: Caring for the earth: A strategy for sustainable living. Gland : IUCN/UNEP/WWF.
- Johnson,S. 1991: Towards a national strategy for environmental education. Environmental Education Association of Southern Africa Newsletter, July 1991.
- Johnston,R.J. 1982: *Geography and the state*. London : Macmillan Press.
- Joyce,P.T. 1988: *The South African pocket digest*. Bureau for Economic Research, University of Stellenbosch/Cape Town : Struik.
- Kallaway,P. (ed) 1984: *Apartheid education*. Johannesburg : Ravan Press.
- Kallaway,P. 1987: Education and the state: From mass education to Bantu education to People's education - Some preliminary notes. In Young,D. and Burns,R. (eds): *Education at the crossroads*. Cape Town : School of Education, University of Cape Town, 20-56.

- Kemmis, S. (ed) 1982: *The action research reader*. Victoria : Deakin University, Australia.
- Khan, F. 1990a: Contemporary South African environmental response: An historical and socio-political evaluation, with particular reference to blacks. Cape Town : University of Cape Town, partial fulfilment of MA.
- Khan, F. 1990b: Looking back to look forward. *Earthyear 90* June: 14-17.
- Khan, F. 1991a: Post-apartheid South Africa. *Earthyear 91* June: 15-17.
- Khan, F. 1991b: Proceedings of workshops 1-3 on 'Strategies to reconnect people with the environment'. Cape Town : The Botanical Society of South Africa.
- Khan, F. 1991c: Proceedings of workshops 1 and 2 on 'Community Greening' held by the National Botanical Institute, Kirstenbosch, 15 June and 27 July 1991.
- Kirk, J.J. (ed) 1982: *Facets and faces of environmental education*. New Jersey : New Jersey School of Conservation.
- Knamiller, G. 1985: Environmental education for development - a course at the University of Leeds. *Reed* 13(2): 3-5.
- Knill, W.G. 1990: What is green? *Green Piece* 1(1): 1-4.
- Knill, W.G. 1991a: The green paradigm. Cape Town : University of Cape Town, unpublished Phd. thesis.
- Knill, W.G. 1991b: Towards the green paradigm. *South African Geographical Journal* 73(2): 52-59.
- Knill, W.G. 1991c: Green and the Third World. Discussion Paper. University of Cape Town, Centre for African Studies.
- Korir-Koech, M. 1988: Environmental education in Kenya. Report to the Moscow EE Congress, 1987. *Connect* 13(3): 5.
- Kruss, G. 1988: *People's education: An examination of the concept*. Cape Town : Centre for Adult and Continuing Education, University of the Western Cape.
- Lacey, C. and Williams, R. (eds) 1987: *Education, ecology and development*. London : Kogan Page.
- Lahiry, D.; Sinha, S.; Gill, J.; Mallik, U. and Mishra, A. (eds) 1988: *Environmental education: A process for pre-service teacher training curriculum development*. *Environmental Education Series 26*. Paris : UNESCO/UNEP.
- Lappe, F. and Collins, J. 1988: *World hunger: Twelve myths*. London : Earthscan Publications.
- Leather, A. 1988: Mega-flops. *New Internationalist* 183: 10-11.

- Lekgetho, J. 1990: Keynote address. In Proceedings of the Conference on the Implementation of Environmental Education. Wildlife Society Conference, University of the Orange Free State, Bloemfontein, 18-19 May 1990.
- Lodge, T. 1983: *Black politics in South Africa since 1945*. Johannesburg : Ravan Press.
- Lovelock, J. 1986: Gaia: The world as living organism. *New Scientist* 18: 25-28.
- Low, B. and Hoon, E. 1990: Community involvement in environment (CEE). *Environmental Education Bulletin* 3: 10-13.
- Maher, M. 1986: Environmental education. What are we fighting for? *Geographical Education* 5(2): 24-25.
- McCarthy, C.L. 1981: The report of the independent commission on international development issues (Brandt Report): Relevance for South Africa. Stellenbosch : Unit for Futures Research, University of Stellenbosch.
- Muir, K. 1986: Motherwell's science bus. *Environmental Education* 32(Winter): 24.
- Muller, J. 1987: People's education for people's power and the NECC. In University of the Western Cape: *People's education: A collection of articles from December 1985 - May 1987*. Cape Town : Centre for Adult and Continuing Education, University of the Western Cape, 106-113.
- Murphy, B. 1988: Learning on our feet. *New Internationalist* 183: 12-13.
- Naidoo, P. 1990: An analysis of the concept of people's education and how it relates to environmental education. *Environmental Education Bulletin* 3: 14-15.
- National Environmental Awareness Campaign 1990: *NEAC 1990*. Dobsonville : NEAC.
- Neal, P. 1987: Environmental education in schools. *Annual Review of Environmental Education* 1: 2-3.
- Neal, P. 1991: The implementation of environmental education as a cross curricular theme in a secondary school. *Environmental Education* 37(Summer): 7-8.
- Njobe, M.W. 1990: *Education for liberation*. Braamfontein : Skotaville.
- Numata, M. 1985: A survey of environmental science and environmental education. *Environmental Education and Information* 4(4): 298-306.
- O'Donoghue, R. and McNaught, C. 1991: Environmental education: The development of a curriculum through 'grass roots' reconstructive action. *The International Journal of Science Education* (in press).
- O'Donoghue, R. and Taylor, J. 1988: Towards participant-centred resource development for environmental education. *Southern African Journal of Environmental Education* 7: 3-5 and 31.

- O'Donoghue,R. and Taylor,J. 1990: Towards a co-operative network for environmental education. *Environmental Education Bulletin* 2: 2-5.
- Okot-uma,R.W'O. and Wereko-Brobby,C. 1985: Environmental education: The African dimension. *The Environmentalist* 5(2): 137-142.
- Open Schools Association 1990: Guidelines towards non-racial schooling. Cape Town : Open Schools Association.
- Opie,F.W.J. 1989: *The outdoor classroom*. Cape Town : Maskew Miller Longman (Pty)Ltd.
- Opie,F.W.J. 1990: Factors associated with the development of positive student attitudes and aesthetic response towards a South African natural environment. Cape Town : University of Cape Town, unpublished Phd. thesis.
- O'Riordan,T. 1981: Environmentalism and education. *Journal of Geography in Higher Education* 5(1): 3-17.
- O'Riordan,T. 1988: Future directions for environmental policy. In Pitt,D. (ed): *The future of the environment*. London : Routledge, 168-198.
- O'Riordan,T. and Turner,R.K. 1983: *An annotated reader in environmental planning and management*. Oxford : Pergamon Press.
- Oxenham,J. (ed) 1984: *Education versus qualifications?* London : George Allen/Unwin.
- Painter,M.; Evans,W. and Nimick,C. 1979: The Tinker Truck - EE in motion. In Sacks,A. and Davis,C. (eds): *Current issues v: The yearbook for environmental education and environmental studies*. Ohio : ERIC Clearinghouse for Science, Mathematics, and Environmental Education, 256-260.
- Palmer,J. 1989: The national curriculum. *Environmental Education* 31(summer): 4-6.
- Parry,M. 1988: Planning and implementing environmental education. *Annual Review of Environmental Education* 2: 9-10.
- Paxton,L. 1990: Centre aims to improve environmental literacy. *Conserva* 5(2): 18.
- Peng,K.K. 1987: Polluting the poor. *New Internationalist* 171: 12-13.
- Pepper,D. 1984: *Roots of modern environmentalism*. London : Croom Helm.
- Pepper,D. 1987: The basis of a radical curriculum in environmental education. In Lacey,C. and Williams,R. (eds): *Education, ecology and development*. London : Kogan Page, 65-79.
- Perrot,E. 1977: Environmental education - key issues of the future: The role of the educator. In Council for the Environment, 1984: Working documents for a national policy on environmental education, Midmar Dam, 30-34.

- Pickerill,R. 1987: The Science Education Project (SEP): A Western Cape perspective on an activity-based approach to junior secondary science in Southern African schools. In Young,D. and Burns,R.: *Education at the crossroads*. Cape Town : School of Education, University of Cape Town, 130-140.
- Pitt,D. (ed) 1988: *The future of the environment*. London : Routledge.
- Popkewitz,T.S. 1984: *Paradigm and ideology in education research*. London : Falmer Press.
- Primary Science Project 1988: Primary Science Programme. Western Cape Region : The Urban Foundation.
- Redclift,M. 1987: *Sustainable development: Exploring the contradictions*. London : Methuen.
- Richards,D.R. 1985: An alternative programme for developing environmental literacy in 12 year old South African school children: A study done amongst white senior primary pupils in Natal. Pietermaritzburg : University of Natal, M.Ed.
- Robottom,I. (ed) 1987: *Environmental education: Practice and possibility*. Melbourne : Deakin University.
- Rogerson,C. 1988: Regional development policy in South Africa. In Obudho,R.A. (ed): *Regional development policies and planning in Africa*. Nagoya : United Nations Centre for Regional Development, 228-255.
- Rostow,W. 1960: *Stages in economic growth*. New York : Cambridge University Press.
- Sacks,A.B.; Iozzi,L.A. and Wilke,R. (eds) 1983: *Current issues in environmental education and environmental studies, volume viii*. Ohio : ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Sandbach,F. 1981: *Environment, ideology and policy*. Oxford : Basil Blackwell.
- Saveland,R.N. (ed) 1976: *Handbook of environmental education*. London : John Wiley and Sons.
- Schafer,R.J.H. 1983: Government responsibility and environmental education. In Gustafson,J.A. (ed): *The First National Congress for environmental education futures: Policies and Practices*. Ohio : SMEAC Information Reference Centre, Ohio State University, 87-88.
- Schollar,E. 1986: Alternatives in education. In Sached: *Point of View*. Johannesburg : Sached 14-23.
- Schreuder,D. 1990: Leer eers leerkragte. *Conserva* 5(2): 8-9.
- Seidman,J. 1990: *In our own image*. Gaborone : Foundation for Education with Production.

- Share-Net 1991: Proceedings of the workshop held at Potberg Education Centre, De Hoop 8-10 March 1991.
- Sharp,R. 1980: *Knowledge, ideology and the politics of schooling*. Norfolk : Lowe and Brydone.
- Shongwe,D. 1991: Report on World Environment Day Seminar 1991. University of Bophuthatswana, Mmabatho, 5 June 1991.
- Short,R. 1990: What is sustainable development? *Earthlife Africa (Cape Town)* Nov/Dec: 2.
- Simon,J. and Kahn,H. 1984: *The resourceful earth*. Oxford : Basil Blackwell.
- Sisulu,Z. 1986: People's education for people's power. Keynote address, second national consultative conference. Durban, 29 March 1986.
- Skolimowski,H. 1984: Eco-ethics as the foundation of conservation. *The Environmentalist* 4: 45-51.
- Smith,R. 1988: Local environmental education: a new approach for teachers in Nottingham. *Teaching Geography* 13(3): 129.
- Smythe,J.C. 1983: The place of the environment in general education. *The Environmentalist* 3: 121-129.
- Smythe,J.C. 1988: What makes education environmental? In Briceño,S. and Pitt,D. (eds): *New ideas in environmental education*. Kent : Croom Helm/IUCN, 33-56.
- South 1991: Differences set aside at ecology conference. 18-14 July 1991.
- South African Institute of Race Relations 1989: *Race relations survey 1988/89*. Johannesburg : South African Institute of Race Relations.
- South African Institute of Race Relations 1990: *Race relations survey 1989/90*. Johannesburg : South African Institute of Race Relations.
- Southwick,C.H. 1976: *Ecology and the quality of our environment*. New York : D. van Nostrand Company.
- Stapp,W.B. 1982: Status and analysis of UNESCO's effort to further environmental education internationally - toward a national strategy for environmental education. In Cowan,M.E. and Stapp,W.B. (eds) : *Environmental education in action - v : International case studies in environmental education*. Ohio : ERIC Clearinghouse for Science, Mathematics, and Environmental Education, 7-16.
- Sterling,S.R. 1987: Provision for environmental education in rural areas. *Annual Review of Environmental Education* 1: 12-13.

- Swift,R. 1988: From the grassroots: Solving the development puzzle. *New Internationalist* 183: 4-6.
- Taylor,D. 1985: *Women: A World Report*. London : Methuen/New Internationalist.
- Taylor,J. 1989: The White Paper on environmental education and the Wildlife Society's role. *African Wildlife* 43(4): 206-211.
- Teacher Opportunity Programmes 1991a: TOPS the Organisation: Information brochure. Johannesburg : TOPS Media Office.
- Teacher Opportunity Programmes 1991b: TOPS and expansion. *TOPS Bulletin* 1: 1-3.
- The Star* 1991: Environmental issues can't be shelved. 18 July 1991.
- Timberlake,L. 1985: *Africa in crisis - the causes, the cures of environmental bankruptcy*. London : Earthscan Publications.
- Timberlake,L. 1987: *Only one earth - Living for the future*. London : Earthscan Publications.
- UNESCO 1977: *Trends in environmental education*. Paris : UNESCO.
- UNESCO/UNEP 1977: The international workshop on environmental education: Belgrade October 1975: Final Report. Paris : UNESCO.
- UNESCO/UNEP 1978: Intergovernmental conference on environmental education. Final Report (Tbilisi Report). Paris : UNESCO.
- UNESCO/UNEP 1983-1987: International Environmental Education Programme: Environmental education series. Paris : UNESCO.
- United Nations, 1972: United Nations Conference on the Human Environment, Stockholm, Recommendation 96. In Council for the Environment, 1984: Working documents for a national policy on environmental education, Midmar Dam, 7.
- United Nations Centre for Disarmament 1982: *The relationship between disarmament and development*. *Disarmament Study Series*, 5,A/36/356. New York : United Nations Centre for Disarmament.
- University of the Western Cape 1987: *People's education: A collection of articles from December 1985 - May 1987*. Cape Town : Centre for Adult and Continuing Education, University of the Western Cape.
- Urban Foundation 1991: Mission Statement. Cape Town : Urban Foundation.
- van Zyl,S. 1988: The museum: A partner in environmental education. *Southern African Journal of Environmental Education* 8: 18-19.
- Viljoen,H. 1990: White Paper - symbol of concern. *Conserva* 5(2): 6-7.

- Von Hofsten, A. 1982: Environmental education in Sweden: A project on natural and technical science. In Cowan, M.E. and Stapp, W.B. (eds) : *Environmental education in action - v: International case studies in environmental education*. Ohio : ERIC Clearinghouse for Science, Mathematics, and Environmental Education, 284-290.
- Vulliamy, A. 1985: The diversification of secondary school curricula: Problems and possibilities in Papua New Guinea. In Lillis, K.M. (ed): *School and community in less developed areas*. London : Croom Helm 142-170.
- Vulliamy, A. 1987: Environmental education in Third World schools: Rhetoric or realism. *The Environmentalist* 7(1): 11-19.
- Ward, C. (ed) 1986: *Fields, factories and workshops (tomorrow)*. London : Freedom Press.
- Weekly Mail* 1991a: Mandela goes green. 5-11 April 1991.
- Weekly Mail* 1991b: The changing of the guards - in SA's game reserves; Preserve our heritage for our people, says Mandela. 16-22 August 1991.
- Weekly Mail* 1991c: Education Update. 23-29 August 1991.
- Whitman, J. 1988: *The environment in Israel*. Jerusalem : Environmental Protection Service.
- Wilke, R.J. 1983: Mandating preservice EE teacher training: The Wisconsin Experience. In Gustafson, J.A. (ed): *The First National Congress for environmental education futures: Policies and Practices*. Ohio : SMEAC Information Reference Centre, Ohio State University, 63-64.
- Wilke, R.J. Peyton, R.B. and Hungerford, H.R. 1980: *Strategies for the training of teachers in environmental education: A discussion guide for UNESCO training workshops on environmental education*. PARIS : UNESCO.
- Wilke, R.J.; Peyton, R.B. and Hungerford, H.R. 1987: *Strategies for the training of teachers in environmental education*. *Environmental Education Series 25*. Paris : UNESCO.
- Wilson, F. and Ramphela, M. 1989: *Uprooting poverty, the South African challenge*. Cape Town : David Philip.
- World Commission on Environment and Development (WCED) 1987: *Our common future*. London : Oxford University Press.
- Worldwide Fund for Nature 1987: Annual report. *Annual Review of Environmental Education* 1: 31.
- Zeichner, K.M. and Tabachnick, B.R. 1981: Are the effects of university teacher education "washed out" by school experience? *Journal of Teacher Education* 32(3): 7-11.

PERSONAL COMMUNICATION

The following individuals are cited in the text. Communication was conducted in non-formal interviews or discussions, as well as by post. In many instances this has been an on-going process of dialogue and exchange. The organisations or positions ascribed to individuals, reflect the *status quo* at the time of communication.

AINSLIE, A.
Primary Science Project
Urban Foundation
Cape Town, Cape

BARUTI, A.
Education Officer
Treasure Beach Project (Wildlife Society)
The Bluff
Durban, Natal

CARELSE, V.
Regional Chairperson
Western Cape Region
South African Democratic Teachers' Union (SADTU)
Cape Town, Cape

CLAYTON, Dr.J.
Principal
School in the Wild
Villiersdorp, Cape

DA COSTA, Dr.Y.
Lecturer
Faculty of Education
University of the Western Cape
Bellville, Cape

FOORD, A.
Lecturer PROTEC College/
Mvuze Mvuze Comprehensive School
Khayelitsha, Cape

FOWKES, S.
Environmental Evaluation Unit
University of Cape Town
Rondebosch, Cape

GRINDLEY, S.
Environmental Evaluation Unit
University of Cape Town
Rondebosch, Cape

GUBB, A.
Conservation Officer
Wildlife Society (Western Cape Branch)
Tokai, Cape

GUNTHER, A.
Assistant Director
Department of Education and Training
Cape Town, Cape

HALLINAN, J.
Regional Services Council
Simonstown, Cape

HARRISON, J.
South African Museum
Cape Town, Cape

HEESE, S.
Geography Head of Department
Mvuze Mvuze Comprehensive School/
Regional Geography Supervisor (Inservice Training)
Khayelitsha, Cape

HOBDEEN, P.
Shell Science and Mathematics Resource Centre Educational Trust
Science Education Co-ordinator
Natal University
Durban, Natal

HOLDERNESS, W.
Primary Education Upgrading Project (PEUP)
Mmbatho, Bophuthatswana

HOON, E.
Department of Nature Conservation (Education)
Cape Provincial Administration
Cape Town, Cape

HURRY, Dr.L.
Director of Education
Kangwane Department of Education
Louw's Creek, Kangwane

IRWIN, Prof.P.
Faculty of Education
Rhodes University
Grahamstown, Cape

JAMES, I.
Principal
Mowbray Teachers Centre
Mowbray, Cape

JOHNSON, S.
Bophuthatswana Parks Board
Mafeking, Bophuthatswana

KELLY, A.
Education Officer
Wildlife Society (Western Cape Branch)
Tokai, Cape

KEOGH, M.
Science Education Project
Natal University
Durban, Natal

KLEIN, C.
Project Co-ordinator
Environmental Education and Resources Unit
University of the Western Cape
Bellville, Cape

LLOYD, G.

Teachers and Learners Resource Centre (TLRC)
University of Cape Town
Rondebosch, Cape

LOW, B.

Director Environmental Education and Resources Unit
University of the Western Cape/ Botanical Society of South Africa (Botsoc)/ National
Botanical Institute (NBI)
Newlands, Cape

MADUNGWE, J.

In-service Education and Training Scheme
Bophuthatswana Department of Education
Mmabatho, Bophuthatswana

MARSHAL, J.

Regional Co-ordinator Environmental Education
Cape Provincial Administration
Cape Town, Cape

MOHAPE, E.

Bophuthatswana College of Education
Mmabatho, Bophuthatswana

MOLEFE, M.

Past Principal,
Pilanesberg Environmental Education Centre/
Full time student
University of Bophuthatswana
Mmabatho, Bophuthatswana

MORRISSON, K.

In-service Education
Catholic Institute of Education (CIE)
Cape Town, Cape

MPUTLE, P.

Principal
Pilanesberg Environmental Education Centre
Pilanesberg National Park
Mogwase, Bophuthatswana

NIGHTINGALE, S.
Head of Geography Department
Edgewood College of Education
Pinetown, Natal

O'DONOGHUE, R.
Natal Parks Board
Pietermaritzburg, Natal

PICKERILL, R.
Science Education Project (SEP)
c/o School of Education
University of Cape Town
Rondebosch, Cape

RAIMONDO, Dr.J.
Director
Environmental Evaluation Unit
University of Cape Town
Rondebosch, Cape

RAMMUTLA, L.
Bophuthatswana National Parks Board
Mmabatho, Bophuthatswana

ROSSOUW, H.
National Parks Board
Cape Town, Cape

RUSSELL, E.
Lecturer
Goodhope Teachers' College
Khayelitsha, Cape

SINCLAIR, P-J.
The Fairest Cape Association
Cape Town, Cape

SNYDERS, N.
Co-ordinator
Potberg Environmental Education Centre
De Hoop, Cape

SOUTTER, R.
Southern African Nature Foundation (SANF)
Stellenbosch, Cape

SOWMAN, M.
Environmental Evaluation Unit
University of Cape Town
Rondebosch, Cape

SPARGO, Prof.P.
School of Education
University of Cape Town
Rondebosch, Cape

STONE, R.
Teacher Opportunity Programmes (TOPS) facilitator/
Lecturer
Goodhope Teachers' College/
Khayelitsha, Cape

TAYLOR, J.
Extension Services
Umgeni Valley Project (Wildlife Society)
Howick, Natal

VAN DEN BERG, F.
Geography Education
Natal Education Department
Pietermaritzburg

VAN DEN BERG, I.
Environmental Education Course Convenor
Natal College of Education
Pietermaritzburg

VILJOEN, H.
Department of Environment Affairs
Pretoria, Transvaal

APPENDICES

APPENDIX A: FIELD RESEARCH

APPENDIX B: WORKSHOP DOCUMENTS

APPENDIX A

FIELD RESEARCH

- i) **BOPHUTHATSWANA AND SELECTED CENTRES IN THE TRANSVAAL**
23 - 26 MAY 1988
- ii) **SELECTED CENTRES IN THE CAPE PROVINCE**
3 - 7 OCTOBER 1988
- iii) **NATAL FIELD RESEARCH**
27 FEBRUARY - 3 MARCH 1989



The aims behind conducting field research were as follows:

- 1) • to investigate existing environmental education and environmental teacher education programmes (Particular, though not sole, emphasis was on the non-formal provision of environmental education);
- 2) • to examine the flexibility, structure and suitability of such programmes for environmental teacher education;
- 3) • to evaluate alternative organisational opportunities;
- 4) • to introduce practitioners of environmental education to the research idea and to encourage their input;
- 5) • to identify suitable workshop participants; and
- 6) • to extend the range of contacts for ongoing personal communication.

Three field trips were undertaken. These covered regions beyond the immediate range of the research base and included Bophuthatswana and selected areas of the Transvaal, the Eastern Cape Province, and Natal. The research trips allowed for non-structured interviews and visits to the people and organisations detailed below. These are arranged chronologically rather than alphabetically.

i) **BOPHUTHATSWANA AND SELECTED CENTRES IN THE TRANSVAAL**
23 -26 MAY 1988

1. DELTA PARK
Linda Paxton
Co-ordinator
Southern African Nature Foundation
Johannesburg
2. HAPPY ACRES
Brenda Cauldwell
Co-ordinator
Magaliesburg
3. UNIVERSITY OF THE WITWATERSRAND
Department of Geography
Johannesburg
4. Professor Pat Irwin (currently Rhodes University)
Faculty of Education
University of Bophuthatswana (UNIBO)
Mmabatho, Bophuthatswana

As a result of the thorough and kind planning of Prof. Irwin, further interviews in Bophuthatswana were conducted with the following individuals:

E. Mohape:	Bophuthatswana College of Education
P. Naude:	Mmabatho High School
S. Mahura:	Teacher and Unibo graduate
M. Molefe:	Ex-principal of Pilanesberg environmental education centre and current full-time student
A. Irwin:	Pre-primary teacher
L. Rammutla:	Bophuthatswana National Parks Board
P. Buckland:	Institute of Education
J. Madungwe:	Bophuthatswana In-service Education and Training scheme
W. Holderness:	Primary Education Upgrading Project
P. Mputle:	Principal, Pilanesberg environmental education centre
A. Monau:	Education officer, Pilanesberg
E. Morei:	Education officer, Pilanesberg
K. Gaborone:	Education officer, Pilanesberg
T. Monchusi:	Education officer, Pilanesberg
P. Nobela:	Interpretation officer, Pilanesberg
S. Johnson:	Pilanesberg National Park

ii) **SELECTED CENTRES IN THE CAPE PROVINCE**
3 - 7 OCTOBER 1988

1. **SCHOOL IN THE WILD**
Dr John Clayton
Principal
Villiersdorp
2. **THE POTBERG ENVIRONMENTAL EDUCATION CENTRE**
Norris Snyders
Co-ordinator
De Hoop

Coinciding with the two day visit to this centre, was an in-service course for all Cape Provincial Administration education officers. Links were therefore established with the staff from Potberg itself, the Gold Fields centre in the Cape Point Nature Reserve (Cape Town), Camdeboo Environmental Education Centre (Graaf Reinet), and the Thomas Baines Centre (Grahamstown). The regional co-ordinator of environmental education, Johan Marshal, was also present and available for discussion.

3. **VELD AND VLEI**
Bill Collins
Co-ordinator
Willow Point
Sedgefield

Through visiting the Sedgefield facility it became apparent that the Estcourt (Natal) and Milnerton (Cape) facilities offer similar opportunities:

4. CENTRE FOR OUTDOOR EDUCATION

Mr.Horn
Principal
Liebenbergstraat
Graaf-Reinet

iii) NATAL FIELD RESEARCH
27 FEBRUARY - 3 MARCH 1989

1. Dr. Lynn Hurry
Director of Education
Kangwane
Louw's Creek

2. Rob O'Donoghue
Natal Parks Board
Pietermaritzburg

3. Jim Taylor
Extension Services
Wildlife Society
Howick

4. UMGENI VALLEY PROJECT
Wildlife Society
Howick

5. ASSOCIATION OF SCIENCE TEACHERS (ASTE)/ SCIENCE
EDUCATION PROJECT (SEP)
Margaret Keogh
University of Natal
Durban

6. NATAL EDUCATION DEPARTMENT
F. van den Burg
Geography Education
Pietermaritzburg

7. NATAL COLLEGE OF EDUCATION
I. van den Burg
Environmental Education Course Convenor
Pietermaritzburg

8. THE SHELL SCIENCE AND MATHEMATICS RESOURCE CENTRE
EDUCATIONAL TRUST
Paul Hobden
Science Education Co-ordinator
University of Natal
Durban

9. EDGEWOOD COLLEGE OF EDUCATION
Sing Nightingale
Head of Geography Department
Pinetown

10. TREASURE BEACH PROJECT
Allie Baruti
Debbie Hibbit
Education Officers
Wildlife Society
The Bluff
Durban

APPENDIX B

WORKSHOP DOCUMENTS¹⁵

- i) PROGRAMME**
- ii) LIST OF PARTICIPANTS**
- iii) DISCUSSION SHEET**
- iv) FACT SHEET**
- v) TASK SHEET**
- vi) PLAN FORM**
- vii) EVALUATION FORM**

¹⁵ Earlier versions of these documents used the term 'teacher training'. This was subsequently changed to reflect more clearly the aims of environmental teacher education.

i) PROGRAMME

**WORKSHOP ON ENVIRONMENTAL TEACHER EDUCATION
CONSTANTIA, CAPE TOWN, SEPTEMBER, 1989.
PROGRAMME**

DAY ONE: Tuesday, 5 September

09h30 - 09h40: Welcome Delegates - Dr.Roy Ballantyne
09h40 - 10h00: Opening Address - Prof.Richard Fuggle
10h00 - 10h30: Introductory Session - Dr.Roy Ballantyne
10h30 - 10h45: Structures for Environmental Teacher Education - Peta Aston
10h45 - 11h15: Task One - "Developing a Plan"

11h00 - 11h30: TEA

11h30 - 12h45: Task One continued

12h45 - 13h45: LUNCH WILL BE SERVED

13h45 - 15h00: Task Two - "Evaluating Plans"

15h00 - 15h20: TEA

15h20 - 16h30: Task Three - " Presentation and Discussion"

PLEASE JOIN US FOR CHEESE AND WINE IN THE PATIO ROOM

DAY TWO: Wednesday, 6 September

09h30 - 09h50: Introductory Session - Dr.Roy Ballantyne
09h50 - 10h30: Task One - "Model Refining"
10h30 - 11h15: Task Two - Presentation and Discussion

11h15 - 11h45: TEA

11h45 - 12h45: Task Three - Procedures for Implementation: "What Now?"

12h45 - 13h30: LUNCH WILL BE SERVED

13h30 - 14h45: Further Debate

14h45 - 15h00: A Final Word - Dr.Roy Ballantyne

TEA

ii) LIST OF PARTICIPANTS

N.Christian
Teacher
Department of Education and Culture
c/o Department of Environmental and Geographical Science
University of Cape Town
Rondebosch 7700
Ph: 650 2878

Dr.Y.Da Costa
Geography Education
Faculty of Education
University of the Western Cape
Private Bag X17
Bellville 7535
Ph: 959 2857

R.Goodwin
South African Teachers' Association/
Cape Town Teachers' College
Mowbray
Ph: 686 3659

A.Gunther
Department of Education and Training
Ph: 21 5426

J.Hallinan
Regional Services Council
P O Box 62
Simonstown 7995
Ph: 80 1100

S.Heese
Regional Geography Supervisor (In-service Training)
Department of Education and Training/
Mvuse Mvuse Comprehensive School
Khayelitsha
Ph: 650 2878

E.Hoon
Cape Provincial Administration Nature Conservation
Private Bag 9086
Cape Town 8000
Ph: 203 4089

Dr.L.Hurry
Kangwane Department of Education
Private Bag X1002
Louw's Creek 1302
Ph: 01314 - 79111

Prof.P.Irwin
Faculty of Education
Rhodes University
Box 94
Grahamstown 6140
Ph: 0461 - 22023

C.Katts
Hewat College of Education
Kromboom Road
Crawford 7764
Ph: 696 5133

A.Kelly
Wildlife Society
P.O.Box 145
Tokai 7966
Ph: 701 1397

D.Kennedy
Department of Education and Culture
Administration: House of Representatives
Private Bag 9008
Cape Town 8000
Ph: 45 5641 X176

F.Khan
Western Cape Teachers' Union (Wectu)
c/o Department of Environmental and Geographical Science
University of Cape Town
Private Bag
Rondebosch 7700
Ph: 650 2872

W.King
Hewat College of Education
Kromboom Road
Crawford 7764
Ph: 696 5133

S.Michelle
Cape Town College of Education
Private Bag
Mowbray 7705
Ph: 686 3659

N.Oliver
Hewat College of Education
Kromboom Road
Crawford 7764
Ph: 696 5133

Dr.F.Opie
Cape Town College of Education
Private Bag
Mowbray 7705
Ph: 686 6948

R.Pickerill
Science Education Project
c/o School of Education
University of Cape Town
Private Bag
Rondebosch 7700
Ph: 650 2776

Dr.J.Raimondo
Environmental Evaluation Unit
c/o Department of Environmental and Geographical Science
University of Cape Town
Private Bag
Rondebosch 7700
Ph: 650 2867

H.Rossouw
National Parks Board
P.O.Box 7400
Roggebaai 8012
Ph: 419 5185

E.Russell
Goodhope Teachers' College
Private Bag X001
Khayelitsha 7784
Ph: 397-1605

D.Schreuder
Department Didactics
University of Stellenbosch
Stellenbosch 7600
Ph: 02231 - 772293

R.Soutter
Southern African Nature Foundation
P.O.Box 456
Stellenbosch 7600
Ph: 02231 - 72892

Prof.P.Spargo
School of Education
University of Cape Town
Private Bag
Rondebosch 7700
Ph: 650 2778

H.Viljoen
Department of Environment Affairs
Private Bag X447
Pretoria 0001
Ph: 012 - 310 367

iv) **FACT SHEET**

The following may inform your suggestions regarding the development of pre- and in-service environmental teacher education in the South-Western Cape.

Some statistics regarding teachers and student teachers:

- There are 18 departments of education in South Africa.
- In 1987/88 there were 265 759 teachers employed in South Africa (Institute of Race Relations, 1989).
- This year, the House of Representatives employs 15 339 teachers in the South-Western Cape. The student teacher enrolment in the colleges of education under its jurisdiction is 8 197.
- The Cape Education Department (CED), in 1988, employed 14 895 teachers in primary and secondary schools. The student enrollment in CED colleges of education was 1 578.
- The Department of Education and Training employs 8 657 teachers in all schools in the South-Western and Eastern Cape. It has some 3 280 full-time student teachers in its three colleges of education in the Cape Province.

Education Centres:

- The CED has established teacher centres in Mowbray and Bellville which are equipped with teaching aids and a variety of resources.
- The CED administers and staffs outdoor schools such as School in the Wilds in Villiersdorp and the outdoor centre in Graaff-Reinet.
- No teacher centres are available for use by black teachers
- In-service education for black teachers is largely facilitated by organisations outside of the departments. For example, the Science Education Project (SEP) is a nationally based operation concerned with upgrading the teaching of sciences at junior secondary level and producing innovative curriculum materials. Their materials are used in over 2 000 schools in South Africa. (Details of the project can be found at the Information Desk in the copy of:

Young, D. and Burns, R. (eds) 1987: *Education at the crossroads*. Cape Town: School of Education, University of Cape Town.)

- The Wildlife Society does not, as yet, have an environmental education centre in the Cape. The Western Cape branch employs a full-time education officer who has begun, on a small scale, to introduce teacher education.

The Southern African Nature Foundation continues to support environmental education in a largely financial capacity. They have recently produced the "We Care!" package which contains resource materials for teachers interested in an environmental education approach to teaching. (A copy is provided at the Information Desk).

- Details of the facilities and services of the National Parks Board, the Cape Provincial Administration, the Regional Services Council, and various education projects are provided at the Information Desk.

Participants themselves are a valuable source of information and informal discussion is encouraged.

vi) TASK SHEET

DAY ONE - Tuesday, 5 September, 1989GROUP COMPOSITIONGroup 1

Mrs.Russel, Dr.Opie, Mr.King, Mr.Katts, Mrs.Michelle, Hewat Rep.

Group 2

Prof.Spargo, Mr.Schreuder, Prof.Irwin, Mr.Da Costa

Group 3

Mr.Kennedy, Mr.Gunther, Mr.Swanepoel, Dr.Hurry, Ms.Heese

Group 4

Dr.Raimondo, Ms.Hoon, Mr.Soutter, Mr.Viljoen, Ms.Kelly, Mr.Hallinan, Ms.Rossouw

Group 5

Mr.Goodwin, Ms.Khan, CTPA Rep., Mr.Pickerill, Mr.Christian

TASK ONE: DEVELOPING A PLAN**1.1: The Design**

- How would you develop pre- and in-service environmental teacher education to ensure that the aims and objectives of environmental education were achieved?
- Does your idea take into account the variables identified in the discussion sheet?
- Fill in the Plan Forms provided.

1.2: Plan evaluation**1.2.1: Opportunities**

- List the opportunities afforded by your plan.
- Rank them in descending order of importance.
- Note each point on a separate evaluation card and rate its relative importance on a scale of 1-7 in the space provided (A score of 1 would indicate a factor of minor importance, while 7 would indicate one of extreme significance).
- Fill in the rank number and 'O' for 'opportunity' in the appropriate block.

1.2.2: Constraints

- List the constraints evident in your plan.
- Rank them in order of importance.
- Note each point on a separate evaluation card and rate its relative importance on a scale of 1-7 in the space provided.
- Fill in the rank number and 'C' for 'constraint' in the appropriate block.

TASK TWO: FURTHER EVALUATION**2.1**

- You will receive a plan designed by another group.
- Follow the same procedure as in 1.2 above, identifying, ranking and weighting opportunities and constraints.

TASK THREE: PRESENTATION AND DISCUSSION**3.1**

- Select a member of your group to present your plan to the forum.
- A general discussion will follow.

DAY TWO - Wednesday, 6 September 1989**GROUP COMPOSITION**

Group 1: Mrs.Russel, Prof.Spargo, Mr.Gunther, Mr.Hallinan, Ms.Khan, Ms.Hoon

Group 2: Dr.Opie, Mr.Schreuder, Mr.Swanepoel, Ms.Kelly, CTPA Rep., Mr.Katts, Ms.Rossouw

Group 3: Mrs.Michelle, Mr.Da Costa, Mr.Soutter, Mr. Goodwin, Ms.Heese, Dr.Hurry, Hewat Rep.

Group 4: Mr.King, Prof.Irwin, Mr.Viljoen, Mr.Pickerill, Dr.Raimondo, Mr.Kennedy, Mr.Christian

TASK ONE: A SYNTHESIS OF IDEAS**1.1: The Group Design**

- In your groups, attempt to synthesise a design for both pre- and in-service environmental teacher education. Should you disagree on a particular issue, you may have to incorporate a problem-solving mechanism into your plan.
- Fill in the plan form provided.

1.2: An Individual Response

- Comment, in turn, on the viability of the plan for your respective interest group.

TASK TWO: PRESENTATION AND DISCUSSION**2.1**

- Select a delegate from your group to present your plan to the forum.
 - A general discussion will be held.
-

vi) **PLAN FORM**

This form is a summary of your model for environmental teacher education.

Indicate if pre- or in-service:

Group number:

1. COMPOSITION OF TEACHER GROUPS

Provide details as suggested in the discussion sheet.

.....
.....

2. ADMINISTRATION

Complete: The co-ordination and administration of pre/in-service environmental teacher education could be facilitated by

.....

3. VENUE

Complete:

Administration

Funding

Staffing

4. CURRICULUM

Complete:

Curriculum development.

Programme facilitation.

Programme structure.

.....
.....
.....
.....

If you envisage that your programme will be standardised, explain the standardisation procedure:

.....
.....

vii) **EVALUATION CARD**

This point is a comment on the plan produced by Group

Indicate if Opportunity (O) or Constraint (C)

Rank Number.

Relative Importance: (Tick the appropriate block)

1	2	3	4	5
---	---	---	---	---

Minor importance ----- Major significance