AN INVESTIGATION INTO THE AVAILABILITY AND ADEQUACY OF ENVIRONMENTAL INFORMATION RESOURCES TO SUPPORT FIELD WORKERS AT THE WILDLIFE AND ENVIRONMENT SOCIETY OF SOUTH AFRICA'S FOUR ENVIRONMENTAL EDUCATION CENTRES IN KWAZULU-NATAL

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Submitted as the dissertation component (which counts for 50% of the degree) in partial fulfilment of the requirements for the degree of Master of Information Studies, School of Human and Social Studies, University of Natal, Pietermartizburg

January 2000

Abstract

This study is concerned with the availability and adequacy of environmental information resources to support field workers at the Wildlife and Environment Society of South Africa's (WESSA) four environmental education centres in KwaZulu-Natal. It begins by examining the environment, the environmental crisis and environmental education as a response to the crisis, before giving an overview of the history of WESSA.

To provide a wider context within which to view the study, literature dealing with environmental education, environmental education centres in South Africa and environmental information was examined.

A study population consisting of 18 field workers and eight management staff, based at the four environmental education centres, was surveyed by means of interviews. This allowed for selected attributes such as length of employment at the centre, highest education qualification and previous environmental education experience to be elicited from field workers. Other information asked of the population concerned available environmental information resources, the environmental information support required by field workers and the adequacy of this support to field workers.

Results were then analysed. With the responses to the open-ended questions, content analysis was used to determine categories which were subsequently tabulated, together with the responses from closed questions.

The results revealed that WESSA provides a number of ongoing, in-house training opportunities which expose field workers to environmental information resources; WESSA publications dominate the environmental information resources used during the training of field workers and consequently, during the preparation and conducting of courses by field workers; booklets, books and colleagues are considered valuable information resources by field workers; and there is a recognised lack of environmental information by both field workers and management staff.

Recommendations for improving the environmental information resource support to field workers are made in light of the results of the survey and the literature review.

Acknowledgements

Many people have made this study possible and I would like to record my gratitude to them.

Acknowledgements are due first and foremost to all the field workers and management staff of the Wildlife and Environment Society of South Africa, for their enthusiastic support and time.

My supervisor, Athol Leach, for his constant guidance, encouragement, patience and editing of chapters as they slowly arrived at his office.

Jim Taylor, Mike Ward, Kim le Roux and Alison Kelly for their constructive comments regarding the interview protocols. Heather Ducasse, Nathi Ndlovu and Wayne Peddie for being "guinea pigs" and allowing the interviews to be "pre-tested" on them.

Sally Kiln, Alison Kelly and Kim le Roux for moral support.

My mother, Maureen Holland, and Wayne Peddie, who encouraged me to finish and never complained when the thesis took precedence over everything else.

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C2005	Curriculum 2005
CAB	Commonwealth Agricultural Bureau Abstracts
CATNIP	Cataloguing Network in Pietermaritzburg
DWP	Drakensberg Wetland Project
EEASA	Environmental Education Association of Southern Africa
ERIC	Educational Resources Information Centre
INFOTERRA	Global Environmental Information Exchange Network
ISAP	Index to South African Periodicals
IUCN	The World Conservation Union
OPAC	Online Public Access Catalogue
SABINET-Online	South African Bibliographic and Information Network, Online
SACD	South African Co-operative Database
SADC REEC	Southern African Development Community, Regional Environmental Education Centre
SEOs	Senior Education Officers
TBP	Treasure Beach Project
TSP	Twinstreams Project
UVP	Umgeni Valley Project
WESSA	Wildlife and Environment Society of South Africa

Chapter 1

Introduction

This study is concerned with the availability and adequacy of environmental information resources to support field workers at the Wildlife and Environment Society of South Africa's (WESSA) four environmental education centres in KwaZulu-Natal. In this introductory chapter, the environment, environmental crisis and environmental education as a response to the crisis are discussed. A brief history of WESSA is then given. Following this is a discussion of the research problem, as well as the aim, objectives and limitation of the study. Finally, definitions of terms used in the study are provided and the structure is briefly delineated.

1.1 Background to the study

Of all the species that have evolved during the Earth's long history, *Homo sapiens* has been amongst the most successful. From a small, highly vulnerable group, the species has made its presence felt in every corner of the planet (Yeld 1997:11). No part of the natural world remains untouched and none of the major ecosystems is now unaffected by people's behaviour.

However unlikely it may seem to many people, humanity still remains closely connected to nature and natural processes. Despite technological advances, people remain totally dependent on the Earth's capacity to sustain them with natural life-support systems such as air, water and soil (Yeld 1997:11).

Caring for the Earth means two things - helping people to have long, healthy and fulfilling lives, and at the same time conserving the complexity of all life on the planet. In order to achieve this, there has to be a commitment to a new ethic - the ethic of sustainable living. In addition, there must be certain constraints on development, to ensure that the material benefits that are harvested from the Earth continue for more than just one or two generations (Yeld 1997:11).

1.1.1 The environment

The environment is not simply something "out there" that is seen and experienced in the same way by all people. People see the environment in many different ways which develop throughout their lives due to the experiences and language interactions that they have in places, with reading materials and with other people. The environment includes everything around people, including people themselves, as well as where they live, shop, relax, play, study, work and enjoy nature. Historically, people's understanding of what the concept "environment" includes has broadened. Early on, "environment" was used to refer to nature, or biophysical elements. Later, people started including urban and built-up surroundings into the concept and still later there was a recognition that the concept itself was man-made (Taylor and Paxton 1994:7).

Fien, in 1993, defined the environment as

> ... a social construct referring to the interactions between social and biophysical systems (Taylor and Paxton 1994:7).

This is complemented by the four-dimensional model of O'Donoghue (1993:18) which presents the environment with biophysical, economic, social and political elements or dimensions (see Figure 1).

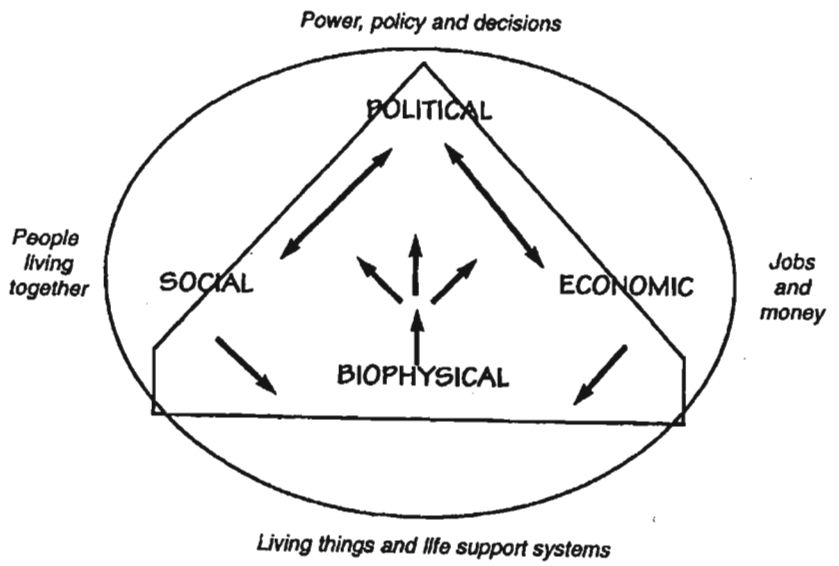

Figure 1 : Four-dimensional concept of the environment (O'Donoghue 1993:18)

1.1.2 The environmental crisis

These dimensions of the environment - biophysical, economic, social and political - are areas within which environmental problems become visible. Together, environmental problems make up what can be seen as a four-fold global environmental crisis, linked to the various dimensions, which includes issues of

- conservation - pollution, extinctions of species and habitats/life support degradation (**biophysical**);
- development - first/third world consumption, poverty, starvation (**economic**);
- world peace - social conflict and violence, war (**social**); and
- democracy - human rights, repression, exploitation, social justice (**political**).

These problems have been around for many years, but people are only now becoming more aware of them, and of the fact that environmental issues have begun to take on crisis proportions. The growing scale of the problems can be linked to the rapid growth in human numbers and to the advancement of technology and industrialisation (Taylor and Paxton 1994:8).

Because of the sophisticated social, political and economic systems of modern societies, environmental problems are complex and interlinked. One sees this when looking at any environmental issue - such as poverty, population growth, soil erosion or water pollution - and its causes and effects. Both the causes and effects of environmental problems can often be found in all four dimensions of O'Donoghue's model.

Environmental problems are also becoming less visible. Examples are global warming (the greenhouse effect), the depletion of the ozone layer and nuclear or radioactive pollution. The environmental crisis can be linked to the modern way of living and peoples' modern world views. Modernisation is a development process which has changed the way people live, bringing with it a cash economy and the rise of industries, sophisticated technologies and scientific advances. The social beliefs and values which accompany modernisation are

called *modernism.* These beliefs and values include a striving for progress, mostly through economic and scientific development; the pursuit of material wealth (*materialism*); a tendency to value the individual person above the community (*individualism*); a belief that science is the only way to find answers to problems (*scientism*); and a belief that the best solutions are technical in nature (*technicism*). Scientism should not be confused with science, or technicism with technology. The "-isms" are unquestioning beliefs and the usefulness of science and technology should not be rejected. Similarly, it would be an error to think that modernity is completely bad, or that "pre-modern" people had better lives than "modern" people. Before the advances of science and technology, people feared magic and suffered many hardships. Modernism has brought many improvements to society, but it also has a dark side - the world environmental crisis. Modernism includes ideals which are worth striving for, such as enlightenment from myths, equality and a better life for all. However, people need to find ways of minimising its darker side, namely the crisis in the environment (Taylor and Paxton 1994:9).

A number of solutions to environmental crises have been proposed. These include those proposed by the World Conservation Strategy in 1980, in Caring for the Earth in 1991 and, most recently, Agenda 21 in 1992. One of the most widely recommended responses to environmental crises was and is education, specifically environmental education (Taylor and Paxton 1994:9).

1.1.3 Environmental education

Agenda 21 of the Earth Summit claims that "education is critical for promoting sustainable development and improving the capacity of the people to address environmental and developmental issues" (Lotz *et al.* 1994:7). South Africa, like the rest of the world, has not escaped environmental and developmental problems and issues. The long-term success of education activities will depend on the consistency of the ideas behind what is done, the quality of the support and the development of curricula which are relevant to teachers, learners and the entire community (Lotz *et al.* 1994:7).

Environmental education is a response to the environmental crisis. The concept of environmental education was first used by Patrick Geddes (1854-1933). Geddes developed and practised environmental education because he was dissatisfied with school and university learning and teaching methods and was alarmed by Britain's spreading slums. He dedicated his life to education and the environment and emphasised a holistic view which included seeing the importance and necessity of beauty and function in towns and cities (Leketi 1992:3).

Although the concept of environmental education was first used by Geddes, many attempts have been made to define the term. An example of one of the most commonly used definitions is that given by the World Conservation Union (IUCN). (See 1.6.3.)

In 1975, Martin argued that

> ... environmental education does not ultimately have validity unless it also involves educating to change the human environment for the better by understanding on the one hand the political processes by which this can be done as "participating citizens"; and on the other hand, as noticed by conservationists and other environmentalists, by acquiring an environmental ethic and a knowledge of the ecological basis of life, on which value judgements about the environment can be based (Janse van Rensburg and Shongwe 1994:10).

In 1991, Huckle saw environmental education as education **for** the environment.

> Education for the environment should be a shared speculation with the pupils on those forms of technology and social organisation which can enable people to live in harmony with one another and with the natural world (Janse van Rensburg and Shongwe 1994:11).

Although environmental education has a long history (having been practised since the 1800s by Geddes), until fairly recently formal curricula in South African education largely ignored environmental principles (Yeld 1997:58). However, the launching of Curriculum 2005 (C2005) by the Minister of Education in March 1997 marked a significant change in the history of education in South Africa. Most importantly, it led to the inclusion of environmental education as part of the school curriculum (Tselane and Mosidi 1998:5). (This is discussed in 2.1.)

In addition to the slow and lengthy process it took to include environmental education in the curriculum, there have been powerful forces effectively nullifying many of the positive benefits of environmental education that have taken place in the past - advertising and mass entertainment have promoted over-consumption, ignored the need to conserve scarce resources and promoted wasteful living practices. The result is that many South Africans have become accustomed to, or take as a desirable role model, an unsustainable lifestyle, based on consumerism and characterised by disposable goods and excessive packaging. Also, many people do not understand the links between individual lifestyles, the alleviation of poverty, the use of resources, environmental degradation and, ultimately, the survival of humanity. They do not see how changing their behaviour can help others and have a positive influence on the natural environment. A new approach is essential - one in which an understanding of the balance between humanity and the natural world is emphasized (Yeld 1997:59).

Yeld (1997:59) argues that environmental education should aim, firstly, at providing the required understanding of political processes so that all citizens can participate actively and effectively in decision-making about environmental issues on a local, national and global scale. Secondly, it should enable all citizens to acquire the necessary knowledge and understanding (including that of ecological principles and processes) which will enable them to make informed choices and decisions about environmental issues (Yeld 1997:59). In order for these aims to be achieved, environmental information has become a vital resource and tool for supporting environmental education. As noted earlier, the environment is now recognised as being inclusive of biophysical, economic, social and political dimensions, all of which are intimately connected.

The relatively recent growth of environmental awareness has implications for finding environmental information, both positive and negative. On the positive side, the rapid growth of interest in the environment has led to an equally rapid growth in the provision of environmental information, not only of a scientific and technical nature but also legislative, regulatory and commercial (Sweeney 1995:10). There is, however, also a negative side.

The late development of environmental awareness means that environmental information still, to some extent, falls between several older, established scientific disciplines, such as chemistry, engineering and the life sciences. This makes finding information more difficult, in that there are not only specific environmental information sources to consider, but also those covering the more traditional disciplines (Sweeney 1995:10). In addition, although "grey literature" (literature outside the easily recordable categories such as books and journals) is abundant in the environmental area, it can be difficult to trace (Sweeney 1995:11). These are a few of the many issues and concerns about environmental information that challenge the aims of environmental education.

1.1.4 The Wildlife and Environment Society of South Africa

The Transvaal Game Protection Association was formed in 1902 to address the widespread depletion of wildlife in the north-eastern regions of South Africa (Pringle 1982:302). It lapsed during the First World War and was resuscitated in 1920. The emphasis was on the "protection of wildlife" and, in 1926, the Association was instrumental in the proclamation of the largest game reserve in South Africa, the Kruger National Park (Pringle 1982:300).

In 1926 the Association was disbanded to form the Wildlife Protection Society of South Africa, which was later renamed the Wildlife Society of Southern Africa. Seventy years later, in 1996, the name was changed to the Wildlife and Environment Society of South Africa (Taylor 1997:13).

The development of the Society reflects an important trend in conservation in South Africa. This trend is evident in the changes in the name of the Society and its policy, as the Society evolved from the "protection of nature" to the "wise use of natural resources". The recent inclusion of the word "environment" in its name reflects a wider concern about environmental issues. Early Society practices aimed to "preserve" natural areas, but today the policy of the Society is to ensure long-term environmental sustainability (Wildlife and Environment Society of South Africa policy document 1999:1).

In 1986 the main objective of the Society was, according to its mission statement, "... to promote environmental conservation and environmental education in southern Africa" (Wildlife Society 1986:2). In the 1990s, and in keeping with the focus of sustainable living, the Society revised its mission statement, "to promote public participation in caring for the Earth" (Wildlife Society 1994:4).

Today, the Society is the largest and oldest non-governmental environmental organisation in South Africa. In keeping with its mission statement, and in order to respond to the increasing deterioration and exploitation of the natural environment by increasing public awareness of, and knowledge about, the environment, as well as environmental problems caused by people's actions, WESSA has established environmental education centres throughout the country.

Much of the early environmental education development within the Society took place in what was then the province of Natal (Taylor 1997:15). The first organised education course run by the Society was in 1952 and was conducted by Ian Garland, with a "fun-with-learning" focus (Pringle 1982:246). The participants were schoolboys and the course was an outdoor camping experience interspersed with nature studies. From these early beginnings in 1952, four environmental education centres (see Figure 2) have since been established by WESSA in KwaZulu-Natal. These are :

- the Umgeni Valley Project, outside Howick, established in 1973;
- the Treasure Beach Project in Durban, established in 1989,
- the Drakensberg Wetland Project, near Giant's Castle, established in 1994 and
- the Twinstreams Project, Mtunzini, established in 1996.

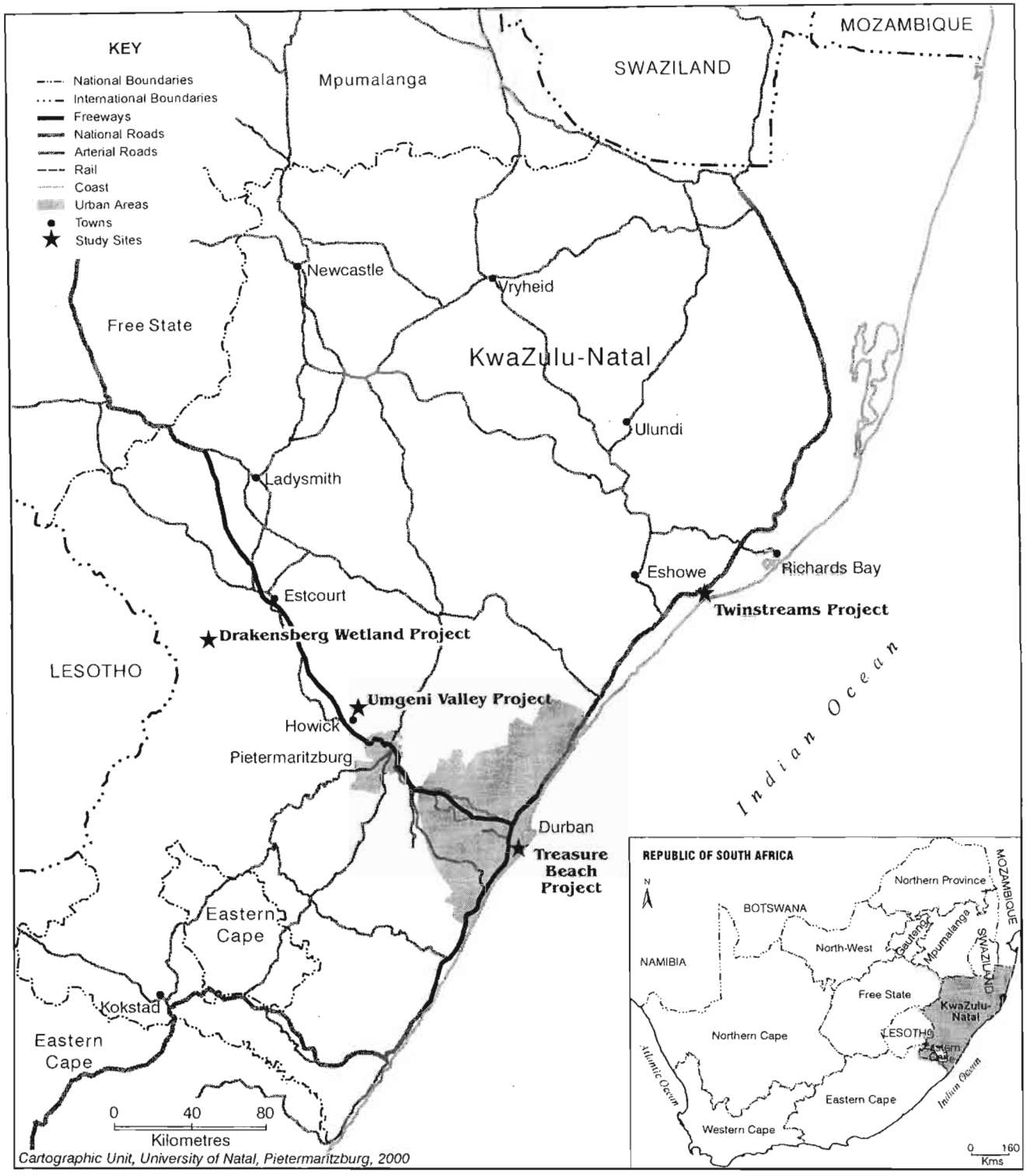

Figure 2 : Map showing the location of the four WESSA environmental education centres in KwaZulu-Natal

1.2 The research problem

Field workers at WESSA's four environmental education centres in KwaZulu-Natal are in direct contact with about 35 000 "visitors" who annually attend courses offered at the centres (Friedel 1999). The courses are primarily ecology-based, "hands-on" courses for schools. In addition, there are environmental educator courses for adults, teachers, student teachers and those already in the field of environmental education. Furthermore, leadership courses, conservation career courses, hunters' courses and specific courses which are tailor-made to suit clients are conducted. The role of the field worker is to encourage and promote an understanding of ecological processes and the balance between people and the "natural" world.

One of the guiding principles, accepted as policy by WESSA, is that the organisation

> ... will engage in educational initiatives that produce resource materials (tools) that enable people to find out about the environment and support action to improve it (empowerment) (Environmental education policy guidelines for WESSA 1996:4).

However, from personal experience as a field worker during 1994, the present researcher often found herself in situations where the environmental information resources she had at her disposal, and those which were in place at the centre where she worked, were inadequate or unavailable. In addition, a fellow field worker mentioned a lack of environmental information relating to social, political and economic issues (Peddie 1999). This field worker felt that the resources to support ecological teachings (such as food chains, photosynthesis and the carbon cycle) were available, but in attempting to place these teachings within a global context of economic issues (first/third world consumption, poverty, starvation), social issues (world peace involving social conflict and violence, war, the stockpiling of weapons) and political issues (human rights, repression, exploitation, social justice) - all of which are interlinked and facets of the "environment" - environmental information resources were insufficient.

Paxton's study in 1994 on the *Enviro Facts Project* - a project involving the development of environmental "fact sheets" - emphasises the need in South Africa for environmental information and the numerous requests for this kind of information (see 2.2.1). Paxton's study is supported by Taylor's research (1997), which recognises both the lack of environmental information and the sharing of available information. Taylor reviews the development of Share-Net, a resource network located within WESSA, with a view to revealing what might be learnt from its experience and from the development, dissemination and use of resource materials for environmental education. In addition, Shongwe's study (1997) on environmental education programmes offered by the Delta Environmental Centre, in the Gauteng region, also raises the issue of a lack of information. Focusing on the role that environmental education centres play in South Africa, Shongwe concludes that, while these centres play a significant role in promoting and supporting environmental education about, for and in the environment, there is very little available information on these centres, not only in South Africa, but in other countries as well.

Given the above, the problem which this research attempts to address is the apparent inadequate and insufficient environmental information resources to support field workers at WESSA's four environmental education centres in KwaZulu-Natal.

1.3 Aim, objectives and research questions

1.3.1 Aim of the study

The aim of this study is to investigate the environmental information support for field workers at WESSA's four environmental education centres in KwaZulu-Natal. This entails examining the availability and adequacy of environmental information resources.

1.3.2 Objectives of the study

The objectives of the study are :

- to determine the availability of environmental information resources to field workers at WESSA's four KwaZulu-Natal environmental education centres;
- to determine the environmental information support required by field workers at WESSA's four KwaZulu-Natal environmental education centres;
- to determine the adequacy of environmental information resources to field workers at these environmental education centres; and,
- to make recommendations relating to environmental information support availability and adequacy.

1.3.3 Research questions

The following research questions arose from the research objectives given above :

- What environmental information resources are available to field workers at the four centres?
- What is the identified environmental information support required by field workers?
- How adequate is the environmental information support offered to field workers?

1.4 Importance of the study

Each year over 35 000 people are participants on various courses at the four environmental education centres. The role of the field worker is primarily to encourage and promote an understanding of ecology. It could be argued that the availability and adequacy of environmental information resource support received by field workers will contribute to the long-term success of environmental education activities. It could further be argued that this support will help ensure that the educational programmes run at the centres are relevant to teachers, learners and other visitors.

It is envisaged that this research will enable support in terms of environmental information resources for field workers to be assessed and, should the recommendations that emerge be taken further, improved.

1.5 Limitation of the study

A limitation of the study was that the researcher interviewed field workers in one geographical region only, namely KwaZulu-Natal, employed by one environmental organisation, WESSA. The Department of Environmental Affairs and Tourism has a database of over 200 environmental education centres in southern Africa. This is an indication of the demand for these centres (Beeton 1998:310). The findings of the present study are, however, not necessarily applicable to all these environmental education centres.

1.6 Definitions of terms used in the study

The definitions that follow are working definitions that best describe what the researcher means when using certain terms in the context of this study. The definitions apply to the present study only. They are listed alphabetically, for easy reference.

1.6.1 **Adequate**, according to the Oxford Dictionary (1988), is "to be sufficient or satisfactory". **Adequacy of resources** implies environmental information resources which satisfactorily support field workers in correctly and fully answering and dealing with environmental questions and queries.

1.6.2 **Available**, according to the Oxford Dictionary (1988) is "ready or able to be used or obtainable". **Availability of resources**, therefore, implies that the required resources are either at a field worker's disposal or can be obtained with minimal difficulty.

1.6.3 **Environmental education** is, according to the IUCN, "the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality" (Janse van Rensburg and Shongwe 1994:10).
(See also 1.1.3.)

1.6.4 **Environmental information** is a term which does not appear to have a finite definition. Information has been defined as data that is meaningful or useful, usually in the sense of letting the recipient know something that was not previously known or understood. Information has also been defined as organised data which reduces uncertainty in decision-making (Murdick 1980:29). Environmental information can, therefore, be broadly defined as meaningful and/or useful data dealing with environmental issues of a biophysical, social, economic or political nature.

1.6.5 **Environmental information resources** are resources dealing with environmental issues which may be of a biophysical, social, economic or political dimension. These resources cover all environmental information "tools" used by field workers. The resources are available in a number of formats, including radio, television and personal communication (oral), booklets, fact sheets, newspapers, magazines, the Internet (text or text with associated visuals) and posters and models (visual formats with no associated text).

1.6.6 **Field workers** are people, based at environmental education centres, running hands-on, practical, ecology-based conservation courses, primarily with school groups.

1.6.7 **Identified information resource** describes any environmental information resource recognised by field workers and required in order to accomplish a task.

1.6.8 **Project Managers.** There is a Project Manager at each of the four WESSA centres. These managers are involved in co-ordinating the running of the education centre and the training and support required by field workers.

1.7 Structure of the study

Having outlined the research problem and aim of the study, as well as a background to the study, in this introductory chapter, the next chapter will review the literature relevant to the study. The research methodology used for the study is explained in Chapter 3 and the results are given in Chapter 4. A discussion of the results follows in Chapter 5 and the final chapter deals with conclusions, recommendations and suggestions for further research. Appendices are located after the list of sources cited.

1.8 Summary

In this introductory chapter, the environment, environmental crisis and environmental education, as a response to the crisis, were discussed. A brief history of WESSA was given. Following this was a discussion of the research problem and of the availability and adequacy of environmental information resources to support field workers at WESSA's four environmental education centres in KwaZulu-Natal. The aim, objectives and the limitation of the study were given. Finally, definitions of terms used in the study were provided and the structure was briefly delineated.

Chapter 2

Literature Review

To provide a wider context within which to view the study, this chapter reviews some of the South African and other relevant literature which relates to environmental education centres and environmental information resources. The review is divided into two sections. The first section focuses on relevant works relating to environmental education and environmental education centres in South Africa. The second section deals with environmental information resources.

The literature search began with the "Cataloguing Network in Pietermaritzburg" (CATNIP) database. This resulted in a number of catalogues, including those from the Natal Society Library and the University of Natal, Pietermaritzburg, being accessed. The University of Natal's Durban Online Public Access Catalogue (OPAC) was then accessed, as were Rhodes University, the University of Durban-Westville and the University of Port Elizabeth. The next database to be accessed was SABINET-Online, with SACD (South African Co-operative Database) and ISAP (Index to South African Periodicals) being searched. Library Literature, ERIC (Educational Resources Information Centre), Dissertations Abstracts Ondisc and CAB (Commonwealth Agricultural Bureau Abstracts) were also searched.

At this stage, the present researcher, having access to a complete set of the *Southern African journal of environmental education* and the *Environmental education bulletin* (also a southern African publication), was able to manually search the indexes of both these publications. Next, the Internet was searched but this proved to be a disappointment, with no relevant documents being retrieved. It should, however, be noted that the researcher did not have much Internet experience. The *Directory of environmental education research in southern Africa*, published in 1998, was also consulted. Finally, an attempt was made to access the Global Environmental Information Exchange Network (INFOTERRA), an environmental database. Access through the Internet was denied and, although the Department of Environmental Affairs and Tourism was telephoned, they were unable to assist with details of how and where the researcher could access this database.

In general, very few published sources could be traced with specific reference to the support (in terms of environmental information resources) required by field workers at environmental education centres, either in South Africa or in other countries. Those sources which were traced were specific to Australia, and focused on environmental education resource support for teachers. Therefore, although a large amount of literature could be found on "environmental information" and "environmental education", nothing specific to this study could be traced that was of more than marginal relevance. Consequently, the literature on environmental information and environmental education provides the basis for the literature review.

2.1 Environmental education and environmental education centres in South Africa

In 1.1.3, there is a global focus on environmental education and a brief introduction of the situation in South Africa. The following discussion is specific to South Africa.

According to the environmental education policy guidelines for the Wildlife and Environment Society of South Africa (WESSA), environmental education is a "reconstructive process with the aim of reversing a world trend of environmental destruction" (Environmental education policy guidelines for WESSA 1996:11). Good environmental education, WESSA suggests, is simply good education which will facilitate this process in a positive way. Ideally, this will result in more informed people capable of making decisions and taking actions as and when these are necessary. In this way, environmental education is not simply a process of creating awareness.

At the world inter-governmental conference on environmental education held in Tbilisi, Georgia, in the then Soviet Union, in October 1977, twelve guiding principles for effective environmental education programmes were adopted. These have been incorporated into WESSA's policy for environmental education.

According to the Tbilisi guidelines, an environmental education programme should

1. consider the environment in its totality - natural and built, technological and social (economic, political, cultural-historical, moral, aesthetic);
2. be a continuous lifelong process, beginning at the pre-school level and continuing through to adulthood and parenthood;
3. be interdisciplinary in its approach, drawing on the inherent aspects of each discipline to create a holistic and balanced perspective;
4. examine major environmental issues from local, national, regional and international points of view, so that people receive insights into environmental conditions in other geographical areas;
5. focus on current and future environmental problem situations, while taking into account the historical perspective;
6. promote the value and necessity of local, national and international co-operation in the prevention and solution of environmental problems;
7. inform laymen and planners of the need to consider environmental aspects in plans for development and growth;
8. enable students to have a role in planning their learning experiences and opportunity in this process for making decisions and accepting their consequences;
9. relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age. During the student's early years, special emphasis should be placed on environmental sensitivity within the home environment;
10. help students to recognise and understand the symptoms and real causes of environmental problems;
11. emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
12. utilize diverse learning environments and a broad array of educational approaches to teaching, learning about and from the environment, with due stress on practical activities and first-hand experience (Environmental education policy guidelines for WESSA 1996:12).

The early days of environmental education in South Africa were initially confined to nature reserves, with the main emphasis being on ecological instruction and simplistic notions of attitude change through awareness creation, so as to change behaviour. Such views were strongly influenced by the idea that the environment was in a crisis, in terms of ecosystems being at risk and endangered wildlife which needed to be protected in nature reserves. People, therefore, needed to experience nature in wild, protected areas and had to be provided with information and made aware (Shongwe 1997:53).

Following this particular type of environmental philosophy, visits to environmental field or education centres in nature reserves were prominent and these centres played a significant role in the early days. Now, however, with the "environment" inclusive of political, social, economic and biophysical elements (see Figure 1), environmental education can no longer be concerned with ecological issues only, but should be broader in approach, so as to achieve education for sustainable living and development, with minimum impact on the ecological environment (Shongwe 1997:53).

At present, environmental education is applied in different ways by different individuals and organisations in South Africa. The need for environmental education to reform education in a desirable way, rather than to replace existing structures, is becoming apparent (Environmental education policy guidelines for WESSA 1996:14). Most education follows a classroom situation, with teacher's instruction and a teacher-to-pupil lecture. However, a useful way of approaching environmental education involves classroom plus fieldwork, teacher's instruction plus pupil experience and teacher-plus-pupil dialogue (Environmental education policy guidelines for WESSA 1996:14).

A pioneering role in the practice of environmental education in South Africa has been played by non-governmental conservation organisations and state conservation agencies. Organisations such as the Wilderness Leadership School and WESSA had, by the 1960s, recognised the importance of educating people about their environmental responsibilities and had begun to set up programmes to put these ideas into effect (Irwin 1990:5). WESSA's Umgeni Valley Project, established in 1973, has played a major and innovative role in the development of environmental education in South Africa (Irwin 1990:3).

As mentioned in Chapter 1 (see 1.5), the Department of Environmental Affairs and Tourism has a database of over 200 environmental education centres. Although the database does not give information on when the different centres were first established, which organisations are responsible for them and what their focuses are, it does give the contact details for individual centres. This allowed for the following distribution pattern of environmental education centres in South Africa to be determined - Gauteng has 65 centres, KwaZulu-Natal has 38 centres, the Western Cape has 32 centres, Mpumalanga has 31 centres, the Northern Province has 12 centres, the Free State has 11 centres, the North West Province has 9 centres and the Northern Cape has 6 centres.

This study focuses on the four WESSA environmental education centres in KwaZulu-Natal. These are the Umgeni Valley Project, the Treasure Beach Project, the Twinstreams Project and the Drakensberg Wetland Project. WESSA has one other environmental education centre, located in Gauteng. This centre is Abe Bailey. The five centres mentioned employ field workers to conduct environmental education and conservation courses.

During the 1980s, the *Southern African journal of environmental education*, published by the Environmental Education Association of Southern Africa (EEASA), ran a series of articles which covered some of the major environmental education centres in southern Africa. The articles often stated the aims of the different environmental education centres. These included :

- "promoting an awareness amongst all peoples of the serious effects of the continuing abuse of natural resources in southern Africa" - Lapalala Wilderness School (Irwin 1986:22);
- "educating the public about our natural environment" - Suikerbosrand Nature Reserve (Mills 1987:21);
- "increasing environmental awareness and concern amongst all sectors of the community" - South African Nature Conservation Centre (Paxton 1987:27);
- "promoting peoples' awareness of their relationship with nature, thereby encouraging them to live sustainably within the constraints imposed by and opportunities offered by the natural environment" - Gold Fields Environmental Education Centre, Pilanesberg National Park (Irwin 1987:28).

Considering the Tbilisi principles and the new Curriculum 2005 (C2005) education policy which includes the "environment" as a "phase organiser[1]", environmental education centres, like the Gold Fields Environmental Education Centre and the Lapalala Wilderness School, are becoming important places in contributing towards a greater environmental understanding (Mills 1990:21; Loubser 1994:3).

Bearing in mind the aim of this research, WESSA environmental education centres, therefore, have the potential to play a vital role in the implementation of both the Tbilisi principles and WESSA's aim to ensure a more participatory approach in their environmental education programmes. In addition, with very few teachers having been trained to teach in an environmentally directed way, environmental education centres may be able to offer the necessary guidance (Loubser 1994:3).

According to Loubser (1994:3), and supportive of O'Donoghue's model of the environment (see Figure 1), there is a tendency to move away from centres which run programmes based on nature studies, wildlife experiences, ecology and adventure courses. In place of this, environmental education centres should :

- provide integrated programmes;
- emphasize concept and skills development;
- liaise with school programmes;
- base programmes on experiential hands-on activities; and
- change peoples' attitudes towards the total environment.

This view is further supported by Odendal (1986:14), who states that any successful environmental education programme should :

- disseminate knowledge;
- create an appropriate awareness in people; and
- create a commitment in people to use (and *live*) that knowledge and awareness.

[1] A phase organiser provides context and focus through which specific outcomes can be achieved at all levels and phases within General Education and Training. "Environment", as a phase organiser, enables environmental education processes to support learning in different learning areas, such as technology, communication and literacy and human and social sciences (Lotz, Tselane and Wagiet 1998:6).

Loubser adds that no environmental education programme will be successful if it does not address relevant environmental problems or phenomena. One may reason that it is only necessary to address those problems which relate to local community issues such as housing, poverty and the provision of water. However, one should also remember that many people's attitudes may be changed when aesthetic issues, such as the natural beauty of an area, are addressed (Loubser 1994:3). It should be recognised that environmental problems are related to both poverty and wealth (Loubser 1994:4).

In recent years, the education system in South Africa has been revolutionised and is currently in the process of transforming drastically. As mentioned earlier, C2005, with its "outcomes-based" approach, was phased in from Grade 1 in 1998. C2005 strongly represented the "environment" as a "phase organiser". For the first time in South Africa's history, all teachers will have to deal with the "environment" in a cross-curricular and integrated style. The infusion of environmental education in C2005 marks a historic shift from the past, where it was marginalised. For many teachers, especially at the intermediate and senior phase, this is a new challenge and one for which they are ill-prepared and under-trained. The provincial education departments are not able and, in some cases, lack the capacity to conduct relevant and "hands-on" training courses (Beeton 1998:310). As mentioned, the Department of Environmental Affairs and Tourism presently has a database of over 200 environmental education centres in southern Africa. This indicates that there is a great need for facilities of this kind (Beeton 1998:310).

Given the significant role which environmental education centres have played in the historical development of environmental education, a major part of South Africa's environmental education resources have been channelled into such centres. However, Shongwe (1997:53) notes that not enough is known about how these centres operate. This is not unique to South Africa, but also applies to centres in England (Shongwe 1997:53). In addition, Shongwe (1997:54) makes mention of the fact that many field workers at environmental education centres are not trained as teachers and do not have an educational background.

An interesting observation from Shongwe's study on the Delta Environmental Centre in Gauteng was that field workers recognised that their knowledge of what the pupils know and expect from the environmental education programme was limited and lacking. The only information available to the Centre before the groups arrived related to the booking procedure (Shongwe 1997:58). There was no evidence of any research effort or process to establish the pupils' requirements. These requirements are important in the selection of suitable methods, content and resources for a particular activity (Shongwe 1997:58). The relevance of the programme was, therefore, compromised by this lack of information. Environmental information resources, be they worksheets or questionnaires, to establish both the pupils' expectations and requirements may, therefore, have been either inadequate or lacking.

2.2 Environmental information resources

Environmental information resources are environmental information "tools" used by field workers. These "tools", as noted in 1.6.5, are available and transmitted in a number of formats including the radio, television or between fellow field workers (oral), booklets, fact sheets, newspapers, magazines, the Internet (text or text with associated visuals) and posters and models (visual formats with no associated text). According to Lotz (1995:7), people often think only of material resources and may forget that people are also very important resources in environmental education. Environmental information resources, therefore, include anything or anyone that provides some form of environmental information.

As mentioned earlier, the literature search revealed very little on the environmental information resource requirements of field workers at environmental education centres in South Africa. With the introduction of outcomes-based education and curriculum changes in schooling, as well as emerging environmental crises in South Africa, environmental education field centres need to respond to changing environmental information requirements, in order to be appropriate and relevant. Environmental information requirements are constantly changing and responding to these changing requirements is an ongoing process.

2.2.1 Lack of environmental information resources

One of WESSA's policy guidelines is that the use of all WESSA's publications in support of environmental education is to be encouraged. WESSA produces regular publications such as *African wildlife* (the Society magazine), *EnviroKids* (the Society junior magazine), as well as newsletters. Environmental books, including field guides, are also published. These publications all play an important role in environmental education (Environmental education policy guidelines for WESSA 1996:9). Environmental information resources are, therefore, available and produced by WESSA.

Share-Net, an information participatory network and a project of WESSA, has the purpose of developing environmental education resources for teachers and community groups. The network had its beginnings in the late 1980s in response to the lack of educational resources (Taylor 1995:91). A workshop was held at Midmar near Howick in 1991, to address this problem and 50 participants from all over southern Africa, who were interested in environmental education resources, attended. From the workshop a directory of names and telephone numbers was compiled - a mechanism which was to help people develop contacts for further co-operative projects. Taylor highlighted both the lack of environmental information and the sharing of this information. This lack of environmental information is commented on by Dlamini (1995:10), who considers the development of environmental awareness and the acquisition of knowledge toward, and about, the environment to be imperative.

In addition, Paxton's study focused on the need for environmental information by school children and the general public in South Africa. She found that written and verbal requests for information have steadily increased in recent years. These requests for material on particular environmental issues were placing increasing pressure on conservation organisations to respond to this information need. Following a survey of the more commonly requested environmental topics, the concept of simple fact sheets, the *Enviro Facts*, was developed (Paxton 1994:28).

The *Enviro Facts* are 60 fact sheets, each approximately 1000 words in length, on, for example, urban conservation, the ozone layer, and endangered species. Each fact sheet provides an overview, or orientating framework, for a particular topic. The fact sheets aim to be concise, up-to-date, easy-to-understand and South African in perspective. Each fact sheet includes a list of "Further Reading", which allows the reader to locate more information. Also included is "Useful Contacts", such as the names and addresses of organisations active in each field covered. Differing viewpoints and contentious issues are often included, as well as "Topics for Debate", which provide ideas for discussion. The *Enviro Facts*, published between September 1990 and November 1993, have proved popular and are selling in increasing numbers. In 1999 the fact sheets were updated and additional sheets were added to the existing 60.

The motivation for the production of the *Enviro Facts* was provided by a South African chain store, Pick 'n Pay, which was launching a series of "Green" displays in their supermarket outlets and saw the need for information sheets on environmental issues. A joint project was therefore established and representatives of the South African Nature Foundation (now the World Wide Fund for Nature, South Africa), who provided the funding, the Natal Parks Board (now the KwaZulu-Natal Nature Conservation Service), origination and editing, Pick 'n Pay (printing and free distribution through Pick 'n Pay outlets) and the Wildlife Society of Southern Africa (now WESSA), which provided further distribution opportunities, all served on the steering committee. A co-ordinator was appointed and, with the assistance of a number of scientists, the fact sheets were developed (Taylor 1997:85).

This acknowledgement of the need for environmental information has also been recognised further afield. During the past 10 years, the need for relevant environmental information has been recognised in Zimbabwe. Environmental information resources that did exist were scattered throughout the country among different conservation and environmental organisations. The lack of accessible information and resources was often noted at conferences, with participants calling for better provision and access to information on environmental education (Bhunhu, Muptini and Chari 1998:312). Moving even further afield, to New York in the United States of America, one saw the establishment of the Centre for Environmental Information, in 1974. This was in response to the growing dilemma of where to find timely, accurate and comprehensive information on environmental issues (Stoss 1989:17).

2.2.2 Staff development and environmental information resources within WESSA

One of WESSA's aims, in terms of environmental education, as stated in the "Staff training curriculum for WESSA environmental education centres", is to equip field workers at environmental education centres with the knowledge, resources and skills necessary for providing environmental education learning programmes to a wide variety of learners.

At a meeting of WESSA Senior Education Officers (SEOs), held at the Umgeni Valley Project in January 1997, the idea of staff development was discussed and it was felt that the commitment of formal "benchmarks" would improve the development process. These "benchmarks" included a staff training course in January each year, a second staff training course to be run in July, "free" days to be kept for staff development, the Principal Education Officer to observe every staff member once a year, all SEOs to observe their staff members once per quarter, the Rhodes University/Gold Fields Course[2] to be recommended for staff members in their second year of employment, all staff to attend an Environmental educators' course, and all staff to observe each other twice per year (Staff training curriculum ... 1999:1). This idea of "staff development" supports earlier statements by Lotz (1995) on the value of people as environmental information resources.

These "benchmarks" have become an integral part of the staff training and development programme at WESSA environmental education centres. At the SEOs meeting held at the Twinstreams Project in April 1998, it was suggested that a curriculum for a two-year cycle of staff training be drafted. After consultation with specialists, a document, "Formal recognition of the skills developed within the bursary system", was written (Staff training curriculum ... 1999:1).

In September 1998 an informal workshop was held which resulted in a list of activities, methods, skills and outcomes for staff training. Possible formats for presenting these as a curriculum were investigated. During October 1998, workshops were held at a number of KwaZulu-Natal environmental education centres and it was decided that a curriculum would need to be drawn up (Staff training curriculum ... 1999:1).

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2 The Rhodes University/Gold Fields Participatory Course in Environmental Education is offered through Rhodes University and supported by the Gold Fields Foundation. The year-long correspondence course focuses on the environment, the environmental crisis, environmental education as a response to the crisis and environmental resource development.

A current report, in terms of the availability and adequacy of environmental information resources, is that which was written by Neate, a "Staff Development and Training Co-ordinator", employed at one of the WESSA KwaZulu-Natal environmental education centres. Neate was employed from January 1999 to July 1999. She found that, on her arrival, the centre lacked current and comprehensive environmental information and environmental resources (Neate 1999:2).

The concern regarding environmental information resources is obvious, not only within WESSA's environmental education centres in KwaZulu-Natal, but within the country as a whole, and further afield (as noted by Bhunhu, Muptini and Chari in Zimbabwe and Stoss in the United States of America). This concern, together with the fact that little has been written on environmental information support for field workers at environmental education centres in southern Africa, has been a motivating factor for the present study.

2.3 Conclusion

According to Burge (1998:277), "Developing the ability of young people to make wise environmental decisions is one of the most important educational investments we can make". There are no simple solutions to environmental issues. However, environmental education centres and their staff, having environmental education experience and expertise, have much to offer. As mentioned by Lotz *et al.* (1995:7), in 1.1.3, the long-term success of education activities will depend on the consistency of the ideas behind what is done and on the quality of the support and the development of curricula which are relevant to teachers, learners, and the entire community. It can be argued that adequate and available environmental information resources in well-equipped environmental education centres will contribute towards this success.

2.4 Summary

Subsequent to describing the literature search process, this chapter reviewed some of the South African and other relevant literature which relates to environmental education centres and environmental information resources. The first section of the review concentrated on relevant works relating to environmental education and environmental education centres in South Africa. The second section dealt with environmental information resources.

Chapter 3

Research methods used

In this chapter, the research methods chosen to investigate the availability and adequacy of environmental information resources to support field workers are described and discussed.

3.1 Choice of research methods

Two methods of data collection were used. These were the search for, and review of relevant literature and the interview survey of the population of field workers and management staff of the four environmental education centres.

3.1.1 The literature search and review

Before any research is conducted, it is important for a researcher to have a thorough knowledge of earlier research that has been undertaken on the same subject. The review of related literature, therefore, is as important as any other component of the research process.

The review involved the identification, location and analysis of documents containing information related to the research problem, which was the availability and adequacy of environmental information resources to support field workers at environmental education centres. The main purpose of reviewing related literature was to determine what had already been done that related to the present researcher's problem. This knowledge not only avoids unintentional duplication, but also provides the understanding and insight necessary for the development of a logical framework into which the research problem fits.

As noted in Chapter 2, the literature review, very few published sources could be traced with specific reference to the support (in terms of environmental information resources) required by field workers at environmental education centres.

3.1.2 The survey method

In order to collect data which would serve the intended purpose of this study, the survey was considered the most appropriate research method to use. The survey method enables a researcher to gather practical knowledge of a contemporary nature (Busha and Harter 1980:151). Although survey research is characterised by the selection of random samples from populations, in the case of this research a census survey was conducted, as all field workers and management staff at the four environmental education centres were included in the study.

An exploratory study, as was the case in this research, can increase the researcher's familiarity with the phenomenon in question, it can help clarify concepts, it can be used to establish priorities for future research, it can identify new problems and it can be used to gather information with practical applications, although such results cannot always be anticipated (Powell 1997:59). This method was thus well-suited to the little-researched subject area of the present study.

The survey was conducted by means of interviews using protocols developed specifically for the purpose of the study. The results of the survey were discussed in the light of insights provided by the literature review.

Support for this particular approach is provided by Mutshewa's (1997) study, which examined methods used to communicate environmental information to rural communities in Botswana. The study looked at the attitude and environmental awareness of rural communities, using Nata Village as a case study. Of particular interest was the methodology used in the study - the survey method, which was employed to investigate the information providers and recipients. In order to gather data from the study population, interviews were conducted. Mutshewa was

personally involved in the data collection. This would have reduced any inconsistencies which can occur when more than one person is involved. This was recognised as useful and was adopted by the present researcher. Also used in Mutshewa's study, and subsequently used in the present study, was the method of taping all interviews to serve as a permanent record of what was said, instead of what the researcher thought was said.

3.2 Data collection method

The data collection method used during this study was semi-structured interviews (one for field workers and one for management staff). It was decided to use the interview method, as the population was sufficiently small. In addition, the interview almost always produces a better response rate than many other methods of data collection (Powell 1997:112). According to Powell (1997:112), the personal contact of the interview encourages people to respond fully. The present researcher was also aware that personal contact provided a greater capacity than the mail questionnaire for the correction of misunderstandings by respondents.

One of the major advantages of the interview method was its flexibility. The researcher could probe for more specific answers and could repeat a question when the response indicated that the person had misunderstood the question. In addition, the interview method ensured that all questions were answered. A tape-recorder was used in the one-to-one interviews. This was to record open-ended questions asked during the interview process, as well as any other comments by interviewees that were added. Although the researcher took notes throughout the interviews, the "back-up" of the tape-recorder was useful and ensured accuracy when quoting statements. According to Powell (1997:111), tape-recorders provide a relatively easy method of recording answers word for word and allow the researcher to use the respondent's own words rather than summaries or paraphrases.

3.3 Construction of the survey instruments

The questions for the two survey instruments (see Appendices A and B) were derived from the researcher's own experience as a field worker at an environmental education centre. In addition, suggestions and comments received during the pre-testing of the instruments were added.

Both structured and unstructured questions were used in the survey instruments. Open-ended or unstructured questions are designed to permit free responses from participants rather than responses limited to specific alternatives (Powell 1997:93). They are usually associated with qualitative data, but not exclusively so, and are especially useful for exploratory studies. On the negative side, however, because there is almost no limit to the possible responses to open-ended questions, respondents' answers are usually more difficult to categorise and analyse than answers to structured questions (Powell 1997:94).

Fixed-response or structured questions, also known as closed questions, limit the responses of the participant to stated alternatives (Powell 1997:94). Structured questions have several advantages and disadvantages, in comparison with unstructured questions. They accommodate pre-coding more easily, in that the possible responses are generally known and stated. The pre-coding, in turn, facilitates the analysis of the data gathered by the questions (Powell 1997:94). However, structured questions have the disadvantage of forcing the respondent to choose among the answers provided (Newell 1993:102).

3.4 Limitations of the interview

3.4.1 Time

The interviews were lengthy - the interview for field workers had 46 questions and the interview for management staff 36. Interviews therefore took at least an hour to complete, with one interview lasting two and a half hours. Since the interviewer had to travel to three of the four environmental education centres, much co-ordination between centre management staff and the researcher was needed. This was to ensure that on the days of planned interviews, field workers and management staff were not busy, or absent.

3.4.2 Possible interviewer bias

Bias is perhaps the greatest danger in the interview survey (Powell 1997:112). Interviewing is a subjective technique and the interviewer may unconsciously affect respondents. The interviewer may misunderstand the respondent's answer or may understand it but still make a clerical error in recording it. In addition, expansions or revisions of questions, or unnecessary explanations, in effect result in different questions being asked of different participants (Powell 1997:111).

The interviewer was aware that there is a fine line between encouraging a response and helping to word it or forcing an answer where there should not be one. Where necessary, however, and only in order to clarify a question, prompts were given.

3.5 Population

The population consisted of 18 field workers and eight management staff, based at the four environmental education centres. The four centres are the Drakensberg Wetland Project (DWP), near Giant's Castle, the Umgeni Valley Project (UVP) near Howick, the Treasure Beach Project (TBP), Durban, and the Twinstreams Project (TSP), Mtunzini.

At the time of this research there were 18 field workers employed at the four KwaZulu-Natal centres. Personal interviews, conducted by the researcher, were therefore not impractical nor unduly expensive, as only three of the four centres had to be visited. The fourth centre, UVP, was where this researcher was based during 1999. Four field workers were interviewed at UVP, four at DWP, three at TBP and five at TSP. Two field workers, based at DWP, were conducting an environmental course and were not available to be interviewed when the researcher visited their centre. In addition, all eight management staff were interviewed - three at UVP, two at DWP, two at TSP and one at TBP.

The total population was, therefore, 26 and this small size made sampling unnecessary.

3.6 Pre-testing the instrument

Pre-testing is the final stage in an interview protocol and considered one of the most important (Powell 1997:105). A pre-test gives the researcher an opportunity to identify items in the interview protocol that tend to be misunderstood by the participants or do not obtain the information that is needed (Powell 1997:105).

3.6.1 Population for the pre-test

Newell (1993:113) suggested that a 10% pilot sample is helpful and that it is vital that this initial group have similar characteristics to those of the population to be studied. The instruments were, therefore, pre-tested on a group of three people, all of whom had been involved in field work. This represented 11.5% of the intended population. The interviews were conducted in the same manner as those in the final survey. In addition, four colleagues, also involved in environmental education field work (two of whom had been field workers at UVP), were given copies of the instruments for comments.

3.6.2 Changes to the interview protocols

After the pre-test, some questions were re-worded, in order to ensure that they were unambiguous. In addition, suggestions, in terms of additional questions, were added. Three people felt that the questions (from the interview protocol for field workers) encouraged field workers to expect the centres to provide them with all their environmental information requirements. They felt that a "dependency" on the centre was being encouraged. With these suggestions in mind, a number of additional questions were added which encouraged field workers to examine their own personal contributions to finding environmental information resources themselves.

3.7 Administering the interviews

Once the design of the interviews had been completed and checked, a covering letter (Appendix C) was faxed to the Senior Education Officers and/or Project Managers at the four centres. The covering letter explained the purpose of the study. Follow-up telephone calls were then made to ensure that the faxes had been received and to make tentative arrangements for the researcher to visit the relevant centre. Final interview arrangements were made a week or two later.

As mentioned, 16 field workers and eight management staff were interviewed. Staff were interviewed at the environmental education centre where they were permanently based. The interviews at TSP, near Mtunzini, necessitated an overnight trip.

As noted, the time taken to complete the interviews ranged from one hour to two and a half hours. Interviews were conducted during the latter half of July and early August of 1999.

3.8 Data analysis

Data analysis was done manually by the researcher. With the responses to the open-ended questions, content analysis was used to determine categories, which were subsequently tabulated, along with responses to the closed questions.

3.9 Evaluation of the interview survey method

A study is said to have validity if it measures what it sets out to measure (Newell 1993:99). In research which requires that members of a population remember behaviour that they performed in the past, the factor of human error has to be taken into consideration (Aitchison 1998:70). Two interview questions called for field workers and management staff to recall situations in the past where there had been an unusual request from a visiting group or a question they had been unable to answer. A number of field workers indicated that they had experienced both these situations but could not remember examples.

In spite of the researcher's efforts to ensure that the interview questions were clearly and simply stated, questions 44 and 45 were problematic. Both these open-ended questions asked field workers and management staff to comment on the strengths and weaknesses of their centre. A few respondents struggled in answering these two questions, particularly those whose mother tongue was not English.

According to Powell (1997:110), the interviewer should also create an informal, friendly and non-threatening atmosphere. Despite the interviewer's attempts to put respondents at ease, a couple of them were tense. Most of the respondents, however, were relaxed and enjoyed the interview process. Respondents had been warned about the interviews in advance and some had read the letter (Appendix C) which was sent to the management staff of their respective centres.

In terms of reliability, a study is said to be reliable if similar results would be obtained by others using the same questions and a similar population (Newell 1993:99). It may be difficult to use the two instruments for non Wildlife and Environment Society of South Africa (WESSA) centres, as this study and the instruments focused specifically on field workers based at WESSA environmental education centres.

In general, the researcher felt that the research instruments used in the interview survey served the purpose for which they were intended, namely to obtain data for analysis relating to the availability and adequacy of environmental information resources to support field workers.

3.10 Summary

Two methods of data collection were used to gather information about the availability and adequacy of environmental information resources for field workers. The two methods were the search for and review of relevant literature and the interview survey of the population of field workers and management staff. Both have been described in this chapter and the interview survey evaluated.

Chapter 4

Results of the survey

The results of the survey, conducted by means of personal interviews, are reported in this chapter. With two different questionnaires being administered - one to field workers and another to the Principal Education Officer, Project Managers and Senior Education Officers (from now on to be referred to as "management staff") - it was decided to report the results in two sections. Section One gives results from questions asked of field workers. The responses from questions asked of management staff are reported in Section Two.

The layout of the results is in the following format : the question, an explanation of why the question was asked and, lastly, the results in the form of a table (where necessary), followed by a comment or comments. Where multiple responses were elicited (such as in questions 7, 9 and 10 of the structured interview for field workers and questions 5, 13 and 14 of the structured interview for management staff), the total number of responses is quoted, but the percentage quoted is always relative to the number of respondents for that particular question.

Questions which are "linked", such as questions 4 and 5 in the interview for field workers, are indicated. The justification for the question being asked is given after the first of the linked questions is stated.

4.1 Section 1

4.1.1 Responses from interviews with field workers

Question 1 : In what year did you start working for the Wildlife and Environment Society of South Africa (WESSA)?

This question was asked as the length of employment may have had an influence on the knowledge and use of environmental information resources, particularly if the interviewee had no previous experience within the field of environmental education.

Table 1 : Length of employment

Length	*N = 16*	*%*
0-6 months	6	38
7 months - 1 year	2	12
13 months - 2 years	2	12
More than 2 years	6	38
Total	*16*	*100*

Most field workers had been employed by WESSA for either less than six months (38%) or for more than two years (38%).

Question 2 : Have you worked at other WESSA environmental education centres?

The reason for this question being asked was that working at a number of centres could be related to the field worker being exposed to a greater diversity of environmental information resources.

Ten field workers (63%) had worked at other centres. Three of the six field workers, who responded in the negative to this question, had been employed by WESSA for less than three months.

Question 3 : What is your highest educational qualification?

There may be a relationship between resources used in preparing for, and during, courses (Questions 11 and 12) and tertiary qualifications. Consequently, this question was asked. In addition, field workers were asked to give details of any ongoing studies that they were involved with. Here, again, ongoing studies linked to their work could expose them to environmental information resources.

All field workers had completed their secondary education. Eleven field workers (69%) had a senior certificate, and five (31%) had some form of tertiary education. Seven field workers who had a senior certificate were involved in further studies. Two of the five field workers, having completed either a degree or diploma, were involved in further studies.

Questions 4 and 5

Question 4 : Did you have any environmental education experience before you began working for WESSA?

If field workers had been involved in environmental education prior to working for WESSA, it would be highly likely that they had been exposed to and worked with a variety of environmental information resources from other environmental organisations.

Eleven field workers (69%) had no environmental education experience prior to being employed at one of the WESSA centres.

Question 5 : What environmental education experience did you have before you began working for WESSA?

Table 2 : Environmental education experience

Environmental education experience	*N = 5*	*%*
Member of the Boy Scouts	2	40
Member of environmental club at school	2	40
Practical part of tertiary education	1	20
Total	*5*	*100*

Of the five field workers who had environmental education experience, only one had practical experience, this being part of his tertiary qualification. The other four field workers felt that their involvement as Scouts or environmental club members during their secondary education warranted a "yes" response to Question 4.

Questions 6 - 9

Question 6 : Are you aware of any training opportunities that this centre provides to support the work you do?

These questions established the awareness of training courses and which ones had been taken advantage of. These questions led on to Question 10, which focused on the environmental information resources that field workers were exposed to during these courses.

All field workers, except one, knew that a number of training opportunities existed to support their work. The only field worker who was not aware of any training opportunities had, at the time of the interview, been employed by WESSA for only two weeks.

Question 7 : Which training opportunities are you aware of?

Table 3 : Training opportunities that field workers are aware of

Training opportunities	*N = 15*	*%*
Environmental educators course	14	93
Other external courses	14	93
Staff exchanges between centres	13	87
Annual KwaZulu-Natal staff induction	12	80
Formal and informal discussions	7	47
Workshops	6	40
Other	8	53
Total	*74*	*493*

The Environmental educator's course, staff exchanges between centres, the annual KwaZulu-Natal staff induction, and other external courses, rated the highest in terms of knowledge of their existence. Of particular interest was that 12 of the 14 respondents who had knowledge of "Other external courses" used the Rhodes University/Gold Fields Course as their example.

Question 8 : Have you taken advantage of any of these training opportunities?

Only one field worker had not taken advantage of training opportunities and this individual had been employed for only two weeks at the time of the interview.

Question 9 : Which training opportunities did you take advantage of?

Table 4 : Training opportunities that field workers take advantage of

Training opportunities	*N = 15*	*%*
Annual KwaZulu-Natal staff induction	12	80
Environmental educators' course	10	67
Staff exchanges between centres	6	40
Other external courses	4	27
Formal and informal discussions	3	20
Workshops	3	20
Other	5	33
Total	*43*	*287*

Most field workers (80%) had taken advantage of the annual KwaZulu-Natal staff induction and the Environmental educator's course (67%). Of note was that only 40% had been involved in staff exchanges between centres. "Other", scoring the fourth highest, included community-based conservation training programmes and centre-based staff development programmes throughout the year.

Question 10 : What environmental information resources were you exposed to during these training support courses?

With the number and variety of training courses offered to field workers, it was decided to examine the range of environmental information resources exposed to field workers during these courses. This question is linked to two later questions which examine the resources field workers use when preparing and conducting courses.

Table 5 : Environmental information resources exposed to field workers during training courses

Resources	*N = 15*	*%*
Booklets	15	100
Magazines	10	67
Books	10	67
Posters	8	53
Pamphlets	7	47
Newspapers	5	33
Television programmes	4	27
Internet	3	20
Radio programmes	2	13
Other	9	60
Total	*73*	*487*

Of particular interest is that when examples of "Booklets" were asked for, the only ones mentioned were those published through Share-Net[1]. The most commonly referred to magazines were *African wildlife* and *EnviroKids* (both in-house publications of WESSA).

The category "Other" included people, additional Share-Net resources (such as the enviro picture building games and the school environmental policy and management pack), White and Green government papers, water resources and academic papers from the Rhodes University/Gold Fields Course.

Questions 11 and 12

Question 11 : What environmental information resources do you use when you prepare for courses?

If field workers were exposed to a variety of resources during training support courses, it was felt there would be a link between these resources and those used during pre-course planning. Bearing in mind that one of the objectives of this research was to determine the availability of environmental information resources, it was felt that these two questions would lend themselves to revealing the range of resources available to support field workers.

[1] Share-Net, a project of WESSA, is an informal network of people and organisations involved in the production of low-cost, environmental information resources.

Table 6 : Environmental information resources used in the planning of courses

Resources used in planning courses	*N = 16*	*%*
Booklets	10	63
Books	10	63
Magazines	8	50
Posters	5	31
Pamphlets	4	25
Newspapers	2	13
Internet	1	6
Other	10	63
No response[2]	1	6
Total	*51*	*320*

Booklets and books were the most-mentioned resources, followed by magazines. Of the 10 field workers using booklets, nine made use exclusively of Share-Net booklets and other WESSA publications. *African wildlife*, *EnviroKids* and *EnviroTeach* (also a Share-Net project) were mentioned as examples of magazines used. Seven of the 10 responses, which fell within the category of "Other", were "colleagues".

Table 7 : Environmental information resources used during courses

Resources used during courses	*N = 16*	*%*
Booklets	14	88
Books	6	38
Posters	5	31
Magazines	3	19
Pamphlets	1	6
Radio programmes	1	6
Newspapers	1	6
Television programmes	1	6
Other	10	63
No response	1	6
Total	*43*	*269*

[2] One field worker had only been employed for two weeks at the time of the interviews. She chose not to comment on a number of questions and this is recorded as a "no response".

Question 12 : What environmental information resources do you use during courses?

Again, booklets were the most-used resource, with 14 field workers (88%) making use of this type of information resource. Share-Net booklets were used exclusively by nine of the 14 field workers. The remaining five did not specify what type of booklets were used. "Other" resources used included those developed by field workers themselves, additional Share-Net resources (such as water kits, water slides, coliform testing kits, enviro picture building games and the school environmental policy and management pack), pre-planned worksheets, models, information cards, journals and bulletins, personal notes, stories, role-play and people.

Question 13 : Do you regard your colleagues as environmental information resources?
People are not often thought of as "information resources". However, not only may they know the answer to a question, they may also be able to direct one to where additional information may be obtained, be it in a newspaper, a journal or a specific book.

All 16 field workers (100%), without hesitation, answered this question positively.

Questions 14 and 15

Question 14 : Have you had an environmental information query within the last month from one of the groups, that you did not have an answer to?

The following two questions were asked to allow field workers to identify a lack of information and then determine whether or not the centre has the support structures, in terms of environmental information resources, in place to ensure that this known lack of information could be dealt with.

Eleven field workers (69%) had experienced a situation where they had been unable to answer an information query.

Although an example of these queries was not asked for, field workers volunteered examples and most of these were a lack of knowledge regarding the names of species (both faunal and floral).

Question 15 : What did you do when you had an environmental information query from one of your group members that you could not answer?

Table 8 : Course of action when a query could not be answered

Action	*N= 11*	*%*
Referred to a book	6	55
Asked a colleague	3	27
Enquired at the local university	2	18
Did not follow up on the query	1	9
Total	*12*	*109*

Six of the field workers (55%) who undertook a course of action referred to books when following up on an information query. Three field workers (27%) asked colleagues.

Questions 16 - 18

Question 16 : If you are asked a particular question and you are unsure of the answer, who or what do you turn to?

This question was a general one and did not refer to a specific time or example, unlike Questions 14 and 15. It included those questions asked of field workers during their leisure times and queries from the general public.

Table 9 : Sources of information that field workers turn to when unsure of an answer to a question

Sources	*N = 16*	*%*
Another field worker/colleague	16	100
A book, journal or magazine	13	81
Project Manager	8	50
The library	7	44
Senior Education Officer	4	25
Personal experience	3	19
Regional Manager	1	6
A university, college or technikon	1	6
Other	4	25
Total	*57*	*356*

All 16 field workers said that, if the situation allowed, they would turn to a colleague. This was closely followed by 13 field workers (81%) making use of a book, journal or magazine. Since the question allowed for field workers to choose more than one source, one field worker chose seven. However, on average, three or four sources were chosen.

The category of "Other" comprised telephoning experts from other institutions or someone in the local community, asking the group and/or the teacher with whom they were with, making use of personal notes and accessing the Internet.

Question 17 : Which one of the sources is the most helpful to you in getting answers to your questions?

Table 10 : Most helpful source

Most helpful source	*N = 16*	*%*
Another field worker/colleague	6	38
A book, journal or magazine	6	38
Project Manager	3	18
Senior Education Officer	1	6
Total	*16*	*100*

Colleagues and books, journals or magazines were identified as the most helpful sources. Of interest was that the only other sources considered to be the most helpful were the Project Manager and Senior Education Officer.

Question 18 : Why do you think this source is the most helpful to you in getting answers to your questions?

Only four sources were chosen in Question 17. These were the Project Manager, Senior Education Officer, another field worker/colleague and a book, journal or magazine. Table 11a refers to colleagues and includes the Project Manager and Senior Education Officer. Table 11b refers to responses elicited from the use of books, journals or magazines.

Table 11a : Reasons why the Project Manager, Senior Education Officer and other field workers/colleagues were the most helpful sources

Reasons for choosing people	*N = 10*	*%*
Experienced and knowledgeable	6	60
Accessible, especially when in the field	1	10
Can explain concepts/ideas simply	1	10
More interactive	1	10
Could not say why this source was chosen	1	10
Total	*10*	*100*

Six of the ten field workers (60%) felt that their colleagues, the Project Manager or the Senior Education Officer were more experienced and knowledgeable than themselves. This was given as the main reason why they would be consulted as an information source.

Table 11b : Reasons why a book, journal or magazine was the most helpful source

Reasons for choosing written sources	*N = 6*	*%*
More reliable and informative information	4	66
More accessible if in the field	1	17
Could not say why this source was chosen	1	17
Total	*6*	*100*

Four of the six field workers (66%) who chose a book, journal or magazine as the most useful source felt that these sources were reliable and informative. One field worker always consulted a book but could not, chose not to say why this source was preferred.

Questions 19 and 20

Question 19 : Have you had any unusual requests for any courses lately?

It was anticipated that the answers to these questions could help isolate specific environmental information resources that were occasionally required by field workers. Although not asked for, many field workers elaborated on these questions by giving their responses to these kinds of situations.

With the interviews being conducted in July and August, relatively quiet times at all four centres, field workers related examples of unusual requests that had happened and a specific time period (such as "within the last month") was not adhered to. Some of these unusual course requests may, therefore, have occurred in 1998 or early 1999.

Nine field workers (56%), a small majority, had not had any unusual requests for courses.

Question 20 : What were some of these unusual requests for courses?

Table 12 : Unusual requests

Requests	*N = 7*	*%*
Ecosystem study	2	29
Game management course	2	29
Cross-section of a tree	1	14
Teaching people how to teach	1	14
Life skills course	1	14
Total	*7*	*100*

The examples given by the seven field workers who had received unusual requests varied from social skills, and thus information resources related to social issues (life skills), through to scientific skills and their associated resources (cross-section of a tree).

Question 21: A scene was set and field workers were asked how they would go about acquiring the necessary environmental information to run a three-day, outcomes-based course on millipedes and centipedes for Grade 7 learners.

This question complemented Questions 11 and 12 and examined environmental information resources that field workers used during the preparation of unusual courses.

Table 13 : Means of acquiring information for a course

Means of acquiring information	*N = 16*	*%*
Consult books	12	75
Consult colleagues	9	56
Use the library	8	50
Consult outside people	6	38
Consult teachers	5	31
Consult magazines	3	19
Consult Internet	2	13
Consult post-course reports	1	6
Consult worksheets	1	6
Total	*47*	*294*

Multiple responses were received from this open-ended question and the answers were broken down into the sources that were consulted. The use of books (75%), colleagues (56%) and the library (50%) (which probably meant consulting written material) received the highest scoring.

Questions 22 and 23

Question 22 : Have you ever changed (adapted) an environmental information resource to make it more useful?

Field workers who have been adequately trained should be competent enough to, if need be, change or adapt an environmental information resource.

Eight field workers (50%) had adapted a resource. Of those eight who had not changed or adapted a resource, 50% had been employed by WESSA for less than six months.

Question 23 : How did you change or adapt an environmental information resource? Please give an example.

Table 14 : Examples of how resources were adapted or changed

Examples of how resources were adapted	*N = 8*	*%*
Reworked an existing resource	2	25
Developed a rocky shore dial	1	12.5
Photocopied and laminated centre page of Share-Net booklet	1	12.5
Developed a pre-course questionnaire	1	12.5
Developed water test worksheet for younger children	1	12.5
Photocopied illustrations from Share-Net books to make a food web	1	12.5
Added information to an existing resource	1	12.5
Total	*8*	*100*

Most of the examples were those which complemented existing resources or streamlined them to make them easier to use in the field.

Questions 24 - 27

Question 24 : Some aspects of field work are well documented, such as the theme of water. Are you aware of any information that you do not have on a particular theme or subject?

These questions were asked to determine what environmental information field workers recognised as not being available and encouraged them to consider how they could alleviate this problem.

Seven field workers (44%) were aware of a lack of information on a particular theme or subject.

Question 25 : What information are you aware of that is not available on a particular theme or subject?

Table 15 : Information recognised to be unavailable

Information	*N = 7*	*%*
Ecosystems (dunes, sandy shores and mangroves)	2	30
Climatology	1	14
"How to take people on a trail"	1	14
Waste and recycling	1	14
Outcomes-based education	1	14
Electricity and energy	1	14
Total	*7*	*100*

Only one area lacking in information (that of ecosystems) was mentioned more than once. It was interesting to note that the areas that field workers felt were lacking in information were areas of personal interest.

Question 26 : Do you have any ideas as to what can be done about this?

Table 16 : Ideas of dealing with the lack of environmental information

Ideas	*N = 7*	*%*
Booklets could be developed	3	44
Field workers record their work during an interpretative trail then develop a booklet	1	14
Staff attend specific courses	1	14
Companies could develop fact sheets	1	14
No idea	1	14
Total	*7*	*100*

Four of the seven field workers who identified a lack of environmental information within a particular subject or theme felt that booklets could be developed in order to deal with this lack of information.

Question 27 : What could YOU personally do about a lack of environmental information on the subject you have just mentioned which appears to lack environmental information resources?

Table 17 : Response to lack of environmental information

Response to lack of information	*N = 7*	*%*
Personally develop the resource	3	44
Contribute towards writing and co-ordinating the resource	2	28
Contribute towards writing the resource but not co-ordinating it	1	14
No ideas	1	14
Total	*7*	*100*

Six field workers suggested that they could assist in developing an environmental information resource which was not available, with three indicating that they could develop the resource themselves.

Questions 28 - 35

Question 28 : In your opinion, does this centre keep you and other field workers up-to-date with new environmental information resources?

In keeping with the research objectives (see 1.3.2), the following eight questions were asked to determine the availability and adequacy of environmental information resources and environmental issues to field workers at the four centres. This would be through the centre and/or management staff exposing field workers to new environmental information resources, as well as the latest environmental issues. It would be complemented when field workers used their own initiative in finding out more about environmental resources and contemporary environmental happenings.

Twelve field workers (75%) felt that the centre kept them up-to-date with the latest developments in terms of environmental information resources.

Question 29 : How does this centre keep you and other field workers up-to-date with new environmental information resources?

Table 18 : Ways the centre keeps field workers up-to-date with new resources

Ways centre keeps field workers up-to-date	*N = 12*	*%*
WESSA and non-WESSA magazines	6	50
Colleagues from departments within WESSA giving talks on new resources	4	33
Printed updates from Share-Net and Head Office	4	33
Discussion groups	3	25
New staff bringing in new ideas	2	17
Staff development and staff induction	1	8
Newspapers	1	8
Internet at the centre	1	8
Centre purchases new information resources	1	8
Total	*23*	*190*

Six of the 12 field workers who stated that the centre kept them up-to-date felt that this was achieved through the in-house publications of WESSA, namely *African wildlife* and *EnviroKids* as well as non-WESSA publications.

Question 30 : How do YOU keep yourself up-to-date with new environmental information resources?

Table 19 : Ways that field workers supplement their knowledge of the latest resources

Ways field workers keep up-to-date	*N = 12*	*%*
Reading magazines and newspapers	10	83
Talking with colleagues	5	42
Community involvement	2	17
Use of the library	1	8
Television	1	8
Total	*19*	*158*

There was a predominance of the use of magazines, with the majority of field workers (70%) making use of this resource to keep themselves up-to-date with environmental information resources. The magazines included both in-house publications and others. Talking with colleagues (42%) also ranked high.

Question 31 : You said "no, the centre did not keep you and other field workers up-to-date with new environmental information resources". How do YOU keep yourself up-to-date with new environmental information resources?

Table 20 : Ways in which field workers keep themselves up-to-date with new resources

Ways field workers keep up-to-date	*N = 4*	*%*
WESSA publications	3	75
Informally through colleagues	2	50
Internet	1	25
Reading	1	25
Do not keep up-to-date	1	25
Total	*8*	*200*

Of the four field workers who felt that the centre did not keep them up-to-date, three made use of in-house WESSA publications. One field worker said that, although the centre did not keep him up-to-date, he himself did not attempt to seek out new resources.

Question 32 : In your opinion, does this centre keep you and other field workers up-to-date regarding the latest environmental information issues happening around the country and around the world?

Eight field workers (50%) felt that the centre kept them up-to-date concerning the latest environmental issues happening around South Africa and on a global scale. Seven felt the centre did not fulfil this role and one field worker did not give a response.

Question 33 : How does this centre keep you and other field workers up-to-date regarding the latest environmental issues happening around the country and around the world?

Table 21 : Ways that the centre keeps field workers up-to-date with the latest environmental issues

Ways centre keeps field workers up-to-date with environmental issues	*N = 8*	*%*
Magazines	4	50
Through interaction with the Project Manager and/or other field workers	4	50
News Board	2	25
Discussion groups	2	25
Staff development	1	13
Enviro Facts	1	13
Through interaction with the groups with which one works	1	13
Total	*15*	*189*

Half of the eight field workers who felt that the centre kept them up-to-date with the latest environmental issues stated that the channel through which this was achieved was the official in-house publications. This "formal" means of disseminating information about the latest environmental issues was complemented by an informal means of disseminating information - four of the eight field workers mentioned that they were kept up-to-date through interacting with the Project Manager and/or other field workers.

Question 34 : You answered "yes, the centre does keep you and other field workers up-to-date regarding the latest environmental issues happening around the country and around the world". How do you complement this by ensuring that YOU keep yourself up-to-date?

Table 22 : Ways field workers complement centre support to keep themselves up-to-date with environmental issues

Ways field workers keep up-to-date with environmental issues	*N = 8*	*%*
Reading, magazines and newspapers	6	75
Interacting with other people	4	50
Television	2	25
Listen to radio	1	13
Make use of the notice board	1	13
Interacting with colleagues	1	13
Personal studies	1	13
Total	*16*	*202*

Six of the eight field workers (75%) kept themselves up-to-date with the latest environmental issues by reading publications, particularly magazines (38%). Half the field workers (50%) interacted with other people in order to keep themselves up-to-date.

Question 35 : You answered "no, the centre does not keep you and other field workers up-to-date regarding the latest environmental issues happening around the country and around the world". How do YOU keep yourself in touch?

Table 23 : Ways field workers keep themselves up-to-date with environmental issues

Ways field workers keep up-to-date with environmental issues	*N = 7*	*%*
People and/or colleagues	6	86
Magazines, newspapers and books	6	86
Radio	3	43
Internet	2	29
Visiting new places	1	14
Do not keep up-to-date	1	14
Total	*19*	*272*

Six of the seven field workers who felt that the centre did not keep them up-to-date with the latest environmental issues happening around the country and around the world interacted with other people and read magazines, newspapers and books in order to keep themselves up-to-date.

Questions 36 and 37

Question 36 : Do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

The following two questions examined ways that field workers felt the support, in terms of environmental information resources, could be enhanced.

Fourteen of the sixteen field workers (88%) felt that the professional support (in terms of environmental information resources) could be improved. It was interesting to note that a number of field workers felt the professional support was already very good but added that, in all situations, there was always room for improvement and that one should continually strive to improve the existing support structures.

Question 37 : How do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

Table 24 : Ways in which the professional support could be improved

Ways to improve support	*N = 14*	*%*
Experts in different fields to work with field workers	3	21
Centre newsletters	2	14
Staff discussions at individual centres	1	7
Staff discussions involving all four centres	1	7
Greater diversity of resources	1	7
Additional copies of existing resources	1	7
Active encouragement for studying conservation diploma	1	7
Centre to subscribe to magazines and journals	1	7
Improvement on existing information filing system	1	7
Translation of existing resources into other languages	1	7
Better liaison with management staff	1	7
Special training, i.e. for the deaf, visually impaired	1	7
Unsure of how centre could be improved	1	7
Total	*16*	*112*

A number of suggestions were put forward by the respondents as to how the centre could improve and enhance its professional support. Involving experts within a specific field, from both WESSA and other organisations, and centres producing newsletters were the only two suggestions mentioned by more than one field worker.

Questions 38 - 43

Question 38 : Does this centre have a library/resource centre?

Libraries and resource centres are collections of resources which should be easily accessible. They bring to mind a collection of information that can be shared and, at the same time, cut financial costs because more than one person can access the same resource. The following questions were asked, in the light of this view of support, to a number of field workers.

All centres had some form of library or, as some field workers called them, "resource centre". The terms "library" and "resource centre" were used interchangeably.

Question 39 : Do you use it?

All field workers, except one, made use of the centre's library.

Question 40 : What do you use the library/resource centre for?

Table 25 : Uses of the library/resource centre

Library use	*N = 15*	*%*
Preparing for courses	7	47
Personal development, knowledge, interest	7	47
Identification	4	27
Answering questions	4	27
Research	1	7
Keeping up-to-date	1	7
Total	*24*	*162*

Most field workers (47%) used the library when preparing for courses or for their own personal knowledge and growth.

Question 41 : Why do you not use the library/resource centre?

One field worker did not make use of the centre library as he felt the book stock was inadequate. He did, however, make use of the local city library.

Question 42 : Do you have your own "collection" of resources?

Eleven field workers (69%) had their own collections of resources. Of the five who did not have their own collections, four (or 80%) had been employed by WESSA for less than six months and may not have had the time to build up these collections.

Question 43 : Why do you feel it is necessary to have and maintain your own collection of resources?

Table 26 : Reasons for field workers having their own collections of resources

Reasons	*N = 11*	*%*
Readily accessible	7	64
Centre library has general and a limited number of publications	3	27
Look after them better	2	18
To supplement what is available in the centre's library	2	18
Interested in a specific subject	1	9
Total	*15*	*136*

Seven of the 11 field workers (64%) who had their own collections felt that these collections were more accessible, especially if they were not at the centre or involved with WESSA activities. Three respondents mentioned that the library had more general, rather than specific subject, books. They also felt that some resources were often used and that with only a few copies of these resources, difficulties arose when a number of field workers needed to use that particular resource at the same time.

Questions 44 and 45

Question 44 : What are the strengths of this centre from an environmental information point of view?

The following two open-ended questions were asked of field workers so that suggestions could be recorded and, if need be, taken further, to improve and/or enhance the existing environmental information resource support in place at the four centres.

Table 27 : Strengths of the four centres

Strengths	*N = 16*	*%*
The collective knowledge and experience of the people who work at these centres	8	50
Environmental information resources	3	19
Share-Net	2	13
SADC REEC[3]	1	6
Communications among the four centres	1	6
Experts in and around the centres	1	6
No response	2	13
Total	*18*	*113*

Of the 14 field workers who commented on strengths of their centres, two respondents gave more than one answer to this open-ended question. Eight field workers (50%) felt that the collective knowledge and experience of people who work at the centres was a strength in terms of environmental information. This was followed by the information resources (19%) already available at these centres, which have been collected over time.

3 SADC REEC, the Southern African Development Community Regional Environmental Education Centre, is based at the Umgeni Valley Project. Established in 1997, the Centre offers environmental education support to 14 southern African countries.

Question 45 : What are the weaknesses of this centre from an environmental information point of view?

Table 28 : Weaknesses of the four centres

Weaknesses	*N = 16*	*%*
Lack of up-to-date information on national and global issues	3	19
High turn-over of education staff	2	13
Limited or no access to Internet	2	13
No information boards about the centre or outside the centre	1	6
Lack of diversity of publications other than those produced through WESSA	1	6
Lack of field trips	1	6
Selective sharing of information	1	6
Available information is not sufficiently outcomes-based education and theory-related	1	6
Isolation of the centre	1	6
Lack of communication between colleagues	1	6
No response	2	13
Total	*16*	*100*

Only three weaknesses were mentioned by more than one respondent. Lack of up-to-date information on national and global issues were mentioned by three field workers. This was followed by the high turn-over of staff and limited or no access to the Internet - both mentioned by two respondents.

Question 46 : Do you have any comments that you would like to add concerning the availability and adequacy of environmental information resources to support field workers which you feel would be helpful in a study of this nature.

This open-ended question paved the way for field workers to add and comment on issues that had not been raised during the interview but which they felt needed to be expressed. No prompts to this question were provided and a variety of comments were received. Some of the responses were reiterations from the previous two questions.

Table 29 : Comments from field workers

Additional comments	*N = 16*	*%*
Share-Net is impressive with its low-cost, dynamic production of relevant guides	2	13
Need a well-equipped library	1	6
Information resources to be up-to-date	1	6
Information resources to be of a wider range	1	6
Need access to newspapers	1	6
Heavy reliance on Share-Net booklets	1	6
Field workers need to constantly be learning new environmental information	1	6
Need to be supported by scientific information	1	6
Field workers sometimes feel limited by available information resources	1	6
People are the best resources	1	6
Lack of information about practical and economic sectors	1	6
Onus is on field workers to seek new resources	1	6
No response	3	19
Total	*16*	*98*

Thirteen respondents provided comments. As can be seen from the above table, a number of comments relating to environmental information resources were elicited. Some of these will be discussed in the following chapter.

4.2 Section 2

4.2.1 Responses from interviews with management staff

Questions 1 - 3

Question 1 : Are there any training opportunities available through this centre to support the work of field workers?

These questions were to establish the number and range of training opportunities, and consequently the environmental information resources available through these opportunities, offered to field workers. In addition, the relationship between these courses and field workers (in terms of how it was decided which field worker would attend which training course) was also examined.

All eight management staff (100%) were aware of training opportunities to support field workers.

Question 2 : What training opportunities are available through this centre to support the work of field workers?

Table 30 : Training opportunities available to support field workers

Available training opportunities	*N = 8*	*%*
Annual KwaZulu-Natal staff training	8	100
Formal/informal discussions	8	100
Environmental Educators course	8	100
Other external courses/training	8	100
Workshops	8	100
Staff exchange between centres	7	88
Other	8	100
Total	*55*	*688*

All eight management staff (100%) were aware of a number of courses available to support field workers. Only one person did not consider "Staff exchanges between centres" as a form of training, consequently only seven (88%) management staff responded positively to this training option.

"Other" training opportunities that were mentioned included a 50% bursary scheme offered by WESSA for studying purposes, informal and formal courses, guest speakers, continuous staff development throughout the year, and visits or excursions to places of educational interest.

Question 3 : How do you determine which staff will attend which courses?

Table 31 : Ways of determining which field workers will attend training courses

Ways to determine who will attend courses	*N = 8*	*%*
Compulsory training courses	6	75
Field workers interest	4	50
Field workers training needs	3	38
Whoever is available	1	13
Equal competence (regarding staff exchanges)	1	13
Total	*15*	*189*

Many of the courses offered to enhance the skills of field workers are compulsory. These include the annual KwaZulu-Natal staff induction, ongoing staff development throughout the year and the Environmental educators course. If a training need within a centre is identified by either the field workers themselves or by management, there will be a response by management to this need. 50% of management mentioned that staff interest played an important role - should a course (either in-house or external) become known to management that would be of interest and support a particular field worker, that particular field worker would be encouraged to attend.

Questions 4 and 5

Question 4 : Are field workers exposed to environmental information resources during these training support courses?

The following two questions were asked with the research question, "What environmental information resources are available to field workers at the four centres?", in mind. The questions focus on environmental information resources that field workers would be exposed to during the different training courses.

All eight management staff (100%) responded that field workers were exposed to environmental information resources during either the formal or informal training opportunities offered through WESSA.

Question 5 : What environmental information resources are field workers exposed to during these training support courses?

Table 32 : Range of environmental information resources

Range of resources	*N = 8*	*%*
Booklets	8	100
Magazines	8	100
Books	6	75
Posters	5	63
Pamphlets	3	38
Newspapers	2	25
Television programmes	2	25
Internet	2	25
Other	8	100
Total	*44*	*551*

All eight management staff (100%) made mention of the use of booklets during training courses. Seven of these eight (88%) mentioned the use of Share-Net booklets. All management staff mentioned the use of magazines - these were both in-house publications (such as *African Wildlife* and *EnviroKids*) and other external publications.

In addition to these resources, all management made mention of other Share-Net resources and the use of people as environmental information resources.

Questions 6 and 7

Question 6 : Have field workers had any unusual requests for any of their courses with groups of people that you know about?

The following two questions looked at the range of courses that field workers were involved with. Many would have implications in terms of the environmental information resources needed to gather background knowledge to co-ordinate the environmental courses.

The majority of management (88%) noted that field workers had been exposed to unusual requests. Only 12% (one person) said that during her length of employment (which, at the time of the interview was only two weeks), field workers at her centre had not encountered any unusual course requests.

Question 7 : What are some of these unusual requests that field workers have had during their courses with groups of people?

Table 33 : Unusual requests

Unusual requests	*N = 7*	*%*
Conflict resolution	2	30
Poetry, language and field sketching	1	14
Tertiary level courses	1	14
Ferns and mosses	1	14
Sandy shores	1	14
Scientific courses	1	14
Total	*7*	*100*

A number of unusual requests were mentioned by management. "Conflict resolution" was mentioned by two of the management staff.

Questions 8 - 10

Question 8 : Are field workers who miss the annual staff induction in January at a disadvantage regarding access to and knowledge about environmental information resources?

The annual staff induction in January introduces newly employed field workers to WESSA and environmental education, as well as to the numerous environmental information resources available to support the work they do. With the high turn-over of field workers and many leaving WESSA throughout the year, many newly employed staff miss out on the initial "induction". The following three questions were asked to examine, if the answers were positive, how this problem was overcome.

Six of the management staff answered the question positively. Two of them responded to the question with a "yes and no" answer.

Question 9 : How are field workers who miss the annual staff induction in January disadvantaged regarding access to and knowledge about environmental information resources?

Table 34 : Ways that field workers who miss staff induction are disadvantaged

How are staff disadvantaged	*N = 8*	*%*
Overview/introduction to all resources	4	50
Interaction with and introduction to colleagues from all four centres	3	38
Difficult to draw all environmental education approaches and resources together	1	12
Total	*8*	*100*

Half the management (50%) felt that one of the advantages of the January staff induction was that it gave field workers, particularly those who were newly employed, an overview and introduction to environmental information resources which could be used during their work. A disadvantage mentioned by three people (38%) was the introduction to and interaction with colleagues from all four centres. Staff induction allowed field workers the opportunity to discuss and work through the environmental information resources as a team.

Question 10 : How are field workers who miss the annual staff induction in January not disadvantaged regarding access to and knowledge about environmental information resources?

Table 35 : Methods to overcome difficulties when field workers miss the staff induction

Methods	*N = 2*	*%*
Access to resources is encouraged	1	50
Personal assistance to help staff	1	50
Total	*2*	*100*

The above two ways of overcoming difficulties when field workers miss out on the January staff induction were from management staff who gave a "yes and no" answer to Question 8.

Question 11 : In your opinion, do field workers regard themselves and colleagues as environmental information resources?

People are often not thought of as "information resources". However, if they do not have the answer to a question, they may also be able to direct one to where the information can be obtained, be it in a newspaper, a journal or a specific book.

Five of the management staff (63%) felt that field workers regarded themselves and their colleagues as environmental information resources. One Project Manager, having only been employed at the centre for a month, answered that she did not know and could not give an answer to this question.

Questions 12 and 13

Question 12 : Which environmental information resources do field workers use to prepare for courses that you know of?

The following two questions were linked to questions 4 and 5 and were asked in order to look at the range of environmental information resources that field workers used both during the preparation of courses and the conducting of courses. It was anticipated that there would be a link between what resources field workers were exposed to during the training support courses and those that were used for preparing and conducting courses.

Table 36 : Environmental information resources used during the preparation of courses

Resources used in preparing courses	*N = 8*	*%*
Booklets	7	88
Books	6	75
Magazines	5	63
Pamphlets	3	38
Posters	2	25
Newspapers	1	13
Internet	1	13
Other	7	88
Total	*32*	*403*

Of the seven management staff who indicated that "booklets" were used, four mentioned Share-Net booklets. The category "Other" was dominated by colleagues, previous course reports, personal information files and other Share-Net resources.

Question 13 : What environmental information resources do field workers use on courses that you know of?

Table 37 : Environmental information resources used by field workers when conducting courses

Resources used during courses	*N = 8*	*%*
Booklets	7	88
Magazines	4	50
Pamphlets	3	38
Books	2	25
Posters	2	25
Radio programmes	1	13
Other	7	88
Total	*26*	*327*

All seven management staff, who mentioned booklets, gave the Share-Net booklets as examples. The category of "Other" included and was dominated by worksheets, personal files and additional Share-Net resources.

Question 14 : How do you determine what additional support, in terms of environmental information resources, is needed?

This open-ended question generated responses for the research question, "How adequate is the environmental information support offered to field workers?"

Table 38 : Methods of determining what additional support is needed

Methods to determine additional support	*N = 8*	*%*
Unusual new course	3	38
Information needs of staff through personal observation	3	38
Through staff discussions	2	25
Feedback from teachers	2	25
Through interaction with other people	1	13
Total	*11*	*139*

Additional support, in terms of environmental information resources, was determined by the information needs of field workers through personal observation by management (38%), and unusual new courses being conducted at the centre (38%). Staff discussions and feedback from teachers were mentioned by two management staff members.

Questions 15 - 20

Question 15 : Some aspects of field work are well documented. Are you aware of any information that field workers do not have on a particular subject or theme?

The following five questions focused on supporting field workers by determining environmental information, known to be unavailable. In addition, questions 18 and 19 looked at responses by the field workers themselves to an unavailable resource (as perceived by management).

Four of the management staff (50%) mentioned that they were aware of a lack of environmental information within certain fields or subjects.

Question 16 : What information are you aware of that is not available on a particular subject or theme?

Table 39 : Unavailable environmental information

Unavailable information	*N = 4*	*%*
Soil	2	50
Environmental action taking after a course	1	25
Community issues	1	25
Total	*4*	*100*

Two of the four management staff noted that soil was an area which lacked information, particularly in terms of edaphic factors (such as soil structure, soil shape and soil moisture content).

Question 17 : Do you have any ideas of what can be done about this lack or unavailability of information on a particular subject or theme?

Table 40 : Ideas of what can be done about the lack of information

Ideas	*N = 4*	*%*
Research by field workers	2	50
Field workers to write about their work	1	25
Work closely with teachers and communities	1	25
Total	*4*	*100*

The suggestions as to how this lack of information could be dealt with involved the field workers themselves either doing research (50%), writing about and publishing their work (25%) and working with teachers and communities (25%).

Question 18 : If a specific environmental information resource is not available, do field workers develop their own "tailor-made" environmental information resources?

Seven of the eight management staff (88%) felt that field workers, in situations where environmental information resources were not available, tailor-made their own environmental information resources.

Questions 19 : If field workers develop their own "tailor-made" environmental information resources, please could you give an example.

Table 41 : Examples of tailor-made environmental information resources

Examples of resources	*N = 7*	*%*
Worksheets	2	29
Booklets	2	29
Revision of grassland study	1	14
Thematic posters	1	14
Guided investigation cards	1	14
OBE inserts for booklets	1	14
Total	*8*	*114*

The production of booklets and worksheets were the two most commonly mentioned types of resources that were tailor-made by field workers.

Questions 20 - 27

Question 20 : Does this centre keep field workers up-to-date regarding any new environmental information resources?

Questions 20 through to 27, many of them open-ended questions, focused on the availability of environmental information resources for field workers at the four centres. The questions not only asked what the centre and WESSA provided to support field workers in terms of both environmental resources and keeping them up-to-date with environmental issues, it also questioned and examined the actions of field workers themselves in dealing with the numerous new environmental information resources that become available, and the daily environmental issues that emerge in South Africa and around the world.

The majority of management staff (75%) felt that the centres kept field workers up-to-date with new resources that became available to support their work.

Question 21 : How does this centre keep field workers up-to-date regarding any new environmental information resources?

Table 42 : Ways to keep field workers up-to-date with new resources

Ways to keep field workers up-to-date	*N = 6*	*%*
Share-Net resource updates	5	83
Resource updates from other organisations	2	33
Centre subscribing to magazines	2	33
Informally through other people	1	17
Actively source out resources	1	17
Total	*11*	*183*

Although a number of ways were mentioned whereby field workers were kept up-to-date in terms of the latest environmental information resources, Share-Net resource updates were the most significant with 83% of management staff making mention of this. These Share-Net updates were both in printed form and through the staff at Share-Net keeping other departments up-to-date by verbally informing them of the latest developments.

Question 22 : Do field workers keep themselves up-to-date with new environmental information resources?

Six of the management staff (75%) felt that field workers kept themselves up-to-date regarding new environmental information resources.

Question 23 : How do field workers keep themselves up-to-date with new environmental information resources?

Table 43 : Ways in which field workers keep themselves up-to-date with new resources

Ways to keep up-to-date	*N = 6*	*%*
When need specific resources, seek them out	2	32
Personal studies	1	17
Subscribe to environmental magazines	1	17
Media (such as television and newspapers)	1	17
Ad hoc (go to Share-Net, see something new)	1	17
Total	*6*	*100*

A number of ways in which management felt field workers kept themselves up-to-date were given. One method, mentioned by two of the management staff, was that it was only when a course demanded a specific resource (in other words, an unusual course request), that new environmental information resources were searched for.

Question 24 : Does this centre keep field workers up-to-date regarding the latest environmental issues happening around the country and around the world?

All eight management staff felt that the centres kept field workers abreast of the latest environmental issues both around the country and around the world.

Question 25 : How does this centre keep field workers up-to-date regarding the latest environmental issues happening around the country and around the world?

Table 44 : Ways of keeping field workers up-to-date regarding environmental issues

Ways to keep up-to-date with issues	*N = 8*	*%*
Magazines	5	63
Discussions	3	38
Internet	1	13
Radio	1	13
Media releases from Head Office	1	13
Staff information board	1	13
Colleagues	1	13
Newspapers	1	13
Videos	1	13
Share-Net	1	13
Involvement in other environmental committees	1	13
Total	*17*	*218*

The use of magazines (both in-house and external publications) as well as discussion groups were the two most commonly mentioned methods of ensuring field workers were kept up-to-date regarding the latest environmental issues happening around the country and around the world.

Question 26 : Do field workers keep themselves up-to-date with the latest environmental issues happening around the country and around the world?

A small majority of management staff (63%) felt that field workers kept themselves up-to-date regarding the latest environmental issues happening around the country and around the world.

Question 27 : How do field workers keep themselves up-to-date with the latest environmental issues happening around the country and around the world?

Table 45 : Ways which field workers keep up-to-date regarding environmental issues

Ways that field workers keep up-to-date with environmental issues	*N = 5*	*%*
Newspapers	2	40
Magazines	2	40
Actively seek out information	1	20
Colleagues	1	20
Internet	1	20
Running courses	1	20
Share-Net	1	20
Total	*9*	*180*

Magazines (40%) and newspapers (40%) were the two ways that were mentioned by management staff more than once.

Questions 28 and 29

Question 28 : Do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

The following two questions (question 29 being open-ended) were asked of both management and field workers. The questions were to determine the adequacy of the environmental information support offered to field workers as seen from both management and field workers perspectives.

Seven of the management staff (88%) felt that the professional support in terms of environmental information resources offered to field workers could be improved upon.

Question 29 : How do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

Table 46 : Ways in which the professional support can be improved

Ways to improve support	*N = 7*	*%*
More direct involvement of Share-Net staff with education staff	2	29
Encouragement of staff to write about their experiences	1	14
Workshops between different WESSA departments	1	14
Sustained rather than sporadic support	1	14
Access to Internet	1	14
More in-depth exploration of resources with field workers	1	14
Contact with non-WESSA organisations	1	14
Developing and capturing available environmental information so that it is accessible to field workers	1	14
Total	*9*	*127*

A number of suggestions from management were put forward as ways to improve the professional support, in terms of environmental information resources, to field workers. More direct involvement of Share-Net staff with education staff was a suggestion mentioned by two of the management staff.

Questions 30 and 31

Question 30 : Does this centre have a library/resource centre?

Libraries and resource centres are collections of resources and should allow for easy access of these resources. They bring to mind information that can be shared and, at the same time, cut financial costs because more than one person can borrow the resource. The following questions were asked in light of this view of support to field workers. These questions were asked of both management and field workers.

All centres had a library or a resource centre. Some of these libraries were fairly extensive while others were merely a single shelf of environmental information resources.

Question 31 : How, in your opinion, do field workers make use of the library/resource centre?

Table 47 : Uses of the library/resource centre

Uses of the library/resources centre	*N = 8*	*%*
Interest	5	63
Course preparation	5	63
Field workers do not make use of the library	1	13
Total	*11*	*139*

The libraries or resource centres at the four different centres were used primarily, according to management staff, for course preparation and interest.

Questions 32 and 33

Question 32 : Do field workers have their own "collections" of resources?

The following two questions were asked to ascertain the dependency field workers may have on the available environmental information resources provided by the library/resource centre.

The majority of management staff (75%) were aware of field workers having their own collections of resources which complemented those available through the centre.

Question 33 : How do they make use of these "collections" of resources?

Table 48 : Uses of these collections of resources

Uses of collections of resources	*N = 6*	*%*
Preparation for courses	5	83
Interest	4	67
Study material	1	17
For use by learners	1	17
Total	*11*	*184*

Management felt that field workers used their personal resource collections for the preparation of courses (83%) and for interest (67%).

Questions 34 and 35

Question 34 : What are the strengths of your centre from an environmental information point of view?

These open-ended questions, asked of both management staff and field workers, offered an opportunity to voice any information strengths or weaknesses.

Table 49 : Strengths of the centre from an environmental information point of view

Strengths	*N = 8*	*%*
Share-Net	5	63
Knowledge and experience of people working at the centres	3	38
Network of contacts and friends linked to the centres	3	38
SADC Regional Environmental Education Centre	1	13
Resource cupboard	1	13
Involvement in community issues	1	13
Information files	1	13
Library	1	13
Total	*16*	*204*

A number of environmental information strengths were voiced by management. These were dominated by Share-Net (63%), the knowledge and experience of the staff working at the centres (38%) and the established network between and within the centres and other organisations and people (38%).

Question 35 : What are the weaknesses of your centre from an environmental information point of view?

Table 50 : Weaknesses of the centre from an environmental information point of view

Weaknesses	*N = 8*	*%*
Lack of interaction between staff and other environmental practitioners	2	25
Lack of knowledge on how to access environmental information	1	13
High staff turnover	1	13
Field workers lack tertiary qualifications	1	13
Lack of field guides	1	13
Lack of non-WESSA publications	1	13
Lack of audio and visual equipment	1	13
Lack of newspapers	1	13
No weaknesses	1	13
Total	*10*	*129*

A number of suggestions relating to the weaknesses of the centres were voiced by management. Networking and thus interaction both between staff within a centre, between centres and with other environmental education practitioners was mentioned by two management staff (25%)

Question 36 : Do you have any comments that you would like to add on the availability and adequacy of environmental information resources which you feel would be helpful in a study of this nature?

This final, open-ended question accommodated any additional comments which management wanted to voice. No prompts were provided and a variety of comments were received. Only those comments which had not been mentioned earlier (as this question resulted in some repetition from earlier questions) were tabulated.

Table 51 : Additional comments relating to the availability and adequacy of environmental information resources

Additional comments	*N = 8*	*%*
Currency of information is important	1	12.5
Need colour brochure of what information resources are available through WESSA	1	12.5
Need to increase budget for environmental information resources	1	12.5
Need to evaluate the way resources are distributed throughout the centres	1	12.5
Resources determine and create the programmes run at the centres	1	12.5
Difficult to separate formal and informal training and experiences	1	12.5
No comments	2	25
Total	*8*	*100*

Six of the eight management staff had comments to add and, consequently, a number of responses were elicited from this final question.

Chapter 5
Discussion

The following chapter consists of a discussion of the results from the interviews which have been tabulated in Chapter 4. Findings will be considered in the light of the research questions and the literature reviewed. The discussion begins with attributes of the field workers and then follows the order of the research questions. Significant findings are indicated in bold type and followed by a discussion. Each section, excluding the attributes of the population, is drawn to a close with a brief summary of the findings.

The aim of this study was to investigate the availability and adequacy of environmental information resources to support field workers at the Wildlife and Environment Society of South Africa's (WESSA) four environmental education centres in KwaZulu-Natal. This entailed personally interviewing field workers and management staff at these centres.

The research objectives, as stated in 1.3.2, gave rise to the following research questions:

- What environmental information resources are available to field workers at the four centres?
- What is the identified environmental information support required by field workers?
- How adequate is the environmental information support offered to field workers?

5.1 Attributes of the population

Questions about selected attributes of the field workers were asked during the interviews.

5.1.1 Work experience at other WESSA centres

The majority of field workers (63%) had worked at other centres. Of the remaining six who had not worked at another WESSA centre three had been employed by the Society for less than three months.

With the four WESSA centres being located throughout KwaZulu-Natal, and each centre having a specific field of interest (the Treasure Beach Project, for example, has a marine focus and the Drakensberg Wetland Project focuses on mountain ecology), centres will have environmental information resources specific to their field of interest. It stands to reason, therefore, that field workers who have the opportunity to spend time at other centres would be exposed to these information resources during their stay. In addition, a centre may acquire an unusual environmental information resource (such as an energy kit) which may only be "discovered" once time is spent at that particular centre. An example of this occurred during this researcher's travels between two centres. A field worker asked her to bring an "energy kit" from the Umgeni Valley Project (UVP) to the Twinstreams Project (TSP). The field worker had previously worked at UVP and consequently knew of the existence of the kit.

5.1.2 Highest educational qualification

The majority of field workers (69%) had a senior certificate but only five of the 16 (31%) had some form of tertiary education. **These five field workers with tertiary qualifications were located at two of the four centres.** Of those 11 field workers, with a senior certificate, six were involved in ongoing studies of a conservation or environmental nature.

As mentioned in the literature review, the education system in South Africa is currently in the process of transformation. Curriculum 2005, with its "outcomes-based" approach and the "environment" represented as a "phase organiser", has meant that all teachers will have to deal with the environment in a cross-curricular and integrated style. For many teachers this is a challenge for which they are ill-prepared and under-trained (Beeton 1998:310). This is supported by Loubser (1994:3), who argues that with very few teachers trained to teach in an environmentally directed way, environmental education centres may be able to offer the necessary guidance.

Because the four environmental education centres focus primarily on courses for school groups, this finding, namely of five field workers having tertiary qualifications, of which four were within the field of environmental education and/or conservation and only one having a tertiary qualification specific to outdoor environmental education, was considered significant. In addition, these tertiary qualifications were not evenly distributed throughout the four centres but held by field workers at two of the centres. Tertiary training would expose field workers to additional environmental information resources throughout the duration of their courses. Not only would they bring with them resources that they had collected during their training, but they themselves are "information resources" (Lotz 1995:7). In this way they could support other field workers. Furthermore, only one field worker had environmental education experience prior to working for WESSA. Shongwe's (1997:54) concern, as noted in the literature review, that many field workers at centres are not trained as teachers and do not have an educational background, is realised by this finding at WESSA environmental education centres in KwaZulu-Natal.

5.2 Environmental information resources available to field workers

5.2.1 Training opportunities

The majority of field workers (63%) were not aware of training opportunities other than those offered through WESSA.

One of WESSA's aims, in terms of environmental education, is to equip field workers at their environmental education centres with the knowledge, resources and skills necessary for providing environmental education learning programmes to a wide variety of learners (Staff training curriculum ... 1999:2). WESSA, therefore, offers a number of training opportunities to support field workers employed at the four centres. Training is ongoing and ranges from the annual KwaZulu-Natal staff induction in January, attendance of which is compulsory, to staff exchanges between centres during the year, to organised discussion groups at individual centres. With such a range of training opportunities, it would be obvious for field

workers to attend this in-house training, before embarking on external or "non-WESSA" training programmes. However, excluding the Rhodes University/Gold Fields Course, only six field workers (37%) were aware of available training courses, other than those offered through WESSA. This may be due to a number of reasons : WESSA may see itself as the provider of all training; the four environmental education centres under study are isolated in terms of their location; and half the field workers have been employed at the centres for less than six months. This may not be sufficient time with which to meet other people involved in environmental education and consequently find out more about available "external" courses.

Also of significance was the low percentage of field workers (40%) who had taken part in staff exchanges between centres. Staff exchanges involve two field workers "exchanging" with one another and spending up to three months at a different centre. Staff exchanges were felt to be unusually low, considering that, during interviews with management staff, it had been pointed out that staff exchanges between centres were encouraged. As one of the management staff said, "It's so important to get the cross-pollination of ideas during staff swops". This low percentage may, however, have been due to half the field workers having been employed at the centres for less than six months, at the time that the interviews took place.

All eight management staff (100%) felt that field workers would be at a disadvantage if they missed the annual KwaZulu-Natal staff induction. The two main reasons given were that the induction provided a concise overview and introduction to a broad range of environmental information resources that field workers would use during their work. The second reason was that staff induction allowed for the interaction with, and introduction to, colleagues from all four centres.

Training courses, whether in-house or external, provide opportunities for those running the courses, as well as for the participants themselves, to share their collective knowledge of environmental information resources.

5.2.2 Environmental information resources

WESSA publications dominate the environmental information resources used by field workers.

In response to Question 10, which looked at the environmental information resources field workers were exposed to during training programmes, the category of "booklets" dominated the responses, with 15 field workers making use of them. With WESSA involved in the production of regular publications, including field guides, magazines and books, all of which play an important role in environmental education (Environmental education policy guidelines for WESSA 1996:9), it was not unusual that 12 of the 15 field workers (75%) mentioned Share-Net publications. What was unusual, however, was that no other external publications in terms of booklets were mentioned. The Share-Net "range" of resources are produced by numerous environmentalists and educators from many organisations throughout the country, and are only printed and published through Share-Net. The Share-Net *Hands-On* booklets (mentioned by the majority of field workers) are simple, easy-to-use and easy to access ecosystem or species guides. The present researcher is of the opinion, however, that the use of one specific type of resource, which follows a particular style, may be limiting and inadequate in terms of in-depth environmental information.

5.2.2.1 Environmental information resources used to prepare for and conduct courses

Booklets and colleagues are considered valuable information resources by field workers.

During pre-course planning, a number of resources were used. Booklets (63%) and books (63%) dominated the responses, with 10 field workers making use of these two types of resources. Those field workers giving examples of booklets made mention of the Share-Net range. The category of "Other" was dominated by "colleagues", with seven of the 10 respondents mentioning the value of fellow colleagues during course preparation.

The value of human resources, as environmental information resources, was further confirmed by Questions 16 and 17, which asked field workers which sources they turn to when unsure of an answer (12 options including "Other" were given) and which of these they found the most helpful. Ten field workers (62%) felt that the Regional Manager, Project Manager, Senior Education Officer and other field workers were the most helpful. These choices were justified by explanations that colleagues were more interactive, experienced and knowledgeable and could explain concepts more simply than, for example, books or journals.

Six field workers (38%) chose written publications, rather than colleagues, as the most helpful source to consult. The majority of these six field workers (66%) commented on the reliability of the information contained in these resources as being very important.

A significant contradiction arose between Question 12 and Question 13. Question 12 asked field workers to comment on the resources used during courses. Booklets dominated the response, with 14 field workers (88%) making use of them. As mentioned earlier, only seven field workers made mention of the use of colleagues as environmental information resources, during course preparation. However, in Question 13, which asked field workers whether they regarded their colleagues as environmental information resources, all 16 field workers, without hesitation, answered the question positively. In addition, all field workers responded that, when unsure of an answer, they turn to a colleague. This positive response supports earlier statements by other environmental educators who see people as valuable resources (Lotz 1995:7). In addition, eight field workers felt that one of the strengths of their centre was the collective knowledge and experience of people who worked at these centres. In terms of the field workers themselves, however, this contradicts the results of Question 12. This may be seen as a weakness of the instrument in that Question 13 directly asked field workers whether they considered their colleagues as resources, whereas Question 12 did not offer "colleagues" as an option - "colleagues" fell within the category of "Other".

As mentioned earlier, the environmental information resources used during the planning of courses were either booklets (63%) or books (63%), followed by magazines (50%). However, when an unusual course is conducted, as was the case when a scene was set in Question 21 and field workers were asked which resources they would use when planning a three-day course on centipedes and millipedes for Grade 7 learners, books (75%), colleagues (56%) and the library (50%) were chosen more often than other resources. No field workers consulted booklets, indicating that booklets are, perhaps, only useful for a general overview of a particular subject or when a field worker already has an in-depth knowledge of the subject and needs the booklets to refer to.

All field workers made use of more than one source of information when preparing for either a general or unusual course. This is to be expected, since the present researcher found from personal experience that one type of resource is often not adequate and a variety of information resources allow for a "better" course to be prepared and conducted. Environmental information resources, be they human, written or visual are, according to one of the management staff, ... "something you can never have enough of".

5.2.3 Summary

WESSA provides a number of training opportunities to support field workers (see 5.2.1). In addition, a number of "non-WESSA" training programmes are available. However, other than the Rhodes University/Gold Fields Course, only 37% of field workers are aware of any additional "external" training courses.

WESSA also produces a number of publications, including magazines, field guides and books, to support environmental education. These publications, in particular the Share-Net range of booklets, dominated the environmental information resources used by field workers, both during the preparing of courses and the conducting of courses. Books and colleagues dominated as the resources used when preparing for unusual or special courses. When asked whether they considered their colleagues as environmental information resources, all field workers responded positively. However, additional questions, which were not as direct, resulted in six field workers choosing written publications rather than colleagues as the most helpful resources to consult in getting answers to questions.

5.3 Information support required by field workers

Seven of the 16 field workers (44%) identified a lack of environmental information. This included information on specific ecosystems such as mangroves and sandy shores, waste and recycling, electricity and energy and outcomes-based education. As field workers spoke about unavailable or inadequate information, it became apparent that identified areas lacking in information were often those which had a personal interest to field workers. This is to be expected, since when one has an interest in a specific field, one actively seeks out information relating to that field. In addition, four management staff (50%) identified areas lacking in environmental information. These included information on soil, taking environmental action and community issues. With the majority of management staff having been employed by WESSA for a number of years, their experience and recognition of changing trends and requests for courses is very helpful in identifying the shortcomings in environmental information resources at centres.

It has been recognised that there is a lack of environmental information (Paxton 1994:29; Dlamini 1995:10; Taylor 1997:84). Furthermore, Neate, a field worker at the Drakensberg Wetland Project in 1998, and later contracted as the "Staff Development and Training Co-ordinator" in 1999, found that, on her arrival, the centre lacked current and comprehensive environmental information and environmental resources (Neate 1999:2). This lack of environmental information is not unique to WESSA and South Africa. As noted in the literature review, Bhunhu, Muptini and Chari (1998) mention the need for relevant information on environmental education in Zimbabwe. The lack of information and resources is often noted at conferences and calls are made for better provision and access to environmental education information. There has, to a certain extent, been a response to the situation, particularly in South Africa. One sees this in the *Enviro Facts Project* (Paxton 1994) and Share-Net (Taylor 1997), both of which have been discussed in more detail in Chapter 2. What is interesting about the unavailable information categories articulated by field workers is that, 10 to 15 years ago, these categories would not have been considered part of the "environment". This is because, early on, the "environment" referred solely to nature. It was only in the 1990s that social, political and economic elements were included in the concept and environmental education could no longer be concerned with ecological issues only (Shongwe 1997:53). Unavailable information like outcomes-based education, waste and recycling, and energy and electricity, would not, therefore, 10 to 15 years ago, have fallen within the realm of "environmental information".

Six of the seven field workers (86%) who identified a lack of information felt that they could assist in developing the "unavailable" information resource. The researcher felt that this was a very pro-active approach to adopt in times when money is an issue and centres may not be able to afford expensive specialists to develop a specific environmental information resource.

The majority of field workers (88%) felt that the professional support (in terms of environmental information resources) could be improved.

Many of the field workers felt that the professional support was already very good but added that, in all situations, there was always room for improvement and that one should continually strive to improve the existing support structures. This was seen by the researcher to be a positive attitude as it encourages both the centres and the field workers to continually strive for improvement.

A number of suggestions as to how the professional support could be improved were put forward by field workers. Promoting the involvement and interaction of experts in different fields from within WESSA and other organisations was mentioned by three field workers. In addition, the production of centre newsletters was mentioned by two field workers. One of the centres had already started producing a quarterly newsletter which was distributed to other centres (Shaw 1999). Centre newsletters can be effective tools in keeping colleagues in touch with the latest developments at the centre, as well as in sharing news between centres. They can also be a useful medium for field workers to voice concerns about specific environmental information resource issues, such as a lack of information on energy or waste management. In addition, if field workers contribute to the newsletter in terms of articles (and this was the case with the centre which had begun producing quarterly newsletters), their writing skills would be developed and this could contribute towards their confidence and ability in developing additional environmental information resources.

Two of the management staff felt the support to field workers could be improved by more direct involvement of Share-Net staff with field workers. The Share-Net office, home of many environmental information resources, and located at the Umgeni Valley Project, is a very active, people-filled place, with individuals coming and going all the time. Some people have resources that need to be printed, some have ideas in their heads and others have news to tell of new resources they have seen and heard of elsewhere. With more interaction between sections within WESSA, this kind of useful information regarding environmental information resources could be shared.

5.3.1 Summary

A number of areas lacking in information were identified by field workers. These included information on specific ecosystems such as mangroves and sandy shores, waste and recycling, electricity and energy and outcomes-based education. In addition, four of the management staff (50%) identified areas lacking in environmental information.

The majority of field workers (88%) felt that the professional support (in terms of environmental information resources) could be improved. Suggestions included promoting the involvement and interaction among experts in different fields and field workers, and the production of centre newsletters. Two of the management staff felt that support to field workers could be improved by promoting more direct involvement of Share-Net staff with the field workers themselves.

5.4 Adequacy of the environmental information support for field workers

5.4.1 Environmental information resources

The majority of field workers (75%) felt that the centre and WESSA kept them up-to-date with new environmental information resources. This was primarily through the in-house publications, *African wildlife* and *EnviroKids,* and other magazines which the centres subscribe to. *African wildlife* offers readers access to information on many environmental issues occurring in southern Africa. *EnviroKids* is WESSA's "junior" magazine, but has proved to be a very useful resource for teachers and field workers. Each issue features a specific theme, such as water and endangered animals, and includes an outcomes-based education insert which provides practical activities to do within the new curriculum framework (Kelly 1999). Other ways of keeping field workers up-to-date were through colleagues from departments within WESSA giving talks on new resources (33%) and printed information updates from Share-Net and Head Office (33%).

In addition, one centre and one person at each of the other three centres are members of the Environmental Education Association of Southern Africa (EEASA). EEASA produces two publications each year for its members, the *Southern African journal of environmental education* and the *Environmental education bulletin*. Both publications are useful tools for environmental educators and the bulletin almost always has articles on new environmental information resources.

Three field workers (25%) mentioned the value of discussion groups. It was interesting to note that one field worker, having spent time at a different centre during a staff exchange, recognised the importance of discussions that were being held at the "visited" centre. On returning to his own centre, he was, at the time of the interviews, in the process of implementing a weekly discussion group.

Support from the centre was supplemented primarily by reading magazines or newspapers (83%). This was followed by conversations with colleagues (42%). Three of the four field workers who felt that the centre and WESSA did not keep them up-to-date with new resources mentioned the use of WESSA publications in order to keep themselves up-to-date. This is interesting in terms of how field workers interpret these in-house publications - some see them as a channel through which WESSA and the centres can support them, others do not.

5.4.2 Environmental information issues

Half (eight) the field workers felt that the centre kept them up-to-date with the latest environmental information issues happening around the country and the world. Seven felt that the centre did not fulfil this role.

Of those who felt that WESSA and the centre kept them up-to-date, four (50%) felt this was achieved through the official in-house publications. This "formal" method of disseminating information about the latest environmental issues is particularly effective in reaching centres on a regular basis. These centres might otherwise have been isolated from the South African environmental community. Four field workers felt that centres kept them up-to-date through interaction with the Project Managers and other field workers.

Field workers supplemented this support primarily by reading, magazines and newspapers (75%) and interacting with other people (50%). All four centres permit volunteers to spend time working at the centres. This allows for new ideas and resources to be brought into the centres. While the researcher was conducting her interviews, Twinstreams Project had an Australian spending time at the centre and they were expecting a university student from the Netherlands. The Umgeni Valley Project had a student, affiliated to the Centre of Environment and Development at the University of Natal, who spent a month working with the field workers. As one management staff said .... "It's so important to get the cross-pollination of ideas" not only when field workers themselves spend time at different centres, but when visitors volunteer their time and, obviously, their knowledge.

Field workers who felt that the centre and WESSA did not keep them up-to-date with the latest environmental issues kept themselves abreast of environmental issues primarily by interacting with other environmental educators (86%) or by reading (86%).

5.4.3 Centre libraries

All four centres had a library - some were more extensive than others, having been started when the centre was established. All field workers, except one, made use of the libraries. With multiple responses being elicited from the question asking field workers what they used the library for, the majority replied that they used them for the preparation of courses and personal interest.

It would appear, therefore, that the centre libraries are adequately stocked with the environmental information resources needed to prepare and conduct environmental courses. The fact that the libraries were also used for personal development and interest suggests that the collections are fairly extensive and general and include resources other than those specifically needed for courses. It was not surprising when seven field workers (47%) made mention of using the library for their own personal development and interest. This was because the present researcher had made use of the library herself for personal knowledge growth, during her time as a field worker in 1994.

A question was posed to field workers asking whether they had their own private collections of resources. The majority (69%) did. However, the main reason given for having these collections was that they were readily accessible (64%). One could argue, therefore, that the centre libraries are adequate in terms of their resources.

5.4.4 Strengths and weaknesses of the centres

Eight field workers (50%) felt that the collective knowledge and experience of the people who work at the centres was a strength. This was followed by three field workers (19%) who felt that the environmental information resources held at the centres were also a strength. On the other hand, five of the eight management staff (63%) felt that Share-Net and the available information resources was the main strength of the centres. This was followed by 38% of management commenting that the staff based at the centres were a strength.

A wide range of weaknesses were noted by field workers. However, only three were mentioned by more than one respondent. These were a lack of up-to-date information on national and global issues (19%); a high turn-over of field workers (13%); and limited or no access to the Internet (13%). Two management staff mentioned the lack of interaction between staff and other environmental education practitioners and saw this as a weakness of their particular centre.

5.4.5 Other comments

Numerous comments were elicited from the last open-ended question, which allowed field workers and management staff to voice any final comments relevant to the study. The environmental information guides and low cost of Share-Net publications was commented on by more than one field worker. As noted in the literature review, Share-Net had the purpose of developing environmental education materials and was a response to the lack of resource materials (Taylor 1995:91).

5.4.6 Summary

The majority of field workers felt that the centre and WESSA kept them up-to-date with new environmental information resources. This was mainly through in-house publications and other magazines. Other ways of being kept in touch with new resources were through talks by colleagues within WESSA, updates from Share-Net and Head Office and through discussion groups. To supplement this support, field workers read magazines and/or newspapers and interacted with colleagues.

Eight field workers felt the centre kept them up-to-date with the latest environmental issues. As was the case of keeping up-to-date with resources, field workers turned to other people and reading (primarily magazines) to supplement their knowledge of environmental issues.

All centres had a library which was used primarily for the preparation of courses and for personal interest.

The collective knowledge and experience of the people who work at the centres and the environmental information resources held at the centres were two of the most frequently mentioned strengths of the centres. A lack of up-to-date information on national and global issues, a high turn-over of field workers and limited or no access to the Internet were the most commonly mentioned weaknesses.

Chapter 6

Conclusions, recommendations and further research

The aim of this study was to investigate the availability and adequacy of environmental information resources to support field workers at the Wildlife and Environment Society of South Africa's (WESSA) four environmental education centres in KwaZulu-Natal. This final chapter begins with an overview of the study, followed by conclusions, recommendations and suggestions for future research which are made after briefly revisiting the objectives of the study.

6.1 Overview of the study

The introductory chapter began with a discussion of the environment, the environmental crisis and environmental education as a response to the crisis. A brief history of WESSA was given. Following this was a discussion of the research problem, which is the availability and adequacy of environmental information resources to support field workers at WESSA's four environmental education centres in KwaZulu-Natal. The aim, objectives and research questions were given, as was the importance and limitation of the study. Finally, definitions of terms used in the study were provided and the structure of the study was briefly delineated.

Chapter 2 reviewed some of the South African and relevant literature which relates to environmental education centres and environmental information resources. The first section of the review focused on relevant works relating to environmental education and environmental education centres in South Africa. The second section dealt with environmental information resources.

The research methods used were described in Chapter 3. Two methods of data collection were used to gather information about the availability and adequacy of environmental information resources for field workers. These two methods were the search for, and review of, relevant literature and the interview survey of the population of field workers and management staff. Both of these are described in this chapter and the interview survey evaluated.

The results of the survey, conducted by means of personal interviews, were tabulated in Chapter 4. Chapter 5 consisted of a discussion of these results. Findings were considered in the light of the research questions and the literature reviewed. The discussion began with the attributes of the population and then followed the order of the research questions. Significant findings were :

- the majority of field workers were not aware of training opportunities other than those offered through WESSA;
- WESSA publications dominate the environmental information resources used by field workers;
- booklets, books and colleagues are considered valuable information resources by field workers;
- seven field workers (44%) identified a lack of environmental information;
- the majority of field workers (88%) felt that the professional support (in terms of environmental information resources) could be improved;
- the majority of field workers felt that the centre and WESSA kept them up-to-date with new environmental information resources through in-house publications and other magazines;
- half the field workers felt that the centre kept them up-to-date with the latest environmental issues happening around the country and around the world;
- all centres had libraries;
- half the field workers felt that the collective knowledge and experience of the people who work at the centres was a strength. In addition, some field workers felt that the environmental information resources held at the centres were also strengths; and,
- a lack of up-to-date information on national and global issues, a high turn-over of field workers and limited or no access to the Internet were considered weaknesses of the centres.

This last chapter, Chapter 6, will list the conclusions and recommendations, as well as make suggestions for further research.

6.2 Revisiting the objectives of the study

The objectives of the study were :

- to determine the availability of environmental information resources to field workers at WESSA's four KwaZulu-Natal environmental education centres;
- to determine the environmental information support required by field workers at WESSA's four KwaZulu-Natal environmental education centres;
- to determine the adequacy of environmental information resources to field workers at these environmental education centres; and,
- to make recommendations relating to environmental information support availability and adequacy.

6.3 Conclusions

The interview survey of 16 field workers and eight management staff, at WESSA's four environmental education centres in KwaZulu-Natal, resulted in several significant findings.

- WESSA supports field workers by providing a number of ongoing, in-house training opportunities, some of which are compulsory. These expose field workers to environmental information resources which can be used during the preparation and the conducting of environmental courses. An issue that emerged during the survey was that the majority of field workers (63%) was not aware of training opportunities other than those offered through WESSA. This may have implications on the diversity of environmental information resources that field workers are exposed to.

- WESSA publications, particularly those of Share-Net, dominate the environmental information resources used during the in-house training, and consequently the preparation and conducting of environmental courses by field workers. With WESSA being actively involved in the production of regular publications and Share-Net, a project of WESSA, publishing numerous resources, this was not considered unusual. However, field workers did not appear to make use of any other "external" environmental information resources. This may be due to lack of knowledge thereof or field workers not requiring information resources additional to those published through WESSA.

- Booklets, books and colleagues are considered valuable information resources by field workers. Booklets dominated the environmental information resources used by field workers during course preparation and the conducting of courses. Books and colleagues dominated as the environmental information resources most frequently used when preparing for unusual courses. However, although the instrument revealed that field workers recognised their colleagues as potential environmental information resources, they did not appear to be exploiting them as information resources, since only seven field workers mentioned using colleagues as resources during the preparation of environmental courses.

- There is a recognised lack of environmental information. Seven field workers (44%) commented on this and gave examples of areas which were lacking. These included information on specific ecosystems such as mangroves and sandy shores, waste and recycling, electricity and energy and outcomes-based education. In addition, management staff identified soil, the taking of environmental action and community issues as areas lacking information.

- With the "environment" becoming more embracing and including political, social, economic and biophysical elements, the implications are that environmental education needs to be broader in approach, so as to achieve education for sustainable living and development, with minimum impact on the ecological environment (Shongwe 1997:53). In addition, for the first time in South Africa's history, all teachers will have to deal with the "environment" in a cross-curricular and integrated style. The infusion of environmental education in Curriculum 2005 marks a shift from the past, when it was marginalised. For many teachers this is a new challenge and one for which they are not prepared. The provincial education departments are not able, and in some cases lack the capacity, to conduct relevant and "hands-on" training courses. In terms of environmental information resources and field workers at environmental education centres, this could result in an increase in cross-curricular courses and, possibly, an increase in the demand by field workers for additional environmental information resources to assist in the preparation and conducting of these courses.

- The in-house magazines of WESSA, *African wildlife* and *EnviroKids*, keep field workers up-to-date with the latest environmental information resources. These publications also assist in keeping some of the field workers up-to-date with the latest national and global environmental issues. Other ways of keeping up-to-date (in terms of environmental information resources) are through interacting with colleagues, receiving printed updates from Share-Net and Head Office and reading magazines and newspapers. To supplement their knowledge/awareness of environmental issues, field workers make use of newspapers, magazines and colleagues.

- Centre libraries are used primarily for the preparation of courses and for personal interest. Although the majority of field workers have their own collections of resources, these are mainly used because these collections are readily accessible. This would indicate that the libraries are adequately stocked in terms of their resources.

- Half the field workers felt that the collective knowledge and experience of people who work at the centres was a strength. Management staff, on the other hand, felt that the available information resources was the major strength of the centres. In terms of weaknesses of the centres, field workers mentioned a lack of up-to-date information on national and global issues, a high turn-over of staff, and limited or no access to the Internet. Management staff made mention of the lack of interaction between field workers and other environmental education practitioners.

- The results from the interviews indicated the presence of a large number of environmental information resources to support field workers at the four environmental education centres under study. These resources ranged from printed media such as booklets and magazines through to people. However, not all these resources are available to field workers, as many of them (particularly "non-WESSA" environmental information resources) are scattered throughout the four centres. In addition, there is no comprehensive database of all these existing resources and this contributes to their "unavailability".

- In terms of adequacy, there appears to be differing opinions, with some field workers commenting on the lack of detailed information within the resources that are presently being used, while others feel that the resources are adequate. It would seem that "adequacy" or "inadequacy", "availability" or "unavailability" is, to a large extent, linked to individual field workers and how they utilise and/or adapt existing environmental information resources to which they have access.

6.4 Recommendations

The following recommendations are based on the findings of the study, the personal experience of the researcher and the related literature that was reviewed.

- All environmental information resources available at the four centres would be more accessible if they were indexed, with each centre having a catalogue or database of these resources. WESSA, in general and Share-Net, in particular, produce many environmental information resources and Share-Net acts as an agent for a number of other environmental information resource developers. In addition, many environmental educators and field workers from other centres and organisations who visit WESSA centres leave examples of their resources. These, however, are only available and accessible to field workers at that particular centre if they are "shared" and there is knowledge of their existence. This "sharing" could be enhanced to all field workers at all centres by individual centre newsletters with a section that lists new resources at each centre. Someone, preferably a field worker, would need to collate and compile a complete inventory of environmental information resources, using the information from these centre newsletters.

- Only one field worker had a tertiary educational qualification, with another studying towards a degree in education. If people are resources, then having more field workers with tertiary qualifications in education, or at least a solid understanding of educational theory, would enable those field workers with this educational experience to share it with others and also address Shongwe's concern that many field workers at environmental education centres do not have an educational background. It would seem sensible for the management staff to appoint more field workers with educational qualifications, or encourage those already at the centres to engage in courses in education.

- It could be argued that resources do not do anything, people do. With this in mind, it may be useful for the management staff to run training sessions or workshops on the use of environmental information resources. A comment made during the interviews was that the available resources often direct the type of courses that are run by field workers. This could possibly be due to a lack of confidence on the part of the field worker, as well as a perceived inability to change or adapt a resource to what is needed. This could result in field workers seeing the available environmental

information resources as inadequate, because they do not appear to be fulfilling the task that is required. Field workers could be trained to develop the skills needed to use resources to their full potential and adapt existing resources or, where need be, source and access new environmental information resources.

- Three field workers suggested that promoting the involvement and interaction of experts in different fields from within WESSA and other organisations would improve the professional support offered to field workers. This could be done by individual centres interacting with nearby organisations, or collaboratively, with experts being invited to one centre and all WESSA field workers meeting at the centre.

- The value of discussion groups, whereby field workers can share any environmental news and/or new environmental information resource, was noted by three field workers. At present, some centres have "allocated" discussion periods, and other centres have discussions when time permits. It may be useful to formalise these discussions, as well as have quarterly discussion groups for *all* field workers. Other than meeting once a year for the annual KwaZulu-Natal staff induction, there does not appear to be any other "formal" meeting of all WESSA field workers.

6.5 Suggestions for further research

- This study concentrated on field workers at four environmental education centres in KwaZulu-Natal. However, the study also interviewed management staff at these centres, in order to obtain perspectives on environmental information resources required by field workers. Since both field workers and management staff make up an integral support team to teachers and groups that visit these centres, it is suggested that the availability and adequacy of environmental information resources to support management staff be investigated.

- The availability and adequacy of environmental information to support teachers and school children would be useful in terms of where these sectors of the population are able to receive the support they need, be it for their teaching or for learners' project and assignment work.

- It may be helpful to look at how environmental educators (both field workers and environmental managers) *access* and *use* existing environmental information resources.

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Appendices

Appendix A

Structured interview for field workers

Instrument
STRUCTURED INTERVIEW FOR FIELD WORKERS

Name of environmental education centre_____

1. In what year did you start working for WESSA?
□ 19__

2. Have you worked at any other WESSA environmental education centres?
□ Yes.
□ No.

3. What is your highest educational qualification? *Ongoing studies?*
_____
_____

4. Did you have any environmental education experience before you began working for WESSA?
Yes. *Go to Question 5.*
No. *Go to Question 6.*

5. What environmental education experience did you have before you began working for WESSA?
_____
_____
_____

6. Are you aware of any training opportunities that this centre provides to support the work you do?
□ Yes. *Go to Question 7.*
□ No. *Go to Question 11.*

7. Which training opportunities are you aware of? You can give more than one. *Give interviewee card with the following training opportunities.*
□ Annual KwaZulu-Natal staff induction
□ Staff exchange between centres
□ Environmental educators course
□ Other external courses/training *Prompt: Rhodes/Gold Fields Course*
□ Workshops
□ Formal/informal staff discussions around social, political and economic issues
□ Other, please specify _____

8. Have you taken advantage of any of these training opportunities?

□ Yes. *Go to Question 9.*

□ No. *Go to Question 10.*

9. Which training opportunities did you take advantage of? *Allow interviewee to look at card with list of training opportunities.*

□ Annual KwaZulu-Natal staff induction

□ Staff exchange between centres

□ Environmental educators course

□ Other external courses/training

□ Workshops

□ Formal/informal staff discussions around social, political and economic issues

□ Other. Please specify _____

10. What environmental information resources were you exposed to during these training support courses? *Give interviewee card with the following options. If necessary, explain what is meant by environmental information resources.*

□ Booklets

□ Magazines

□ Books

□ Pamphlets

□ Posters

□ Radio programmes

□ Newspapers

□ Television programmes

□ Internet

□ Other, please specify _____

11. What environmental information resources do you use when you prepare for courses? *Allow interviewee to look at card from Question 10.*

□ Booklets

□ Magazines

□ Books

□ Pamphlets

□ Posters

□ Radio programmes

□ Newspapers

□ Television programmes

□ Internet

□ Other, please specify _____

12. What environmental information resources do you use during courses?

- ☐ Booklets
- ☐ Magazines
- ☐ Books
- ☐ Pamphlets
- ☐ Posters
- ☐ Radio programmes
- ☐ Newspapers
- ☐ Television programmes
- ☐ Internet
- ☐ Other, please specify _____

13. Do you regard your colleagues as environmental information resources?

- ☐ Yes.
- ☐ No.
- ☐ Sometimes. Please explain _____

14. Have you had an environmental information query within the last month from one of the groups, that you did not have an answer to?

- ☐ Yes. *Go to Question 15.*
- ☐ No. *Go to Question 16.*

15. What did you do when you had an environmental information query from one of your group members that you could not answer?

_____

_____

16. If you are asked a particular question and you are unsure of the answer, who or what do you turn to? *Give interviewee card with the following options.*

- ☐ The Project Manager
- ☐ The Senior Education Officer
- ☐ Another field worker
- ☐ Training offered by this centre
- ☐ The radio
- ☐ The library
- ☐ The newspaper
- ☐ The television
- ☐ A book
- ☐ A university, college, technikon
- ☐ Personal experience
- ☐ Other. Please specify _____

17. *If more than one source is given in Question 16.* Which one of the sources is the most helpful to you in getting answers to your questions?

_____

18. Why do you think this source is the most helpful to you in getting answers to your questions?

_____

_____

_____

19. Have you had any unusual requests for any courses lately?

□ Yes. *Go to Question 20.*

□ No. *Go to Question 21.*

20. What were some of these unusual requests for courses?

_____

_____

_____

21. I am going to set a scene for you - even if you have not been in a situation like this, try and think of how you would go about getting the information you need to conduct the course.

A group of Grade 9 (Std 7) learners are doing a project on centipedes and millipedes. You are asked to run a three-day course with them, with outcomes-based education in mind. How would you go about acquiring the necessary environmental information to plan this "academically challenging" ecology course?

_____

_____

_____

22. Have you ever changed (adapted) an environmental information resource to make it more useful?

□ Yes. *Go to Question 23.*

□ No. *Go to Question 24.*

23. How did you change or adapt an environmental information resource? Please give an example.

_____

_____

_____

24. Some aspects of field work are well documented, such as the theme of water (water testing kit, hands-on stream and pond life, enviro facts).
Are you aware of any information that you do not have about a particular theme or subject. *Prompt : Nothing on freshwater shrimp in the Hands-On Stream and Pond life.*

□ Yes. *Go to Question 25.*

□ No. *Go to Question 28.*

25. What information are you aware of that is not available on a particular theme or subject?

_____

_____

_____

26. Do you have any ideas about what can be done about this?

_____

_____

_____

27. What could YOU personally do about a lack of environmental information on the subject you have just mentioned which appears to lack environmental information resources?

_____

_____

_____

28. In your opinion, does this centre keep you and other field workers up-to-date with new environmental information resources? *Prompt : The Primary Science Project Plant Cards Pack, Rob O' Donoghue's Windows on the Wild.*

□ Yes. *Go to Question 29.*

□ No. *Go to Question 31.*

29. How does this centre keep you and other field workers up-to-date with new environmental information resources? *What do they do?*

_____

_____

_____

30. How do YOU keep yourself up-to-date with new environmental information resources?

_____

_____

_____

31. You said "no, the centre did not keep you and other field workers up-to-date with new environmental information resources". How do YOU keep yourself up-to-date with new environmental information resources?

_____

_____

_____

32. In your opinion, does this centre keep you and other field workers up-to-date regarding the latest environmental issues happening around the country and around the world? *Prompt : Who has Thabo Mbeki appointed as the new Minister of Environment and Tourism.*

□ Yes. *Go to Question 33.*

□ No. *Go to Question 35.*

33. How does this centre keep you and other field workers up-to-date regarding the latest environmental issues happening around the country and around the world?

_____

_____

_____

34. You answered "yes, the centre did keep you and other field workers up-to-date regarding the latest environmental issues happening around the country and around the world". How do you complement this by ensuring YOU keep yourself up-to-date?

_____

_____

_____

35. You answered "no, the centres does not keep you and other field workers up-to-date regarding the latest environmental issues happening around the country and around the world". How do YOU keep yourself in touch?

_____

_____

_____

36. Do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

□ Yes. *Go to Question 37.*

□ No. *Go to Question 38.*

37. How do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

_____

_____

_____

38. Does this centre have a library/resource centre?

□ Yes. *Go to Question 39.*

□ No. *Go to Question 41.*

39. Do you use it?

□ Yes. *Go to Question 40.*

□ No. *Go to Question 41.*

40. What do you use the library/resource centre for?

_____

_____

_____

41. Why do you not use the library/resource centre?

_____

_____

_____

42. Do you have your own "collection" of resources?

□ Yes. *Go to Question 43.*

□ No. *Go to Question 44.*

43. Why do you feel it is necessary to have and maintain your own collection of resources?

_____

_____

_____

44. What are the strengths of this centre from an environmental information point of view?

45. What are the weaknesses of this centre from an environmental information point of view?

46. Do you have any comments that you would like to add concerning the availability and adequacy of environmental information resources to support field workers which you feel would be helpful in a study of this nature?

Thank you for your time.

Appendix B

Structured interview for managers

Instrument

STRUCTURED INTERVIEW FOR PROJECT MANAGERS

Name of environmental education centre _____

1. Are there any training opportunities available through this centre to support the work of field workers?

□ Yes. *Go to Question 2.*

□ No. *Go to Question 7.*

2. What training opportunities are available through this centre to support the work of field workers? *Give interviewee card with the following training opportunities.*

□ Annual KwaZulu-Natal staff induction

□ Staff exchange between centres

□ Environmental educators course

□ Other external courses/training

□ Workshops

□ Formal/informal staff discussions around social, political and economic issues

□ Other. Please specify _____

3. How do you determine which staff will attend which courses?

_____

_____

_____

4. Are field workers exposed to environmental information resources during these training support courses?

□ Yes. *Go to Question 5.*

□ No. *Go to Question 6.*

5. What environmental information resources are field workers exposed to during these training support courses? *Give interviewee card with the following environmental information resources.*

□ Booklets

□ Magazines

□ Books

□ Pamphlets

□ Posters

□ Radio programmes

□ Newspapers

□ Television programmes

□ Internet

□ Other. Please specify _____

6. Have field workers had any unusual requests for any of their courses with groups of people that you know about?

□ Yes. *Go to Question 8.*

□ No. *Go to Question 9.*

7. What are some of these unusual requests that field workers have had during their courses with groups of people?

_____

_____

_____

8. Are field workers who miss the annual staff induction in January at a disadvantage regarding access to and knowledge about environmental information resources?

□ Yes. *Go to Question 10.*

□ No. *Go to Question 11.*

10. How are field workers who miss the staff induction in January disadvantaged regarding access to and knowledge about environmental information resources?

_____

_____

_____

11. How are field workers who miss the staff induction in January not disadvantaged regarding access to and knowledge about environmental information resources?

_____

_____

_____

12. In your opinion, do field workers regard themselves and colleagues as environmental information resources?

□ Yes.

□ No.

13. Which environmental information resources do field workers use to prepare for courses (the courses that field workers themselves run) that you know of? *Allow interviewee to look at card from Question 5.*

- ☐ Booklets
- ☐ Magazines
- ☐ Books
- ☐ Pamphlets
- ☐ Posters
- ☐ Radio programmes
- ☐ Newspapers
- ☐ Television programmes
- ☐ Internet
- ☐ Other. Please specify _____

14. What environmental information resources do field workers use on courses (the ones field workers run themselves), that you know of?

- ☐ Booklets
- ☐ Magazines
- ☐ Books
- ☐ Pamphlets
- ☐ Posters
- ☐ Radio programmes
- ☐ Newspapers
- ☐ Television programmes
- ☐ Internet
- ☐ Other. Please specify _____

15. How do you determine what additional support, in terms of environmental information resources, is needed?

_____

_____

_____

16. Some aspects of field work are well documented, such as the theme of water (water testing kit, hands-on stream and pond life, enviro facts).
Are you aware of any information that field workers do not have on a particular subject or theme? *Prompt : nothing on freshwater shrimp in the Hands-On stream and pond life*

- ☐ Yes. *Go to Question 17.*
- ☐ No. *Go to Question 21.*

17. What information are you aware of that is not available on a particular subject or theme?

_____

_____

_____

18. Do you have any ideas of what can be done about this lack or unavailability of information on a particular subject or theme?

_____

_____

_____

19. If a specific environmental information resource is not available, do field workers develop their own "tailor-made" environmental information resources?

□ Yes. *Go to Question 20.*

□ No. *Go to Question 21.*

20. If field workers develop their own "tailor-made" environmental information resources, please could you give an example.

_____

_____

_____

21. Does this centre keep field workers up-to-date regarding new environmental information resources? *Prompt : The Primary Science Project Plant Cards Pack, Rob O' Donoghue's Windows on the Wild.*

□ Yes. *Go to Question 22.*

□ No. *Go to Question 23.*

22. How does this centre keep field workers up-to-date regarding any new environmental information resources?

_____

_____

_____

23. Do field workers keep themselves up-to-date with new environmental information resources?

□ Yes. *Go to Question 24.*

□ No. *Go to Question 25.*

24. How do field workers keep themselves up-to-date with new environmental information resources?

_____

_____

_____

25. Does this centre keep field workers up-to-date regarding the latest environmental issues happening around the country and around the world? *Prompt : Who has Thabo Mbeki appointed as the new Minister of Environment and Tourism*

□ Yes. *Go to Question 26.*

□ No. *Go to Question 28.*

26. How does this centre keep field workers up-to-date regarding the latest environmental issues happening around the country and around the world?

_____

_____

_____

27. Do field workers keep themselves up-to-date with the latest environmental issues happening around the country and around the world?

□ Yes. *Go to Question 28.*

□ No. *Go to Question 29.*

28. How do field workers keep themselves up-to-date with the latest environmental issues happening around the country and around the world?

_____

_____

_____

29. Do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

□ Yes. *Go to Question 30.*

□ No. *Go to Question 31.*

30. How do you think the professional support (in terms of environmental information resources) offered to field workers could be improved?

_____

_____

_____

31. Does this centre have a library/resource centre?

□ Yes. *Go to Question 32.*

□ No. *Go to Question 33.*

32. How, in your opinion, do field workers make use of the library/resource centre?

_____

_____

_____

33. Do field workers have their own "collections" of resources?

□ Yes. *Go to Question 34.*

□ No. *Go to Question 35.*

34. How do they make use of these "collections" of resources?

_____

_____

_____

35. What are the strengths of your centre from an environmental information point of view?

_____

_____

_____

36. What are the weaknesses of your centre from an environmental information point of view?

_____

_____

_____

37. Do you have any comments that you would like to add on the availability and adequacy of environmental information resources which you feel would be helpful in a study of this nature?

_____

_____

_____

Thank you for your time.

Appendix C

Example of the letter faxed to the Senior Education Officers and/or Project Managers at the four environmental education centres

MR NIC SHAW, PROJECT MANAGER,
DRAKENSBERG WETLAND PROJECT

Dear Nic

Greetings from Howick. I tried to telephone you last Friday but heard that you were on leave - hope it was peaceful and relaxing. The person I spoke with also mentioned that a new SEO has been appointed so perhaps you could let him read this fax once you have finished with it.

The data for the thesis is based on interviews and the plan is to interview all field workers, SEOs, Project Managers and Tim. At the moment, Jim, Alison and a couple of other folk are "pre-testing" the interview instruments to evaluate the questions I will be asking, look at the wording and make sure that the questions being asked will answer the research objectives.

I believe you will be back on Wednesday. I shall be in touch and we can then decide which day is suitable for me to come up to DWP.

Many thanks

Clare Holland
Umgeni Valley Project (033) 3303931

RESEARCH TITLE
An investigation into the availability and adequacy of environmental information resources to support field workers at WESSA's four environmental education centres in KwaZulu-Natal.

THE RESEARCH AIM
The aim of the study is to investigate the environmental information support for field workers at WESSA's four environmental education centres in KwaZulu-Natal. This will entail examining the availability and adequacy of environmental information resources.

RESEARCH OBJECTIVES
- To determine the availability of environmental information resources for field workers at WESSA's four KwaZulu-Natal environmental education centres.
- To determine the environmental information support required by field workers at WESSA's four KwaZulu-Natal environmental education centres.
- To determine the adequacy of the environmental information support to field workers at these environmental education centres.
- To make recommendations relating to environmental information support availability and adequacy.

RESEARCH QUESTIONS
- What environmental information resources are available to field workers at the four centres?
- What is the identified environmental information support required by field workers?
- How adequate is the environmental information support offered to field workers?

DEFINITIONS OF KEY CONCEPTS

The definitions that follow are working definitions that best describe what the researcher means when using certain terms in the context of this study. The definitions apply to the present study only. They are listed alphabetically, for easy reference.

Adequate, according to the Oxford Dictionary (1988), is "to be sufficient or satisfactory". **Adequacy of resources** implies environmental information resources which satisfactorily support field workers in correctly and fully answering and dealing with environmental questions and queries.

Available, according to the Oxford Dictionary (1988) is "ready or able to be used or obtainable". **Availability of resources**, therefore, implies that the required resources are either at a field worker's disposal or can be obtained with minimal difficulty.

Environmental education is, according to the IUCN, "the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality" (Janse van Rensburg and Shongwe 1994:10).

Environmental information is a term which does not appear to have a finite definition. Information has been defined as data that is meaningful or useful, usually in the sense of letting the recipient know something that was not previously known or understood. Information has also been defined as organised data which reduces uncertainty in decision-making (Murdick 1980:29). Environmental information can, therefore, be broadly defined as meaningful and/or useful data dealing with environmental issues of a biophysical, social, economic or political nature.

Environmental information resources are resources dealing with environmental issues which may be of a biophysical, social, economic or political dimension. These resources cover all environmental information "tools" used by field workers. The resources are available in a number of formats, including radio, television and personal communication (oral), booklets, fact sheets, newspapers, magazines, the Internet (text or text with associated visuals) and posters and models (visual formats with no associated text).

Field workers are people, based at environmental education centres, running hands-on, practical, ecology-based conservation courses, primarily with school groups.

Identified information resource describes any environmental information resource recognised by field workers and required in order to accomplish a task.

Project Managers. There is a Project Manager at each of the four WESSA centres. These managers are involved in co-ordinating the running of the education centre and the training and support required by field workers.