Perceptions of Environmental Education among Senior Ciskeian Educationists, and the Implications for Educational Change in the Ciskei Region

by

Pumla P. Mkala-Pholo

Thesis submitted to the Department of Education,
Rhodes University

in partial fulfilment of the requirements
for the degree of Master of Education
in Environmental Education.

January 1994

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

I wish to thank Professor P. Irwin for his guidance during coursework and in the initial stages of this study. I also wish to express heartfelt gratitude to my supervisor, Ms Eureta Janse van Rensburg, for her patience and kindness during the supervision and production of this study. I appreciate the meticulous and constructive way in which the supervision was conducted.

Thanks are also due to other members of the Faculty of Education at Rhodes University, particularly Ms Ursula van Harmelen, Mrs Judy Cornwell, and Mrs Sophia Bester, who helped in typing the draft chapters of the project.

My thanks go also to the Department of Education, Ciskei, for allowing me to interview senior educationists in its employ. Without the cooperation of these educationists, the information necessary to complete this study could not have been obtained, and I am grateful to them.

Finally, my sincerest thanks go to my family and friends for their moral support during the writing of this thesis.

ABSTRACT

This study was conducted to investigate perceptions of Environmental Education among senior Ciskeian educationists, and to explore the possibility of implementing Environmental Education in school and college curricula in the Ciskei region.

Data was collected from interviews with a sample of senior Ciskeian educationists, then analysed and assessed. Corroborating information was obtained from attendance at several regional workshops organised by the Environmental Education Policy Initiative.

The data indicated a sound general awareness of environmental problems in Ciskei and a belief in Environmental Education as a means toward their solution. Although the interviewees' understanding of Environmental Education was imperfect, there was broad support for its aims and principles. Since the study was motivated by concern about the implementation of Environmental Education in Ciskei, the results obtained were encouraging.

ABBREVIATIONS USED IN THE TEXT

DEA	-	Department of Evnironmental Affairs
DET	-	Department of Education and Training
DNE	-	Department of National Education
DSP	-	Dominant Social Paradigm
EEASA	-	Environmental Education Association of Southern Africa
EEPI	-	Environmental Education Policy Initiative
IUCN	-	International Union for the Conservation of Nature and Natural Resources, from 1993 the "International Conservation Union"
NEP	-	New Environmental Paradigm
NETF	-	National Education Training Forum
NGO	-	Non-Governmental Organization
RSA	-	Republic of South Africa
UNESCO	-	United Nations Educational, Scientific and Cultural Organisation
UNEP	-	United Nations Environment Programme

A List of Figures and Tables Used in Text

CHAPTER 1: INTRODUCTION

The background against which this study was initiated has two important dimensions. The first is the growing awareness of environmental issues and concern about environmental problems, both globally and in South Africa. The second is the emergence of Environmental Education in both formal and non-formal endeavours as a process of assisting people to engage with environmental issues so as to ensure the sustainability of their environment and improve their quality of life. The researcher had become aware that increasing environmental awareness and an emerging educational response were not having a significant effect in the area where she lived, the Ciskei region. This study is therefore motivated by concern about the implementation of Environmental Education in the Ciskei.

Part of the pattern of growing international awareness is a trend to see Environmental Education as involving a re-thinking or reconceptualisation of formal education in general. The current international debate questions whether societies are sustainable, and on what basis. The set of beliefs and values upon which society is based has been termed the "dominant social paradigm" (DSP) (Milbrath, 1984; Fien, 1993a). This is in the process of being replaced by a "new environmental paradigm" (NEP) (Fien, 1993a:4). The DSP views Nature as "subservient to human needs and economic growth"; its main tenet is that material wealth is the key to the quality of human life (Milbrath, 1984:117). The DSP involves "education about and through the environment" (Fien, 1993a). By contrast, the NEP "views people and nature as interdependent", and incorporates

> a high regard for nature; respect for natural and social limits to growth; empathy with other species, other people and future generations; support for careful planning in order to minimize threats to nature and the quality of life; and a desire for change in the way most societies conduct their economic and political affairs. (Fien, 1993a:4-5)

In short, the NEP involves "education for the environment" (Fien, 1993a:5; emphasis added).

Environmental Education is more widely practised in the developed countries of northern America and western Europe than in the Third World, despite the urgent need for it in less developed regions like Africa. The African biophysical environment is generally degraded, levels of environmental awareness are low, and the necessary skills to deal appropriately with environmental problems are lacking. Moreover, education systems in African countries are often in need of revision and renewal. These generalisations certainly obtain in the case of Ciskei.

At the time of planning this study, the researcher worked as a teacher and principal in an agricultural school in Ciskei. The researcher's work with children and communities involved the development of the attitudes and skills requisite for producing food for sustainable living. During the course of this work, she came to perceive among Ciskeians a general absence of the sort of values which would support a sustainable society, such as a commitment to the health of the environment.

As an educationist, the researcher was aware of the limited extent to which Environmental Education was practised in the formal education system. Her study for a Masters degree in Environmental Education alerted her to the value of a holistic approach to Environmental Education. This holistic approach to Environmental Education (see Chapter 2) allows for recognition of the total environment, natural and built, and for a broad and in-depth understanding of the multiple interactions among economic, political, cultural, educational and biophysical systems, and the role of these in the complex causes of environmental problems. Such an approach also allows for a focus on change in formal education systems and practices. This understanding of Environmental Education is, however, a fairly recent development, and does not seem to be widespread (Blignaut, 1991).

This research was designed to investigate the perceptions or

understanding (terms used interchangeably in this study [see Chapter 4.6]) of Environmental Education among senior decision-makers in the Department of Education and Culture in Ciskei, and to explore with them the possibility of implementing Environmental Education in the schools and education colleges. The study therefore serves the following purposes: first, it provides information about how senior educationists currently perceive Environmental Education. Secondly, it aims to help such educationists and the researcher to clarify their thinking about and understanding of Environmental Education.

When the study was planned, it was assumed that the senior educationists concerned were not intimately conversant with the philosophy, objectives and methods of Environmental Education. The study was intended to explore with them the possibility of implementing Environmental Education in Ciskei schools and colleges, identifying the potential and pitfalls, while at the same time stimulating debate about the principles of Environmental Education among the participants. Finally, it was hoped that the study might provide a springboard for further, better informed initiatives to work towards the implementation of Environmental Education in the curriculum, should the research indicate support for such initiatives.

In the course of the data collection phase, the researcher was appointed as a subject advisor for Agriculture in the Ciskei Department of Education. She is thus now in a good position to initiate and support appropriate processes of curriculum development. The research results will be discussed with this perspective in mind.

The study involved data collection through semi-structured interviews with 14 senior educationists, during March to April 1992. The data was analysed quantitatively and qualitatively. The report was written up during 1993. It provides the reader with information about the literature which informed the researcher's understanding of Environmental Education (Chapter 2); information about the context in which the study took place

(Chapter 3); an outline of the research methodology employed (Chapter 4); details of research findings (Chapter 5 and Appendices); discussion of the research findings (Chapter 6); and finally, in Chapter 7, conclusions and recommendations about the implementation of Environmental Education in Ciskei curricula. The final chapter also includes an evaluation of the research design and of the perceived value of the study.

CHAPTER 2: LITERATURE REVIEW

2.1 Perspectives on Environmental Education, with particular reference to Environmental Education as a "holistic" approach to education

While this research focuses on the perceptions of Environmental Education among senior educationists in Ciskei, it is usefully contextualised by an overview of international and national perspectives on Environmental Education, with specific reference to Environmental Education as a holistic approach to education.

Environmental Education can be described as a holistic approach to education for the following reasons:

1. The objectives of Environmental Education target the cognitive and affective domains of learning, as well as action skills. The emphasis is not only on knowledge, but also on values, attitudes, critical thinking, problem-solving skills and active participation.
2. Environmental Education draws attention to interrelationships in nature, and between nature and society, including humanity's dependence on natural resources.
3. The term environment refers to a complex construct consisting of bio-physical, social, economic and political dimensions.
4. Environmental Education is generally envisaged as best taught in an inter-disciplinary manner, integrated across the formal school curriculum.
5. Environmental education is concerned not only with academic knowledge, but also with the everyday life of the learner. Moreover, it aims at broad participation in decision-making and improvements in environmental quality.

These points will be elaborated below.

The most widely accepted of the many definitions of

Environmental Education which have been put forward, reads as follows:

> Environmental Education is a process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man [sic], his culture and his biophysical surroundings. Education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality. (IUCN, 1971:17)

This definition of the IUCN (International Conservation Union) illustrates the cognitive (knowledge), affective (values and attitudes) and practical (skills) objectives of Environmental Education. Local authors also see Environmental Education as a holistic approach to education "involving all three domains of human development, the cognitive, affective and psychomotor" (Irwin, 1990a:3; see also Blignaut, 1991:3). This implies a consideration of the whole learner and of all his or her developmental domains. It is illustrated clearly by the five categories of objectives for Environmental Education suggested by United Nations organisations (UNESCO-UNEP, 1978:3), namely:

Awareness: to help social groups and individuals acquire an awareness of and sensitivity to the total environment and its allied problems;

Knowledge: to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems;

Attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment, and motivation for actively participating in environment improvement and action;

Skills: to help social groups and individuals acquire the skills for identifying and solving environmental problems;

Participation: to provide social groups and individuals with an

opportunity to be actively involved at all levels in working towards the resolution of environmental problems.

The IUCN (1971) definition also notes Environmental Education's emphasis on interrelationships within and between natural and social systems, and it refers to broad participation and decision-making about issues that concern environmental quality.

Like the IUCN definition, the Tbilisi Principles from the Tbilisi Declaration (UNESCO-UNEP, 1978) provide guidelines for Environmental Education in the formal and non-formal sectors. All the Tbilisi Principles are summarised here, with added emphasis, for they illustrate the full range of aspects pertinent to a holistic approach to education. They advise that Environmental Education should:

* support holistic education in the total environment, that is, the natural and built, the technological and social (economic, political, cultural-historical, moral and aesthetic);
* be a continuous **life-long process**, beginning at the pre-school level and continuing through all formal and non-formal stages;
* be **interdisciplinary in its approach**, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
* enable a conceptualisation of major environmental issues from **local, national, global and universal points of view** so that one gains better insights into environmental conditions in one's own and other geographical areas;
* focus on **current and potential** environmental situations while taking into account the **historical** perspective;
* promote the value and necessity of **local, national and international co-operation** in the solution of

environmental problems;

* explicitly consider environmental aspects in plans for **development** and growth;
* enable **learners to have a role** in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
* relate environmental sensitivity, knowledge, problem-solving skills and values clarification to **every age**, but with special emphasis on environmental sensitivity to the learner's own community in the early years;
* help learners discover the **symptoms and** real **causes** of environmental problems;
* emphasize the **complexity** of environmental problems and thus the need to develop critical thinking and problem-solving skills;
* utilise diverse learning environments and **a broad array of educational approaches** to teaching and learning about and from the environment with due stress on practical activities and first-hand experiences.

From the Tbilisi Principles one gains an idea of the broad nature of Environmental Education as a learning process that involves all levels of formal and non-formal education, and works towards a conceptualisation of the complexity of local, global and universal environmental issues, their symptoms and causes, as well as their temporal nature. Education should stimulate critical thinking and environmental awareness, and develop the learners' ability to take appropriate actions to improve their existing situation. The implications for formal education include an emphasis on learner-centredness, the employment of a broad range of teaching strategies, and an inter-disciplinary approach.

An important facet of the holistic nature of Environmental Education is the broad conceptualisation of the term "environment", referred to in the first Tbilisi Principle. Discussing the nature of the environment concept, O'Donoghue

notes that it has not always been interpreted in a holistic way:

> The initial conception of environment has successively been clarified from its plants, animals and problems beginnings to more holistic ideas that integrate political, social, economic and biophysical life support processes to explore patterns of people living together with a good quality of life in a healthy environment. (O'Donoghue, 1991:3)

With regard to the interdisciplinary nature of Environmental Education in formal education and curriculum development, the following definition developed by Okot-Uma and Wereko-Brobby (1985:137) in an African context also suggests how the process of education can be approached in a holistic manner:

> In its formal pedagogical sense Environmental Education implies an integrated course cutting across traditional subject areas, including both pure sciences and the social sciences. A basic objective of such a course aims to enhance in the learner an awareness, understanding and concern for the environment and its associated problems, through dissemination of knowledge, development of skills and attitudes and inculcation of motivation and commitments pertinent to aspects of the environment in relation to human activities.

These comments and definitions indicate what is intended in the description of Environmental Education as a "holistic approach to education". This particular interpretation of Environmental Education is widely shared, but not universal. Furthermore, as suggested above, Environmental Education has not always been understood in this way: rather, Environmental Education has evolved from humble beginnings, when the concept tended to focus on the biophysical, and developed with time and international debate into a holistic idea (see Irwin, 1988). The variety of perspectives on Environmental Education can to a certain extent be explained by looking at the historical development of Environmental Education at international and national levels. The development of Environmental Education in South Africa seems to parallel world trends (Irwin, 1990a,b).

Internationally the origins of Environmental Education can be traced to the promotion of nature study and outdoor education, and later conservation education (Stevenson, 1987; Irwin,

1990a,b). The educational approaches in nature study, outdoor education and conservation education had a narrow focus on knowledge about the biophysical environment, experiences in natural outdoor environments, and nature conservation. These approaches were not concerned with the social and political contexts in which person-environment and person-person interactions take place.

A review of school practices in general indicates that nature study and conservation education have been fairly widely incorporated into primary school curricula and the science and geography curricula of secondary schools (Ben-Peretz, 1977; Eichler, 1977; UNESCO, 1977; Childress, 1978; Stevenson, 1987). The primary purpose of nature study was to transfer knowledge about the biophysical environment (Blignaut, 1991) and to develop an understanding and appreciation of the natural environment through first-hand observation (Stevenson, 1987).

Whereas nature study has tended to be a school subject (Blignaut, 1991), conservation education is usually treated as a broad approach, focusing on the teaching of basic ecology and the fostering of positive attitudes towards conservation (Martin, in Martin and Wheeler, 1975). Like nature study, conservation education tends to concentrate on the wise use of mainly natural resources and seldom concerns itself with the political, social or even built environment (Irwin, 1990a,b). Conservation education emanated from a movement that introduced a concern for the preservation of species and areas of natural significance through sound management (Stevenson, 1987). This concern was expressed in moral and aesthetic terms by Aldo Leopold in A Sand County Almanac (1966/1984) and in political (albeit conservative) terms by the formation of the then International Union for the Conservation of Nature and Natural Resources (IUCN) (Stevenson, 1987).

Outdoor education in its turn is described as a teaching methodology that involves fieldwork and experiential learning (Opie, 1989). The observation has been made that outdoor education and Environmental Education overlap to some extent, but

that they are addressed by entirely different theoretical perspectives (Irwin, 1990a,b).

Internationally, both outdoor and conservation education are rooted in the liberal-progressive philosophies of, for example, Dewey, Rugg and Counts (Robottom, 1985), and they have modest educational and environmental goals. Their social and political character reflect the middle-class and liberal democratic tradition that dominates Western capitalist societies. In other words, neither nature study nor outdoor or conservation education attempts to challenge the socio-economic or political fabric of society (Stevenson, 1987).

The modern concept of Environmental Education has moved beyond a narrow focus on people and nature, to a recognition of the role of people-to-people interactions in environmental issues, thereby taking cognisance of the socio-political aspects of environmental issues and teaching about them (Irwin, 1990a,b; Fien, 1993a,b). Environmental Education has evolved ideals based on a new philosophy which embodies a commitment to grass-roots action and participation in all social concerns, centering on a desire for a lifestyle that expresses both individuality and community (as a reaction against conformity and isolation) and a good quality of life based on non-materialistic values (see comments on the "new environmental paradigm" in the Introduction, above). Environmental Education has expanded across class boundaries (at least in Australia and Britain) and has broadened the understanding of the term "environment" to include urban, social, economic and political aspects as well as natural, historic and aesthetic elements (Stevenson, 1987).

South Africa is not yet a democratic country, and unequal social and economic development may hinder the idealistic approach to Environmental Education described above. A particularly appropriate approach for the South African context is offered in the work of O'Riordan (1990, cited in Fien, 1993a) and Fien (1993a,b), which advocates engagement with social, political and economic domains. Fien (1993a,b) argues that Environmental Education should promote a world ethic involving

both social justice and ecological sustainability. Social justice involves people-to-people interactions and requires attention to core values of basic human needs and rights, intergenerational equity, and broad participation in decision-making. Along with the above goes ecological sustainability, based on the principles of interdependence, biodiversity, "living lightly on the earth" (making wise use of natural resources) and "interspecies equity" (Fien, 1993a:64).

Social behaviour towards the environment has been classified by O'Riordan (1981, 1989, 1990, cited in Fien, 1993a), who delineates a continuum of environmental ideologies with two clearly distinguishable poles: a technocentric and an ecocentric environmentalism. These two principal ideologies embody contrasting ways of perceiving and utilising the environment. O'Riordan argues that the difference between technocentrism and ecocentrism represents:

> the clash of two world views . . . between those who believe that the earth is capable of being improved or manipulated for the benefit both of humankind as well as for life on earth itself, and those who believe that human beings should at best be only equal with other forms of life on the planet and that societies must learn to adjust their economics and aspirations so as to cohabit with the imperatives of earth and life processes for the survivability or sustainability of the earth. (O'Riordan, 1990:143, cited in Fien 1993a:26).

Technocentrism is embraced by "cornucopians" and environmental managers (O'Riordan 1981, 1989, 1990, cited in Fien, 1993a), and entails human-centred, manipulative ways of perceiving and using the environment (Fien, 1993a). Advocates of technocentrism believe in "retention of the status quo and the existing structure of political power, but with growing responsiveness and accountability in political, regulatory, planning and economic institutions" (Fien, 1993a:27).

Ecocentrism is the ideology of "deep ecologists" and "soft technologists" (O'Riordan, 1981, 1989, 1990, cited in Fien 1993a), and is perceived to have an earth-centred, nurturing way of perceiving and using the environment (Fien, 1993a:26).

Ecocentrists believe in the "demand for redistribution of power towards a decentralised, federated economy with more emphasis on informal economic and social transactions and the pursuit of participatory justice" (Fien, 1993a:27).

Technocentric environmentalism contains two major positions. A cornucopian environmentalist views "nature along with human ingenuity and technology, as being able to provide for all human needs and wants indefinitely" (Fien, 1993a:26). The environmental manager is an accommodationist in a "light green" position who "believes that the environment can be managed to satisfy human needs and wants, provided certain accommodations to ecological principles are made through improvements in environmental legislation and management practices" (Fien, 1993a:26).

Ecocentric environmentalism also contains two major positions. The "deep ecologists" (O'Riordan, 1981, cited in Fien, 1993a), those who hold a "dark green" or "Gaianist" position (Fien, 1993a), believe that the relationship between people and nature can be a spiritual one and that humans can enjoy a satisfying quality of life only when they recognise their "oneness" with the earth. The "dark greens" argue that

> ecological laws should regulate social relationships and institutions so that the "Utopian" ideal of man [sic] as a co-operative being living in harmony with his natural surroundings in a classless society can govern human behaviour. (O'Riordan, 1987:6, cited in Fien 1993a:28)

A second major position is "red-green environmentalism" (Fien, 1993a) or that of the soft-technologist (O'Riordan, 1981, cited in Fien 1993a), which incorporates some of the technocratic "light green" care for improved environmental legislation and management in order to provide the economic resources to sustain an equitable standard of living for all people (Fien, 1993a). This ideology argues that such an ideal can be achieved only when legislation reflects a concern for ecologically sustainable development and distributive social justice, and when environmental management and production are directed by appropriate, small-scale technologies (Fien, 1993a).

In South Africa the linking of the socio-political with the conservation of the biophysical has in the past led some more conservative educationists to attach a radical connotation to Environmental Education. They saw the possibility of sanitising Environmental Education by conflating it with outdoor education, which was perceived to be free of such notions -- other than those which were acceptably patriotic (Irwin, 1990a,b).

This narrowly-interpreted idea of Environmental Education was in the past largely implemented by conservation agencies and, to some extent, by education departments such as the Department of Education and Culture in the Transvaal. The approaches to Environmental Education of both the non-formal and the formal sectors reflected an emphasis on nature study, ecology, conservation education and outdoor education. They thus neglected democratic values relating to social justice and ecological sustainability, essential components in the holistic approach to Environmental Education favoured by contemporary authorities internationally.

There are signs that South African Environmental Education is beginning to move away from these narrow interpretations towards one which starts to engage with the socio-political and historical dimensions of the environment (O'Donoghue 1993). Such an approach has yet, however, to be widely adopted.

The concept of Environmental Education thus appears to elicit a complex mixture of perceptions. This is partly because both "environment" and "education" hold different meanings for different people. This can be inferred from the work of Naidoo, Kruger & Brookes (1990), who argue that the term Environmental Education appears not to be widely understood. Despite numerous papers clarifying the broad nature of the term "environment" (Gough, 1989; O'Donoghue, 1987; Robottom, 1987; Irwin, 1988), Naidoo et al. (1990) note that even enlightened educationists use the term "environment" and "nature" interchangeably, thereby perpetuating the misunderstanding of the term. A narrow understanding of "environment" may also be perpetuated by the recent introduction of the tautological phrase "socio-

environmental education" (Blignaut, 1991). As noted above, Environmental Education is often still associated exclusively with nature (the biophysical component of the environment), reflecting its historical roots, and hence it is often automatically considered the responsibility of science and geography education (O'Donoghue, 1987).

2.2 Education for the environment

Fien (1993a:12) explains that "education for the environment" emphasises the development of a critical environmental consciousness based upon:

* a holistic view of the environment as the totality of the interdependent relationships between natural and social systems;
* a historical perspective on current and future environmental issues; and
* the study of the causes and effects of environmental problems, and alternative solutions to them, through an examination of the relationships among ideology, economics and technology, and the linkages between local, regional, national and global economies and governments.

Education for the environment emphasises the development of critical thinking and problem-solving skills through a variety of practical and interdisciplinary learning experiences which focus on real-world problems and involve the study of a wide range of sources and types of information.

Education for the environment emphasises the development of an environmental ethic based upon sensitivity and concern for environmental quality. It also stresses the development of the attitudes and skills of political literacy which promote participation in a variety of forms of social action to help improve and maintain environmental quality.

Education for the environment requires teaching strategies that are consistent with its goals. The critical pedagogy of

education for the environment reveals that the rhetoric-reality gap, perceived as a curriculum problem in Environmental Education circles (see, e.g., Vulliamy, 1987), is unfortunately quite widespread. Education for the environment examines this problem and suggests critical curriculum theory as a means of avoiding the "macro-micro divide" in the practice of Environmental Education in schools (Fien, 1993a:12).

2.3 Implementing Environmental Education in the formal school curriculum

As a holistic and critical approach to education, Environmental Education is a curriculum innovation that requires careful consideration and strategic planning. Among the salient considerations in this process of curriculum development are the need for sensitivity to the context of the innovation, with reference to the needs of the learners and the existing education system; the possibilities for implementation, with specific reference to the debate about whether Environmental Education should be a formal school subject or not; and the possible constraints on incorporation in the curriculum.

An educational innovation should be sensitive to the specific context in which it is attempted. Vulliamy makes the point that in most Third World countries with conventional centralised curricula and examinations, any innovation involves changes to national syllabuses and examinations together with teacher training programmes to support such changes (Vulliamy, 1987:18). The centralised, authoritarian education systems which characterise many Third World countries, including Ciskei, call for a strategy which involves changes to the central curriculum and the involvement of senior education planners and decision-makers. This factor has helped to shape the design of the present study.

Regarding the needs of learners within a particular context, Symth (in Bakshi & Naveh, 1978) has described an educational

situation in which the youth are from an impoverished home environment, their sense of past and future diminished, and their attitudes to many established ideas and institutions apathetic or antagonistic. This situation is typical of the Ciskei context. Any educational change must be designed to attract and involve the interest of impoverished and antagonistic young people.

The two possibilities for the implementation of Environmental Education in formal school curricula to be discussed here involve construing Environmental Education within either a subject or a non-subject approach to education.[1] "This remains a controversial issue, but in the present context serves to emphasise the importance of attitudes, approaches, methods and the organisation of input, rather than the accumulation of knowledge" (Symth in Bakshi & Naveh, 1978:43).

At the IUCN conference in Nevada in 1970 it was agreed that Environmental Education "is not a subject but a science-oriented multidisciplinary approach where most, if not all, subjects could and should be incorporated" (Martin in Martin & Wheeler, 1975:21). The view that Environmental Education should not be implemented as a subject but rather as a new approach to teaching, across the curriculum, is supported and discussed locally by Hurry (1982), Blignaut (1991) and Irwin (1992).

Vulliamy (1987) makes a strong argument, based on his research in the Third World, for the infusion of Environmental Education into existing subjects. He suggests that environmental concerns should be "infused" into high status subjects such as English, Mathematics and Science. His argument is that Environmental Education as a new subject would inevitably be accorded a lower status than other subjects. This would probably hold true in Ciskei, where environment-related components of existing subjects, such as Ecology and Conservation, are lightly regarded by teachers and often not even taught (see Chapter 3).

---

1. It must be stressed that capitalisation in the phrase "Environmental Education" in this study does not denote curriculum <u>subject</u> status.

Whereas Symth, too, believes that Environmental Education should not be a school subject, he suggests that it might be implemented as such at an initial stage: "Such an innovation is not just an insertion of a new subject in the school time table, although it may have to begin that way: it is a redirection of educational philosophy" (Symth in Bakshi & Naveh, 1978:42).

The arguments raised in favour of Environmental Education as a subject take into account academic tradition and the identity of the subject in the curriculum, as well as economic requirements for teacher education and resource development. It is proposed that, as a new subject, Environmental Education may gain both status and resources (Symth, 1978; Goodson, 1987). Symth argues that the subject would benefit from the academic status conferred by examinations, and Goodson elaborates on how this 'academic tradition' has been used by curriculum developers to include ideologies in the form of a subject, after first obtaining the subject status which is conferred by a formal school examination.

Teachers of Ecology and Conservation, who equate their subject areas with Environmental Education, often fear that through "integration" or "infusion" their study areas might become diluted, less highly regarded, and finally obviated. There is also the possibility that Environmental Education may be dealt with only as an extracurricular activity. They argue that the unity and cohesion of environmental teaching would be ensured if Environmental Education becomes a subject (Eichler, 1977).

Environmental educators who take a more holistic approach to Environmental Education, however, believe that as a curriculum initiative Environmental Education might indeed have to surrender its identity; according to Robottom, Environmental Education "must engage in 'solicitor's surrender' to voluntarily give up something of its identity (its very name) and to associate with established, discipline-based subjects" (Robottom, 1990:42). The study by Goodson (1987), reviewed by Robertson (1992), is informative in this regard. If one follows Goodson's discussion on the development of school subjects, it would appear that it is

not Environmental Education which will lose its identity, but rather "certain conceptions of environmental education advanced by certain interest groups [which] will diminish with time, while others, promoting a more academic conception [i.e. Environmental Education as an academic subject], will be more advanced" (Goodson, 1987).

2.4 Constraints on the implementation of Environmental Education

There are, however, constraints on the introduction of a new subject, not the least of which is competition between subject interest groups for resources. Environmental Education as a new subject might be received antagonistically by teachers of established subjects, especially those subjects that had already been promoting environmental concerns. Research in Britain has revealed that "related disciplines such as Geography and Biology reacted by refusing to acknowledge [Environmental Education] as a scholarly discipline" (Robertson, 1992:7-8). Robertson (1992:8) warns that "established subjects will defend their academic status at the same time as denying such status to any new subject contenders, particularly in the battle over new examinations". He foresees that the subject associations will ensure that their subjects and their members are best served, for example in respect of available resources. In this regard it is important to note the limited resources available in South Africa with which to improve the biophysical environment (Blignaut 1993).

Goodson's study (1987) highlights aspects to take into account in any Environmental Education initiative in formal education. It provides insight into the various influences on the school curriculum, particularly the political interactions of contending individuals and interest groups. The study also alerts one to the conservative aspect of established education structures and entrenched orientations. It is recommended that South African Environmental Education curriculum initiatives take note of the British experience, as there are a number of

similarities in the education systems, for example a centralised curriculum with emphasis on evaluation by means of external examinations (Robertson, 1992).

There are also other constraints on the implementation of Environmental Education in South African curricula, regardless of whether it is seen as a subject or as an inter-disciplinary approach to education. One of them is a lack of awareness of Environmental Education among local educationists, as argued by Blignaut (1993), whose research indicated that many educationists did not understand the philosophy, the process or the objectives of Environmental Education, and were unaware of its potential to improve education in schools and to act as a common relevant focus for education in South Africa.

What is sometimes interpreted as a lack of understanding of Environmental Education may in fact reflect the existence of different perspectives on Environmental Education and/or education. Robertson (1992:5) warns that any attempt to implement Environmental Education should realise that "there are a range of ideological interests underlying different approaches [to education] in South Africa (Ashley, 1989) and a similar diversity can be expressed within any subject discipline in this country".

Despite the existence of severe constraints on educational innovation in this country, some positive steps have already been taken. Ballantyne and Oelofse (1989), for example, have considered Environmental Education policy in South African schools and have raised various examination-related issues. Hurry (1982) and Irwin (1992), while writing extensively about the inclusion of Environmental Education in the curriculum, have also proposed directions for teachers' education. There is furthermore a growing awareness of Environmental Education in academic circles, reflected by and stemming from the presence of university faculties offering new courses in environmental studies/sciences/education, for example the Universities of Cape Town, Bophuthatswana and Rhodes.

An important recent initiative has been taken jointly by the

Environmental Education Association of Southern Africa (EEASA) and the Department of Environment Affairs (DEA) (Clacherty, 1993a). This initiative involves a range of government and non-government participants in discussing the realities of implementing Environmental Education in the new curriculum for a post-apartheid South Africa. In the process of debate it should be decided whether South African curriculum innovators and educators see Environmental Education as a distinct subject or as an approach across the curriculum. The various constraints on the implementation process also need to be assessed. Blignaut (1993) further reminds South African curriculum developers that:

> Successful implementation involves a commitment to the aims of socio-environmental education at policy level, a concerted effort by curriculum developers to address the process in all subjects and provide some structures for integrated learning, a more appropriate evaluation system, commitment by school executives to incorporate the process into the process of education operating in schools, and most important, teacher training.

This literature review has highlighted the elements of a holistic approach to Environmental Education, as well as a number of factors relevant to the introduction of Environmental Education initiatives. The possibilities for and constraints on the implementation of Environmental Education discussed here, generally hold true for Ciskei (the close relations between Ciskei and South Africa are described in Chapter 3). The researcher supports Blignaut's (1993) call for a commitment to the aims of Environmental Education at policy level, as well as her argument that much of the resistance to the incorporation of Environmental Education in the curriculum can be attributed to a lack of awareness and in-depth understanding among educationists. This study sets out to focus on senior educationists and education planners, to explore their understanding of Environmental Education and their perceptions of the possibilities for implementing it in the Ciskei curriculum. The next chapter seeks to provide some idea of the background and context in which the study was conducted.

CHAPTER 3: CONTEXT OF THE STUDY

3.1 Introduction

In this chapter the aim is to describe the physical, social and educational context of the study area, the Republic of Ciskei. The geographical layout of the Ciskei region is shown in Figure 1. The area is situated within the Eastern Cape Province of the Republic of South Africa (RSA). Although Ciskei gained the status of an 'independent homeland' from the RSA in 1981, strong economic and education links between the two countries remain in place (see below). Bisho is the capital of Ciskei; the other urban and peri-urban areas which will be mentioned in this study are Alice, a university town in the Victoria East district, Zwelitsha and Mdantsane.

3.2 Physical environment

Aspects pertinent to a description of the physical environment of Ciskei are its low rainfall, few and over-exploited rivers, small land area, the susceptibility of the soil to erosion, deforestation and land degradation. Soil erosion is a serious problem, as in other parts of southern Africa (Huntley, Siegfried & Sunter, 1989). Ramphele and McDowell (1991:26) describe how natural resources have been over-utilised in Ciskei, leading to land degradation:

> In rural areas the heavy use of traditional fuels, notably wood, has far outstripped the capacity for natural regeneration. Rapid deforestation, soil erosion, the silting up of rivers and general soil depletion have been the result. A shift towards the use of animal dung and crop waste as fuel precludes their use as fertilizers, giving an even lower crop yield. In addition, they are inefficient fuel resources.

The overall picture is one of a biophysical environment generally degraded through the over-utilisation of limited natural resources.

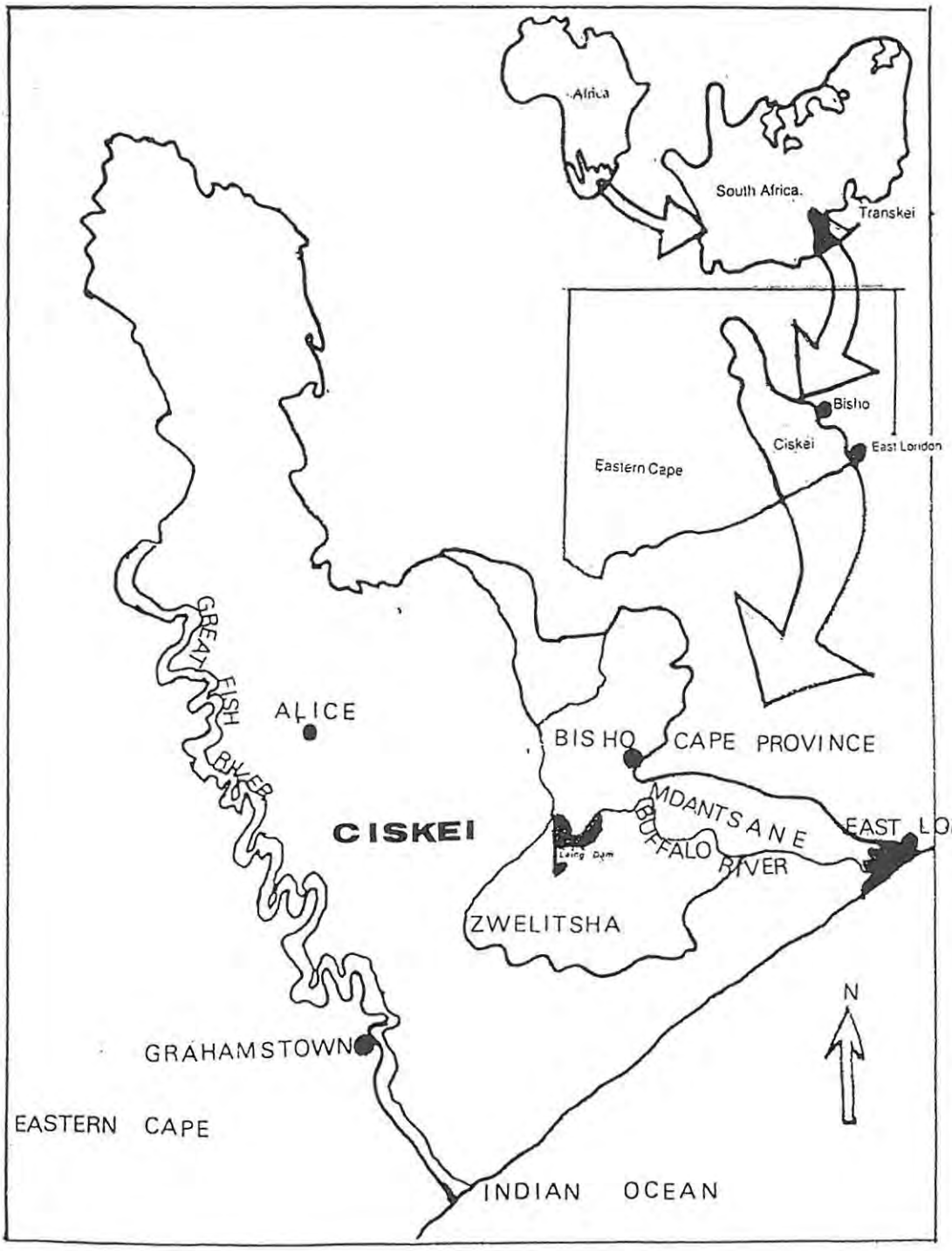

FIGURE 1. MAP SHOWING THE CISKEI URBAN AND PERI-URBAN AREAS MENTIONED IN THIS STUDY.

The Ciskei is supplied by three main rivers, the Great Fish, Buffalo and Yellowwood Rivers (see Figure 1). The Great Fish River flows predominantly through semi-arid ranch farming land, and provides water for limited agriculture. Viewed as an agricultural resource, the major problems in the river are the increasing salinity caused by irrigation runoff and the blackfly Simulium chutteri, which became a pest when the flow of the river was altered in the Fish-Orange scheme.

The Buffalo River is fully exploited, with various riperian areas devoted to extensive and intensive agriculture, and urban and industrial exploitation. The sole exception is the forested upper region, which enjoys a high conservation status. The section between Zwelitsha and Laing reservoir is now a liability because of organic and industrial effluent, which causes intermittent fish kills and is probably a health hazard to rural users (O'Keefe, 1989:266-67).

The Yellowwood River is a tributary of the Buffalo. It feeds mainly informal rural settlements, agriculture and the city of Bisho. Bisho discharges treated effluent into its lower catchment, from where water is collected directly for domestic use (O'Keefe, 1989:268).

Groenewald (1987:203) has described the southern African agricultural industry as a dualistic industry, consisting of a modern commercial agriculture sector side-by-side with 'traditional' subsistence farming sectors. Inappropriate farming methods, by both commercial and subsistence farmers, have led to serious land degradation in Ciskei.

In some parts of Ciskei economic growth is being pursued at the expense of a degraded environment (Van Rooyen, 1989 (pers.comm.)). Van Rooyen warns that intensive commercial agriculture not only harms the land but naturalises a mechanistic, exploitative attitude towards it. Ramphele & McDowell (1991) blame the monoculture of maize, lack of managerial expertise and poor state policy for the degradation of farmlands.

Poor agricultural methods in Ciskei are exacerbated by a

general shortage of land. Cooper has described how land has been allocated in the homeland areas:

> The 1913 Land Act laid down the basic racial division of land in South Africa, allocating 7 per cent of the land for African occupation. The 1936 Native Trust and Land Act confirmed this division and increased the land to 13,6 per cent. Much of this land is arable, but on slopes, and thus needs to be protected from erosion. (Cooper, 1991:240)

Although the various Land Acts and the Group Areas Act have recently been repealed, historical inequalities in land and population distribution have yet to be substantially redressed.

Over-stocking has been reported as a major environmental problem in most of Ciskei. Kruger (in Ramphele & McDowell, 1991) reports that many farmers are livestock owners although they have little knowledge of farming. Over-stocking has caused soil erosion as most 'sweetveld' has been overgrazed, thus destroying the vegetation cover and denuding the land. In the researcher's experience, the black farmer keeps large herds of cattle, as well as other livestock, because this has been the traditional way of accumulating capital in Ciskei.

3.3 Socio-economic environment

There is a severe shortage of employment opportunities in both urban and rural areas. Many families have to survive on government pensions or the remittances of family members working elsewhere as migrants; such sources of income are meagre and uncertain. Thus the rural community is compelled to produce agriculturally for survival in a desperate situation which has been described, without exaggeration, as a question of life or death (Kruger in Ramphele & McDowell, 1991).

The rapid population growth in Ciskei in itself places stress upon the natural environment. There is evidence that the population of Ciskei more than doubled between 1950 and 1980 to 666 000 (Kruger in Ramphele & McDowell, 1991). Population growth was to a large extent the result of forced relocation by the

South African government. The Surplus People Project (a non-governmental organisation concerned with the effects of forced removals, relocation and land dispossession) has estimated that some 142 000 people, about a quarter of its population, entered Ciskei during the 1970s through forced relocation (Kruger in Ramphele & McDowell, 1991). The extent of overcrowding in Ciskei is indicated by the figures reported by Homer-Dixon et al. (1993), who state that in 1980 the homeland was supporting 82 persons per square kilometre of rural territory, whereas the adjacent Cape Province had a rural population density of only two persons per square kilometre.

As in other parts of southern Africa, demographic patterns in Ciskei have been characterised by the migration of people seeking employment from rural to urban areas, thus overcrowding them (Kruger in Ramphele & McDowell, 1991). Increased urbanisation has aggravated an urban housing shortage, and as a result informal settlements are a common occurrence within Ciskei. Probably the most unpleasant aspect of these unplanned settlements is the absence of sewage and other refuse disposal facilities. The high population densities in townships, in unplanned settlements and in the homelands in general, places further stress on an already degraded physical environment.

From the above it is clear that both the rural and urban physical environments in Ciskei have been neglected, and that environmental conditions have become acute (Kruger in Ramphele & McDowell, 1991). Although this is partly due to overcrowding in limited areas, bad land use practices also play a role. It may thus be worthwhile to examine the attitudes of Ciskeians towards their environment.

Although presently the physical state of the environment is poor, it would seem that in the past Ciskeian communities were environmentally aware and active. This is argued in a historical overview by Khan (1989) which attempts to explain current attitudes to conservation among Blacks in southern Africa. In 1917 an Eastern Cape community-based, participatory organisation called the Native Farmers Association (NFA) undertook to address

the then widespread environmental degradation and poverty among rural communities. Although the NFA finally failed, its example indicates the existence of a positive and responsible attitude to the environment in the past.

Another organisation which was deeply involved in raising the conservation consciousness of black communities through its environmental education campaigns in schools, as well as among communities in urban and rural areas, was the African National Soil Conservation Association (ANSCA) which was formed in 1953. ANSCA had a publication called Green Earth which expressed the environmental concerns of the community (Khan, 1990). Khan's research (1989, 1990) argues that black communities in South Africa and in Ciskei were in the past active in environmental education. This is important to note for, as she proposes, if environmental awareness once existed among Ciskeian communities, it could probably be resuscitated.

3.4 Political context

The political arena in Ciskei is dominated by three groupings, namely the ruling party, the African Democratic Movement, and two 'liberation movements', the African National Congress (ANC) and the Pan Africanist Congress (PAC). The latter two organisations have expressed their concern about environmental issues and the need for Environmental Education (Irwin, 1990a,b). The PAC and ANC have both released discussion documents (Desai, 1990; Sangweni & Sisulu, 1990) which commit their respective organisations to a holistic environmental policy, incorporating the concept of sustainable development within a democratic political framework.

At the time of the study, Ciskei was experiencing political unrest. This was linked to conflicts between the ruling party and the two liberation movements, as part of the larger struggle for democracy in South Africa. The liberation movements, supported by a large part of the Ciskei population, are demanding

that the independent government be dissolved and the state re-incorporated within a democratic South Africa. The Ciskei goverment is naturally resisting this call. As in South Africa, the education system, particularly the schools, has often been targeted for this political struggle, which includes a drive towards the reconstruction of the existing education system.

3.5 Educational context

The education system in Ciskei, like other education structures in South Africa, has been characterised by a centralised, top-down and expert-driven approach, which has not allowed for consultation (Clacherty, 1993b). Management in the education system has been hierarchical and authoritarian, both in the formulation of education policy development and in the administration of schools.

Although Ciskei was declared an independent homeland by the South African government, there are still strong links between the economic and education systems of the two countries. It is well-known that "the Ciskei government depends almost entirely on direct subsidy from the South African government" (Kruger in Ramphele & McDowell, 1991:39). Education in the homelands is similarly dependent on the Department of National Education (RSA): "The homelands are responsible for their own budgets and spending in education but the South African government gives budgetary grants, professional and technical help" (Butler & Perold, 1985:130). Hartshorne has recently confirmed that the economic and administrative dependency of the homelands on Pretoria is stronger than ever:

> In Transkei and Ciskei a number of factors have led to increasing dependence upon the control treasury in Pretoria, stricter control by the Development Bank and a decrease in the degree of 'independence' which these territories enjoy. (Hartshorne, 1992)

The links between South Africa and Ciskei extend to other facets of education, besides financing. It appears that the Department

of Education and Culture in Ciskei is still under the control of the Department of National Education (DNE) in South Africa, despite the fact that each homeland has passed its own Education Act. It is reported in a National Education Policy publication called Education Realities in South Africa 1991 (DNE, 1992) that the DNE determines national education policy for eighteen education departments which function as separate administrative entities. Hartshorne explains further:

> In most cases homeland education tends to be very similar in character to the parent Education and Training Act. Even in the case of independent homelands the Department of Education and Training (DET) did everything in its power to influence them to stay in line with education policy in the Republic of South Africa and to continue to use DET curricula and examinations. Ciskei and Venda have tended to remain more closely under the general influence of DET in education matters. (Hartshorne, 1992:127)

From the above it is evident that Ciskei's education system has been dependent on the DNE for its economy, policy, curriculum development and examinations. But it is necessary to point out that despite this dependence, Ciskei has its own authoritarian bureaucracy, from the Minister of Education through the inspectorate division to the schools. The principal, deputy principal and vice-principal form the top of the hierarchy at school level. Butler & Perold (1985:132) give a sense of the power of this hierarchy in those schools where the principals have offices: "The hierarchy can be felt from the size of their offices and where teachers sit in the staffroom".

The pupils and their parents are lower down in the hierarchy. If they need to speak to the administerial level they do so through either the Students Representative Council or the Parent Teacher Committees. Both the ANC and the PAC suggest that parent-teacher-student associations or parent-teacher associations be established to improve parent and student participation in educational matters and to support a move away from the hierarchical structure in the schools.

The hierarchical structure is also evident in the classroom where the teacher is an authoritarian leader. Most classrooms in

Ciskei are still dominated by teachers using 'show and tell' and 'textbook' methods to promote the rote-learning of knowledge which is to be accepted uncritically. Lately, however, there have been calls for a shift towards child-centred approaches, largely through the influence of progressive educational support programmes such as the Molteno literacy project and the Science Education Project (SEP). These programmes have been run extensively in Ciskei, supporting education with in-service training and resources (Hartshorne, 1992).

Given the strong links between the DNE and the Ciskei Department of Education and Culture, it is no suprise that, since the DNE has not formally included Environmental Education in its policy or curricula, neither has Ciskei. The Ciskei school curriculum does not refer to Environmental Education but includes Environmental Studies as a subject at the junior primary school level and in the primary teacher diploma course. In the researcher's experience, the latter subject is in practice taught in only a limited number of primary schools. At post-primary school level the syllabuses of the subjects Agriculture, Biology and Geography include ecology and conservation, but these sections are not taught by all teachers. Some schools depend on the limited number of extension officers from the Department of Agriculture for the teaching of ecology and conservation (Mfenyana, pers. comm., 1992). Teacher training in Ciskei does not cover Environmental Education to a significant extent: of the three colleges of education only one offers a related course, namely Environmental Studies.

3.6 The need for Environmental Education in Ciskei

The researcher believes that all efforts to improve environmental quality in Ciskei should be built on the foundations of environmental awareness, education and training. Environmental Education may be a major means to address the poor environmental situation described above, because the basic aim of Environmental

Education is to produce citizens whose actions reflect a concern for the health of the total environment, as well as the quality of life of all its inhabitants (Hurry, 1984; Fien, 1993a,b). Hurry (1984) endorses the idea that formal education should play a role in addressing the environmental crisis:

> In countries where formal education plays an important role in the development of the individual, a certain amount of blame for the failure of many people to reflect concern for environmental health is laid at the door of the various educational systems. (Hurry, 1984:10)

Recently, the Environmental Education Association of Southern Africa (EEASA) and the Department of Environmental Affairs embarked on a joint venture to investigate the incorporation of Environmental Education into formal education (Clacherty, 1993a,b). A national workshop held in August 1993, involving a broad range of educational parties from South Africa and the Independent States, formed part of this process. This workshop has identified the need for broader regional participation which will, it is hoped, provoke debate about and commitment to Environmental Education in South Africa, including Ciskei.

When this research was planned late in 1991, it was designed to include a workshop in which senior educationists would participate and express their own views on the possibility of implementing Environmental Education in the school and college curricula. It was envisaged that senior educationists would be in a better position to discuss Environmental Education after the interviewing phase and that during the workshop they would have the opportunity to relate their perspectives to the existing education curriculum, syllabi and future teacher education. Due to unforeseen circumstances, including the unrest that is still continuing in Ciskei, this workshop had to be abandoned as a research strategy. The methodology used in the enquiry process is discussed in more detail in Chapter 4.

CHAPTER 4: METHODOLOGY

4.1 Aims of the study

The aims of this study were:

1. to investigate perceptions of Environmental Education among senior Ciskei educationists; and
2. to explore with them the possibility of implementing Environmental Education in the school and college curricula in the Ciskei.

4.2 The Sample

The focus of the research was on educational decision makers and planners in their capacity as policy formulators and curriculum developers. The intended research sample was all fourteen major curriculum planners in the Ciskei, subdivided as follows:

1. The four curriculum planners from Head Office, namely
   * a chief director, who is in control of nine assistant directors from all nine directorates in the Ciskei;
   * a planner and co-ordinator for all three colleges of education within the Ciskei;
   * a planner for post-primary education;
   * a planner for pre-primary and primary education.
2. The ten subject advisors who are responsible for guiding and controlling the following subjects at both primary and secondary level: Afrikaans, Agriculture, English, Environmental Studies, Geography, History, Library Science, Mathematics, Physical Science, Religious Education and Xhosa.

Owing to circumstances beyond the researcher's control, however, the final research sample differed from the intended sample. The final sample comprised three of the four education planners (excluding the Chief Director), five of the ten subject

advisors and five college lecturers.

Interviews proved difficult to arrange with both planners and subject advisors, because of their busy schedules and insurmountable logistical problems. The fact that the subject advisors not interviewed were all new (1992) appointees and therefore lacked experience was turned to advantage by the researcher, who interviewed in their stead five college lecturers with subject-specific teaching experience.

Lecturers from a local college of education seemed to be in a position to provide relevant information, particularly since the interviews with the subject advisors and planners indicated an important role for the teacher training colleges in the implementation of Environmental Education. Most subject advisors felt that teacher training was poor and that teachers' in-service training needed to be improved. The implementation of a curriculum innovation like Environmental Education has clear implications for teacher training, and on the basis of these considerations, it was decided to interview the college lecturers.

The college lecturers were chosen to represent those subjects which were not covered by the five subject advisors in the sample. They were drawn from the same college for reasons of convenience: the college concerned is situated close to where the researcher lives.

4.3 Procedure for obtaining permissions and gaining access

A letter to obtain permission for the research was mailed to the Director-General of the Department of Education and Culture, Ciskei. The letter explained the purpose of the study in detail, the intended research sample and the proposed date of commencement for the research. Accompanied by a copy of the research proposal and a supporting letter from Rhodes University, this letter was sent out in January 1992, two months before data collection was due to start.

A courtesy visit was paid to the Director-General's office early in 1992 in order to obtain verbal permission to continue with the research arrangements. This was essential at the time since the Director-General's post was vacant and the duties were being delegated to other senior officials. The researcher realised that in the circumstances a written response might be considerably delayed. The written reply was indeed received only at the end of April 1992, by which time eleven interviews had already been conducted on the strength of the verbal permission granted by the Director-General's office.

A visit was also paid to the head of subject advisors to inform him about the research and to obtain a list of the names of all subject advisors. The list was obtained, and letters were sent to all individual subject advisors requesting their participation, two months before interviewing time. The letter explained the purpose of the study and also that the respondent would be accorded full confidentiality.

4.4 Data collection technique: the research interviews

The research interview, rather than a questionnaire, was chosen as the principal data-gathering technique for the study, for the following reasons. First, the rate of return of questionnaires is often poor (Cohen & Manion, 1989), and because the respondents in this study were busy people, it was expected that this might have been the case here.

A second advantage of the interview over the questionnaire is that the interview lends itself to the creation of a relaxed person-to-person interaction, in which the interviewee can be put at ease by the interviewer, encouraging co-operation. Thirdly, it is possible to gain additional information during an interview, through probing and follow-up questions (Verma & Beard, 1981). Furthermore, an interviewer can make reasonably sure that an interviewee has not misunderstood a question, that he or she does not digress from the topic of the question (Behr,

1983; Cohen & Manion, 1989), or fail to respond to a particular question (Miller & Cannel, 1988).

The semi-structured interview (Burroughs, 1975:104) was deemed the most appropriate technique. The broad nature of both the topic (Environmental Education) and the objectives of the research led to the choice of a semi-structured interview; a structured interview, in which all set questions and answers are recorded on a standardised schedule (Cohen & Manion, 1989:106-12), would have been too restrictive. Although in the semi-structured interview the researcher poses pre-determined questions, the technique is relatively informal and allows considerable flexibility in the follow-up of questions. The interviewer is free to modify the sequence of questions and to probe for more specific answers to clear up any misunderstandings (Cohen & Manion, 1989:309-10).

On the other hand, the semi-structured interview is not as informal and loose (or open-ended) as the unstructured interview, which tends to be difficult to control, record and analyse (Burroughs, 1975:104). The schedule used in the semi-structured interview guides the interviewer and helps her to steer the interview, while also acting as a checklist to make sure that all areas to explore have been covered (Burroughs, 1975:104).

Audio-recording the interviews, as was done in this study, provides a permanent record that prevents the unwitting selection of data that might occur with note-taking. The information captured on the tape recordings was transcribed, creating a reliable resource for reference and analysis.

Interview methods generally require experience, are time-consuming and therefore tend to limit a study to small samples. Research shows that the reliability of interview data is lower than that of questionnaire data, but that the validity of the data that interviews yield is much higher (Dane, 1990:129). Reliability "involves the extent to which a measure is consistent", while validity refers to "the extent to which a measure is related to its theoretical concept" (Dane, 1990:257-62). In this project validity was regarded as more important

than reliability. Consistency was not a primary consideration because part of the purpose of the exercise was to stimulate the development of better understanding as the interview went along. Validity was a major concern, because the intention was to obtain the genuine views of participants (rather than mere windowdressing). The flexibility of interviews, together with the opportunities they afford for gathering in-depth data, led the researcher to choose this data collection technique.

4.5 Data collection: the research workshop

The researcher planned to use a second data collection tool, a workshop, to further investigate the possibility of implementing Environmental Education in school and college curricula in Ciskei. This would have been achieved by convening all senior educationists, sharing with them the research results and creating an opportunity to discuss ideas for implementation, thus giving the project an action research orientation (Kemmis, 1988). Owing both to difficulties encountered in securing the participation of some decision makers (mentioned above), and to the political unrest during 1992 and 1993 in the Ciskei, it proved unfeasible to conduct a workshop during the data collection phase of the research. This potential source of data, as well as the action research orientation, had to be abandoned.

The researcher did, however, try to make use of other opportunities to further explore Ciskeian educators' understandings of Environmental Education, and in particular their views on the possibilities for implementing Environmental Education in the curriculum. These opportunities were local workshops in Bisho, East London and Grahamstown, and a national workshop in Dikhololo, all four of which were part of the Environmental Education Policy Initiative mentioned before. These workshops provided valuable background on the current curriculum development process. The researcher attended these regional workshops as a participant observer (Ball, 1988; Dane,

1990).

4.6 Interview schedule

As background to the interview schedule (see Appendix 1), a couple of stipulative definitions of terms used in the schedule and in this study will be given here.

Understanding and Perception

'Understanding' is a complex, dynamic and multidimensional concept. In this study, interviewees' understanding has been assessed through the verbal expression of their propositions -- facts, opinions or beliefs (White and Gunstone, 1992:2-4). The concept 'understanding' encompassed not only these propositions, but also the links or patterns of association among propositions: it thus involves more than knowledge alone. A deeper understanding is characterised by a clearer formulation of propositions, and coherent links between them (White and Gunstone, 1992:12-13).

This study investigates the nature of the understanding of the senior educationists interviewed: it does not assess the depth of that understanding, nor does it systematically compare the understanding of different individuals. Any assessment of understanding has to be tentative and subjective, for understanding is not a constant variable, nor is it linear in extent (White and Gunstone, 1992:7).

The terms 'understanding' and 'perception' are employed interchangeably in this study. The term 'perception' is not therefore restricted to its psycho-physiological sense of sensory cognition (see e.g. Woolfolk, 1984). In this study perception denotes primarily mental perceiving (reception/construction); that is, understanding.

Environmental aspects

The phrase "environmental aspects" refers to a wide range of concepts, fields of interest, tools, methods and issues relating to the environment, where "environment" is a complex social construct referring to interactions among biophysical, political, economic and other social systems (Fien, 1993a,b).

The first part of the interview was used to explore perceptions on local environmental issues, their causes and solutions. The rationale behind these questions was that the researcher anticipated that some interviewees would be unable to discuss Environmental Education from the start of the interview. By commencing with a section on environmental issues, with reference to the situation in Ciskei, the interviewees would have the opportunity to express their views on matters about which they might feel reasonably confident. The discussion could then proceed naturally to Environmental Education as a possible solution to environmental problems. Although this design could be seen as leading, the researcher was very aware that if interviewees did not feel comfortable with the interview questions, they would be very reluctant to participate in the research. Furthermore, the data on interviewees' perceptions of environmental issues, their causes and solutions, was deemed to be informative in itself.

The first part of the interview schedule thus investigated the understanding of the term "environmental issues" (Appendix I, item 1), followed by perceptions of the major environmental problems within the Ciskei and their causes (Appendix I, items 2, 4). Both questions were open-ended to allow the respondents a chance to offer as much information as they could. Open-ended questions allowed the respondents to give a genuine opinion rather than simply to echo what they inferred to be the researcher's view (Tuckman, 1972; Saunders and Pinhey, 1972). The causes (Appendix I, item 4) were explored concurrently with each major environmental issue mentioned during the interview.

The third question (Appendix I, item 3) probed into

environmental issues that were not spontaneously given, for example, "Do you think there are any environmental problems related to soil?". Interview probes were used to stimulate respondents, to motivate them to reply adequately and to steer the communication (Cohen and Manion, 1989), and in some instances to prompt them to elaborate on a particular response (Behr, 1983). The probes used in (Appendix I, item 3) referred to the following categories of environmental issues: land-, water-, plant-, animal-, energy- and society-related environmental problems. This classification was one of many which could have been used; its purpose was simply to structure the interview to cover a broad range of issues.

The next part of the interview (Appendix I, item 5) comprised three open-ended questions asking for respondents' opinions regarding solutions to the existing environmental problems in the Ciskei, the possible initiators of those solutions (item 6), and the targets for solutions (item 7).

The following section of the interview concerned the role of the Department of Education, Ciskei, in addressing environmental problems (Appendix I, item 8). At this point an assessment of which school subjects had been addressing environmental issues was done. Subject specialists were required to express their views on whether their subject and the curriculum in general had been addressing or ought to be addressing environmental concerns; whether environmental aspects should be included in the formal school curriculum; which subjects should include environmental aspects, and at what level of schooling environmental aspects should be formally included in the school curriculum (items 9.1 to 9.6).

Items 10.1 to 10.2 (Appendix I) covered the main objectives of this research, namely perceptions of Environmental Education. Open-ended questions were used to explore the respondents' perceptions of what Environmental Education is (item 10) and which concepts they regarded as part of Environmental Education (item 10.1).

Concepts relating to Environmental Education, taken from the

IUCN (1971) definition of Environmental Education, were then used to explore interviewees' perceptions in more depth. Closed questions were asked, for example, "Do you think that Environmental Education includes the following: recognising and clarifying values?" (Item 10.2). This question gave the respondent an opportunity to review his or her previous thoughts on and responses to questions about environmental problems, causes and solutions, and then to agree or disagree with the given statement. As explained above, this aspect of the schedule design reflected an anticipation that many interviewees would not be in a position to clearly articulate their views on Environmental Education without a discussion of local issues and causes beforehand. To ascertain whether a particular response reflected a real perception, or whether the interviewee was just agreeing, the following probe -- "In what way?" -- was used in response to a positive answer. This allowed the respondent a chance to give reasons and so to show whether or not he or she indeed perceived a particular concept to be part of Environmental Education.

The last part of the interview schedule assessed the possibility of implementing Environmental Education within the Ciskei school and college curricula by means of open-ended questions (Appendix I, items 10.3 to 10.6).

4.7 Pilot testing of the interview schedule

A pilot run was used to test and evaluate the interview schedule. Pilot interviews were conducted with a group of teachers in the Department of Education at Rhodes University. The chosen group resembled the intended research sample in that the interviewees were all experienced teachers representing different subject perspectives at different levels of schooling, ranging from primary to high school. This furnished an opportunity to improve the questions in the interview schedule. The pilot test also improved the researcher's interviewing skills, which required

training and practice.

There were no substantial changes made to the content of questions, but those questions which respondents found difficult to answer were modified by using non-technical language as far as possible. According to Spaul (1988:77), an interviewer should converse at the level of language of the interviewee.

4.8 The interview process

All respondents had the same level of education as the interviewer, which facilitated communication and helped to decrease the response error which can occur when people use the same term in different senses, thus misunderstanding each other (Miller and Cannel, 1988:459). Nevertheless, most interviewees were initially very tense and apprehensive (see Chapter 6, Section 6.1).

Questions in the interview schedule were asked exactly as written and, if misunderstood, were repeated without change. Clarifications or explanations were used only when probes did not stimulate the respondent sufficiently.

A transcription of tape-recorded responses completed the interviewing process. A general impression of the interview process is provided at the beginning of Chapter 6 (6.1).

4.9 Data analysis

The data analysis was both qualitative and quantitative.

In the qualitative analysis phase, each individual's interview transcript was interpreted and analysed by comparing responses with the IUCN definition of Environmental Education, the Tbilisi principles and international perspectives on a holistic approach to Environmental Education and "education for the environment", as outlined in Chapter 2.

The individual respondent analysis was followed by group

analysis, which was quantitative. The data obtained from each individual was broken down into categories which emerged from the data; there were different categories for each question in which such a breakdown seemed appropriate. The responses in the various categories were then quantified, to give a sense of how widely held various opinions were, and presented in table form where appropriate. The analysis was done on the basis of categories, for as Ely et al. (1991:145) point out, categories can serve the function of helping us to "tease out the meaning of our findings, as we consider the supporting evidence in each category and as we determine how categories may be linked".

A descriptive summary was made of data relating to the groups' perceptions of Environmental Education. Out of this description, key features of what appeared to be distinct but overlapping approaches to Environmental Education held by the respondents, were highlighted. An attempt was made to present a quantitative analysis of the different positions as well, by identifying and grouping together similar thinking units with apparently similar meanings and quantifying them, (tables 5.1 to 5.12). Identifying categories of response was a repetitive, reflective process, involving -- for example -- frequent re-listening to the original tape recordings. According to Ely et al.,

> making categories means reading, thinking, trying out tentative categories, changing them when others do a better job, checking them until the very last piece of meaningful information is categorized and even at that point, being open to revising the categories. (Ely et al., 1991:145)

Themes were developed from categorised statements which highlighted interviewees' perceptions or understandings of Environmental Education. These themes were used to inform the conclusions and recommendations drawn from the study. The process of moving from raw data to eventual conclusions has to be defensible (Toulmin 1969); the warrants used in this study were a thorough grounding in the literature and extensive reference to and quotation from the interviews. The data-gathering and processing strategy which was employed is endorsed by Lawson

(1988, cited in Lynthcott & Duschl, 1990:448), who advises that "interview segments must be provided to represent and legitimize the data, to support any collapse of data, and to allow a critique of the claims".

CHAPTER 5: RESEARCH RESULTS

5.1 Introduction

This chapter reports the results of the small-scale interview survey conducted amongst senior educationists in Ciskei. The report follows the structure of the interview schedule. The data on interviewees' understanding of Environmental Education was studied carefully and analysed qualitatively and quantitatively against the IUCN definition, the Tbilisi principles, and the "holistic" approach to Environmental Education ("education for the environment") outlined in Chapter 2. The entire interview transcript (and not just the reply to a specific question) was consulted for evidence of an interviewee's perceptions of a particular concept.

The data was analysed, and will be reported, in the following order: First, perceptions of the concept "environmental issues", followed by perceptions of the major environmental issues and their causes. Environmental issues cited by respondents are reported in the categories land-related, water-related, plant-related, animal-related, energy-related and society-related. (These categories were used in the interview to prompt further responses.) Then follow proposed solutions to environmental problems, including the suggested initiators and targets for these solutions. Reported next is the interviewees' understanding of Environmental Education, one of the major points of focus of the study. Lastly, interviewees' views on the possibility of implementing Environmental Education in the curriculum are tabulated, the second major focus of the study.

5.2 Perceptions of "environmental issues"

Perceptions of environmental issues were investigated partly with the ulterior objective of eliciting perspectives which could help inform interviewees' understanding of Environmental

Education, the focus of later questions. Interviewees' notions of what is meant by "environmental issues" were explored by means of an open-ended question: "What is your understanding of the term environmental issues?" (Appendix I, item 1).

Elements of interviewees' perceptions of "environmental issues" are given in Table 5.1. The largest group of respondents perceived environmental issues as relating to people (9), saying that "they affect people" (6), or that "people affect the environment" (3). Secondly, eight respondents noted the broad nature of environmental issues, indicating that they concerned "everything" or "anything". Thirdly, three respondents mentioned that environmental issues have to do with one's immediate surroundings. Another three respondents perceived the "problematic" nature of environmental issues, while two specified that environmental issues "affect man, soil, animals and water".

TABLE 5.1: Elements occurring in understandings of the term "environmental issues"

Elements in understanding of environmental issues		Frequency
Social:	"Affect people" "People affect environment"	9
Broad:	"Anything" "Everything" "Affect man, soil, animals, water"	8
They involve the immediate surroundings		3
The problematic nature of environmental issues ("Are problems")		3
They involve resources		1
Unsure		1

Other views of environmental issues emerged with less frequency; for example, one respondent mentioned that environmental issues relate to resources, such as "plants,

soil, animals and water". Another respondent was not confident of his answer, saying "I am not sure, it is treating well of the environment, ploughing back what nature has accorded us". This answer appears to prioritise the notion of environmental management.

5.3 Perceptions of environmental problems in Ciskei and perceived causes

The second question was aimed at exploring perceptions of the major environmental problems in the Ciskei: "Could you name some of the major environmental problems in the Ciskei?" (Appendix I, item 2). Environmental problems spontaneously cited by respondents are shown in the first column in Table 5.2, in order of frequency of citation.

It is interesting to note that the environmental problems mentioned most frequently all related to the land. The most commonly cited environmental problems seemed to be the most visually obvious ones; "litter" and "plastic pollution" (terms used interchangeably), for instance, are encountered daily in the respondents' environment.

TABLE 5.2: Major environmental issues cited by senior educationists in Ciskei

Problem mentioned	Spontaneously mentioned	Mentioned after probing
Pollution; "littering"	9	8
Soil erosion	2	8
Depletion of resources	3	3
Lack of beauty	2	0
Overpopulation	1	0
Shack settlements	2	0
Insufficient land	0	2

Even on probing for other land-related problems (Appendix I, item 2; Table 5.2, column 3) the above-mentioned issues were still uppermost in respondents' minds. The land-related issues that were mentioned after probing were soil erosion (8), littering and pollution (8), and insufficient land (2).

5.3.1 Causes of land-related problems

Causes of Soil Erosion

Several causes of soil erosion were mentioned (Table 5.3). The reader will note that the perceived causes relate to lack of education and environmental values, bad land use practices and neglect consequent on economic factors.

One respondent spoke about soil erosion caused by the rain washing top soil away, and said:

> I would say that no precautions are taken to [prevent] soil erosion. Manpower is there, unemployed, perhaps because of [the] present economic climate people cannot be employed. Previously people would be employed for filling dongas, but it does not happen any more.

Causes of pollution

Causes of pollution were seen to be lack of education (5), and the lack of social services and control by local authorities (3). Two respondents mentioned that there were very few litter bins in Zwelitsha, Bisho and Mdantsane. One of them felt that the provision of litter bins was inadequate, even in the Department of Education's Head Office in Bisho. One interviewee expressed a concern that the absence of litter bins and the haphazard dumping of refuse encouraged children from poor families and hungry dogs to play in litter, thus causing potential health hazards. Other causes of "litter" mentioned were "lack of values" (2), carelessness (by both residents and local authorities, (2), and a lack of environmental law enforcement (1). (Other references to pollution are dealt with under water-related issues.)

TABLE 5.3: Land-related issues and their causes

Problem	Cause	Frequency mentioned
1. Soil erosion	a. Lack of education	7
	b. Bad land use practices	3
	c. Overstocking, overgrazing	2
	d. Veld fires	2
	e. Lack of values	1
	f. Lack of attention to the matter, perhaps economic	1
2. Pollution "littering" "land pollution" "soil pollution"	a. Lack of education	5
	b. Lack of social services and control by municipality	3
	c. Lack of values	2
	d. Carelessness	2
	e. Lack of environmental law enforcement	1
3. Overcrowding	Many people on limited land	1
4. Insufficient land	a. Limited land allocated/family	1
	b. Neglect by authority	2
5. "Lack of beauty"	a. Lack of education	3
	b. Lack of social services in urban areas	1

Causes of overcrowding and land shortage

Overcrowding was perceived to be caused by too many people on limited land (1). Insufficient land was reported to be due to an inadequate allocation of land per family (1) and to neglect by the authorities (2). Respondents were not keen to address the land issue further, perhaps because they saw this as a political matter which they did not feel free to discuss in the

interview, not being quite sure how the data would be used. The general opinion is perhaps captured by the following quote: "There is little land for the people and no expansion to cater for many people".

Causes of lack of beauty

"Lack of beauty" (indicating the absence of landscaping and trees and the prevalence of litter, particularly in the environs of Bisho) was perceived to be caused by a lack of education (3) and a lack of social services in urban areas (1).

Interviewees did not spontaneously mention any environmental problems relating to water, plants, animals or social issues. Hence the following questions were used as probes to stimulate the respondents to contribute further: "Do you think that there are any environmental problems related to water . . . plants . . . animals . . . energy . . . social issues?" (Appendix I, items 3.1 to 3.7).

5.3.2 Water-related environmental problems

Water-related problems mentioned by interviewees after probing are listed in Table 5.4. Water pollution was reported by seven respondents as a major environmental problem in Ciskei. The different forms of water pollution they referred to are clearly indicated in the table, as are other water-related issues mentioned, namely water wastage (1) and the scarcity of water in the Ciskei in general (1).

TABLE 5.4: Water-related problems mentioned after probing

Water-related problem	Frequency
Water pollution:	7
* unclean water	5
* industrial effluent	4
* washing in open water	3
* animals drinking domestic water	2
* sewage spills in water	2
Other problems:	2
* water wastage	1
* scarcity of water	1

TABLE 5.5: Water-related problems and their causes

Problem	Cause	Frequency
Water wastage	Neglect by local authority	1
Shortage of water	Poor rainfall and few rivers	1
Water pollution	Lack of education	5
	Lack of infrastructure, no [water] taps	4
	Neglect by authority	3
	Neglect by factory owners	3

The most frequently cited causes of water-related problems are listed in Table 5.5. They relate mainly to lack of education, negligence, lack of infrastructure, lack of government control and the arid climate of the Ciskei. The respondents who mentioned industrial pollution were concerned that nothing was being done about it, and one noted that there was "no form of legislation to control industrial pollution". Another respondent was concerned about the health hazards posed by open, shared water sources in rural areas, particularly in

periods of drought: "Rivers are used for drinking, by animals, irrigation, washing clothes, washing bodies. River water is a health hazard when there is drought."

Concern was expressed about the economic implications of the water shortage in Ciskei: residents in some areas were taxed heavily on water use, and were subject to water restrictions. In other areas, burst reticulation pipes went unrepaired and water was wasted.

5.3.3 Plant-related environmental problems and perceived causes

The major plant-related problems perceived by the interviewees are listed in Table 5.6. These were wood depletion (mainly the chopping down of trees for firewood), which was mentioned by 10 respondents, veld fires (4), overgrazing (4), unkempt grass as both a traffic hazard (4) and for aesthetic reasons (1), cutting grass for roof thatching (1), "thin vegetation" (implying a process of denudation, 1), and limited backyard gardening (1). Perceived causes of wood depletion (Table 4.7) were the cutting down of trees for firewood and fencing (8), a lack of education and "awareness of [the need for] replacing used resources" (6), and new settlements increasing the pressure on natural resources (1). Veld fires were perceived also to be the result of a lack of education (4).

TABLE 5.6: Plant-related problems mentioned after probing

Problem	Frequency
Chopping down of trees	10
Veld fires	4
Overgrazing	3
Unkept grass as a traffic hazard, unaesthetic	2
Cutting grass for roofing	1
"thin vegetation" (denudation)	1
limited backyard gardening	1

One respondent further explained that "depletion of firewood was not done because people did not appreciate trees, it is because there is a need for firewood by poor people in rural areas and in squatter camp settlements". Another interviewee explained that the failure to replant trees was aggravated by the fact that there were few woodlots: "Mount Coke woodlot seems to be the only one around Zwelitsha, and Amatola Forest near Keiskammahoek". A third respondent mentioned the occurrence of what she termed "thin vegetation". She felt that this was caused by veld fires and by the leaching of nutrients from the soil as a result of poor farming practices. Limited backyard gardening was seen as a problem, consequent on the allocation of insufficient land per family. This was a problem exacerbated by and contributing to impoverishment, for it meant that people were not in a position to grow enough vegetables to feed themselves.

TABLE 5.7: Plant-related problems and their causes

Problems	Frequency	Causes	Frequency
Deforestation	10	- Need for "firewood, fencing, kraal" resources - Lack of education. "Lack of awareness of replacing used resources" - "New settlements impose pressure on natural resources"	8 6 2
Veld burning (veld fires)	4	- Lack of education: "ignorance"; "no knowledge of effects of veld fire . . . harm on veld, animals, man". "Lack of knowledge of effects on plant depletion" - "Lack of value for plant life in ecosystem" - "Negligence from smokers" - "Negligence from people travelling at night"	4 1 1 1
Unkept grass as a traffic hazard	4	- Lack of social services - Lack of community effort to control grass along the road	3 1
Overgrazing	3	- Too many cattle in limited grazing area - No rotational grazing	2 1
Cutting grass for roofing	1	- Need for thatched roof material - Ignorance	1 1

5.3.4 Animal-related environmental problems and perceived causes

The major animal-related problems that were reported by senior educationists in Ciskei are shown in Table 5.8: "street

farming" as a traffic hazard (6); overstocking (4); free-ranging livestock destroying gardens (2); disappearing wildlife (2); noise pollution due to dogs (1); hungry cats and dogs (1), and dead livestock and pets rotting unattended in the veld (1).

TABLE 5.8: Animal-related problems and their causes

Problems	Frequency mentioned	Causes	Frequency mentioned
"Street farming" posing a traffic hazard	6	- Lack of control - Farmers purposefully drive animals towards road for green grass - Insufficient grazing, no proper fencing - Lack of animal care	1 1 4 4
Overstocking	4	- Ignorance - "Lack of knowledge" - "People believe in quantity, are ignorant about quality"	4
Disappearing wildlife	2	- Hunting - Lack of food for wild life - Poor people need cheap protein source	2 1 1
Free-ranging livestock destroying gardens	2	- Lack of grazing	1
Dead livestock and pets rotting in the veld	1	- Negligence of man - Ignorance	1 1
Noise pollution due to dogs	1	- Too many uncared-for, hungry pets on street - Lack of control	1
Hungry cats and dogs	1	- Lack of knowledge, "love of animals despite poverty", "animal-friendly although low economy"	1

The causes of animal-related problems are listed in the third column of Table 5.8. The reader will note that they refer to the need for resources, to a lack of knowledge, a lack of control and/or care, and poor farming practices.

5.3.5 Energy-related environmental problems and their causes

Energy-related problems mentioned by senior educationists in Ciskei are shown in Table 5.9. Interviewees pointed most frequently to a shortage of firewood for fuel, and the lack of electricity in both rural and urban areas, which leads to the use of alternative, sometimes dangerous sources of energy. The latter included the use of agricultural residues for fuel, which accelerated the depletion of soil fertility. The need to explore solar and wind power as alternative energy sources was also mentioned. With regard to the causes (Column 3 in Table 5.9), a lack of education or ignorance was again mentioned most frequently, followed by a lack of infrastructure, neglect by the authorities, and limited financial resources.

TABLE 5.9: Energy-related problems and their causes

Problems	Frequency	Causes	Frequency
Shortage of firewood for fuel	10	Lack of education, "ignorance"	3
Electricity needed in both urban and rural areas	12 (7 urban) (5 rural)	- No infrastructure in rural areas; neglect by decision makers - Limited finance - Lack of education	3 1 3
Use of gas, paraffin, cheap but dangerous as an alternative source	8	- Reduces labour - Lack of education	3 2
Use of solar energy to be encouraged	2	Lack of education	1
Use of agricultural residues for fuel (depletion of soil fertility)	1	Lack of education	1
Use of wind energy to be encouraged	1	Lack of education	1

5.3.6 Society-related environmental problems

The environmental problems relating to social issues most frequently mentioned by the interviewees were overpopulation (7), unemployment (5), and rural migration (5) (Table 5.10).

TABLE 5.10: Society-related issues and their causes

Problem	Frequency mentioned	Causes	Frequency
Overpopulation and overcrowding	7	- No education - Negative attitudes towards family planning due to religion and custom - Low income people bear more babies - Many people little land	3 2 2 1
Unemployment	5	- No jobs from government and limited industries (industries closed down in Dimbaza and Mdantsane) - Schools failing to produce qualified people	4 1
Rural Migration	5	- Poverty - Starvation - Chasing easy life - Seeking work - No agriculture for subsistence	3 1 1 1 1
Growth of shack settlements	2	- Housing shortage - Poverty	1 2

An overview of the above tables shows clearly that the major perceived causes of environmental problems in Ciskei were: ignorance or a lack of education, negligence and a lack of control (particularly by the government), poor infrastructure, the absence of appropriate values and attitudes, and -- to a lesser extent -- economics.

5.4 Proposed solutions to environmental problems within Ciskei

After the questions concerning the major environmental problems and their causes, the interviewees were asked to propose solutions to these problems (Appendix I, item 5): "What in your opinion are solutions to these environmental problems?" Their responses were categorised as Education (Formal and Non-Formal), Economic Changes, Legislation, 'Democracy' (political change) and Active Liaison between government and non-governmental organisations (NGOs). The frequency with which the various solutions were mentioned is shown in Table 5.11.

TABLE 5.11: Solutions to environmental problems in Ciskei as perceived by senior educationists

Solution	Frequency mentioned
Education	11
Environmental laws	4
Economic changes	3
"Democracy" (political change)	2
Liaison between government and NGOs	2

5.4.1 Education

The majority of respondents suggested education as a solution to environmental problems in Ciskei. It is clear from the tables listing the perceived causes of environmental problems that respondents regarded ignorance as a major cause of environmental problems in Ciskei. When probed to clarify what was meant by education, their responses were as follows:

Formal Education

All 11 respondents suggested that the formal education sector should devise means to solve the severe environmental problems facing the Ciskei. At this stage in the interview two respondents spontaneously recommended the inclusion of

Environmental Education in the school curriculum. (These responses will be noted again in the section on the implementation of Environmental Education in Section 5.6, below.)

The role of formal education and of the government's Education Department in solving environmental problems was mentioned spontaneously in many of the responses reported above. Item 8 (Appendix I) specifically asked what role interviewees thought education could play in solving environmental problems. The formal education system was universally regarded by respondents as the most effective "vehicle" for Environmental Education. As might have been expected from senior professional educationists, all thought that formal education had a crucial role to play in bringing about change.

Non-formal Education

All 11 respondents also thought that non-formal education had a role to play in solving environmental problems. One respondent affirmed that non-formal education was important because the majority of the Ciskeian population was rural and many adults were illiterate and "ignorant".

Nine respondents suggested that community-based education was essential. One respondent declared that community-based education should incorporate projects for environmental awareness and other educational activities to improve the environment. One respondent mentioned that adult education should include Environmental Education in its literacy programme as well as the "three Rs" (reading, writing and arithmetic). One respondent understood that decision makers needed education on environment issues.

General educational activities

Various educational activities were proposed to improve the environmental situation in the Ciskei. One respondent suggested the use of the media, specifically radio and

television programmes, to promote environmental awareness. Another respondent suggested the recycling of paper, plastic and aluminium cans as a workable solution with a financial return: "Recycling is also an educational activity that enhance[s] a lifestyle where [the] community will abstain from littering and consciously keep [the] environment clean."

Other suggestions included anti-litter campaigns in schools (1), environmental theme days such as tree planting days (1), and community development projects such as the planting of woodlots to replace trees cut down for use (1).

5.4.2 Environmental laws

Four respondents spontaneously identified environmental laws as a solution to environmental problems in Ciskei. One respondent suggested that people continued to act irresponsibly because there was no environmental law enforcement to stop them from acts such as littering. Another respondent suggested that environmental laws should be enforced to stop people from starting veld fires and to prevent further environmental degradation.

5.4.3 Economic changes (finance and employment)

Three respondents thought that economic change would help address environmental problems in the Ciskei. They suggested that funding should be provided by the government (1) and private sector (1) to develop and improve the infrastructure to enable it to cope more successfully with environmental pressures. Two respondents suggested that government should fund employment to combat existing environmental problems, for example to monitor soil erosion, remove litter and control grass along roads.

5.4.4 Democracy (political change)

One respondent suggested that "democracy" was beginning to offer a part-solution to environmental problems in Ciskei. He explained that since the relaxation of South African apartheid laws, in particular the Group Areas Act, many people were encouraged to leave the densely populated areas of the Ciskei for less populated areas in South Africa such as King William's Town and East London.

5.4.5 Active liaison between government and non-government organisations

One interviewee suggested that independent bodies should liaise with the government in the solution of environmental problems in Ciskei. Another proposed that organisations with influence in the community, such as the ANC, should work towards solving environmental problems.

5.4.6 Targets for solutions

"Targeted" groups were discussed in response to the question: "Whom do you think should be reached or targeted in order to solve the environmental problems that you have mentioned?" (Appendix I, item 7). Seven senior educationists' responses were that school children should be the main target in any environmental campaign. Two other respondents mentioned the school, one mentioned the teacher, and one respondent suggested that the school, teacher and children should be targeted in addressing environmental problems. Thus all 11 interviewees thought that the school constituted an important target area. Three interviewees also maintained that "the community" should be targeted, while one suggested that attention should be focused on decision-makers.

5.4.7 Initiators of solutions

In response to the question "Who should be responsible for initiating the solutions?" (item 6, Appendix I), all 11 interviewees proposed that the government bore the primary responsibility for tackling environmental problems.

The reason given was that government was perceived as having the requisite authority and decision-making capacity (2). Two respondents thought that government should initiate solutions to existing environmental problems by providing funds. Another two respondents suggested that some unspecified "responsible" or "sensitive" government departments should initiate environmental solutions, while three others proposed delegating the initiating role to specific departments, namely Agriculture, Health, Justice, Works and Education.

Although the government was perceived by all respondents as bearing the lion's share of responsibility for taking the initiative in implementing solutions to environmental problems in Ciskei, three of them expressed the view that "people [the community] have not been given an opportunity to initiate things". The "environmentally literate" were reckoned to be capable of taking the initial steps in educating the decision-makers, teachers and community in a "democratic education system". The other initiators mentioned in the interviews were the private sector (3), "empowerment structures" (ANC and PAC) (1), and "affected people", for example, people living in squatter settlements (1).

5.5 Interviewees' understanding of Environmental Education

The first primary aim of this study was to explore senior educationists' understanding of the term Environmental Education. After the open-ended question (Appendix I, item 10), interviewees were probed (item 10.2) to explore their understanding of other elements in the process of Environmental Education (as described in Chapter 2). Ten interviewees' responses were consonant with elements of the IUCN's definition

of Environmental Education. One respondent was not sure of the terminology used when asked whether Environmental Education included the knowledge and understanding of concepts.

Interviewees' responses to the questions aimed at gauging their understanding of Environmental Education were categorised as follows:

5.5.1. Environmental Education is a major solution to the environmental problems in Ciskei.

5.5.2. Environmental Education is issue-oriented, that is, it teaches about environmental issues.

5.5.3. Environmental Education has a broad nature and deals with the interrelationships among aspects of the environment.

5.5.4. Environmental Education is a process of fostering attitudes and instilling values of appreciation, preservation and conservation.

5.5.5. Environmental Education includes skills development and decision making.

5.5.6. Environmental Education is relevant education.

5.5.7. Environmental Education can close a gap between schooling and the world of home and employment. It also provides better learning and teaching methods.

5.5.8. Environmental Education is equated with outdoor education, conservation education or environmental studies.

The interviewees' perceptions of Environmental Education were then analysed and interpreted as follows:

5.5.1. <u>Environmental Education is a major solution to the environment problems in Ciskei</u>.

As noted above, all 11 respondents expressed strong feelings that formal education was the most effective vehicle for Environmental Education, in response to item 8, Appendix I.

In reply to item 9, Appendix I, ten respondents claimed that their subjects contained some environmental aspects. The respondents represented the following subjects: Agriculture

(1), Biology (1), Physical Science (1), Geography (3), Languages (2), Biblical Studies (1), Environmental Studies (1). All eleven respondents felt that Environmental Education could address and solve the major problems in Ciskei.

5.5.2. Environmental Education is issue-orientated in that it teaches about environmental issues and their control.

Six respondents understood Environmental Education as a process of raising awareness and imparting knowledge about environmental issues and their control.

Four respondents in this group mentioned spontaneously (in response to item 10.1, Appendix I) that Environmental Education is a form of education focusing on knowledge and understanding of concepts, for example, "pollution, soil erosion, conservation and ecology". After probing (item 10.2, Appendix I), this figure rose to 10.

The perception that Environmental Education is aimed at raising awareness of environmental issues and their control was expressed by one respondent as follows: "Environmental Education includes teaching about pollution, soil erosion, conservation and ecology, and [how to] prevent littering by recycling".

An understanding that Environmental Education was issue-orientated also emerged in responses to Appendix I, item 8, when respondents were discussing the role of education in solving major environmental problems in Ciskei. They evinced an understanding that typical Environmental Education activities were issue-orientated in that they were aimed at raising awareness about/of environmental problems, for example: a tree planting day (1), anti-litter campaigns in schools (1), competitions for the best essay on an environmental issue (1), and community development projects such as woodlots to replace utilised trees (1).

5.5.3. Environmental Education has a broad nature and deals with interrelationships among different aspects of the environment.

Four respondents displayed an understanding that Environmental Education has a broad nature by spontaneously asserting that Environmental Education dealt with both the biophysical and social dimensions of the environment. Examples of such responses included statements that Environmental Education involves "everything in the environment"; that it "involves people, soil, animals and water."

Seven respondents understood Environmental Education as the raising of awareness about environmental resources, interrelationships and issues. After probing (as in item 10.2), all 11 interviewees revealed that they shared this perception.

A response that elaborated on the question of interrelationships in the biophysical environment went as follows: "Environmental Education involves people, animals, soil, [and] water, and all are interrelated." Two other such responses were:

> I think Environmental Education is the process whereby people are made aware of the environment and the role it plays in their life . . . I mean how it affects their life and how it actually affects every aspect of their living;

and: "Environmental Education should teach how we relate to [the] environment and how [the] environment relate[s] to us."

5.5.4. Environmental Education is a process of fostering attitudes and instilling values of appreciation, preservation and conservation.

Environmental Education was perceived as a form of education that instils attitudes of appreciation, preservation and conservation by two respondents who mentioned this spontaneously. After probing (Appendix 1, item 10.2), all respondents agreed that Environmental Education should develop attitudes and values. Some responses that elaborated on the

development of attitudes were: "the school as an initiator should concentrate on improving attitudes and provide information on Environmental Education"; and:

> a solution to environmental problems in Ciskei is to improve [the] attitudes of people. Education should encourage an appreciation of the environment and use of environment properly.

One respondent mentioned spontaneously that the values of appreciation and care for the environment could be part of environmental education, whilst all respondents agreed about this element when stimulated by a probe (item 10.2). A response which expresses this understanding was that

> Educative activities and projects for environmental awareness should motivate each individual to value [the] environment, appreciate plants, appreciate the value of cleanliness.

5.5.5. Environmental Education includes skills development and decision-making.

Two interviewees spontaneously cited skills development as an aspect of Environmental Education during discussion of solutions to environmental problems. On probing, all 11 interviewees agreed that skills development was part of Environmental Education. The nature of the skills involved are reported according to the frequency with which they were mentioned: Observation skills (4), problem-solving skills (4), thinking skills (3), recycling skills (2); analysing skills (2), decision-making skills (1); technical skills, e.g. gardening (1), reading a thermometer (1) or wind meter (1); application skills (1), and calculating skills (1).

One interviewee spontaneously indicated an understanding that decision-making was part of Environmental Education. This view was expressed when discussing the solutions to environmental problems in item 5.4. All 11 respondents agreed when probed (item 10.2) that decision-making was part of Environmental Education.

5.5.6. Environmental Education is relevant education.

This position was held by three respondents. They expressed the view that Environmental Education dealt with issues that affected people's daily lives, and thus provided a more relevant form of education than the current curriculum. In response to item 10.4, the following was said:

> Definitely there is a big need for a change, because you will find that the curriculum as it stands . . . looks so irrelevant and so out of context of our lives. It is so standoffish, it's as though it comes from another planet and yet it is all about our life and our environment. But the way in which it is treated in the syllabus, it's as though it is something totally new. As a result the children do not easily relate to what is taught in the classroom because it is not related to the environment.

Environmental Education was considered by another respondent as able to provide a more relevant education because it "encompasses theoretical and practical aspects and the application of these in life".

5.5.7. Environmental Education can close a gap between schooling and the world of home and employment. It also provides better learning and teaching methods.

The relevance of Environmental Education was underlined by the perception that it was capable of closing a seeming gap between the world of home and employment, and the world of schooling. An example of one of these responses is:

> Environmental Education could close the gap and try to co-ordinate what is taught in school with what confronts the pupil when he leaves school for home and employment.

A similar response went:

> Education should relate to the home situation. There is a lack of application and [too much] theoretical teaching [in the existing curriculum].

Another respondent considered that Environmental Education would assist with the introduction of better learning and

teaching methods in the classroom. He felt that Environmental Education would help teachers "start with familiar terms to children [and then move] to more abstract big scientific terms". This opinion was expressed in the context of teaching abstract concepts in Physics, in the outside environment. The interviewee assumed that bringing the child into direct contact with the natural environment through fieldwork and experiments would help to simplify abstract learning, reducing concepts to familiar, nore easily graspable real-life terms.

Critical enquiry was deemed to be a teaching strategy to facilitate better learning. One respondent mentioned that development in learning skills -- namely, observation, analysis and problem-solving -- was urgently needed in the classroom. This view is consonant with perceptions of the skills-development role of Environmental Education outlined above.

5.5.8. Environmental Education is equated with outdoor education, conservation education or environmental studies.

Another group of perceptions of Environmental Education tended to equate it with conservation education, outdoor education and environmental studies. For instance, one senior educationist expressed the idea that Environmental Education is conservation education, at the same time indicating that there was a need for the latter:

> The level of conservation is very low and needs to be promoted. People lack a knowledge of how to protect soil in their gardening activities.

Three respondents linked Environmental Education to the concept of the outdoor classroom. They construed the latter as a situation in which theoretical concepts are illustrated and experienced in the environment. One view expressed during a discussion of which school subjects address environmental issues in the school syllabus (Item 9), was that "an outdoor classroom relate[s] classroom activity with real life situations". This point was illustrated by another remark, made during discussion on environmental approaches (Appendix 1, item 4), that "velocity in a classroom should be demonstrated

outside: children can ride their bicycle and experience velocity from the environment".

Another interviewee maintained that an outdoor classroom offers opportunities for developing aesthetic and moral values: "Pupils should be made to enjoy and appreciate nature that is outside the classroom."

One respondent equated Environmental Education with environmental studies:

> Environmental studies is not adequately addressing environmental concerns and should do this wholly, by bringing classroom activity [in line] with outdoor real life situation[s].

5.6 The possibility of implementing environmental education in Ciskei

The second primary aim of this study was to explore the possibility of including Environmental Education in Ciskei school and college curricula. The responses reported under the heading of "Implementation" were drawn from the entire interview, for interviewees mentioned aspects relating to implementation in response to items other than those dealing directly with this issue.

5.6.1 Inclusion of environmental aspects in school subjects

In order to investigate the possibility of implementing Environmental Education in Ciskei, the researcher first established from the senior educationists whether they thought that their various subjects currently addressed environmental concerns adequately, and which subjects they thought should address environmental concerns (Appendix I, items 9.1, 9.2, 9.3, 9.5).

5.6.2 Forms of Implementation

Environmental Education should be included in some subjects

Three respondents indicated that environmental aspects should be included in some subjects. After probing, five other respondents named Geography, Biology, Agriculture and Languages as subjects that should include environmental aspects. Three other respondents regarded Geography and Biology as the appropriate subjects. Two more respondents felt that Chemistry and General Science needed to include more environmental material.

In response to item 9.4, 10 respondents indicated that they believed environmental aspects or "concerns" should be included in the curriculum, or that "formal education should include Environmental Education in the school curriculum". However, one interviewee believed that Environmental Education should be an extra-curricular activity.

A reason for not including environmental concerns was given spontaneously by a language respondent, and it has to do with entrenched attitudes:

> Pre-service teacher training is improving. It equips student teachers to use English as a medium for all environmental concerns, but these teachers meet with problems at high school. Old teachers do not accept changes but these new teachers try their best.

This view suggests that some lecturers, for example in English, have been incorporating environmental concerns in their school syllabus, although this has been done informally. Such a situation does not concur with the researcher's view that currently there is virtually no environmental education in schools and colleges.

Environmental Education should be included in all subjects

When interviewees were asked whether they thought that the school subjects of which they spoke should include environmental aspects (item 9.3), eight respondents answered in the affirmative. After a probing question, all 11 respondents

indicated that any subject could include some environmental aspects; for example: "Environmental Education should be included in all subjects and should not be confined to Geography or one subject". Three interviewees mentioned this spontaneously, the other eight after probing. One of the responses was as follows:

> Environmental Education should not be confined in Geography, Biology, Agriculture only. I am not very sure on Language but -- Ah-ha! once there was a competition on essays on environment. I suppose Language include[s] environmental aspects in primary, yes, also in secondary school. Home Economics, too, also History. There are many current issues that are not dealt with in History, General Science, Maths too. I suppose all subjects should include some environmental aspects. This environmental thing is broad and is interesting when you come to think about it.

Environmental education as an Interdisciplinary approach

Although the interview schedule was not designed to establish whether the educationists thought that Environmental Education should be a subject or not, some conclusions may be drawn regarding interviewees' perceptions on ways in which Environmental Education could or should be implemented in the curriculum.

Four respondents seemed to understand Environmental Education as an interdisciplinary or cross-curricular approach, as opposed to a subject. According to one,

> Yes, environmental aspects should be included in the formal school curriculum. Environmental Education cannot be a separate subject. Each subject can include some environmental aspects.

Another respondent elaborated:

> Environmental Education is not a subject but an interdisciplinary approach. There should be an aspect of Environmental Education in almost every subject . . . . subjects like Geography, Agriculture, Biology and Physical Science should bear more environmental concerns. An environmental approach which is an interdisciplinary approach should be followed in schools.

The third interviewee in this group said that "Environmental

Education is a cross-curricular approach which emphasises the linking up of all school subjects", while the fourth understood that "Environmental Education need not necessarily be a subject on its own but . . . can be integrated into all subjects".

Environmental Education equated with Environmental Studies, Outdoor Education or seen as a separate subject

A different set of viewpoints equated Environmental Education with Environmental Studies (1) or Outdoor Education (1). Although these views were not clearly expressed, they could possibly imply a view of Environmental Education as a separate activity, or as one outside the formal curriculum.

5.6.3 Inclusion of environmental aspects from primary to tertiary level

In response to item 9.6, ten respondents indicated that formal education should include environmental aspects from primary to tertiary level. The following remarks illustrate this viewpoint: "the target group should be the pre-school and at every level of school environmental aspects should be included"; "Spread ecology and environmental aspects from primary to tertiary level"; "It should be as early as possible from Sub A because it must be a habit that is built within the child".

5.6.4 Curriculum development

Affirmative responses to items 10.3 to 10.6 (Appendix I) indicated that all 11 respondents thought that the existing curriculum was in need of revision or development. Examples of their contributions were: "the role of education is to develop a curriculum that will be environmentally orientated"; "a more relevant curriculum should be developed that is in context with our daily lives"; and "a new curriculum should be developed

that will close the gap and bring school life [in line] with home and job life".

Teachers' involvement in curriculum development

During the interviews, eight senior educationists responded to item 10 by suggesting that teachers should be involved in curriculum development. The other three were not sure whether education planners or teachers should be involved in curriculum development. One respondent noted that it was high time teachers got involved, for in the past they "were not given a chance to bring changes in the school curriculum". A second response emphasised teacher involvement despite their limited skills: "teachers should be involved in curriculum development although very few of our people have skills for curriculum development". A third interviewee felt that teachers would take pride in curriculum development and be more committed to teaching:

> I desire that teachers should be more involved in curriculum development because a sense of commitment weakens when things come top-down, yet if it is developed by teachers they will take pride in it and want to see it growing.

A fourth opinion was that a teacher's role conferred a certain right to be involved in the planning of the curriculum:

> Teachers will be involved in the curriculum development because they are involved with the classroom, they are 'hands on' with the curriculum.

5.7 Suggested changes to allow for the implementation of Environmental Education in Ciskei curricula

During discussion of desired innovations in the existing education system (Appendix 1, item 10.6), interviewees mentioned a number of changes which they deemed appropriate.

Changes to the teaching approach

Three respondents perceived that Environmental Education could

serve to introduce more practical teaching in the classroom. These interviewees expressed a desire for a more practical classroom situation, where children learn by doing, as opposed to a theoretical, textbook-oriented educational environment, where children learn by saying. One respondent's contribution was that: "Children should learn by doing and not by saying. Teaching methods should change. Learning should be practical." A similar perception was expressed as follows: "In our schools there is a lack of practical approach. [The] Environmental approach will enhance [the] practical approach in our classrooms."

The third interviewee was more specific:

> School subjects, for example, Geography, Biology, Agricultural Science and Physical Science, should break [with] the theoretical approach and be more environmentally orientated. The starting point should be the environment, and [then] back into the textbook, in the classroom -- a practical approach is more desirable.

Three respondents expressed the desire for a shift from a teacher-oriented approach to a child-centred approach. It was felt that the latter approach would encourage more dialogue and the development of ideas which pupils have and which many teachers are not aware of. One response summarised the matter as follows:

> The teaching methods should be pupil-centred and not teacher-centred and teachers should move away from teacher-dominated lessons and encourage group discussions in class. Pupils know more than teachers can imagine. Pupils are deprived of participation.

Changes to the Curriculum

It was very interesting to note that all 11 respondents perceived a need and indicated a desire for change to the existing school curriculum. This included a respondent who had earlier expressed the view that Environmental Education should be an extra-curricular activity. One respondent felt that there was a definite need for change in school curricula because what was being taught in classrooms was not relevant to

the environment. The rationale for this view is that the existing curriculum fails to integrate daily life with what goes on at school, with the result that children find it hard to relate to what is taught in the classroom. As was noted in the section dealing with perceptions of Environmental Education, two other respondents believed this situation could be remedied by including relevant syllabus themes that address the life awaiting a child when he or she leaves school.

Changes to teacher training

When discussing the extent to which school subjects should include environmental aspects (items 9.1 to 9.5) as well as the question of future changes (item 10.6), two respondents indicated that a lack of in-service training stifled the implementation of innovations promoted in Languages and Environmental Studies courses during pre-service training.

At both high schools and primary schools, newly qualified teachers ran into problems with older, more experienced teachers when trying to include environmental themes in their teaching. The point was made in this way:

> Pre-service training is doing its best to improve use of environmental issues but this is like a drop in the ocean, for young teachers meet resistance -- most teachers are old. Old teachers refuse to change and fear to change. In-service teacher training should improve and include environmental concerns in all subjects.

CHAPTER 6: DISCUSSION

Discussion of the research results is divided into four sections. A brief overview of the interview process is followed by discussion of interviewees' understanding of the concept of environmental issues and of their causes and solutions. Thirdly, the interviewees' understanding of Environmental Education is discussed against the background of international perspectives on Environmental Education. Finally, the discussion focuses on interviewees' views and proposals concerning the possibility of implementing Environmental Education in Ciskeian school and college curricula.

6.1 General impression of the interviews

In general, the researcher sensed an initial reluctance and tension on the part of respondents, and the interviews tended to begin on an awkward note. The tension often dissolved once respondents found that they could answer the questions asked. Most respondents were able to express some understanding of the term "environmental issues" and of the major environmental problems in the Ciskei. Addressing these topics at the beginning of the interviews set most of the respondents at ease. However, one respondent was so nervous that he had to leave the office and the interview came to a premature end! Two other respondents expressed anxiety about the interview and asked for a questionnaire to prepare themselves ahead of time. Although some initial nervousness is perhaps natural in the interview situation, the researcher speculates that the unnaturally high levels of tenseness and inhibition encountered in the course of this research may have been the result of a general perception of Environmental Education as something alien or at least unfamiliar.

It was interesting to observe interviewees' interest in the topic of Environmental Education growing during the

interview as they responded to the stimulus of probes. Once respondents realised that they found the topic interesting they contributed freely, and several were sufficiently stimulated to continue discussion even after the tape recorder was switched off. In general there was a large degree of consonance in respondents' views on the nature and causes of environmental problems and their solutions.

The design of the interview schedule undoubtedly influenced the results obtained. For example, probing for major local environmental problems (Appendix I, items 3.1 to 3.6) focused the interviewees' attention on local issues and possibly helped to evince an environmental issue-oriented (content-oriented) understanding of Environmental Education. Yet this aspect of the interview schedule design played a useful facilitating role, easing the interviewees into the information-gathering process (see Chapter 4, section 4.4).

6.2 Interviewees' perceptions of environmental issues/ problems, causes and solutions

The views expressed by interviewees generally reflected a fair understanding of the concept of environmental issues. Environmental issues were perceived as problems of a wide-ranging nature which affected people through their immediate surroundings.

The majority of interviewees also understood that these environmental problems arise in a context and process of reciprocity: that is, in a situation of interdependence between people and their biophysical environment in which people affect the environment and the environment affects people.

Broad range of enviromental issues

Interviewees cited a broad range of enviromental issues. The most frequently mentioned environmental issues were the most obvious ones that could be seen and experienced on a daily basis in respondents' biophysical and social environments.

Land-related issues were cited most frequently, and covered many environmental aspects, including the natural (e.g. deforestation, soil erosion) and the built (e.g. shack settlements). Also mentioned were technological aspects (alternative energy sources, e.g. solar energy); socio-economic aspects (e.g. neglect of soil erosion control measures by the authorities owing to economic constraints); political aspects (e.g. the shortage of land owing to inadequate allocations); moral aspects (e.g.hungry pets); and aesthetic aspects (e.g. litter and untended grass verges). Most frequently mentioned were issues pertaining to the natural, social and built environments. There was considerably less reference to economic and political aspects of the environment, perhaps because of an assumption that Environmental Education had nothing to do with politics. Other possible reasons are given below.

Land-related issues

From the fact that land-related issues were most frequently mentioned, the researcher infers that these were for the respondents the most obvious and salient ones. Pollution and soil erosion, for instance, are wide-spread and endemic in Ciskei, Southern Africa and Africa generally. As noted earlier, soil erosion is widely regarded as an environmental problem causing particular concern in Ciskei (Kruger in Ramphelele and McDowell, 1991). In confirmation a 1980 report cited in Homer-Dixon et al. (1993) found that "nearly 50 percent of Ciskei's land [was] moderately or severely eroded".

In comparison to land-related issues there was little spontaneous mention of plant-related issues, and no mention of animal-, water-, energy- and society-related issues. Probing stimulated interviewees to give some thought to these, and many examples were subsequently cited. It should perhaps be stressed that probing did not put words in the mouth of respondents, but encouraged them to take a broader view of the concept of environmental issues and so bring more of their own observation and experience into its purview.

Plant-related issues

The most frequently mentioned plant-related problems were the depletion of firewood, overgrazing and veld fires (Table 5.7). The depletion of firewood was understood to be due mainly to a demand for this resource coupled with a lack of awareness of the necessity of taking active steps to replenish it, and ignorance of how to go about it. One interviewee noted that although people valued trees, they also needed them for firewood, and needed to be taught how to replace used trees. These examples of human impact on plant resources (depletion, overgrazing, veld burning) are recognised in a study by Kruger (in Ramphele & McDowell, 1991) as major problems in Ciskei (see Chapter 3). Homer-Dixon et al. (1993) reported that "close to 40 percent of Ciskei's pasture [is] overgrazed".

Animal-related issues

As reported in Chapter 5 (Table 5.8), the animal-related issue most frequently mentioned was the bad management of livestock. Cattle and other animals were allowed to range freely, destroying gardens and posing a traffic hazard while grazing the grass on road verges. Concern was also expressed about diminishing wild species and the neglect of household pets. Some respondents deplored the way in which dead animals were left rotting in the veld. This moral concern with "animal rights" was, however, subsidiary to the more pragmatic concern about livestock management.

Water-related issues

Water pollution was perceived to be a major environmental problem, and was cited more frequently than water wastage and water shortage. Respondents understood water pollution well and were aware of its various manifestations and causes (see Chapter 5, Table 5.6), for instance, the industrial effluent and sewerage spills affecting the Buffalo river. This problem

has been well documented by O'Keefe (1991).

Energy-related issues

The most frequently mentioned energy-related issue was the need for electricity in rural and urban areas of Ciskei (see Table 5.9). Two interviewees knew of alternative, more environment-friendly energy sources, such as solar energy and wind energy. The interviewees were aware that gas and paraffin were used by many families, and understood that these were a cheap but dangerous source of energy. Gas and paraffin, they pointed out, have caused many accidents in shack homes. There was also an awareness of the problems associated with the use of dung and other agricultural residues for fuel, a practice which deprives the soil of an important nutrient source.

Society-related issues

Most frequently cited in this category were overpopulation and overcrowding, rural migration and the rapid growth of shack settlements (Table 5.10). This testimony is supported by the research of Homer-Dixon et al., who report that in 1980 "the Ciskei homeland supported 82 persons per square kilometer, whereas the surrounding Cape Province had a rural density of two", and that "high natural birth rates exacerbated population densities" (1993:21). Kruger (in Ramphele & McDowell, 1991) has pointed out that "increased urbanisation has aggravated an urban housing shortage. As a result informal settlements are a common occurrence within Ciskei". Homer-Dixon et al. (1993) confirm "the rapid growth of squatter settlements and illegal townships", despite the fact that "thousands of people have migrated to South African cities".

It is worth noting that even during probing no interviewee thought of mentioning atmospheric pollution, which has implications for climate change, global warming and ozone depletion. Such environmental issues have no boundaries, and probably affect Ciskei too. But perhaps such issues appear to the non-specialist abstract, even invisible, and their neglect

by the interviewees indirectly supports the evidential validity of their observations.

Major causes of environmental problems in Ciskei

Environmental problems in Ciskei were attributed mainly to neglect by local authorities and to bad resource use practices, stemming from ignorance or a lack of education and an absence of the appropriate values among the people. There thus seemed to be a reasonably informed understanding of the causes of environmental problems, although reference to the broader political implications was inhibited (see below).

Lack of education was reported in various ways. It was understood that people who exploited natural resources inappropriately lacked basic awareness and/or skills. Some problems were attributed to cultural factors. For instance, traditional beliefs and religion were deemed partly responsible for overstocking with livestock: an abundance of cattle has traditionally measured wealth and symbolised bounty. The interviewees also perceived that traditional beliefs obstructed family planning education, with the result that there were too many births in low income families.

Neglect by local authorities was blamed for the problems of pollution and waste. Essential social services were inadequate: there were insufficient litter bins and a general failure to dispose of refuse appropriately; pipe bursts causing water wastage were not attended to timeously. Local authorities were also accused of not attending to the restoration and conservation of eroded land as they used to in the past. Respondents' understanding of the cause of pollution problems is supported by the report An Analysis of the Strategic Option for Ciskei Population Development Programmes and Related Awareness Campaigns (Development and Communication Consultants, 1990), which asserted that in Ciskei refuse problems were largely the result of neglect by local authorities.

There seemed to be a basically sound understanding among the interviewees of environmental problems stemming from **bad**

resource use practices. Nine respondents understood that deforestation, overstocking and overgrazing were caused by pressure on natural resources consequent on overpopulation.

Political inhibitions

It is difficult to assess the extent of interviewees' awareness of the political and socio-economic causes of the issues of land shortage and overpopulation, because they were hesitant to elaborate in this direction. They could not or would not make any clear connections between political issues and environmental problems (or Environmental Education, for that matter). It is widely known, for instance, that the forced relocation of people into Ciskei has aggravated the problems of land shortage and overpopulation, which are in turn the root cause of the depletion of natural resources through intensified agriculture, overstocking, deforestation and soil erosion (see Kruger in Ramphele & McDowell, 1991). This silence on the part of the interviewees is no doubt partly the result of the authoritarian system in which they live and work, which mandates the view that the status quo is not to be questioned or confronted (see Chapter 3, section 3.3). The sensitive and volatile political climate in Ciskei is naturally also a factor.

A critical analysis of the interviewees' understanding of causes of environmental problems therefore suggests that interviewees either had a limited understanding or were reluctant to share their full understanding with the researcher. Sometimes they perceived a problem as a cause, and vice versa. For instance, the shortage of land was understood to be caused by too little land being allocated to each family; but the latter is surely a consequence rather than a cause. Interviewees seemed unwilling to construe the land issue as the legacy of the various racially discriminatory South African Land Acts (see Chapter 3, section 3.2).

Fien (1993a) has argued that people should learn to identify and examine the root causes of environmental problems, and that these root causes lie in current social, economic, and

political systems. The Tbilisi Principles (1977) also suggest that learners should be helped to discover the real causes as well as the symptoms of environmental problems. It is suggested further by the UNESCO-UNEP International Education Programme that:

> a critical perspective on the causes of environmental problems unquestionably reveals that inappropriate human behaviour patterns, that is, over-utilisation of natural resources, poverty and unemployment result from socio-economic situations. (UNESCO-UNEP, 1988:6)

Solutions and initiators

Most of the senior educationists interviewed perceived Environmental Education as the major potential solution to environmental problems in the Ciskei. Other possible solutions mentioned were economic change, environmental legislation, active liaison between government and non-government organizations, and political change.

The interviewees believed that in the first instance **education**, both formal and non-formal, should tackle the environmental problems facing the Ciskei. This view deserves to be taken seriously: as senior educationists, the interviewees were presumably well qualified to recognise an educational problem when it presented itself. As detailed in Chapter 5, the respondents saw an urgent need for education about the environment for all ages and at all levels in the community. They felt that Environmental Education should not be confined to the formal education system but should be spread to both the decision-making level and the community at large. In this the respondents were reacting as environmentalists (albeit unconsciously so!), for according to Hug (cited in Grover, 1985:80): "any world citizen who advocates with greater or lesser action that wrongs against our environment must be stopped is an environmentalist". The same applies to the respondents' remarks concerning the mismanagement of natural resources through neglect on the part of the authorities, and makes their recommendation that decision-makers be targeted for Environmental Education entirely logical. A lack of

environmental awareness is presumably partly responsible for the absence of appropriate and enforced **environmental legislation** in Ciskei, which was another area in which respondents felt solutions could be sought. They believed that suitable legislative measures would ensure the accountability of the individual to the community, and the community to the ecosystem as a whole. Apart from its practical effects, law-making could also help inculcate the sorts of values and positive attitudes towards the environment recommended in the Tbilisi principles (1977, see Chapter 2).

It is interesting to note that despite the fact that interviewees were reluctant to give political reasons for problems like the land and housing shortage, they were not shy to propose essentially political solutions, such as **democracy** and **liaison between government and non-government sectors.** This inconsistency is more apparent than real: whether through ignorance or the understandable defensiveness of people working within the system historically responsible for the inequity in land distribution, they would naturally be inclined to look toward the future rather than the past and, with change in the air, be hopeful of political solutions to present problems.

Initiators of solutions

As was noted in Chapter 5, the respondents identified as the initiators of solutions to environmental problems the government in the first instance, but also the community, the private sector, and "environmental literates" in general. This perception shows that they saw a need for broad participation in the solution of problems of a broad nature.

The interviewees envisaged a prominent role for the government although they themselves are in government service, in top-level positions as policy formulators, decision-makers and curriculum developers. This produced some confusion, as the following response reveals:

> The government should solve the environmental problems. [Hesitation] . . . Actually I should not say this, [the] Department of Education Ciskei is not responsible for such changes.

Another response was: "Government . . . not sure who is responsible to solve the problem". As responsible office-bearers, they were surprisingly vague in their references to "the government", and clearly were unwilling to see themselves as having the authority to change the curriculum. They made it sound as if there was some superior government agency vested with the prerogative to introduce and implement change. These senior educationists were perceived by the researcher to be inappropriately shifting their responsibility to some "higher authority", thus showing symptoms of the traditional disease of bureaucracy. Alternatively, it is possible that they did not want to be seen to be treading on delicate ground: among their suggested solutions they proposed "democracy" and "liaison with non-government organisations", perhaps implying that real authority lay with non-government organisations with mass support like the ANC.

The researcher had expected that the respondents as decision-makers would make commitment statements, or refer to some relevant government policy statement, or introduce their views as government personnel with authority; but they did not do so.

The researcher also detected a sense of reluctance among respondents to express or share their own personal views, especially with regard to the question: "Who is responsible for curriculum development?" (Appendix I, item 10.6). A typical response was that:

> Department of Education and Training [DET, the South African "parent" Department] has been involved in the development of curricula and core-syllabi.

This response reflects the dependency of the Ciskei Department of Education and other homeland education bodies on the South African Departments of National Education and Education and Training for the development of curricula and core-syllabuses (Hartshorne, 1992). As was discussed in Chapter 3, the homeland education authorities have never really enjoyed true independence from South Africa. This, coupled with the authoritarian nature of the organisational system in the Ciskei Department, no doubt contributes to a reluctance to assume responsibility and make decisions.

There is also the wider consideration that in Third World countries government tends to be equated with authority. The Strategic Option for Ciskei Population Development Programmes report (Development and Communication Consultants, 1990) states that there is in such countries a long history of dependence upon the State, perhaps stemming from the interference in and control over the native population's social and economic existence in colonial times. Scott (1988) states that until recently the most popular development strategy in South Africa has been a centrally-based "trickle down" approach. This helps further to explain why the respondents in this study evinced a dependency upon the government to implement necessary changes: it has always acted as a problem-solving agent and a finance provider.

Targets

The interviewees perceived that Environmental Education should target every level of school from primary to tertiary level. They also understood that adults should be reached through non-formal, community-based education, and that decision-makers should be give special attention. This view is in accord with the guidelines for Environmental Education as set out in the Tbilisi principles of 1977. According to Ben-Peretz, 1980 (in Bakshi and Naveh, 1978:21), "the target population of Enviromental Education is not confined to school pupils but encompasses all ages and all spheres of society".

6.3 Perceptions of Environmental Education

Most interviewees had a limited understanding of Environmental Education. Reviewing the interviews as a whole, the general understanding of Environmental Education was as follows:

First, a large group of respondents had a "people and nature" focus. A perception shared by all in this group was that Environmental Education can make a major contribution toward the solution of environmental problems in the Ciskei

region. Other perceptions within this group were:

* that Environmental Education teaches about environmental issues and their control;
* that is has a broad nature and deals with interrelationships;
* that it is a process of fostering attitudes and instilling values of appreciation, preservation and conservation;
* and, finally, that it includes skills development and decision-making.

A second distinct perception was that Environmental Education was a relevant form of education capable of bringing about desired educational innovations:

* that it can close a gap between schooling and the world of home and employment;
* and that it provides better learning and teaching methods.

A third view equated Environmental Education with outdoor education and/or conservation.

Although their knowledge of Environmental Education was limited and none of them were directly involved in it, all 11 respondents believed that Environmental Education could play a major role in solving environmental problems in the Ciskei region. The respondents also perceived that their own teaching subjects had not fulfilled their potential in this regard. As discussed in section 3.6 in Chapter 3, the responses in this group agreed that Environmental Education in Ciskei should be built on the foundations of environmental awareness, education and training (Hurry,1984). The group also endorsed the idea that formal education should play a major role in addressing environmental problems (as suggested in Hurry, 1984).

It is interesting to note that before the interviews the respondents had a very limited idea of what Environmental Education was all about and tended to equate it with agriculture. During the interviews this perception changed and their understanding of the topic grew (White and Gunstone, 1992).

Environmental Education is issue-orientated; it teaches about environmental issues and their control.

A perception with a "people and nature" focus, shared by six interviewees, was that Environmental Education is issue-orientated, that is, that it teaches about environmental issues and their management.

This group of respondents perceived Environmental Education as a process of raising awareness and imparting knowledge about environmental issues and their control. In general, their responses revealed an understanding of a broad range of environmental issues. They were also able to suggest, in reply to item 8 (Appendix I), appropriate educational activities focused on solving major environmental problems in Ciskei.

In seeing Environmental Education as concerned with environmental issues and their control, this group of respondents took a somewhat narrow view of the subject. It is one associated with the early development of Environmental Education nationally and internationally, when its aim was to promote environmental awareness and knowledge about the biophysical environment (Stevenson, 1987; Irwin, 1990a,b; Fien, 1993(a,b); see Chapter 2).

Environmental Education has a broad nature and deals with interrelationships.

The group of senior educationists with this perception overlapped with the group described in the previous section, in that both understood Environmental Education as embracing the raising of awareness and the imparting of knowledge about environmental issues, their interrelationships and their control.

Four respondents were of the opinion that Environmental Education has a broad nature, in the sense that it deals with both the biophysical and social dimensions of the environment.

Seven respondents understood Environmental Education as a process of imparting knowledge about environmental issues,

their interrelationships and their control, which is one of the primary objectives of Environmental Education as identified in the international literature (e.g. UNESCO-UNEP, 1978:3). They understood that Environmental Education had an invaluable role to play in helping people to acquire an awareness of the impact of the environment in every sphere of people's lives, and of the frequently negative impact of people on the environment. These interviewees were aware, in other words, that environmental concerns were matters of interaction and interrelationship.

Environmental Education is a process of fostering attitudes and instilling values of appreciation, preservation and conservation.

This perception also had a "people and nature" focus, emphasising the inculcation of an appreciative attitude towards nature and values of cleanliness, preservation and conservation. Two respondents saw this as conducing to a particular lifestyle in which aesthetic values and feelings of concern for the environment were prominent: an aim reflected in the international literature during the early development of environmental education (see Martin in Martin and Wheeler, 1975; Leopold, 1966/1984; Stevenson, 1987). The goal of this view of Environmental Education is to motivate people to care for the environment by becoming actively involved in its improvement and protection (UNESCO-UNEP, 1978).

The interviewees did not, however, perceive "values clarification" as an associated objective of Environmental Education, as reflected in the Tbilisi principles for Enviromental Education (UNESCO-UNEP, 1978) and in the IUCN (1971) definition of Environmental Education. According to Grover (1985:30), values clarification means

> that people should be encourage to make their own choices, to value decisions which they make freely, to discover, examine and choose alternatives, affirming choices publicly, acting and living in accordance with choices, acting repeatedly on choices in the same pattern of life.

The notion of values clarification seems essential to the social justice dimension of "education for the environment". Our respondents' understanding of Environmental Education was generally restricted to a narrow focus on people and nature and did not consider social and political interactions to be relevant.

Environmental Education includes skills development and decision-making.

While only two respondents explicitly identified skills development as an aim of Environmental Education, the group as a whole cited a broad range of cognitive skills which Environmental Education might be expected to develop: observation (4); problem-solving (4); thinking (3); decision-making (1); calculating (1); and application (1). Some technical skills were also reported, namely, recycling (2); gardening (1); reading a thermometer (1); reading a wind meter (1).

One interviewee spontaneously identified decision-making as a important function of Environmental Education, while all concurred after a probing question. Decision-making is a skill, not unrelated to "values clarification", that should be developed so that people can make wise decisions, commit themselves to those decisions and live by them.

The skills cited by the senior educationists all seemed to refer to "the development of the cognitive processes or skills for enquiry and problem-solving based upon deductive and inductive thinking " (Fien, 1993a:61). They did not perceive a need to develop skills for ideology critique or critical thinking. Critical thinking skills help one "identify the links between self, everyday events and processes, and wider social and economic systems" (Fien, 1993a:61). Fien also reminds us that in developing decision-making skills one should "identify who makes decisions and the value and power that legitimates them; also . . . who gains and who loses from such decisions and sources of power" (1993a:59).

Environmental Education is relevant education that can close a gap between schooling and the world of home and employment; it also offers better learning and teaching methods .

The perceptions grouped together under this heading indicate that the respondents recognised Environmental Education as a vehicle for change in the educational system. There was general appreciation of the direct relevance of Environmental Education to learners' lives (see item 5, section 5.5), and ackowledgement that the sort of approach it embodied had the potential to radically revise the existing "irrelevant", "standoffish" curriculum.

The respondents also understood that through its "relevance" Environmental Education could help bring about closer links between schooling and world of home and employment, between the book or classroom and the "real world".

It ought perhaps to be pointed out that most of these perceptions were elicited during the course of the interviews, as interviewees were led to a fuller understanding of the subject through question probes. Once furnished with the IUCN (1971) definition of the objectives of Environmental Education (Appendix I, item 10.2), interviewees were apparently able to recognise the extent to which the aims of Environmental Education tallied with their own desires for a "progressive" or "innovative" approach to education, and they responded accordingly.

Environmental Education was thus seen to offer better learning and teaching methods. This perception expressed a felt need for change from "traditional" learning and teaching methods to more modern, "progressive" learning and teaching methods that encourage experiential learning and help overcome the division between the abstract and the concrete.

Environmental Education as equated with outdoor education, conservation education or environmental studies.

This perception confirmed that interviewees understood Environmental Education as an 'experiential-orientated'

approach. As was reported in the previous chapter, some interviewees equated Environmental Education with the outdoor classroom. The favourable reaction to this notion expressed a desire for change from the traditional desk-bound approach to one in which abstract and theoretical knowledge is experienced, practised, and experimented with, in field work and practical life situations. This view of Environmental Education has been discussed by Irwin (1990a,b), who traces the historical development of the idea of Environmental Education in South Africa from its roots in conservation and outdoor education, noting the vestiges of the latter in current thinking on the subject (see Chapter 2). Respondents' idea of an "outdoor classroom" that involves fieldwork and experiential learning may have been acquired from Opie's influential work (1989).

By equating Environmental Education with outdoor and conservation education and environmental studies, the senior eduationists interviewed perceived Environmental Education as a process focusing on the biophysical and -- to a lesser extent -- social environment. This has been identified as the most prevalent perception in South Africa (Blignaut, 1991; Irwin, 1990a,b). There was scant evidence in the responses of the growing trend to include also economic and political issues in the "holistic" ambit of Environmental Education.

Irwin notes in his 1992 paper on the historical development of Environmental Education in South Africa how some environmentalists and Environmental Educators were unreceptive to the radical dimension of Environmental Education, and preferred to confine Environmental Education to the field of knowledge about the biophysical environment. Because they realised that the holistic treatment of Environmental Education would inevitably touch on politics, they found it convenient to continue to conflate it with outdoor education and conservation education. There may well be an element of this logic informing the responses of the interviewees in this study who shared this perception.

Although most of the interviewees' understanding of Environmental Education was limited to the notion of education in and about the natural environment, then, this situation is

in line with perceptions of Environmental Education recently recorded elsewhere in South Africa (Blignaut, 1991; Irwin, 1990a,b). The nature and quality of an individual's understanding of Enviromental Education will obviously vary according to the extent to which he or she has been personally involved in Environmental Education. This is supported by the observations the researcher made at workshops which she attended as participant observer in Bisho, East London and Grahamstown.

These observations confirmed that the understanding of Environmental Education held by senior educationists in Ciskei was similar to that held by most educators in other parts of the Eastern Cape region. The workshops focused on policy and/or curriculum options development (Clacherty, 1993a; see Chapter 3, section 3.6). Attending the East London workshop was a group fairly homogenous with this study's research sample, in that most delegates were teachers and lecturers, with a few senior educationists and environmental educators. The group had more or less the same general understanding of Environmental Education as the interviewees. However, participants in the Grahamstown workshop tended to have a deeper and better-informed understanding of Environmental Education and the notion of "education for the environment". They consisted of educationists relatively more involved in Environmental Education in schools, colleges and conservation agencies, in addition to non-specialist teachers, lecturers and subject advisors.

6.4 The possibility of implementing Environmental Education in Ciskeian Schools

As we have seen, most respondents perceived Environmental Education as a relevant form of education that could bring about change within the school curriculum. Ten respondents agreed that Environmental Education should be included in schools curricula, while one thought that it should be an extra-curricular activity.

Interviewees were not sure that all subjects should include environmental concerns (see Chapter 5, section 5.4; also Appendix I, items 9.1 to 9.5). After being apprised of the objectives of Environmental Education as set out in the IUCN definition (Appendix I, item 10.3), however, all the interviewees (including the one who initially perceived Environmental Education as an extra-curricular activity) expressed a conviction that such an educational approach would bring about desired change in the existing education system.

Regarding the way in which environmental concerns should be included in the curriculum, the majority of respondents favoured an interdisciplinary approach: Environmental Education should not be a separate subject (see Hurry, 1982; Blignaut, 1992; Irwin, 1992), and environmental aspects "should be included in almost every subject across the curriculum" (Okot-Uma and Wereko-Brobby, 1985).

(The majority of respondents initially favoured an 'infusion' approach [Eichler, 1977; Vulliamy, 1987], that is, the inclusion of environmental aspects in certain subjects: Biology, Agriculture, Geography, Languages and, of course, Environmental Studies. After a further question [Appendix I, item 9.4], however, all the respondents agreed that Environmental Education could be included in all subjects, which implied the adoption of an interdisciplinary approach [see Chapter 5, section 5.4].)

Observations made in EEPI workshops attended during research for this study indicate that many local educators favour the subject option, although this approach has serious economic implications -- the establishment of new Departments, teaching posts, infrastructure, and so on -- for education as a whole.

The interviewees maintained that the curriculum should be developed by teachers as well as professional administrators and experts. Most of them supported the notion of a participatory, collaborative approach to curriculum development. As was pointed out in Chapter 3 (section 3.6), few if any of these educationists had ever been involved in curriculum development in any way, even in sharing ideas about

the structure, content or themes of syllabuses.

Institutionalising Environmental Education will require the education system to make some important choices. If Environmental Education is implemented as an interdisciplinary approach, the entire system will have to be re-orientated toward a "holistic" approach to learning: a greater coordination of policy and curriculum initiatives will become mandatory, involving the re-structuring of education administration (see also the work of Akwa, in press). The design of teacher training programmes will need to be changed, and in-service retraining of experienced teachers undertaken. Resources such as new textbooks will have to be developed.

Obvious constraints on this mode of institutionalisation include the resistance of older teachers and administrators to innovation (noted earlier) and the high costs of in-service training, restructuring, and resource development.

Some of the other difficulties to be encountered in institutionalising Environmental Education are mentioned by Robottom (1987). At school level Environmental Education poses significant curriculum and teaching problems for practitioners: it aspires to be interdisciplinary, but the conventional school curriculum is strongly disciplinary; it entails outdoor education, but school rules and regulations impose constraints on out-of-classroom activities; it is a form of inquiry teaching, but structures and relationships in schools tend to reproduce more didactic forms of instruction; it is interested in inquiries that are critical, involving critiques of environmental situations, while schooling has traditionally tended towards vocational or liberal education.

CHAPTER 7: CONCLUSIONS

7.1 Evaluation of Research in General

The researcher's approach to this study has been influenced by her experience as agricultural officer, teacher and principal in an agricultural school in Ciskei, and her training in the positivism of the natural sciences. Much of the personal value of this study consists in the introduction it afforded the researcher to the social-scientific dimension of educational research and a critical, interpretative view of theory and practice.

The wider value of the research will be assessed here by considering the study, firstly, in terms of the research participants, audience, topic and timing, and secondly, in terms of the research design (Dane,1990).

Since the study was intended to focus primarily on senior decision-makers, education planners and subject advisors who were at least theoretically involved in policy formulation and curriculum development, the choice of **participants** was appropriate. The inclusion of experienced college lecturers was also apposite since they were able to provide first-hand information about teacher education.

The research was aimed at stimulating the process of implementing Environmental Education in the Department of Education in Ciskei. The study showed that the participants thought that a broad range of people should be involved in such a process. Hence the intended **audience** for this research is suitably wide, including curriculum developers, teachers and other researchers in the field, as well as the general public of Ciskei.

The research **topic** was relevant, in that it focuses in the Ciskei context the international awareness of the need for societies to become sustainable and the emerging consensus on the vital role which Environmental Education can play in helping to meet this need. These considerations are of crucial relevance in the South African context, and it is hoped that

this study might make a small contribution to the current EEPI process.

The research **setting** was the Ciskei, an 'independent homeland'. While this study was being compiled the South African political situation was changing in a way that implied the eventual re-incorporation of all the homelands as regions or sub-regions of a unitary South African state. Although such political change -- which has obvious implications for the administration of education in Ciskei -- is imminent, appropriate social change, that is, change in people's attitudes towards and hence actions on the environment, does not come about by political fiat and will presumably take longer to effect. The **time frame** of this research should not therefore affect its utility, and it is suggested that the study was conducted at an appropriate time for the implementation of educational reform.

7.2 Evaluation of Research Design

7.2.1 Limitations of research design

The interview was the only data collection tool used in this research. The intended workshop failed to take place because of disruptions in Ciskei during the data collection phase. These disruptions affected this study because they affected the education system as a whole: for instance, senior educationists were often out of their offices helping to stabilise the situation in schools where there were problems. Public service strikes were also an important cause of disruption.

The intended workshop would have given valuable support to the second objective of this study, which was to explore the possibility of implementing Environmental Education in Ciskei curricula. It would have afforded an opportunity to follow up on the interviewees' understanding of Environmental Education and its implementation in Ciskei, perhaps allowing for a more relaxed situation for the exchange of ideas than was the case with individual interviews.

Another limitation in the design of this research was the failure to interview the top decision-makers in the Education Department. The Chief Director or the Director-General, who were not interviewed because of logistical problems (their unavailability), could have contributed statements on the nature of the Department's commitment to curriculum development and the implementation of Environmental Education. While other decision-makers were apparently unable to commit themselves on these two issues, the top decision-makers ought presumably to have been able to do so. This assumption is based on the authoritarian nature of the Ciskei education system.

The interview schedule failed to elicit in-depth responses. The questions asked were fairly superficial, based on the expectation that the respondents would not be able to cope with more depth and complexity. The researcher's limited experience in Environmental Education was also a factor here. Finally, the interview schedule might be seen to have had a leading design, but without probing the data collected would have been very scanty.

7.2.2 Strengths of research design

The research process was a learning experience for the researcher. She gained a number of research skills: compiling an interview schedule, conducting interviews, analysing and interpreting data, organising and linking data to the context from which it emerged. The researcher has learned to overcome some of the rigidity of thought and method associated with her agricultural science background, which tends to favour fixed and predictive procedures.

There was an indication in the results that the interviewees, too, learned through the interviews. This conclusion is based on the perceived difference in the understanding of Environmental Education between spontaneous and probed responses, especially when the interviewees' understanding of environmental issues was explored. The probes afforded the interviewees a means of clarifying their thinking and understanding, and the enthusiasm for Environmental

Education evinced in the final phase of the interviews compared to the indifference/reticence in the initial phase was a graphic indication of the development which occurred.

That the researcher was able to reciprocate the transfer of information through a mutual learning process was deemed important, for many people have a negative attitude towards just 'giving information' as research informants.

Another strength of this study was the inclusion of experienced college lecturers in the research sample, who reported information about teacher education of great use to this study. For instance, while the researcher had initially believed that there was no Environmental Education in Ciskei schools and colleges (see Chapter 1), the college lecturers divulged that pre-service teacher training had started to include Environmental Education in English courses.

7.3 Conclusions

7.3.1 Perceptions of major environmental issues, causes and solutions

Interviewees perceived environmental issues to be problems of a broad nature which concerned both natural and social environments and which directly affected people's lives. They cited a broad range of environmental issues. The most frequently-mentioned environmental issues were the most obvious ones that could be seen and experienced on a daily basis in respondents' biophysical and social environments.

The interviewees attributed Ciskei's environmental problems mainly to bad resource use practices stemming from a lack of education and an absence of appropriate values among the people. Neglect by local authorities was perceived to be the second most prevalent cause. The interviewees seemed to hold a reasonably informed understanding of the causes of environmental problems, although reference to their broader political implications was inhibited.

Most of the senior educationists perceived Environmental

Education as the major potential solution to environmental problems in the Ciskei. Other suggested solutions were economic change, environmental legislation, active liaison between government and non-government organisations and political change ("democracy").

The frequent citing of the government as the major initiator of solutions to environmental problems reflects a dependency on government as an authority, a problem-solving agent and a finance provider. It might also reflect a lack of commitment or a limited sense of responsibility on the part of educationists in top-level decision-making positions in the government service. Regarding curriculum development, the senior educationists may be seen to be shifting responsibility to some 'higher authority' because they have probably never been involved in the process themselves.

Contrasting with the perception of central government responsibility, which was supported fully by all respondents, was the perception that environmental problems could be solved through a participatory approach, reflected by the identification of the "community", the "private sector" and "environmental literates" as solution initiators. This perception implies the broad participation of all citizens, from government to the general public, in processes of social change. In this view, held by a smaller number of interviewees, "active liaison between government and non-government organisations" was necessary to mobilise finances and other resources to improve the quality of the environment. In addition, the interviewees saw the need for co-ordinated action by various government departments -- Education, Agriculture, Public Works and Health.

Reviewing the interviewees' perceptions of solutions to environmental problems reveals that they lean towards a reformist approach. This is similar to technocratic environmentalism, which "seek[s] to solve environmental problems through improved management practices, legislation and public information" (Fien, 1993a:33). The senior educationists' views can be classified as falling in the "light green position" (Fien, 1993a) within the "technocratic

environmentalism" described by O'Riordan (cited in Fien 1993a). Although a few mentioned community participation and involvement in decision-making, the majority of interviewees did not perceive the "social justice theme" (Fien, 1993a,b) to be an intrinsic aspect of solutions to environmental problems.

The interviewees believed that Environmental Education should be introduced at every level of formal education, from primary to tertiary. They also saw a need for this process to be continued through non-formal, community-based education, and thought that decision makers should be given special attention. Here their views were in accordance with the guidelines for Environmental Education set out in the Tbilisi principles (UNESCO-UNEP, 1978: 3).

7.3.2 Perceptions of Environmental Education

The most prevalent understanding of Environmental Education on the part of the respondents was that it is a process for raising awareness and knowledge about environmental problems and their control. The interviewees understood that this process included teaching about interrelationships between people and the environment, the human impact on the environment and the environmental impact on humanity. Interviewees also saw Environmental Education as a process that involves skills development, fosters attitudes and instills values necessary for understanding and appreciating the biophysical environment.

The composite perception outlined above embraced a fairly limited 'people and nature' focus. It construed Environmental Education as an issue-orientated process of teaching about environmental problems relating to the biophysical, social and -- to a very limited extent -- economic and political environments. It promoted a belief that citizens should be made aware of and be concerned about the major environmental problems in Ciskei. It also embraced a desire to educate citizens about strategies (such as recycling) to control the major environmental problems, and skills for critical enquiry (Fien, 1993), such as problem solving, observation, analytical, decision-making and technical skills.

The perceptions of the interviewees clearly expressed the notion of "education about, and through the environment" (Fien, 1993). They understood -- somewhat superficially -- the five objectives of Environmental Education, namely development of awareness, knowledge, attitudes, skills and participation (UNESCO-UNEP, 1978). They also had a limited understanding of the objectives identified in the IUCN (1971) definition. However the interviewees did not seem to understand the necessary role in Environmental Education of values clarification, the self-formulation of a code of behaviour about issues concerning environmental quality.

Another perception with a clear biophysical focus was the linking of Environmental Education with outdoor education, conservation education or environmental studies. The respondents held the view that in the school situation, Environmental Education teaches about conservation and ecology with an emphasis on experiential learning in the outdoors. This perception is understandable in view of the fact that the limited Environmental Education practised in schools locally has laid stress on conservation education and outdoor education.

This widely held perception of Environmental Education was supported by the opinion expressed that several subjects in the current curriculum in Ciskei (Agriculture, Biology, Geography, Physical Science and English) include Environmental Education to some extent. These subjects were perceived to deal with certain environmental aspects, such as pollution, ecology, conservation, and the importance of natural resources.

Finally, some educationists viewed Environmental Education as a means to promote a more relevant form of education capable of closing a perceived gap between schooling and the world of home and employment; some also maintained that it provides better learning and teaching methods. The group of senior educationists with this perception expressed a desire for a more 'innovative', 'progressive' type of education, that is, more child-centred and orientated toward experiential learning. They linked this desire to Environmental Education, but the reason for this was not explored in this study. It was

seemingly related to the view that the existing curriculum was "irrelevant" and "standoffish", offering knowledge that did not have much to do with the successful conduct of home and working life.

7.3.3 The possibility of implementing Environmental Education in Ciskei

The second primary aim of this study was to explore the possibility of including Environmental Education in Ciskei school and college curricula. The majority of respondents perceived that Environmental Education should be included in school curricula. After being apprised of the objectives of Environmental Education as set out in the IUCN definition, all interviewees (including one who had initially perceived Environmental Education as an extra-curricular activity) expressed the conviction that such an approach to education would bring about desirable change to the existing education system.

The case of the respondent who initially thought that Environmental Education should be extra-curricular and later changed his mind confirms that understanding is not a constant variable (White & Gunstone, 1992). As stated in Chapter 4, Section 4.6, a change in understanding can take place rapidly as new information is assimilated and new patterns of meaning emerge. This was a good example of the learning and growth in understanding that took place during the interviews.

Regarding the way in which environmental concerns should be included in the curriculum, the majority of respondents favoured an interdisciplinary approach. This meant that Environmental Education was not to be a separate subject, but should be included in every subject across the curriculum. There was considerably less support for an approach which saw Environmental Education as a school subject.

The majority of respondents initially favoured an infusion approach that is, the inclusion of Environmental Education in certain subjects (Agriculture, Biology, Geography, Environmental Studies and Languages) (Eichler, 1977). By the

end of the discussion following item 9.4 (Appendix I), all respondents had come to adopt an interdisciplinary approach, agreeing that Environmental Education should be included in all subjects.

The perceptions of Environmental Education that were expressed by the senior educationists interviewed tended to disprove the researcher's preconceived notion that globally increasing environmental awareness and the emerging educational response had had as yet no impact in Ciskei. Although there is very little formal implementation of Environmental Education in school curricula, the interviewees were aware of several curriculum options for the implementation of Environmental Education.

While some of the respondents were not sure whether education planners or teachers should be involved in curriculum development, a small number felt strongly that teachers should be involved in curriculum development. This view rests upon the belief that participation cultivates a sense of commitment and accountability that top-down curriculum development does not.

In addition to curriculum change, interviewees also advocated change in pedagogical practice from a theoretical, textbook-orientated approach to a 'modern classroom' characterised by a child-centred approach allowing for pupil participation. Other suggested changes concerned teacher education, where the senior educationists perceived problems in both pre-service and in-service teacher education. They implied that future education policy should provide for Environmental Education programmes for pre-service and in-service teacher training.

This study has been conducted during a perhaps uniquely opportune time to plan for the inclusion of Environmental Education in Ciskeian schools. Imminent and fundamental socio-political change throughout South Africa will inevitably involve educational change, the need for which -- this study has revealed -- is keenly perceived by senior Ciskeian educationists.

7.4 Recommendations

Environmental Education is urgently needed in the Ciskei as a means of raising the level of public awareness of the dire environmental problems confronting the region, and of helping people to acquire attitudes conducive to the improvement and sustainability of the environment.

The researcher suggests that, in the first instance, steps should be taken to educate the educators: future education policy-makers should seek to broaden the limited understanding of Environmental Education among senior educationists. Opportunities -- for example, workshops -- should be created for educationists to further explore Environmental Education so as to arrive at a full appreciation of its holistic nature, as captured in the phrase "education for environment" (Fien, 1993). Such workshops should geared towards the implementation of Environmental Education in school curriculum and curriculum options.

Since this study has proposed a participatory approach to the development of a future curriculum which will include Environmental Education, the researcher recommends that future workshops should be linked with the EEPI process which has affirmed "a fundamental commitment to participation, consultation and collaboration" (Clacherty, 1993b). The EEPI process was mandated in Dikhololo after wide consultation with participants representing interest-groups across the spectrum of South African society. The process was mandated to submit a policy recommendation to the National Education Training Forum (NETF), to pursue further consultation and to invite broad participation at regional level.

It is suggested that attention should be given to teacher education and resource development in the light of interviewees' recommendations in this regard, and in a manner appropriate to the changing educational context in the Ciskei region. This would include an emphasis on the rationale for Environmental Education, on the fact that it involves much more than training skilled environmental managers or teachers with a

knowledge of ecology; rather, as suggested by Fien (1993) that:

> [Environmental Education] evolved as a field of professional practice to address the changes and personal values and social structures that are necessary to support ecologically sustainable and socially just ways of organising people-nature and people-environment relationships. It seeks to develop the understandings, values and action skills necessary for people to work with others to improve the quality and sustainability of their natural and social environment.

The researcher also recommends that the current and future educational authorities for the Ciskei region should plan an Environmental Education programme to cater for all ages from pre-school to tertiary level. According to the findings of this study, community-based education programmes will also be required for adult groups, especially decision-makers.

Further research in curriculum development is stringly recommended, as follows:

* to explore curriculum content and prepare for new curriculum options, by researching the curriculum requirements from the viewpoints of the general public, teachers and researchers; and
* to investigate the potential for and problems with involving teachers in policy decisions and operational decisions affecting the curriculum.

A recommendation pertaining to future studies of this nature is that they should consider the use of group discussions or workshops rather than individual interviews. Such tools of data collection might be conducive to increasing the usefulness of the research for both the researcher and the participants.

Finally, in whatever manner Environmental Education is eventually implemented, the process must not succumb to an authoritarian, technocratic attitude to problem-solving, but should adopt a critical, participatory approach, rigorously taking account, for the common good, of the self-interest that shapes both environmental predicaments and proposed solutions.

REFERENCES

AKWA, J.Y. (1994), An evaluation of the interdisciplinary nature of Environmental Education in colleges of education in Bophuthatswana. Unpublished Masters thesis. Grahamstown: Rhodes University.

ASHLEY, M. (1989), Ideologies and Schooling in South Africa. Rondebosch: South African Teachers Association.

BAKSHI, T.S. & NAVEH, Z. (1978), Environmental Education: Principles, Methods and Applications. London: Plenum Press.

BALL, S.J. (1988), Participant observation. In Keeves, J.P. (Ed). Education Research Methodology and Measurement. An international handbook. London: Pergamon Press, pp. 507-510.

BALLENTYNE, R.R. & OELOFSE, C.G. (1989), Implementing Environmental Education Policy in South African Schools. Southern African Journal of Environmental Education, 9(1): 7-12.

BEHR, H.L. (1983), Empirical Research Methods for the Human Sciences. Durban: Butterworths.

BEN-PERETZ, M. (1980), Applications of some guiding principles in the development of teaching the total human ecosystem: a case study for Bakshi and Naveh, 2. 1980: Environmental Education Principles, Methods and Applications. Plenum Press: London.

BLIGNAUT, J.B. (1990), The Implementation of Environmental Education in Cape Education. An analysis of the prevailing awareness among senior educationists in the Cape Education attitudes towards its implementation in schools. School of Environmental Studies. Rondebosch: University of Cape Town.

BLIGNAUT, J.B. (1991), Environmental Education within formal Education. Unpublished discussion document. August, 1991. Cape Town: Department of Environmental Science.

BLIGNAUT, J.B. (1993), Socio-Environmental Education. Improving and Enriching Education in Schools. Earthyear 1993, pp 25-26.

BURROUGHS, G.E.R. (1975), Design and Analysis in Education

Research. Birmingham: University of Birmingham.

BUTLER, D. & PEROLD, D. (1985), The Right to Learn. The Struggle for Education in South Africa. Braamfontein: Ravan Press.

CHILDRESS, R.B. (1978), Public school environmental education curricula: A national profile, Journal of Environmental Education, 9(3): 2-11.

CLACHERTY, A.J. (1988), Towards an environmental education programme for the training of primary school teachers. Unpublished MSc dissertation. Cape Town. University of Cape Town.

CLACHERTY, A. (1993a), EEASA discussion document on formal education. Johannesburg. EEASA.

CLACHERTY, A. (1993b), The Environmental Education Policy Initiative: Reflections on the process. Southern African Journal of Environmental Education, 13: 3-6.

COHEN, L. & MANION, L. (1989), Research Methods in Education. London: Croom Helm.

COOPER, D. (1991), Agriculture in the bantustans: Towards development policies. In: de Klerk, M. (Ed) 1991. A harvest of discontent. The Land of Question in South Africa. Cape Town: Institute for a Democratic Alternative for South Africa.

DANE, F.C. (1990), Research Methods. Pacific Grove, California. Brooks/Cole. pp. 126-262.

DESAI, B. (1990), An Environmental Policy for Pan Africanist Congress of Azania. Unpublished discussion document.

DEVELOPMENT AND COMMUNICATIONS CONSULTANTS (1990), An analysis of the strategic option for Ciskei Population Development Programmes and related awareness campaigns. Durban: Ciskei Department of Planning.

DNE (DEPARTMENT OF NATIONAL EDUCATION) (1992), Education Realities in South Africa 1991. Pretoria: University of South Africa.

EICHLER, A. (1977), Environmental Education at the Secondary School Level. In UNESCO 1977: 101-114.

ELY, M. ANZUL, M., FRIEDMAN, T., GARNER, D., STEINMETZ, A.M. (1991)Doing Qualitative Research: Circles within Circles. London: Falmer Press.

FERRAR, A.A., O'KEEFE, J.H.; DAVIES, B.R. (1988), The River Research Programme. A report of the Committee for Nature Conservation Research National Programme for Ecosystem Research. South African National Scientific Programmes, 146. 1988.

FIEN, J. (1993a), Education for the Environment. Critical Curriculum Theorising and Environmental Education. Victoria: Deakin University.

FIEN, J. (1993b), Education for Sustainable Living. An International Perspective on Environmental Education. Southern African Journal of Environmental Education, 13: 7-20.

GOODSON, (1987), In ROBERTSON, A. (1992) Promoting Environmental Education in South African Schools: Insights from British Experiences. Southern African Journal of Environmental Education, 12(2): 3-10..

GOUGH, N. (1989), From Epistemology to Ecopolitics: Renewing a Paradigm for Curriculum. Journal of Curriculum Studies, 21(3): 225-241.

GROENEWALD, J.A. (1987), South African food resources for the future. Development Southern Africa. 1987 4(2).

GROVER, H.J. (1985), A Guide to Curriculum Planning in Environmental Education. Madison, Wisconsin Department of Public Instruction.

HARTSHORNE, K. (1992), Crisis and Challenge. Black Education 1910-1990. Cape Town: Oxford University Press.

HOMER-DIXON, T. BOUTWELL, J.H., RATHJENS, G.W. (1993), Environmental Change and Violent Conflict. Growing scarcities of renewable resources can contribute to social instability and civil strife. Scientific American. February 1993.

HUNTLEY, B., SIEGFRIED, R. & SUNTER, C. (1989), South African Environments into 21st Century. Cape Town: Human and Rousseau.

HURRY, L.B. (1982), Directions in Environmental Education and their implications for the training of primary school teachers in the Transvaal: towards a synthesis. Unpublished D.Ed. Thesis. Pretoria: University of South Africa.

HURRY, L.B. (1984), Directions in Environmental Education and their implications for the training of primary school teachers in the Transvaal: A discussion for B. Primary Programmes. Southern African Journal of Environmental Education, No. 1, November (1984)1: 10-12.

IRWIN, P.R. (1984), The Origin and Development of Environmental Education - A World Perspective. Southern African Journal of Environmental Education, 2.

IRWIN, P.R. (1988), Modern Trends in the Concepts of environmental Education. Discussion paper presented at the Midmar Workshop on core syllabus for environmental education. Midmar, Natal, 22-24 February, 1988.

IRWIN, P.R. (1990a), Environmental Education. In Rhodes Review, 1990. Grahamstown: Rhodes University.

IRWIN, P.R. (1990b), What is Environmental Education. In Conserva, 5(2): 4-5.

IRWIN, P.R. (1992), The Concept and Scope of Environmental Education. Unpublished Seminar paper.

IUCN (1971), Education and The Environment. Papers of the Nevada Conference of 1970 and the Zurich Conference of December, 1971. Morges. IUCN Publication. New series.

KHAN, F. (1989), The role of History in Understanding Current South African Attitudes to Conservation. Southern African Journal of Environmental Education, 10: 3-6.

KHAN, F. (1990), Environmental Education: Past, Present and Future Perspectives. Environmental Education Bulletin, November, 1990. 3: 6-8.

KEMMIS, S. (1988), Action Research. In KEEUES, J.P. (Ed).

Education Research Methodology and Measurement: An international handbook. London. Pergamon Press: pp. 42-49; pp. 457-465.

KRUGER, F. (1991), The Legacy of "Homeland" Policy. The Ciskei: Dumping Ground of the Eastern Cape. A case study of Ciskei examining the ecological and social consequences of intensive resettlement in a limited area. In RAMPHELE, M. & McDowell, C. (Ed) (1991). Restoring the Land: Environment and Change in a Post-Apartheid South Africa. London: Panos Institute.

LYNTHCOTT, J. & DUSCHL, R. (1990), Qualitative Research: From methods to conclusions. Science Education, 74(4): 445-460.

LEOPOLD, A. (1966/1984), A Sand Country Almanac. New York: Ballentine Books.

MARTIN, G.C. (1975), A review of the objectives for environmental education. In MARTIN, G.C. & WHEELER, K. (Eds) 1975. Insights into environmental education. Edinburgh: Oliver & Boyd.

MILLER, P.V. & CANNEL, C.G. (1988), In KEEVES, J.P. (Ed) 1988. Educational Research Methodology and Measurement. An International handbook. Oxford: Pergamon Press.

NAIDOO, P., KRUGER, J. & BROOKES, D. (1990), Towards better education: Environmental Education in the transformation of education. Southern African Journal of Environmental Education, 11, 13-17.

O'DONOGHUE, R. (1987), Environmental Education: A conceptually exciting and pedagogically challenging issue of human survival. Working paper.

O'DONOGHUE, R. (1991), An Overview of Some Trends in Environmental Education. Unpublished paper presented at the Human Sciences Research Council Workshop on "Awareness and the Development." Megaliesburg, 18 November, 1991.

O'DONOGHUE, R. (1993), The Environment, Development and Environmental Education. A working document of sources and perspectives for policy and curriculum initiatives in formal education. Graff 9/1993. Durban: EEPI (Natal working group).

O'KEEFE, J.H. (1989), Conserving Rivers in Southern Africa. Biological Conservation, (1989) 49: 255-274.

OKOT-UMA, R. W'O & WEREKO-BROBBY, C. (1985), Environmental Education: The African dimension. The Environmentalist, 5(2): 137-142.

OPIE, F.W.J. (1989), The Outdoor Classroom. Cape Town: Maskew Miller Longman.

O'RIORDAN, T. (1981), Environmentalism and Education. Journal of Geography in Higher Education, 5(1).

O'RIORDAN, T. (1987), An Environmental Education Agenda for the 1990's. Annual Review of Environmental Education, 1: 1-2.

O'RIORDAN, T. (1989), 'Contemporary environmentalism.' In GREGORY, D. & WALFORD, R. (Eds). Horizons in Human Geography. London: Macmillan.

O'RIORDAN, T. (1990), 'On the "greening" of major projects.' The Geographical Journal, 156(2): 141-8.

RAMPHELE M. & MCDOWELL, C. (Ed) (1991), Restoring the Land: Environment and Change in a Post-Apartheid South Africa. London; Panos Institute.

ROBERTSON, A. (1992), Promoting Environmental Education South African Schools: Insights from British Experiences. Southern African Journal of Environmental Education, 12(2): 3-10.

ROBOTTOM, I. (1985), Education in Environmental Education: time for change in perspective. Journal of Environmental Education, 17, 31-36.

ROBOTTOM, I. (1987), Towards enquiry-based professional development in environmental education in Robottom, I. (Ed) Environmental Education: Practice and Possibility, Nairobi: Deakin University.

ROBOTTOM, I. (Ed) (1990), Environmental Education: Practice and Possibility, Victoria: Deaking University.

SANGWENI, S. & SISULU, S. (1990), Future Environmental Policy for a changing South Africa. Unpublished ANC discussion paper. Workshop 3/11/1990.

SAUNDERS, W.B. & PINHEY, T.K. (1972), The Conduct of Social Research. New York: Holt, Rinehart and Wison.

SCOTT, F. (1988), Burden of African Women. Ciskei Agricultural Journal. 2nd Quarter, Vol. 8. Department of Agriculture and Rural Development Ulimocor and Ciskei Agricultural Bank, pp. 21-25.

SPAUL, A.D. (1988), Oral History. In KEEVES, J.P. (Ed) 1988. Education Research Methodology and Measurement. An international handbook. Oxford: Pergamon Press.

STEVENSON, R.B. (1987), Schooling and Environmental Education: Contradictions in purpose and practice. In ROBOTTOM, I. (Ed) (1987). Environmental Education: Practice and possibility. Melbourne: Deakin University. pp 69-82.

SYMTH, J.C. (1978), Environmental Education in Scotland: Prospects and Problems. In Bakshi, T.S. & Naveh, Z. (1978). Environmental Education: Principles, Methods and Applications. London: Plenum Press.

TINLEY, K.L. (1974), Ecology: The Study of the 'incomprehensible' by the 'incompetent'. Pretoria: SARCCUS.

TOULMIN, S.E. (1969), The uses of argument. New York: Cambridge University Press.

TUCKMAN, B.W. (1972). Conducting Educational Research. New York: Hamart Brace Jovanovich.

UNEP (1977), Environmental education. UNEP Facts. UNEP FS/15 October, 1977, p.2.

UNESCO (1977), Trends in environmental education. Paris: UNESCO.

UNESCO, 1988, International Strategy for action in the field of environmental education and training for the 1990's. Paris: UNESCO.

UNESCO-UNEP (1977), Education and the Challenge of Environmental Problems. Paris: UNESCO.

UNESCO-UNEP (1978), The Tbilisi Declaration, Connect, 3(1): 1-8.

UNESCO-UNEP (1988), The International Strategy for Action in the Field of Environmental Education and Training for the 1990's. Paris: (UNESCO); Nairobi: (UNEP).

VERMA, G.K. & BEARD, K.M. (1981), What is Educational Research? Perspective on Techniques of Research. Aldasket, England: Gower.

VULLIAMY, G. (1987), Environmental Education in Third World Schools. Rhetoric or Realism? The Environmentalist, 7(1): 11-19.

WHITE, R. & GUNSTONE, R. (1992), Probing Understanding. London: Falmer Press.

WOOLFOLK, A.E. (1984), Educational psychology for teachers, In WOOLFOLK, A.E. & McCUNE-NICOLICH, L. (Eds) Prentice-Hall: Englewood Cliffs, N.J.

PERSONAL COMMUNICATIONS

MFENYANA, A. (1992), Director in Department of Agriculture - Environmental Education Section. Ciskei: Personal communication, 1992.

VAN ROOYEN, J. (1989), Head of Department, Development Bank of South Africa. Personal communication, 1989.

Appendix 1

INTERVIEW SCHEDULE

1. What do you understand by the term"environmental issues", or "environmental problems or "environmental concerns"?

2. What are the major environmental problems in Ciskei?

3. Do you think that there are any environmental problems that are related to the following:

3.1 Land
3.2 Water
3.3 Plant
3.4 Animal
3.5 Energy
3.6 Social

4. What are the causes of
4.1 Land related problems-;
4.2 Water related problems-;
4.3 Plant related problems-;
4.4 Animal related problems-;
4.5 Energy related problems-;
4.6 Social related problems, which you have just mentioned?

5. What are the solutions to the existing environmental problems which you have mentioned?

6. Who do you think should initiate possible initiators of the solution which you have mentioned?

7. Who do you think should these solutions target or reach?

8. What role should be played by the Department of Education in addressing environmental problems in Ciskei?

9. Focus on subjects:
9.1 (a) Do you think that your subjects is addressing environmental concerns, Is this adequate?
(b) Do you think that your subject should be addressing environmental concerns?
9.2 Do you think that other subjects should be addressing environmental concerns?
9.3 (a) Do you think that environmental aspects should be included in the formal school curriculum?
(b) Which subjects should include environmental aspects?
9.4 At what level of school should environmental aspects be formally included in the school curriculum.

10. What is Environmental Education?
"Define in your own words what you understand as Environmental Education"?

10.1 What concepts are part of Environmental Education?

10.2 Elements in Environmental Education according to IUCN definition.
Do you think that Environmental Education includes the following elements?

Element in Environmental Education	Yes/No	In what way?
a. recognition and clarification of values		
b. development of attitudes		
c. knowledge and understanding of concepts		
d. appreciation of interrelationships between man,culture and his biophysical surroundings		
e. development of skills		
f. decision making		
g. self-formulation of code of behaviour to solve environmental issues		

10.3 Do you think that these elements can be included in a formal school curriculum?

10.4 What changes can be implemented to include Environmental Education in school curriculum?

10.5 What other changes can be made in school curriculum?

10.6 Who is responsible for curriculum development?