Obstacles to initiating an action research study at a former Department of Education and Training (DET) school: The case of Kayamandi High School

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Thesis submitted in partial fulfilment of the requirements for the
Degree of MASTER OF EDUCATION
at the University of Stellenbosch

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December 1999

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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

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ABSTRACT

The initial aim of the study was to begin a participatory process of teacher involvement in investigating the possibilities of integrating a local environmental issue (polluted river) into ecology teaching using the Schools' Water Action Project (SWAP) as an environmental education process. I had decided to do this in the form of an action research study with biology and geography teachers at Kayamandi High School. The school is situated in Kayamandi, a black township of Stellenbosch in the Western Cape Province, South Africa.

My decision to do this action research study with teachers of Kayamandi, aimed at adapting ecology teaching to address a local environmental issue, was prompted by my involvement with SWAP at the school from September 1998. Having realised the capacity of the project to stimulate not only an interest in the polluted river but also a broader environmental awareness, I decided to involve teachers in order to make the project accessible to as many pupils as possible.

Problems that arose in my efforts to implement the study caused me to change its focus. As my problems turned out to be largely problems of access, I changed the study into an investigation of obstacles to access. The issues that emerged included the relevance of the study to the needs of teachers, the educational background of the teachers (which, in part impacted on the culture of the school), my position as an outsider with no clear understanding of the context, and my flawed assumptions about action research as a change process.

My frustrating but rich experiences during this research journey not only contributed to my understanding of the complex nature of both research and change, but also to my growth and professional development.

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ABSTRAK

Die aanvaklike doel van die studie was die stigting van 'n deelnemende proses van betrokke onderwysers in die ondersoek na die moonlikheid van die integrasie van 'n plaaslike omgewingskwessie ('n besoedelde rivier) na ekologiese onderwys, deur die Skool Water Aksie Projek (SWAP) as 'n omgewingsopvoeding proses. Ek het besluit om dit in die vorm van 'n aksie ondersoek studie te doen in samewerking met biologie en aardrykskunde onderwysers van Kayamandi Höerskool. Die skool is gestasioneer in Kayamandi, die swart woningsarea van Stellenbosch in die Wes-Kaap provinsie in Suid-Afrika.

My besluit om hierdie aksie ondersoek met onderwysers in Kayamandi te doen met die doel om ekologiese onderwys aan te pas, sodat die plaaslike omgewingskwessie aangespreek word was aanvanklik gestimuleer deur my betrokkenheid by SWAP by die skool vanaf September 1998.

Nadat ek besif het dat die kapasiteit van die projek nie net die belangstelling in die besoedelde rivier stimuleer nie maar ook 'n breër ekologiese bewussyn aanwakker, het ek besluit om onderwysers te betrek sodat die projek vir soveel as moontlik leerlinge toeganklik kan wees.

Probleme wat opgeduik het in pogings om hierdie studie te implementeer, het my gedwing om die fokus te verander. Aangesien die grootste probleem 'n toegangs probleem was, het ek die studie verander na 'n ondersoek van die obstruksies in hierdie toegang.

Die kwessies wat na vore gekom het, het op die volgende gedui: op die relevansie van die studie vir die behoeftes van die onderwysers, die opvoedkundige agtergrond van die onderwysers wat ook op 'n manier die kultuur van die skool beinvloed, my posisie as buitestaander met geen duidelike verstaan van die konteks en my foutiewe aannames rondon beide verandering en aksie ondersoek as 'n proses van verandering.

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My furstrasies maar ryke ervarings gedurende hierde ondersoek het nie net bygedra tot my verstaan van die komplekse natuur van beide ondersoek en verandering, maar ook tot my groei en professionele ontwikkeling.

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ACKNOWLEDGEMENTS

I wish to express my appreciation and thanks to all who contributed, guided and supported me during my research journey.

In particular I wish to thank the following:

My supervisor, Mr. Lesley L. L. Le Grange for his guidance, support and constructive criticism during the course of the research.

Professor D. R. Schreuder, my course director, for his theoretical guidance and advice during critical moments in my study.

The rest of the staff at Environmental Education Programme of the University of Stellenbosch (EEPUS), Mr. Chris Reddy and Miss Helga Afrika for the contribution they made in making my time at the University of Stellenbosch a fulfilling one.

Those teachers at Kayamandi High School who supported me, for their unreserved availability and the wealth of knowledge they shared with me.

The students of Kayamandi High School who participated in SWAP and stimulated my interest in the school.

My parents who have supported me during my studies with their love and encouragement.

God for his unconditional love.

The financial assistance of the National Manpower Development Secretariat (NMDS, Lesotho) towards the research is hereby acknowledged. Opinion expressed and conclusions arrived at, are those of the author and are not necessarily to be attributed to NMDS.

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DEDICATION

This work is dedicated to my two sons, Mojalefa and Moji for their patience throughout my post-graduate studies.

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CHAPTER 1

BACKGROUND TO THE STUDY

1.1 Environment and environmental issues

In recent years there has been a growing acknowledgement among environmental educators that the "environment" does not only refer to natural systems but also that human beings and their activities are an integral part of the environment.
Fien (1993:3) states that many people are acknowledging the view of the environment as a social construction. The environment is no longer seen as rigid and unchanging but as a result of the way we exploit nature and its resources for our benefit.
O'Donoghue (1991:29) argues that environment and environmental issues are interlinked dimensions of political, social, economic and biophysical factors. Our economic, political and social values therefore play a big role in the way we relate to the biophysical environment. The socially constructed nature of 'environment' and environmental problems implies that there is not one correct solution to such problems. This is so because environmental problems do not emanate from one source but have multiple causes. Environmental problems become issues when they are interpreted differently by people having conflicting views and interests who invariably do not agree on their causes and consequently on their solutions.

Much as conservation of natural systems is vital, conservationists are often in a dilemma when human requirements come into conflict with natural environments. For example, it has been pointed out in **NAAEE & WWF** (1997) on the biodiversity debate that people of different political and socio-economic backgrounds have very different views concerning the future of fast disappearing temperate rainforests (very rich in biodiversity). Some people argue that trees are important for their economic value, some argue that forests like other ecosystems are becoming scarce and therefore should not be tampered with. Still others may think forests should be valued for their tourist attraction and that failure to recognise this would be detrimental to communities that depend on the tourist industry, and many more do not think the logging companies can be trusted to sustain the use and provision of timber in the long run to ensure that the needs of future generations are not jeopardised. The issue

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then no longer becomes just an environmental issue as it may have been initially perceived, but it becomes an economic, social and political issue.

There are no easy answers to this problem, as there often are several perspectives each inclining towards its own possible solution. An issue that had started as a problem of biodiversity and therefore a problem of the biophysical environment has become a highly controversial issue that involves the economic, political and social aspects of the environment.

In most cases, as in the above example, environmental issues are perceived and described too narrowly as issues pertaining to the biophysical environments. This conservative view leads to shortsighted and equally conservative solutions, which generate even more problems. Fensham (1978:64) attributes the problem to the fact that in many countries environmentalists and curriculum designers come from financially comfortable backgrounds. Because of this, they often resort to programmes that emphasize conservation but do not give the necessary attention to the possible long-term consequences of such conservative solutions on other interest groups.

Environmental issues are further complicated by the fact that they have causes that are deeply rooted in culture and history. Authors like Wa Thiong'o (1986) and Otim (1992) trace the environmental and developmental crises in Africa to the colonial legacy of imperialism. Otim also goes on to warn us that where there is a crisis, instead of treating symptoms (which normally manifest themselves in terms of severe environmental degradation), the root causes must be tackled if long-lasting solutions are to be achieved. Huckle (cited in Khan 1989a) emphasises the importance of a country's history in any attempt to understand its environmental problems and in the framing of an appropriate response. A study of the past is paramount if we are to tackle the problems and build an environmentally literate society.

1.2 Environmental issues in South Africa

According to O'Donoghue (1993:16), modernism, an era of uncontrolled growth and progress that followed the Age of Enlightenment, is responsible for the plethora of

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environmental crises we face today. South Africa like other modernising societies has experienced these crises but its problems have been compounded by apartheid, a differential approach to development that was adopted by the National Party government in 1948. Ramphele (cited in O'Donoghue 1993) blames both modernism and apartheid for giving rise to the country's unique environmental problems. Ramphele further argues that, "many of South Africa's ecological problems are linked to the social engineering process pursued by successive governments which exploited the country's resources for the benefit of the white minority" (Ramphele 1991:2).

Environmental conservation in South Africa has a long history. When it started, it was mostly concerned with wildlife conservation and specifically conservation of large animals, which were valued for hunting purposes (Ramphele 1991; Irwin 1989). The beneficiaries of the group were mainly white with little if any representation of the African people. Ramphele blames what she calls the "insensitive", "elitist" and "racist" conservation policies of the past for having alienated black people from environmental concerns and criticizes these policies for having been at best counter-productive. Other reasons that she feels may have led to the lack of involvement in environmental issues by the black community of South Africa are poverty and the limitations imposed on them in terms of living space which may have led to a narrow perspective of the environment and therefore little exposure to the broader global environmental issues. She further asserts, "Bantu education and other anti-development programmes imposed by authoritarian governments have not fostered in people a love for nature" (Ramphele 1991:7). Khan (1989b) more specifically blames the 1913 Land Act for depriving blacks of the right to own land in their own country, and sees it as paramount in the development of the negative perceptions black people have of the environment.

1.3 Setting the scene

The dispossession of land from Africans dates as far back as the seventeenth century. The 1913 Land Act, which divided land between black and white, seems to have only formalised it. According to Bundy (1992:7), this was part of a much longer and wider process of land dispossession. The Land Act later culminated in other laws like the Urban Areas Act, the Group Areas Act and the prohibition of Illegal Settlement Act,

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which further reinforced the divisions. South Africa was divided into reserves (constituting 8% and later 13% of the land) which were allocated to black people. These were marginal lands that later proved to be incapable of maintaining the population pressures they were exposed to. According to Ramphele (1991:4), black subsistence farmers were moved from productive land to areas that were generally barren and unproductive. In an attempt to overcome increasing levels of poverty, farmers persistently ploughed the already fragile land even though they could not get much from it. This coupled with poor farming methods and over-grazing heightened land degradation by desertification and soil erosion. Massive removals of people from productive to unproductive land increased the pace and extent of environmental destruction this way. Kruger (1991) tells the story of the Hewu district in Ciskei, where some 60 000 people settled in 1976. He points out that as a result of population pressure, poor farming patterns and over-grazing this fragile land was left devoid of any vegetation. As a result, soil erosion - one of the most visible forms of damage to the land - remains as a testimony of the abuse.

By the 1940s and the 1950s the allocated reserves (which were later to be called homelands) had become over-populated and much less agriculturally productive. To combat the immense environmental degradation, Phillips (1992:22) says that the government resorted to stabilisation, rehabilitation, conservation and betterment programmes and turned the homeland areas into nature parks and game reserves. This meant that the already meagre land allocated for black people was even less capable of supporting the population that was growing at an alarming rate. As a consequence of this, whole families were forced to migrate permanently to urban areas to seek employment.

At the same time, in the cities, there was massive industrialisation and cheap labour was sought. Migrant labour was adopted as a solution. Much as industrialisation depended on the personpower of Africans, the Bantustan policy of the apartheid government was such that increased African urbanisation, was forbidden by all means. The only form of accommodation offered for Africans coming to the "white" South Africa in those times were hostels and compounds. No new provision for permanent residence was established. However due to both the deteriorating conditions in the

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homelands and the fact that some of the homelands were too far from their workplaces, migrants brought their families to stay with them in the hostels.

What emerged was a contradictory situation in which successive governments tried to control urbanisation of the workers who were needed to "man" an expanding industry. Some compromise had to be struck. Posel (cited in Mabin 1992) describes the system that was adopted to meet the employers' needs. He claims that to serve the interests of both apartheid and industrialization, local authorities provided housing in the urban areas in the form of "townships". This type of housing was just enough to accommodate the labour needed but was located far from peoples' working areas. Moreover residents of the townships were not considered as residents of and had no rights in "white" South Africa.

This social engineering was intended to force Africans out of reserves into the cities to work as migrant labourers while setting up barriers that prevented them from being permanent residents. According to Ramphele (1991:4), "to discourage African urbanisation, the infrastructure of the townships was neglected". Basic services like housing, sewage removal, stormwater drainage, electricity, telecommunications and social services were not developed. This, however, did not discourage population flow to the cities that escalated after the influx regulations and pass laws were repealed in 1986. The mushrooming of squatter settlements in most metropolitan areas of South Africa was a consequence of overcrowding in townships (Ramphele, 1991).

Phillips (1992:23) contends that during those years when the apartheid era was at its peak, the Transkei/Ciskei homeland areas were nothing more than slums whose purpose was to supply the labour needs of the Western Cape. In the Western Cape province the Coloured Labour Preference policy was applied, but provision was made for temporary residence of African employees in the hostels and compounds. Because the Transkei/Ciskei homelands were far away from the Cape Peninsula, migrants brought their families with them. As the hostels became increasingly overcrowded, people resorted to shacks for urban accommodation. In the Hottentots Holland basin, Lwandle Township originated this way and my research site, Kayamandi, a black

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township outside Stellenbosch, also came into existence this way. In the next section, I discuss the history of water development and the consequent water crisis that South Africa faces.

1.4 South African water development in historical perspective

According to the Department of Water Affairs and Forestry (1994:4), the history of water in South Africa mirrors that of the country as a whole in terms of housing, land, migration, social engineering and development. The introduction of Apartheid with its homelands policy, which sought to take the geographical divisions of the country a step further and turn them into political entities also had its effects on the water sector as did the tri-cameral parliament with its "own affairs" departments. Several government regional water supply schemes were constructed mainly to benefit the white sector of the population; the rest of the departments were to take care of their water needs from the little that was allocated to them. Within "white" South Africa, the black townships, which were managed by the black local authorities, were also largely left to fend for themselves. These local authorities were under serious financial constraints and the provision of services was a problem. Because the townships had no political legitimacy, black local authorities were unable to enforce tariffs and they were faced with protracted payment boycotts, which was a powerful strategy black people used to demonstrate their resistance to the apartheid government.

The lack of adequate service provision was further aggravated by among other things problems like the absence of a coherent policy and an institutional framework which would enable authorities to draft and implement clear rules. The Nationalist government failed to allocate public funds for water supply development where they were most needed but made sure that water was available to farmers and those wealthy municipalities that could afford it (Department of Water Affairs and Forestry (1994)).

The Department of Water Affairs and Forestry (1994:5) further asserts that the development of sanitation follows almost the same lines as the water service in South Africa. In the wealthy municipalities and towns, the development of water supplies

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provided for water borne sewage disposal. Rural areas and black townships received very poor sanitation services. This had a tremendous impact on the health of the population and on the environment at large.

1.4.1 The legacy of the past

When the ANC government came into power in 1994, its main aim was to correct inequities of the past and this included making clean drinking water accessible to all. According to Davies and Day (1998:316), by 1997 between 12 and 14 million South Africans still had no access to safe, potable water; 23 million had no proper sanitation; 90% of rural schools and 50 % of rural clinics had inadequate sanitation.

1.4.2 The water crisis

South Africa is currently faced with a huge water crisis. This is manifested not only in terms of quantity but also in terms of quality, which makes water pollution one of the most pressing environmental issues in South Africa. Both industrialisation and the grossly inadequate urbanisation policies of the past are the two most important processes responsible for the enormity of this problem.

In South Africa as elsewhere, the main sources of water are dams, rivers, streams and boreholes to tap groundwater. In the cities, there is a constant supply of fully-treated water of high quality. In rural areas, there is minimal water treatment and some communities and villages continue to rely on untreated water that comes directly from rivers and streams.

Polluted water impacts on health both in the short and long term. According to Davies and Day (1998:226), at present eighty percent of five people in third world countries who are ill, suffer from diseases that can be directly traced to insufficient or contaminated water supplies. Diseases associated with water include trachoma, malaria, cholera, typhoid, diarrhoea, bilharzia, river blindness, yellow fever and elephantiasis. In 1980, it was estimated that in third world countries alone, about 50 000 people died each day from these diseases and other ill-effects of inadequate water supplies.

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1.4.3 Pollution Survey

According to the South African Water Quality Guidelines (1993: 9), water pollution is defined as the deterioration of water quality to the extent that it is rendered less fit for any legitimate use. In most townships, because of the dwellers' dependence on coal and wood as the predominant sources of fuel, there is severe air pollution. As a result of insufficient provision of electricity in winter especially, these townships are covered in a thick layer of blinding smog. Quinlan and McCarthy (1994:74) point out that this presents a problem of high levels of atmospheric pollution that also affects the water sources situated close to these informal settlements. Furthermore, due to the lack of proper sewerage services the quality of water sources in the proximity of the settlements rate among the lowest in the country.

According to Simpson (1990:28), the pollution survey carried out by the CSIR in Durban showed that runoff from the dense formal and informal squatter settlements revealed significant faecal bacterial contamination. The highest levels of up to 1million coliforms per 100 ml recorded during this study emanated from these residential areas. From this, it can be concluded that informal settlements without proper services affect water sources and pose serious problems.

The poverty of most dwellers in the informal settlements aggravates the conditions. Poverty and environmental degradation are inseparable; the poor in their daily fight against this monster that threatens to undermine their existence have no time to think about conserving nature. Davies and Day (1998:5) point out that many rivers running through poverty-stricken communities are frequently no more than bad-smelling drains. This is the case with the Plankenbrug River that flows close to Kayamandi, my research site. In the next section, I provide a brief overview of the research site.

1.5 The research site

Kayamandi is a black township north of the central business district of Stellenbosch. It is less than two kilometers from the town and is separated from it by a railway line. At present closely-packed shacks that are homes to thousands of people dominate Kayamandi; these extend towards the Plankenbrug River (Appendix 1) that forms another border between the "white" town and the township.

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The Plankenbrug River is one of the tributaries of the Eersterivier. Inadequate sewage and refuse removal services in the township pose serious health problems to the residents of Kayamandi (further elaborated in Section 2.1). Sewage and heaps of stagnating garbage in the streets and on the riverbanks find their way into the river and this affects its quality. Figure 1 below shows part of the river heavily burdened with litter.

Figure 1: A section of the Plankenbrug River polluted with litter.

In February 1998, I became involved with Kayamandi High School whilst working as a research assistant on the Schools' Water Action Project (SWAP). Kayamandi High School was one of the schools served by this project in the Stellenbosch area. The project was an initiative of the Environmental Education Programme based at the University of Stellenbosch (EEPUS). The interest I developed in water quality monitoring came through my involvement with SWAP. The project's association with Kayamandi High School made Kayamandi a convenient study site for me to do my research towards my Master's degree. I decided to initiate a participatory inquiry with biology and geography teachers of Kayamandi High School to establish ways of

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integrating this local environmental issue (the polluted river) into the teaching of ecology.

Due to unforeseen problems that I encountered in the initial stages of research, I was not able to implement the study as I had planned. Instead I was forced to shift the focus of my study. As my problems turned out to be largely problems of access, I decided to investigate these instead. I changed focus of the study to an investigation of the obstacles to access I experienced when attempting to do action research in a school previously administered by the Department of Education and Training (DET).

My research represents a journey that I took from November 1998 when I decided to do my research at Kayamandi High School until the end of September 1999. I have divided the journey into three phases. Phase I includes an introductory workshop I held with the teachers in which I informed them of my decision to do my research with them and the reasons for my decision to do so. I also conducted interviews with teachers to provide me with a background of their orientation to ecology and environmental issues. From the interviews the teachers indicated an interest in joining the project which was scheduled to start in January 1999. The interest expressed by teachers during the interviews gave me the distinct impression that the study would be feasible. Phase II concerns the problems I encountered when I tried to implement the project. Phase III is about events that led to my decision to change the orientation of the study.

1.6 Summary

In this chapter, I discussed the "environment" as an ever changing concept and relate how the understanding of environmental issues have broadened both nationally and internationally over time. The roots of environmental crises in South Africa are traced to both modernity and apartheid. The role played by policies of land dispossession among black citizens of South Africa is discussed. I also discuss the history of the country's water development that seems to have contributed greatly to the development of the country's water crisis whose major symptom is water pollution. Water pollution in black townships in general and the pollution of the Plankenbrug River that passes through Kayamandi Township in Stellenbosch more specifically, is

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discussed. My involvement with Kayamandi High School through the Schools' Water Action Project (SWAP) as an attempt to address this local environmental issue is also discussed. Chapter 2 will describe the context of the study focusing on South African education in historical perspective and Kayamandi High School as a former DET school.

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CHAPTER 2

THE CONTEXT OF THE STUDY AND SOUTH AFRICAN EDUCATION IN HISTORICAL PERSPECTIVE

2.1 The context of the study

Kayamandi High School is a former Department of Education and Training (DET) school situated in a black township of Stellenbosch, Kayamandi, a Xhosa name meaning 'pleasant home'. According to Penderis and Van der Merwe (1994:34), the township is thought to have originated in the 1950s as a temporary residence for contract migrant workers from the Transkei and Ciskei. It started out as a group of hostels and its growth followed the pattern that has been described in Section 1.3. In 1994, there were three housing segments within the township. These were: the formal housing area comprising 245 dwellings; the squatter settlement of about 1 200 informal structures; and the hostel area which comprised 69 hostel buildings. Cloete, Straton and Theron (1999:1) point out that after 1994, the focus of the government, under the banner of the Reconstruction and Development Programme (RDP), shifted to providing basic needs like housing. Housing shortages in Kayamandi were already being addressed from 1989 but unavailability of land was an impediment. In 1989 the housing shortage was estimated at around 1000 units but by the end of 1993 the figure rose to 3 199 units. As of 1997, 150 houses had been built and it was estimated that a total of 1 650 houses will be built in the second phase of the project.

According to Penderis and Van Der Merwe (1994:33), despite the abolition of the Group Areas Act in 1991, very little residential integration had occurred in Stellenbosch and the apartheid pattern of the racially segregated residential areas still remained. The spatial morphology of Stellenbosch still conforms to that of the apartheid era in this respect. According to Cloete *et. al.* (1999:4) the administration of Kayamandi was under the jurisdiction of the Stellenbosch Town Council between 1966 and 1986 and later the Cape Provincial Administration became involved. In 1986, the township attained autonomy and the Kayamandi Town Council was formed. In January 1995, Stellenbosch and Kayamandi councils were amalgamated and six representatives of Kayamandi are currently members of the Stellenbosch Town

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Council. Vermaak (cited in Cloete *et. al.* 1999) states that the various reasons why people live in Kayamandi are the following: birth place (6.0-6.8%), work (47.6-75.4%), further studies (4.1-6.9%), available housing (7.5-29.7%), other (6.1-10%). They say that the population of Kayamandi has grown incredibly even though few of its inhabitants were born in Kayamandi. This may be attributed to further migration from the former Ciskei and Transkei Homelands. In 1994 the population of Kayamandi was estimated at more than 14 000 (Penderis and Van der Merwe 1994:34). It could be reasonably assumed that the population of Kayamandi has increased significantly since.

What struck me most on my first visit to Kayamandi in February 1998 was the closely packed shacks that seemed to fill the whole township. I could observe easily that sanitation was a major problem in Kayamandi. Piles of stagnating garbage lined the streets and even though there were large municipal bins at fairly close intervals, garbage littered public places. The garbage attracted flies, rats and stray dogs, which formed part of the scene. Figure 2 below shows part of the scene with Kayamandi High School in the background.

Figure 2: A photograph showing Kayamandi High School.

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Not very far from these heaps of garbage, just outside the living quarters, business went on as usual as women braaied meat and cleaned heads and feet of sheep/cattle over the fires. Children played happily around the dumping sites and in the streets amidst passing cars. It was obvious to me that health risks in this community were enormous.

Despite its problems, Kayamandi is a relatively peaceful township. In none of my visits to Kayamandi did I ever experience any kind of violence. I was amazed at how people who lived in such an environment could be so peaceful. People here were quite friendly despite the fact that I was not Xhosa-speaking. I am Sesotho speaking and, being a black person in a dominantly Xhosa speaking region, I have often experienced hostile reactions from people who expect me to speak Xhosa. This was not my experience in Kayamandi. This is supported by Penderis and Van Der Merwe (1994:36) who have pointed out that little tension exists between ethnic groups who live harmoniously together.

To an outsider, the residents of Kayamandi appear to be coping very well with their circumstances. However some of the realities that people are faced with daily include rising incidences of tuberculosis and other diseases that flourish under conditions where people live near the sources of infection (Penderis &Van Der Merve 1994). In addition to the health hazards, the lack of personal space and privacy poses problems of crime, upbringing of children and discipline, alcoholism, promiscuity, lack of dignity and respect for others, to mention but a few. These problems are exacerbated by the heterogeneous nature of the shack-dwellers. Phillips (1992:24) points out that, "shack dwellers are not a homogeneous mass but a distinctly heterogeneous group... squatters are in fact made up of individuals and households that have little in common but the area in which they reside." So, even though these people live so closely together, they often have different values, feelings and expectations of life. The next section places Kayamandi High School within the context of South African education and its historical background.

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2.2 South African education in historical perspective

The history of Kayamandi High School as a former DET school cannot be understood out of context of the history of education in South Africa. A good part of this chapter will be dedicated to the role of contextualising both the history of Kayamandi High School and that of South African education. In South Africa, education was the single most important institution of society that was manipulated to maintain and perpetuate the status of oppression by one minority group over the majority by distorting their worldview.

Education does not exist in a vacuum; it is one of the many institutions of society and it takes its form from the society in which it is situated. The curriculum is the heart of education and as Carl (1995:24) points out, "When education in Southern Africa is placed under the spotlight from national to local level, it is clear that many problems are directly related to the curriculum." Any discussion on education is, so to speak, a discussion about the curriculum.

Many people are acknowledging the view of the curriculum, as a complex social process or praxis, counter to the narrow view, which regards the curriculum as being the planned and organised activities pupils experience at school. Van den Berg (1990:30) has pointed out that the curriculum is not only about content, but it also encompasses aspects like process, intentions and values. The view of curriculum as a product depoliticizes both the curriculum and education. In my discussion of curriculum therefore, I align myself with the broader definition. In order to understand the real nature of the educational problems as well as the curriculum process in South Africa, which are unique in so many ways, it is necessary to trace their historical roots.

Those aspects of the social structure which have had a powerful impact on curriculum in South Africa, according to Buckland (1982:168) are: the change of economic relations accompanied by the transition from an agrarian economic system to an industrial one; shifting relations of power both within and between these two; and the shifting ruling group ideology associated with these changes. This last aspect has been the most important in shaping the curriculum in South Africa. I trace the history

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of education in South Africa from 1948 when the Afrikaner nationalists came into power and "...their values and beliefs enjoyed official status in the education systems of the country, hence constituting the major influence on the development of those systems in modern times" (Ashley 1989:ix).

2.3 Fundamental Pedagogics and the Christian National Education

Fundamental Pedagogics (FP) was the philosophy of education used by the previous National Party government. According to the philosophy, the purpose of education is to guide the child who is a non-adult to proper adulthood. An adult who lives the life of a proper adult must perform this important role. This philosophy was charged with reproducing the ruling ideology of Christian National Education (CNE). CNE, according to Ashley (1989:ix) was the educational expression of apartheid whose development rested on two central pillars, namely that all education had to be based on the Christian Gospel and secondly that humankind was divided into nations and that education should reflect these national differences. The justification was that different cultures had different expectations of adulthood and since education was about guiding the child to adulthood, the person who did this had to be of the same race as the child. This led to the perceived need to develop different systems of education for different *nations* in South Africa on the assumption that it was a multinational society with different *cultures.* In this way, FP reproduced and justified the ruling ideology (especially in connection with education for the black South Africans - Bantu Education) as it was expressed in Christian National Education.

Another ideological function that Fundamental Pedagogics performed was to adopt a very conservative and narrow view of education, which equated education with transmission of culture instead of seeing it as a process of emancipation and development of human potential. Criticisms directed at the view of education as the transmission of culture include those by Meerkotter and Van den Berg (1994) and Mncwabe (1990). They said this narrow view was ideological as it neglected important functions of schools, which included promoting the views of the dominant groups in society and serving other important economic, social and political functions to perpetuate the status quo.

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Higgs (1994:14) attributes the damaging potential of Fundamental Pedagogics to the fact that, " it is situated in the Social Sciences where it has taken the role of socialisation in education." He therefore argues for a paradigm shift, declaring, that "...Fundamental Pedagogics is more authentically situated in the human science tradition." Slamat (cited in Higgs 1994) argues that science (though supposed to be objective) can be ideological in those instances where, in the name of scientific expertise, it is manipulated to perform ideological purposes by misusing knowledge to maintain relations of domination. Dreyfus (cited in Meerkotter & Van den Berg 1988) calls this "political technology", whereby what is essentially a political problem is expressed in the neutral language of science. Once this has been achieved, the problems associated with it become technical ones which can only be handled by specialists. When this happens, there are repeated calls for reform while resistance or failure is interpreted as further need for the power of experts. This has been the case in South Africa where a series of educational reforms were adopted instead of transforming the education system that was based on a flawed foundation of distorted reality.

2.4 The introduction of Bantu education

According to Horrell (1964), previous to and during the Second World War, there was a lot of debate among the white South Africans regarding the future positions of black South Africans. Some of these fundamental questions were whether Africans were to be part of a common westernised society or whether they were to have a separate existence. Following this, should education aim to assist them to adjust successfully to the western environment or should it be to prepare them for separate communities? Further, should they be provided with an education that would help them grow to achieve their best potential or should education prepare them for a certain way of life? Should there be separate syllabuses for different races and, if so, to what extent? To what extent should teachers draw from local experience and the local environment in teaching and in what medium should instruction take place?

When the Nationalist Government came into power in 1948, these debates still went on and the Nationalists under Dr. D. F. Malan who was the Prime Minister, felt that acknowledging the existence of a multicultural South Africa would solve the

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problems of the country. Each group was to be given the freedom of shaping its own destiny and of developing its own community in its own way. This view, which increasingly gathered support, was reinforced by comments like those of the then Minister of Native Affairs, Dr. H.F. Verwoed, who declared "Native education should be controlled in such a way that it is in accord with the policy of the state..." "...education must train and teach people in accordance with their opportunities in life" (Horrell 1964: 10). These statements Dr Verwoed made after the Eiselin Commission (which was appointed to investigate into and establish fundamental principles for Native Education mentioned above) reported its recommendations. In general the commission correctly reported that the "Bantu people" were opposed to the idea of a separate education as they felt that it would be to their disservice. They insisted on exactly the same curricula and examinations offered in "European" schools and wanted to be awarded the same certificates. However, the commission recommended that Bantu Education should be an integral part of a carefully planned policy for the development of Bantu societies. It remained adamant that blacks would be educated according to their requirements, just as education of other nations, for example the French or Chinese and would function only in a certain social context.

As the ruling party believed the African culture to be inferior, Africans were to trust the discretion of their white "trustees" for developing the education that was suitable for them. Whites, especially the Afrikaner nation, were superior; therefore it had the responsibility of christianising the "native" and "helping him on culturally". The native would have to "borrow from other cultures" in order to progress, as he was in his "cultural infancy"; the aim of "native education" was to inculcate the white man's views of life (Coetzee et al as cited in Morrow 1989). For this reason, even though other "nations" in South Africa were given the task of writing their own educational policies, the Bantu education policy was an affair of the Department of Native Affairs as it was believed that "natives" did not have "their own philosophy of education."

The Bantu Education Act was passed in 1953 (amended in 1954, 1956, 1959 and 1961). Among other things the Act transferred total control of the education of Africans into the hands of the central government, giving the responsible minister power to make further regulations governing Bantu Education. Mncwabe (1990:34)

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has said that African education was not placed under the central education authority but under the political control of the department concerned with African affairs. Teacher education in South Africa, especially education for black teachers, has also been affected by the policies of the previous Nationalist Government.

2.5 Teacher education

In South Africa teaching has never been regarded as a profession in its own right. Teachers, the key agents of education, have historically had the status of implementers of the knowledge of experts far removed from the classroom. Participating in the development of curricula has never been the business of teachers as they have been used to being handed down the "finished product" which they have neither criticised nor adapted to suit their own contexts. Among others Hartshone (1992) and Davidoff and Van den Berg (1990) made this observation when they commented on the fact that prospective teachers were viewed as passive recipients of professional knowledge of experts. Failure of these externally designed curricula to achieve the intended results has always been seen by educational authorities as a technical problem that can be addressed by further professional expertise. Teachers are often seen as the problem, not as a solution to the problems of education. This has resulted in a situation where the real problems of teachers regarding their preparedness for both the nature of their work and knowledge of their learners have not been identified and appropriately addressed. As these problems have been allowed to accumulate they have reached a point of crisis. Persisting in treating them as technical problems will not solve any of them.

Most of the real problems of teaching can be attributed to teacher education. Giroux (1985) calls for a redefinition of educational problems, which provides for an alternative view of teacher education and work. He says:

> ... recognising that the current crisis in education largely has to do with the developing trend towards the disempowerment of teachers at all levels of education is a necessary theoretical precondition in order for teachers to organise effectively and establish a collective voice in the current debate.
>
> Giroux (1985:376)

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According to Giroux, disempowerment of teachers starts at teacher education, which is characterised by the emphasis on a technocratic approach to both teacher preparation and classroom practice. This approach to teacher education, Giroux says, is based on a number of assumptions about education. These include the notion that construction of ideas and theories about teaching and learning can be developed separately from their implementation; that knowledge can be standardised, managed and controlled; that the critical awareness and alert intellect of teachers are not as important as practical abilities. This behaviouristic approach to teacher education puts a strong emphasis on the mastery of subjects and methods of teaching but neglects the preparation of teachers to cope with the complexities of teaching and learning. This approach to teacher education Kirk (cited in Fien 1991) called the *traditionalist paradigm*. Student teachers are seen as trainees who are drilled in teaching methods courses to be followed by prolonged periods of teaching which most of the time involves teaching the same content in the same manner over and over again. With the help of prescribed syllabuses and textbooks, prepared resources (teaching aids) teachers are further disempowered as they have neither the control in determining the content and direction of their preparation nor the teaching process itself. This produces uncritical teachers who through their training have been prepared to fit into the existing teaching roles. This becomes a vicious cycle as these teachers in turn treat their students in the same manner and produce passive and uncritical learners and citizens. This was especially the case with teachers trained in South African institutions most of which were influenced by Fundamental Pedagogics and Christian National Education where teaching was authouritarian.

2.5.1 Teacher education in South Africa

Bagwandeen (1994:17) argues that teacher education is the most crucial aspect of the development of quality education in every nation. She holds it as an "indisputable fact that the quality of education is to a great extent dependent upon the dedication, calibre and competency of teachers in the classroom". She further argues that if education, above everything else determines the future of a nation, then the education of teachers should be given more attention than is the case at present. The situation in South Africa, unfortunately, falls far short of these ideals, for not only was teacher education not given attention, it has also been manipulated for political ends. Beardall

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(1995:366) says that education for the majority of the population has been internally crippled and blames Bantu Education policies of the Nationalist government for this. These policies did not only affect the education of the majority but they also prevented proper teacher training. Van den Berg and Meerkötter (1994:302) point out that teacher education in many of the country's institutions has been hugely influenced by the apartheid ideologies of CNE and FP and therefore tends to be paternal, authoritarian and non-critical.

When the teacher training for Africans is placed in historical perspective Horrell (1964:7) traces it back to the discussions regarding the future of Africans that took place after the National Party took office in 1948. He quotes Dr Verwoed as having said that the "Bantu" teacher must be guided to "serve his community in all respects, he must learn not to feel above his community with a consequent desire to become integrated into the life of the European community". In this way black teachers were expected to play a big role in providing the inferior education to the majority of South Africans in order to maintain the status quo.

Most of the teacher education for Africans before 1948 was offered by the missionaries in the different provinces. This task, however, was later removed from them and placed under state control for various political reasons. Hartshone (1992:242) gives credit to the missionary institutions for the quality of education they offered prospective African teachers and says that despite their pitfalls, poor conditions and limited facilities, they had essential concern for the education of the whole human being.

Hartshone (1992:236) also points out that after the state took over teacher training for Africans, African teachers were trained in institutions especially designed for them, under the direct control of segregated education departments. To reinforce this, as the state had proclaimed the future of Africans to be in the homelands, training colleges were also destined to serve particular regions, their needs, language and culture. There was to be no provision for teacher education for Africans in urban areas. African lecturers replaced the white teaching staff in these colleges and the use of English was discouraged in favour of mother- tongue instruction.

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Moreover, in the course of time most of the black educators in these colleges themselves were products of Bantu Education and only further entrenched the poor education. Walker (1988:150) points out that in their own schooling the DET teachers had been through a process dominated by "teacher talk" and transmission of prescribed knowledge. By the end of their schooling, they would have internalised these methods to the point that they would neither question their activities nor wonder whose interests they were pursuing by their teaching. This is not surprising, as from the very beginning the DET was not concerned with developing professional teachers capable of being in control of their work but was more concerned with training teachers who would be instruments of government policy. School inspectors acted as watchdogs to ensure that teachers stuck to the demands of the departments. According to Davidoff and Van den Berg (1990:6), education departments did not hesitate to punish those teachers who were seen to not have been dutiful servants of the State.

According to Cross and Sehoole (1997:49), in 1997 South Africa had 109 teacher education colleges which provided teacher education to 150 380 student teachers. There were 20 universities that provided contact teacher education through their departments of education, faculties or schools of education. Only one university, the University of South Africa (Unisa), provided distance education. These 21 universities catered for 28 954 student teachers, 20 743 of whom were involved in pre-service teacher education, 6 279 in in-service training (INSET) and 1 930 in advanced studies in education (masters and doctoral studies). Five out of 15 technikons offered teacher education. This shows that there should not be a shortage of teachers at any time in this country but the statistics of the DET prove otherwise.

A professionally qualified teacher is someone who, apart from subject training has also been trained to teach. Matric is considered to be the starting point and any training and qualifications are expressed as matric plus (M+) the number of years of training. According to Strauss, Plekker and Van der Linde (1994), 15.61% of all teachers had a qualification of matric or less, 35.41% had fewer than three years of training after matric. According to the norm of teacher training which is set at M + 3,

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64. 58% of all teachers are considered qualified. Most of the unqualified or underqualified teachers were employed in the DET schools.

2.6 The Department of Education and Training (DET)

The education dispensation in South Africa before 1994 mirrored the society. The different departments were based on race. According to the report by the Department of Education (1995:15), "These ethnic administrative divisions were reinforced by the inequalities between the resources available to (and subsequently the education offered by) the departments catering for them". The white schools were at the top of the quality scale, followed by those catering for Indians, Coloureds and Africans. Blignaut (1993:18) said that the Department of Bantu Education was renamed the Department of Education and Training after the 1976 riots. It was one of the 15 education departments and it was responsible for the education of blacks in 'white' areas.

According to Strauss et al (1994), 81.85% of the children attending primary school were black. When the enrolment of pupils in primary schools was compared to that of secondary schools, it was noted that a considerably lower percentage of black children progressed to secondary school compared to their white and Asian counterparts. Hofmeyr and Hall (1996:26) found that there were high failure rates in Sub-standard A and Standards 8, 9 and 10 due to the poor quality of many black schools, and they say further that the inefficiency of the system also resulted in high drop-out rates. This is also mentioned by Hartshone (1992:23) who comments on the pronounced differences in the number of pupils at the different levels in the black schools. This he says was due to the high drop-out rate throughout the system and the large number of repeats in the initial standards.

One of the characteristics of DET schools was the shortage of teachers and classrooms. The shortage of teachers resulted in a higher pupil: teacher ratio (PTR) in the schools run by this department compared to other departments. Hofmeyr and Hall (1996:27) say that in 1994 there were 341 903 teachers nationally of whom 61% were teaching at primary level and 39% at secondary level. When these numbers are correlated with the total number of pupils at that time the PTR works out at 34:1. The

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teachers however, were maldistributed across racial groups and across urban and rural areas; different provinces too were either under-supplied or over-supplied. African PTRs were considerably higher than for all the other race groups at the primary level.

The limited funds budgeted for the DET to finance black education meant that schools served by it were under-resourced. According to Moulder (1991:27), most black schools had little space and almost no teaching aids. The shortage of classrooms in black schools created three problems: chronic congestion; double session schools in which one teacher taught two cohorts of pupils in one day; and "platoon system" schools in which teachers taught two separate classes at the same time in the same room.

Apart from the problems mentioned above, the conditions under which black schools operated were appalling. The struggle and resistance against apartheid in the wider black community were projected onto schools and these became the sites of struggle for many years. The level that was most hard hit was secondary schooling where conflict between the students and the police and sometimes the army often resulted in death. The struggle that had been going on for years against Bantu Education and the forced use of Afrikaans as the medium of instruction in black schools reached its peak in 1976. Walker (1988:147) said that schooling for black youth in South Africa was in chaos after this. Their education system has been labeled "gutter education", "rotten" and "perhaps the worst schooling in the world". Hartshone (1992:79) further said that 15 years after the 1976 riots, black secondary education was at the point of collapse and had become the main focus as it was perceived as being at the heart of the education crisis. The collapse of secondary schooling was characterised by deteriorating learning environments, demotivated and burnt-out teachers, unsettled conditions in which violence and intimidation were rife, haphazard and spasmodic school attendance, all of which have led to disastrous Senior Certificate and matriculation results. The persistence of authoritarian and teacher dominated teaching which is content-oriented and knowledge-based remain the legacy of the past.

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2.6.1 Kayamandi High School

Kayamandi High School is a former DET school. No documentation of the history of the school is available, as such records were destroyed in a fire during an act of vandalism at the school at the end of 1998. I had to depend on a secondary source for information. This was a history teacher who has been teaching at the school since it became a secondary school in 1992. She was also born in Kayamandi which according to her, had its beginnings in the late 1940s.

The school started in an ordinary house, at 47 Celile Street. Later on, the missionaries of the Dutch Reformed Church built some classrooms at a new site and the school became a combined school offering Sub-Standard A to Standard 6. Due to the shortage of classrooms, a platoon school system was adopted. Later new buildings were erected on the same site and lecturers from the University of Stellenbosch offered night classes to meet the lack of provision of higher education for blacks in the area. In those days, the government was hesitant to build schools in black townships and only Langa High School catered for pupils from the outlying townships of Worcester, Paarl, Stellenbosch and other townships around Cape Town. The school became a high school in 1990 when Standard 7 was introduced. The school had its first set of matriculants in 1993. By the third term of 1999, the school had a total of 29 teachers, 28 classrooms (including laboratories) and an overall roll of 958 pupils.

The history of the school reaffirms the determination of the state to prevent African urbanisation. The government was hesitant to build schools for black people in the urban areas as they were not regarded as citizens of "white" South Africa and were supposed to attend schools in the homelands. This also shows the low status attached to the education of black people in those times. The state did not see the importance of investing in the education of black people as their proclaimed future roles as manual labourers did not require the mastery of any particular skills. While the government heavily subsidised education for whites, black people had to pay for their own education. However even in those tough times black people's quest for knowledge seems to have overridden these obstacles and they were determined to fight and resist the unfortunate future determined for them. I did not have access to the record of matric results of the school but from informal discussions with some of

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the teachers I came to learn that like most of the black schools, it has not had good matric results in the few years that it had been functioning as a high school. However, the school is a source of pride to the people of Kayamandi and it serves not only local residents but there are many pupils who come from neighbouring townships and from the Ciskei and Transkei.

2.7 Summary

This chapter gives an overview of the context of the study. Kayamandi High School is placed within the context of South African education which is traced from 1948 when the Afrikaner Nationalists came to power and implemented its ideology of Christian National Education. The role which Fundamental Pedagogics played to legitimise this ruling ideology especially in relation to education of Africans (Bantu Education) is discussed. I discussed teacher training for Africans which was also hugely affected by the policy of separate education. The poor conditions under which schools administered by the Department of Education and Training (DET), previously called the Department of Bantu Education, are discussed. The subsequent crisis situation that evolved in black schools, especially secondary schools, which is a legacy of the past is also given coverage. The present state of Kayamandi High School concludes the chapter. In the next chapter I discuss environmental education as a possible response to both the educational and the environmental crises. I discuss the Schools' Water Action Project (SWAP) as an environmental education process and my decision to do a SWAP related action research study with teachers at Kayamandi High School.

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CHAPTER 3

ENVIRONMENTAL EDUCATION AS A RESPONSE TO THE ENVIRONMENTAL CRISIS

3.1 Historical development of environmental education internationally

Environmental education as a response to the environmental crisis has a long history. According to O'Donoghue (1993:12), a changing view of the concept "environment", (see 1.1) and consequently environmental education, can be traced through a succession of international conferences from the Stockholm conference (1972) to the Rio Earth Summit (1992). Fensham (1978:61) describes the conference at Stockholm as being the one that stands out as having captured a world-wide concern about the environment and a recognition of the need for a collective approach to tackle problems of the environment. As early as this the importance of education to address the issues was being urged. Fensham (1978: 62) says that the United Nations Environment Programme (UNEP) was later established to "conduct a wide range of projects concerned with environmental problems throughout the world". The Stockholm conference was followed by the drafting of the Belgrade Charter in 1975 which, Fensham (1978:63) says, emphasised the need for a more holistic approach to environmental education, bearing in mind the multi-faceted nature of environmental issues. Since then there has been a series of conferences like the Tblisi conference which formulated the famous Tblisi Principles for environmental education (Appendix 2). In 1980 the World Conservation Strategy was developed; the Moscow Conference and the release of the Brundtland Report both happened in 1987; Caring for the Earth in 1991 and ultimately the Rio Earth Summit in 1992 all arose out of concern about the environment, development and environmental education.

Irwin (1990:5) says that of the many definitions that have been suggested to describe the concept of environmental education; one of the earliest that has also come to be the most accepted is that of the IUCN (International Union for the Conservation of Nature) (1971) which goes as follows:

> Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and

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> 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.

3.2 The development of environmental education in South Africa

Clacherty (1994:54) says that in South Africa as in most parts of the world environmental education emerged from conservation education. The methods adopted by proponents of this conservative view according to O'Donoghue (1994:65), included using the mass media to educate the public about environmental issues and to foster awareness in the target groups affected by the issues. This was done in the hope that if people were informed about environmental issues they would change their practices. These approaches saw environmental education as an instrument that could be used to modify people's behaviour in a predetermined fashion. Clacherty (1994) argues that with time many people are beginning to see that a top-down approach is inadequate and even offensive, and that an intensive, single-event approach cannot be depended upon for long-term solutions. O'Donoghue (1994) asserts that these approaches share a modernist underpinning, which assumes that the transfer of information and nature experience activities will cause awareness and change values and behaviour.

3.3 Ideology and approaches to environmental education

Fien (1993:15) distinguishes three different approaches to environmental education, which also reflect historical trends in the understanding and development of the concept.. These three views are education *about, through* and *for* the environment. He also contributes to an understanding of education by introducing the concept of "ideology" and its importance in providing a philosophical framework that may be used to guide educational decisions. Kemmis, Cole and Suggett (cited in Fien 1993) suggest three different educational ideologies which Fien says mirror three "knowledge constitutive interests" first coined by Habermas (1972). These are the *technical*, the *practical* and the *critical* interests. The three approaches to environmental education mentioned above could in turn be said to have been influenced by these ideologies as discussed below.

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3.3.1 The vocational /neo-classical orientation

This orientation to education is underlaid by Habermas' technical interest, which is about satisfying the need for mastery and control over the world. Fien (1993) says that the instrumental view of knowledge and education stems from this interest and satisfies physical and economic needs and allows one to fit into society as it is presently constituted. Education *about* the environment, which is also the most common form of environmental education also, has aspects of this orientation. Fien (1993:15) says that this approach emphasises facts and information about natural systems and is most concerned with transmitting this knowledge. The aim is to raise awareness about environmental issues with the hope that people change their values and attitudes towards the environment.

3.3.2 The liberal/progressive orientation

Habermas' *practical* interest is informed by this orientation. According to Fien(1993:21), this orientation sees education as a preparation for life. The need to attend to social problems is recognised, but the means of social change are seen as already existent in the present structures of society. It is believed that these social structures and especially education in its present form need only be adapted to address environmental issues. Education *through* the environment which, Fien (1993:15) says, uses the environment, especially the natural systems, as the medium of instruction is an attempt to link learning to environmental experiences and therefore, complies with this orientation. No need is seen to transform practices which have led to the environmental problems, or to address the socio-political values that have led to the crisis.

3.3.3 The socially critical orientation

This educational ideology is underpinned by Habermas' third knowledge constitutive interest called the *emancipatory* or *critical* interest. This need, Fien (1993:19) writes:

> ...is satisfied by the socially critical orientation in education which seeks to educate students to be aware of the ideological origins of their existing beliefs and purposes in life, conscious of the inequalities and other problems created by unequal power relations in society, and willing and empowered to think and act in the interests of social justice and democratic principles.

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Fien (1993) says, education *for* the environment has as its prominent agenda, values education and social change. If the values and attitudes of people in their relationships with others and their environment are to be constructive and well-meaning then critical awareness and active involvement in the resolution of the environmental problems is vital. Wals and Alblas (1997:254) say education *for* the environment has the potential to lead to educational change that can ultimately help shape relationships between people and between people and their environment.

The two former approaches to environmental education (education *about* and *through* the environment) are criticised by Fensham (1978:64), who says that both are not environmental education in the critical sense of Stockholm or Belgrade. Fien (1993:16) also criticises them for "ignoring the questions, issues and problems facing the learners and their communities" and he says moreover that they do not address "a wide range of knowledge, skills, values and participation objectives necessary for environmental education". He further says that the two approaches are valuable only in so far as they serve as prerequisites of education *for* the environment. Wals and Alblas (1997: 254) call the view of environmental education as an instrument that can modify behaviour reformist and criticise it for conforming to the behaviourist approach to education.

Education *for* the environment is more in line with Huckle's description of environmental education when he says:

> ... education for the environment should be a shared speculation with 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.
>
> Huckle (1990:30)

According to Fensham (1978:66), one feature of environmental education that makes it responsive to the needs of the environment is its holistic nature. As environmental issues are multi-faceted and interdependent, they cannot be tackled successfully by an education system characterised by single disciplines, as is the case of the South African curriculum. In the same manner it cannot be just another subject added to existing curriculum but needs to be integrated in all the disciplines to allow for its holistic nature. Contemporary education is characterised by the gap between formal

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education and the real world, and between the activities in the school and the real needs of the community in which the school is situated. In order to respond successfully to the environmental crisis some of these critical challenges have to be considered.

3.4 Environmental education as the response to the education crisis in South Africa

The educational problems that South Africa faces are discussed in Chapter 2. South Africa is undergoing a transition from an education system that Schreuder (1995:18) blames for what he calls *mis*education of the previously privileged minority and *poor* education of the majority of the population of South Africa to one that will meet the needs of the country. The *poor* education among the majority of South Africans which Schreuder (1995) says led to, among other things, high illiteracy levels and wasteful lifestyles, could in turn be said to have contributed significantly in making South Africa a country with the world's highest crime rate today. Schreuder (1995) further says that *mis*education in South Africa, as in other parts of the world that have been subjected to Western education, manifests itself in different but equally destructive forms. These include the alienation of people from their environments, environmental illiteracy, consumerism, wasteful lifestyles and the exploitation of natural resources (Wa Thiongo 1986, Schreuder 1995).

The educational transition that is taking place involves the replacement of a purely academic education, which benefited a few with a practical one that has the capacity of benefitting all the citizens of South Africa. Moulder (1991) recognises the need for education planners to take Maslow's hierarchy of needs into consideration when drafting curricula so that they are relevant to the needs of their countries. In highlighting the tendency of less developed countries to import education systems of the more developed countries he says:

> Plans for schooling that come to us from the Northern Hemisphere are driven by a greater awareness of growth needs than of basic needs. But most South Africans have basic needs that are more powerful and demanding than their growth needs. If their schooling does not provide them with a practical

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> education that enables them to meet their basic needs for food, water, shelter and work, it leaves them at the bottom of the pit of under-development, from which they cannot escape.
>
> Moulder (1991:10)

Carl (1995:26) also recognises the need to tackle the issue of relevance when he says, "Curricula must be relevant and developed on an accountable basis in order to comply with the demands and the needs of the country and the community."

Environmental education as a process of social change, with its holistic and action-oriented practice, may provide an alternative to the former academic curriculum as well as support this transition from a content-based to an outcomes-based education. Schreuder (1997:463) says that environmental educators have for many years encouraged contextualization of learning within local contexts and have provided opportunities for the development of outcomes-based, problem-solving activities in local communities. These, according to Schreuder (1995:8), "often have a socially critical approach and have given rise to the development of a strong criticism of the elements of modernity entrenched in the formal curriculum". One of the local initiatives aimed at responding to the environmental and educational crises is the Schools' Water Action Project (SWAP). The issue, water pollution, like other environmental issues, is multi-faceted and therefore, may be approached in a multi-disciplinary manner and be accommodated in various school subjects. SWAP provides for this multi-disciplinary learning as aspects of different school subjects are integrated in the investigation of water pollution.

3.5 SWAP as an environmental education process

SWAP is the local version of a river-monitoring programme that is being established in schools worldwide. GREEN (Global Rivers Environmental Education Network) in Michigan, USA, developed the first model. SWAP was initiated in the Faculty of Education at the University of Stellenbosch in 1992. SWAP involves both high schools and primary schools and there are two different water analysis kits, the high school SWAP kit and the primary/junior SWAP kit.

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The junior water analysis kit consists of:

- a tin containing the scientific equipment that is needed for the various tests (See appendix 5 for what is inside the tin)
- a bugdial, which is used for identifying water life
- 8 large A1 posters
- the teacher's guide which contains worksheets, hints and reminders on how to use the kits.

a) seven of these posters are called laboratories and they are:

Room 1 The historical research lab

Room 2 The catchment area and health risk lab

Room 3 The waterlife lab

Room 4 The oxy-bac lab

Room 5 The pH lab

Room 6 The nitrate lab

Room 7 The turbid lab

b) The eighth is filled when the results of the 7 experiments are reviewed.

3.5.1 The rationale for SWAP

Water is one of South Africa's most precious and rare resources (see section 1.4.2). Its careful management is therefore crucial. Davies and Day (1998) blame the water crisis on ignorance and the attitudes that people have to water and advocate education to conscientise people towards the issue. One way of doing this is to involve everyone, especially communities to participate in the process. The need for members of local communities to be empowered in order for them to take development into their own hands and to value the natural resources on which their lives depend is recognised in the White Paper on Water Supply and Sanitation Policy for South Africa (Department of Water Affairs and Forestry, 1994:17):

> The enormous backlog of basic water and sanitation services to local communities will not be reduced unless the communities themselves are empowered to undertake their own development. This is not possible if they do not have the skills required which they can only acquire through training and experience.

SWAP, with its emphasis on community involvement, has the potential of fulfilling this need. Schreuder (1993:2) says that SWAP does this by making the scientific tools

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(once a specialty of experts) accessible to ordinary people. He says that the project introduces learners to real life and local environmental issues (in this case polluted rivers) and the kits are used to test the biological, physical and chemical quality of rivers flowing through their neighbourhoods. The results of these tests reflect human activities in a catchment area of a river. According to Schreuder (1993:3), rivers serve as a reliable indicator of community and social features such as needs, socio-economic development and disposition toward the environment and conservation. As rivers pass through different communities, their quality is significantly altered both by natural and artificial causes and changes that occur as a result of human activities upstream affect communities downstream. The project has the capacity to relate different communities located in the same river catchment to one another and cooperate in effort to address the problem of water pollution. The school is seen as being in the service of the community and as a channel for addressing the needs of the community (Schreuder 1993).

3.5.2 The aims of SWAP

The aims of SWAP as stated in the SWAP teachers' guide include the following:

- To stimulate awareness of environmental issues by focusing on a river or dam, this going hand in hand with the development of the ethic of caring;
- To provide the learners with knowledge about natural resources, the effects of pollution, river ecology and scientific processes;
- To provide learners with the opportunity to apply scientific principles to a real project;
- To promote educational thinking processes as well as aiming at accurate results.
- To promote cross-curricular development and approaches to teaching;
- To encourage self-motivation and self-reliance in pupils as well as providing a sense of ownership and cooperation;
- To encourage a liaison with other schools, institutions and organisations;
- To encourage hope among the learners of their ability to solve rather than to feel victims of environmental issues.

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According to Schreuder (1997:465), SWAP as an environmental education process, has a potential of familiarising those teachers and students who participate in it with teaching and learning activities which support active learning, critical thinking, problem-solving, co-operative and process-based learning. He says that through their involvement with SWAP, teachers are better equipped to develop more appropriate and relevant curricula. SWAP then, has the potential of being a significant response to a number of crises and issues that are associated with education. It can legitimately be said to contribute towards preparing teachers for the role they are expected to play as curriculum designers in the new outcomes-based education.

3.6 My plan to do action research at Kayamandi High School

Through my work with SWAP at Kayamandi High School, which started in September 1998, I came to develop a strong interest in the school. I worked with Standard 8 pupils as part of the biology project which their teacher (Mr. M) wanted them to do. Even though the school is a high school, we decided to introduce the Junior SWAP kit as it involved simple tests. We felt that the learners needed this foundation and because we thought that they were unlikely to have done unsupervised work before, we wanted to keep the tests as simple as possible. The importance of the history and the catchment area analysis labs was also acknowledged.

During this period I realised how the learners became completely absorbed in the various activities of the project and took their own initiative to work together in the several groups they had formed according to the different labs. The students showed eagerness to go to the river and start doing the different tests immediately. The progress in the lab work was impressive and, even though there seemed to be a lack of proper organisation and communication between group members, it was clear that they were doing their best. One teacher when interviewed commented that she had been surprised to see students work on their own without a teacher's supervision. This contradicted teachers' claims that one of the reasons why they did not do fieldwork was that students were not interested in practical work (see section 5.2). Both their questions and discussions that we had with them showed that the pupils not only enjoyed doing practical work outside the confinement of their classrooms, but

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also that they might be developing an interest in the pollution of the river as well as gaining a broader environmental awareness.

This was quite unlike our first days together when I discovered that none of them knew the name of the river that flowed so close to the township and which they crossed from time to time on their way to and from town. The poor state of the river, which was more like a foully drain, was one of the things that had shocked me on my first visits to Kayamandi. This environmental eye-sore which appeared quite obvious did not seem to be seen in the same manner by the pupils who may never have seen the river in a better state before. Schreuder's point that a river serves as a reliable indicator of community and social features such as needs, socio-economic development and disposition toward the environment and conservation is borne out by the case of Kayamandi. Residents of Kayamandi, like most previously disadvantaged communities of South Africa who live in poverty, are generally hardly conscious of environmental concerns. This disposition Ramphele (1991:7) attributes to the "white insensitivity of black survival needs" and says, "environmentally unsound policies in black residential areas discouraged the evolution of ecological consciousness amongst the majority of blacks."

The students who were involved in SWAP seemed to develop an interest in environmental concerns and the history of their township. One member of the historical research lab, who had interviewed his grandmother about the changes in the state of the river and the possible causes over time, revealed that the river was much cleaner than in the past. This led to a discussion of the possible reasons and the part that was played by the neighbouring factories and industries. I found that SWAP stimulated environmental consciousness among the pupils and felt that because the project was so valuable, all learners should have an opportunity of being involved in it. The only way I felt that this could be achieved was by involving other teachers as well. I discussed the idea with Mr. M, who was pleased with the initiative as he felt that it would benefit not only the teachers and the students but also the school and the community. I saw that doing my research at the school would also be beneficial to me as I was familiar with the research site, there was at least one interested teacher to work with me and there was an environmental issue to investigate. Another

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advantage was the proximity of the school to the University of Stellenbosch, where I was doing my studies.

I decided to do action research with the biology and geography teachers to investigate the possibilities of using SWAP to integrate water pollution into the teaching of ecology. I chose these two subjects because their syllabuses have an ecology section, both used the environment as a medium of instruction, I am a biology teacher, and I wanted to keep my study small. I had a strong belief that the involvement of the teachers would make the school community environmentally aware and this would rub off on to wider community. My assumption that change would take place in a linear fashion was not only mistaken but it also represented a positivist stance that I took into my study. I thought that change could be planned, results predicted and that it could be imposed from the outside.

To gain access, I wrote the letter to the principal of the school dated the 6th of November 1998 (Appendix 3), in which I informed him of my plan to do research at his school with some of the teachers (geography and biology), the purpose of the study, how I intended to carry it out and the anticipated duration. I personally delivered the letter and was welcomed warmly by the principal. I introduced myself and explained to him what the study would entail. He seemed pleased that I had chosen his school to do my research and he promised to inform the teachers concerned of my intentions. I negotiated with him a date for me to meet with teachers. We agreed to meet on Tuesday the 12th of November at 2.00 p.m. I had about a week to prepare for the workshop. As the day approached, I became nervous as I was not sure of what to expect. Even though I had been to the school several times, I had not had a chance to meet other teachers. I thought, what if the teachers did not want to join the project? What if I did not manage to get the message across? My supervisor, Mr. Lesley Le Grange, kept reassuring me not to worry about the number of people, saying that even if two people joined, the number would still be enough to get my study going. I still could not relax, quantity was very important to me at that time. I was also not quite aware of how demanding the workshop would be. What transpired in this introductory workshop is discussed in Section 5.1.

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3.7 Summary

This chapter discusses the historical development of environmental education as a response to the environmental and educational crises both internationally and nationally. The educational ideologies that inform the different approaches to environmental education are also discussed. A discussion of SWAP as an environmental education initiative involving a socially critical approach and its potential benefits is also given. It also outlines my personal motivation for conducting this research project and its aims thereof. In the next chapter I discuss the research orientation and methodology. The methods of data collection employed, rigour and ethical issues are also discussed.

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CHAPTER 4

RESEARCH ORIENTATION AND METHODOLOGY

4.1 The methodological approach of the study

According to Connole (1993:19), different approaches to research begin with very different assumptions about reality and knowledge, which in turn flow through into very different ways of constructing research problems and choosing methodologies. Hart (1993:108), who says that different approaches to educational research are informed by different theories of educational change, supports her. Connole (1993: 21) also says that research in education is shifting from the traditional positivist approach to newer approaches due to the failure of the former to bring changes in education as well as solve everyday problems teachers face in their work. This shortcoming is attributed to the failure of this tradition to recognize the complexity of human interactions in education.

Hart (1993:108) says that many debates about the traditional way of studying human behaviour have paved the way for more subjective research methods. He further says that vigorous debate over the relative merits of quantitative and qualitative approaches has "enlivened the discourse of the educational research community once devoted almost exclusively to issues of tests and measurement, reliability and validity, and the search for universal rules for education and generalisation as theory". This has led to a paradigm shift in educational research where the trend is for methods that allow for a "practice-based research that is context-specific" (Hart 1993:109).

While quantitative researchers depend on objective tools for gathering data, qualitative researchers on the other hand, depend solely on their senses. The human instrument is the most important distinguishing factor between quantitative and qualitative studies. According to Cantrell (1993), qualitative researchers observe, interview, record, describe, interpret, and describe settings as they are. The use of self as an instrument of study does not concentrate on checking behaviour but looks for its presence and interprets the significance. In my attempts to do my research I tried to keep abreast of some of the shifts in thinking and understanding which have occurred

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in education in general and environmental education specifically. The type of qualitative research I decided to use was collaborative action research. This kind of relationship normally takes place between outside researchers and practitioners (teachers in educational settings). Collaboration in action research means that both the practitioners and outside researchers share in the planning, implementation, analysis and reporting (Mckernan 1991, Hart 1993).

According to Carr and Kemmis (1986:145) action research as rooted in critical-emancipatory terms is:

> ...a form of self-reflective inquiry undertaken by participants in social situations in order to improve quality and justice of their own practices and the situations in which they are carried out.

Some of the features of action research as described in Cohen and Manion (1980:179)

1. It is situational: it is concerned with diagnosing a problem in a specific context and attempting to solve it in that context.
2. It is usually collaborative: practitioners and researcher(s) work together.
3. It is participatory: team members take part directly or indirectly in implementing the research.
4. It is self-evaluative: modifications are continuously evaluated within the ongoing situation, the ultimate objective being to improve practice in some way or another.

Action research can be used in a wide range of contexts. In educational research projects range from single teachers who aim to improve their practice to research teams made of practitioners and outside researcher(s). Many researchers (Carr and Kemmis 1986, Cohen and Manion 1980, Mckernan 1991, Hart 1993, Davidoff and Van den Berg 1990) cite the following as important justification for the use of action research in the context of the school:

1. Improvement of practice
2. Improvement of understanding of practice
3. Improvement of situation in which practice occurs.

4.2 The rationale for action research

Environmental education is a relatively new area of study in education. Debates about what should constitute research in education have also spilled into this field of study. I attempt to justify my choice of method by firstly looking at what environmental

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education entails. Gough (1993:178) says that environmental education involves cultural as well as textual criticism and that the development of criteria for such criticism should be paramount for educational inquiry. Hart (1993: 117) writes,

> The rhetoric of environmental education focuses on improving the quality of life on the planet. Therefore environmental education has a revolutionary purpose of transforming the values that underlie our decision-making from those that aid and abet environmental degradation to those that support a sustainable planet in which all organisms can live with dignity. This contrasts with the traditional purpose of schools, which have been charged with preserving the existing social order by reproducing the norms and values that currently dominate political, hence environmental, decision-making. Environmental educators have not seriously engaged these contradictions between environmental education and schooling.

Given the nature of contemporary education and that of the environmental crisis, as a researcher in environmental education, I found it important to use the approach that has the possibility of not only reforming but also transforming education. Some of the qualities that make action research most suitable for use in environmental education research as formulated by Altrichter (1993:50) include the following:

> **Action research incorporates reflection and development of educational values*.* This it does by broadening the concerns of practitioners from only being concerned with instrumental questions (how can I promote learning?) to include also the intentional ones (what kind of learning am I promoting thereby?).
> * *Action research is characterised by holistic, inclusive reflection*
> Practitioners in action research are not only concerned with checking whether their actions were instrumental in achieving the objectives (e.g. as stated in the syllabus), but they also examine whether unexpected side-effects result from the action strategy or not. This quality is crucial for professional development of practitioners as they will not only be mere implementers of curricula but will also be in a position to be more responsible for not only how students learn but also what they learn. In this way they will be more aware of the values they instill in their learners and whether these are appropriate, also whose interests they serve. Teaching then will not only be a passive value-neutral activity but a political activity.

Action research requires teachers to be reflective and committed so they can critically examine their own practices and improve them. This is in contrast to the traditional approaches to professional development where outside experts were looked upon to research and provide solutions that would lead to necessary changes. School-based

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research in the form of action research attempts to place control over the process of educational reform in the hands of the teachers.

4.2.1 Steps in action research

According to McNaught and Raubenheimer (1991:3), "What distinguishes action research from more interpretive strategies is the concept of praxis". This is action which, is informed by theoretical ideas and by the process of reflection on existing practice. Theory and reflection feed into the formulation of new practice. According to Davidoff and Van Den Berg (1990:32) action research involves cycles of several stages of planning whereby a problem is formulated and ideas on how the problem can be tackled are investigated; acting, where new ideas are tried; observing which is about gathering information about the action step and; reflecting on the meaning of gathered data and critically evaluating the consequences the action. The knowledge of one cycle informs action of the next cycle. The process is repeated in order to refine and amend one's action. Each cycle of action research is referred to as the 'action research spiral'.

4.3 Methods of data collection

I decided to use the following sources of data production: the research journal, observation and field notes, the questionnaire, interviews (semi-structured), informal discussions, photographs and workshops.

4.3.1 The questionnaire

Questionnaires are normally associated with quantitative forms of research due to their rigidity (in terms of small spaces and fixed responses). They can also be used for qualitative research however, if they are designed with more flexibility. I decided to use a questionnaire (Appendix 4) as one of my sources of data to get biographies of participants in the study. I gave out my questionnaires to the teachers on the 12th of November 1998 after the first workshop I held at the school.

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4.3.2 Participant observation and keeping a research journal

According to Cohen and Manion (1980:103), actions and behaviour of people are a central aspect in any research study, a natural technique is to watch what they do, to record and then describe, analyse and interpret observed behaviour. My observation involved watching what participants did and what they said, these I noted down as field notes and later typed into my journal. To avoid observational biases, I tried to recount all the biases, prejudices and distortions I brought with me into the research. I kept reminding myself that I was not doing this research to prove or disprove any theories but to let theory emerge as the research proceeded.

The research journal is a kind of a journey taken through a learning experience. In a journal, unlike in a diary, one not only notes down experiences but also reflects on them and show how experiences change the pre-existing patterns of thought. I started keeping a journal from August 1998 when I started working at Kayamandi High School with SWAP and the pupils. In my journal I recorded my observations, experiences and interpretations. Later on, when I decided to do research with the teachers, I included my frustrations, doubts and feelings of despair, queries, and moments of understanding and growth. I found that my journal helped me realise how I progressively learnt and grew. I was able to keep track of my long and blurred journey in learning and understanding what research was about. This way of learning enhances active learning and reflection. I found that it is not only compatible with action research, which emphasises action and reflection but also with environmental education, which claims that true learning (capable of bringing about change) occurs only when participants are actively involved in the learning process.

4.3.3 Interviews

Altrichter (1993:47) contends that researchers in the qualitative paradigm assume that "multiple realities may be socially constructed and that different actors may hold, sometimes, different interpretations about what is happening". I decided to use the semi-structured interview to collect these different interpretations of reality that practitioners held. I used semi-structured interviews (Appendix 5) especially because of the freedom they give the interviewer to change the order of the questions, the wording, the amount of time and attention given to different questions. These allowed

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for probing as an interviewee raised interesting issues that I had not considered but which proved to be relevant. I conducted my first interviews on Monday, the 23rd November 1998.

4.3.4 Workshops

One of the characteristics of collaborative action research is its insistence on democratic decision-making. According to Ashwell (1997:4), workshops as a research tool provide for a non-threatening, democratic atmosphere where participants can air their views, construct meaning and make decisions together. The position of the researcher in a workshop is crucial, as Ashwell (1997) warns, workshops have the capacity of making participants change their views as they engage in dialogue with others, provided that the researcher does not take the position of power and participants truly feel that they are not being manipulated. The attitude that one carries with them into the research process will determine the success or failure of not only this valuable method of research, but also the whole research process. It is only when participants are able to trust the researcher that they can open up and share their thoughts.

I held my first and only workshop on the 12th of November 1998. The purpose of the workshop was to inform the teachers, among other things, about my plans to do research with them and the purpose of the research. During this workshop, there was a lot of tension, which could be attributed to the distrust of the teachers and nervousness on my part.

4.3.5 Informal discussions

I depended on informal discussions throughout the research to investigate those contextual issues about which I was ignorant but which impacted on my research. I also used these to find out different perspectives other people had on things that had come up in my review of literature but were difficult for me to understand.

4.3.6 Photographs

I used photographs to collect visual data about the context of my study.

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4.4 Rigour in action research

With the understanding of research as a political enterprise, Lather (1986:67) advocates for reconceptualisation of validity within *openly ideological research.* One of the criteria that she offers that, to a large extent, was achieved by my research is "construct validity". She says that this type of validity is especially important in action research where the main aim is to "conscientise" practitioners. This happens when practitioners find themselves having repeatedly to change the "schemas" they used of understanding social reality and subsequently having to modify them. Research would be said to have construct validity if it changes participants' view of reality after having been involved in it. I found that during my long research journey I had to confront my "schemas" about social reality and change the way I had thought about research as well as learning to understand its complexity. Going through this process as a novice researcher with no clear understanding of action research, I realized from the obstacles that came my way how delicate research with people is. What I learnt, however, was not experienced by the teachers with whom I had planned to do collaborative action research. Due to the problems I encountered when I tried to implement the research project (discussed in Chapter 5), the teachers never got to be involved in the research process and therefore through this process of critical reflection the way I did.

4.5 Ethical issues

4.5.1 Gaining access

As mentioned in the last chapter, to gain access to the school, I wrote a letter to the principal of the school. Gaining access, however, is more complicated than this; a lot of negotiating is needed to build relationships of trust. Having been given permission by the principal to do research at the school did not guarantee cooperation from the teachers who were to be participants in the study. Ashwell (1997: 4) points out that because of the constraints under which black teachers in South Africa work, the need for building up relationships of trust is essential to the developing of action research. My experiences during my attempts to implement my research project (discussed in Chapter 5) confirm this observation.

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4.5.2 Information to subjects

Rhodes University (1995) drafted some guidelines on the ethical issues to be taken into account when doing research with people. These include introducing oneself and one's concerns as fully as is relevant, indicating the role that one's collaborators would play, details of the project and so on. Accordingly at the workshop held on the 12th of November 1998, I identified myself as fully as possible in terms of:

- My association with the university of Stellenbosch as an M.Ed. student doing the research in partial fulfillment of the requirements for the degree;
- The nature of the research, its purpose and possible usefulness;
- The fact that teachers would participate voluntarily;
- The nature of the relationship between them and myself as collaborative researchers;
- The anticipated benefits to them as participants, the learners, the school and the community at large;
- The anticipated duration of the study.

4.5.3 Informed consent

I decided to give the teachers time to reflect on the discussions that took place in this workshop and then interview them individually after a period of one week. During these interviews each teacher indicated whether or not he or she wished to take part in the research project.

4.5.4 Anonymity of subjects and confidentiality of data

Altrichter (1993:52) emphasises the importance of confidentiality when he says that, "data are 'owned' by the persons who have provided them. They must not be made accessible to third persons without authorisation by their 'owners'." He also touches on the principle of anonymity and says that anonymity is not enough when concrete issues are investigated. While the researcher is formally protected, local people will not have any difficulty in recognising the actors. This became a very important ethical issue in my research particularly after I had changed my research topic. I depended on a few teachers as my main sources of information about some sensitive contextual issues.

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4.6 Summary

This chapter provides the theoretical background to the design of the research project. A motivation for the location of the research project within a socially critical methodology and a description of an action research is given. The research techniques used in the research study and issues of validity and ethics are also contained in this chapter. The next chapter is about my experiences during my long journey through research and their consequences thereof.

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CHAPTER 5

RESEARCH FINDINGS

5.1 Phase I

November 1998

5.1.1 The introductory workshop

My first workshop with the teachers of Kayamandi High School was held on the 12th of November 1998. I had taken with me transparencies, notes, several SWAP kits, accompanying teachers' guides, 'labs' (both blank and those filled by the groups we had worked with) and refreshments. I announced my arrival to the principal who assigned one teacher to take me to the classroom where I was to hold the workshop. I asked her to organise a television set and an overhead projector for me. I must point out that I did not find this teacher friendly at all and this made me more nervous than I already was; I initiated small talk but it was not appreciated. What this teacher told me, however, was that she had been involved in SWAP before and she did not sound very enthusiastic about it. She went back to the staffroom and informed her colleagues about my requests. The comments and laughter that followed told me that I was not going to have cooperation from the teachers, the thought of which did nothing to improve my state.

I had plenty of time to organise things and prepare for my presentation. At around 2.00 p.m., the geography and biology teachers I was to address started coming in; the hostility that showed on the faces of the women especially could not be disguised. I tried to stay as calm and in control as possible. I started by introducing myself and explained the purpose of my visit; I told them about SWAP and what I had been doing with the pupils and how they had enjoyed working with the project. I then gave them a brief background of SWAP and its objectives. I showed them the kits and the labs their learners had filled in and explained how they (the labs) and the accompanying teachers' guides worked. I explained my reasons for having chosen to do my research at their school and made it quite clear that I had to do the project to meet the requirements of my studies and that participation would be voluntarily. As I

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continued, I could tell that the teachers were not interested in what I was saying. When I demonstrated how the kits worked, some of them did not even make an effort to look nor did they pay any attention to the demonstrations, but instead kept looking at their watches.

At the end of my demonstration I invited questions and comments. One of the two people who had questions (Mr. O.) wanted to know what would happen after all the water quality tests were performed, whether there would be any kind of follow-up and what I expected from them as teachers. The other one, Mrs. L, alleged that SWAP had been implemented all these years in Stellenbosch schools but the rivers were no cleaner, and that it had not worked in white schools, and wanted to know why it was expected to work in Kayamandi. My presentation had not been well received; I felt that people thought I was there to sell SWAP. However, I explained that SWAP was not meant to clean rivers but was meant to improve education. I told them that what I proposed was for us as teachers to find out how we could adapt our teaching so that it is relevant to the needs of local environments and that we could use SWAP to assist us. Still I could not convince Mrs. L who stated blankly that nobody would join my project, and passed statements like, "Nobody will come to your next workshop". She informed me that after all it had not been their choice to attend the workshop in the first place; they had attended because they had been told to do so by the principal. This made me understand the hostility that I felt; the teachers had not come to the workshop of their own free will but felt obliged to do so because the principal had instructed them to. This began to say something about the culture of the school that was beginning to unfold itself to me at this early stage of my research. Nevertheless, I reminded the teachers that they were not forced to join the project and that if they were not interested, I would be happy to interview them afterwards with a view to understanding the reasons behind their decision. This seemed to calm things and I proceeded to inform them on how I planned to conduct the research. I explained that the kind of research I wanted to do with them was called action research and that we would work collaboratively. I explained that I had never been involved in such a study before and that I, like them, was also going to learn. I promised to tell them more about action research in the next workshops.

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As we had our refreshments I gave out the biographical questionnaire (Appendix 4) that I had prepared for them to complete. Most of the questionnaires were so poorly filled that I could not get any valuable information from them. I decided to interview the teachers individually and I informed them that during the course of the next two weeks, I would come back for this. Three men who had been quiet throughout the discussions came to me at the end and told me that they understood what the project was all about and that they were interested in participating. I was very grateful as I felt that at least I had made an impression on some people and that made me hopeful. At the end of the workshop I still had to clarify to Mrs. L and Mr. O what I meant to do with them and after a lot of convincing my previously skeptical questioners finally understood what my research was about. The two told me that they would love to participate and Mrs. L promised that she would also convince the other teachers to join. This came as a relief to me as I was aware of how influential these two were among the teachers. I felt some of my confidence and strength, which had been drained by the tension and the uncertainty coming back.

Later when I discussed the whole episode with my supervisor, we were able to reflect on the relationship between knowledge and power. Mrs. L and Mr. O had been through previously advantaged education systems (being "white" and "coloured" respectively), while their colleagues had been through Bantu Education. This may be the reason why they were so dominant and influential. Even though they were quite skeptical about the project in the beginning, unlike the other black teachers, they did not totally reject it. I also later came to learn that unlike the other teachers, they were well informed and kept themselves abreast with the latest issues; they also differed from their colleagues in the way they taught and the resources they used. They managed to make their subjects more practical and set up projects that took learners out into the community to investigate real life issues. For instance, Mrs. L had her pupils of domestic science link what they learnt in class about housing to the housing project which was run by the municipality in the township. I was happy that these two were finally convinced and willing to work with me as I felt that they would in turn be able to convince the others. These two teachers ended up being my main contacts at the school.

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5.1.2 The interviews

On Friday, the 20th of November 1998, I went back to the school to make interview appointments with the teachers I intended to work with. I arranged to hold them on the following Monday, Tuesday and Thursday and I was to interview 13 teachers in total. At this time the teachers were busy marking examination papers, I had to fetch them from various classrooms to make the appointments. I could see that some of them did not want anything to do with me anymore, but I was very patient with them. I asked them to choose the time slots that suited them and promised that the interviews would not take longer than 15 minutes. I planned to record the interviews and they did not object to this. Most of the questions I took from the questionnaire and just elaborated where it was necessary. I also tried to make the questions as open-ended as possible (Appendix 5).

On Monday, the 23rd of November about 11.00 a.m. I went to conduct my interviews. At the time the teachers were still very busy invigilating examinations and marking. Because of this, some of them could not keep their appointments and some interviews had to be hurried. One of the first people I interviewed was Mrs. L, whose interview was the longest. I enjoyed talking to her and was intrigued by her broad knowledge. Generally, on this first day the interviews went smoothly and I managed to conduct four. On the second day things did not go so well, some people had forgotten their time slots and I had to fetch them from wherever they were and wait for long periods. The third day was even worse; I had to beg some of the teachers to give me just ten minutes of their time, at the same time reminding them that we could drop the interviews if they did not feel like being interviewed, but they still kept referring me to later slots. In the end I scrapped two appointments I really wished I had not to go back to the school again. Some teachers just simply ignored me; I felt unwelcomed as if I was nagging. I could not decide whether the waning interest was because I had chosen the wrong time for the interviews or whether the teachers were just not interested. What I found positive, however, was that by this time my relations with other teachers were improving and most of them were quite open with me and called me by my first name. I was encouraged through the realisation that even though some of the teachers, especially the women, seemed to regard me as a nuisance, there were those who started to regard me as a friend.

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I managed to conduct ten interviews in all and I started transcribing them just before I left for the December vacation. This part of my work I enjoyed immensely; by the time I went on vacation, I had compiled the results and I was ready to give them back to the teachers the next time we met. Phase I of my study had gone well so far, though I could already sense some future tensions.

5.1.3 Information obtained from the interview

1. (a) Qualifications of the teachers.

- Diploma in Teaching
- Secondary Teachers' Diploma (STD),
- STD and B.Comm.,
- STD plus B.A.
- STD, B.A. and B.Ed.
- National Teachers' Diploma
- B.Sc. and B.Ed.
- B.A. and HDE
- B.Sc. Ed.
- B.Sc. plus an Honours in biochemistry and a Masters in pharmacology.

1. (b) Teaching experience

The teaching experience of the teachers ranged from 3 months to 11 years.

2. In-service training (in ecology)

90% of the teachers had never been to any kind of in-service training while 10% had attended in-service training on management skills.

5.1.4 Summary of the interviews

The summarised responses to each question (in bold) follow:

Q. What is your main reference and guide for teaching ecology?

70% of the teachers used the prescribed textbook and the syllabus as the main guide. 30% supplemented this with magazines and newspaper articles to keep up to date with

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the latest information. More rarely resources like the encyclopaedia, computers were used.

Q. Do you do any fieldwork or projects when teaching ecology? If yes give examples and if no, give reasons.

50 % of the participants did fieldwork and projects when teaching ecology. The examples included:

- Letting learners go outside the classroom, chose an ecosystem and sketch it
- showing them models in class
- sending them out into the community for small projects
- Taking them into the town to identify features they saw on the map, for example, the CBD area.
- One teacher did a project on housing development and health issues in Kayamandi, the aim being to link teaching with the local environment as much as possible.

The other 50% did not do fieldwork or projects in their teaching of ecology, for the same reasons as those given for the question below.

Q. Do you experience any problems when teaching ecology, especially when doing practical work?

Some of the responses included lack of resources, overcrowded classes (ranging from 40 to 80 per class), time and financial constraints, the timetable and short periods, the syllabus and the pressure of examinations. One teacher mentioned that ecology did not form a very important part of the present syllabus. Some of the problems had to do with the pupils. The pupils were said to lack interest and discipline; they could not link what they learnt in class with what happened outside; pupils were not used to working on their own and lacked the basic skills like reporting, analysing and interpreting results, and also did not understand some of the ecological concepts.

Q. Do you use the local environment when teaching ecology?

60 % of the teachers did not use the local environment for teaching ecology. 40% who did used the school grounds, the local town and the township.

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Q. Do you see the benefits of using the local environment compared to taking excursions?

The responses included proximity and relevance; it would make understanding easier as learners would relate what they learnt in class to their own environment and everyday life and it would give them practical experience. This would also enable learners to care for their own environments and keep them clean.

Q. How do you view and understand environmental education? How would you define the environment?

There was a wide range of responses to this question. The environment was described as the physical surroundings, things that were in nature, living and non-living and a place where people lived. Some answers were quite broad referring to the social, the macro, the financial and the political environment. Answers were also as close to home including friends and family.

Environmental education was seen as learning about things in nature and how they should be treated, awareness of the surroundings (plants, animals, water) and how the surroundings should be treated, teaching people about environmental issues. It was also seen to be part of the learning process and not a single subject; it was about people managing the environment and preserving it and about changing peoples' attitudes towards the environment. It was about knowing the environment and teaching people about the importance of other organisms and how they should be taken care of, it was about benefiting, taking something from the environment and also giving back to the environment.

Q. What do you see as the most pressing issues in Kayamandi?

All the interviewees mentioned pollution as the most important environmental issue in Kayamandi. The different kinds mentioned were air pollution from burning coal in the closely packed shacks, water pollution from improper sanitation and littering. Other pressing issues included overcrowding, overpopulation, crime, vandalism, teenage pregnancies and AIDS.

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Q. Would you be interested in taking part in this research project?

Almost all the teachers interviewed were interested in taking part in the project except two.

Q. The research is supposed to take the form of a series of workshops in the first term of 1999; when do you think is the most suitable time for holding them?

Tuesdays and Thursdays at 2.00 p.m. were seen as the best days for holding the workshops.

5.2 Phase II

January 1999

I arrived during the week that the schools reopened, on the 18th of January. I called Mr. O to tell him that I was back and promised to call him later in the week so we could arrange our first meeting. In the days that followed I sent him a fax that he did not receive as the secretary had forgotten to inform him about it (I did not realise then that communication breakdown, was to be one of my major problems). In the fax I asked him to tell the other teachers that I would visit the school on Friday, the 29th of January at 11.15 a.m.

On the agreed date, with refreshments, photocopies of the feedback of the interviews and a summary of an article by C.N. Watson, 1990, entitled *Teaching biology in the next century,* I went to Kayamandi. The agenda of this first workshop was: to choose the day on which the workshops could be held; to give the teachers the compiled results of the interviews. I also intended to share with them Watson's article in which he discussed the aspects of American education that made an impact on him, and compared this to South African education. He said the former was aimed at the average citizen while in South Africa schools were bound by highly academic syllabuses, which were fundamentally irrelevant to most South Africans. His focus was on the biology syllabus, but I wanted us to relate this to other subjects as well. He cited Mike Rosholt in a paper entitled 'Education – a mismatch' in which he showed that in South Africa, 85% of the population did not benefit from the highly academic curriculum that dominated education. Watson (1990) then invited us to question at

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whom we were aiming our education and at whom we should in the future. I wanted this to be our starting point for the next workshop.

To my disappointment, I was told that the timetable for the day had been changed and that at 11.15 a.m. teachers had to be back in class as they had already had their break. I was only able to see Mr. O who had a free period and left the material I had brought with him to distribute to the other teachers. We agreed to postpone the meeting to the next Thursday, the 4th of February. Even as I left this material, I had doubts about whether this was a right move,

> I don't think I am making the correct decision, maybe I should have waited to give the teachers the material personally when I do get to meet them. I had already had problems arranging this meeting and I get the feeling that the secretary gets tired of me phoning. I am beginning to feel discouraged, but maybe it is too soon for that, things will probably get better next time. Journal Entry 29/01/1999.

The following week I telephoned the school several times but could not get the people I wanted to talk to. I left the message with the secretary to tell either Mrs. L or Mr. O to remind the teachers of the meeting on Thursday. That day also, I only got to talk to Mr. O who claimed he had informed the other teachers about the meeting. Other teachers either just ignored me or gave me surprised looks when I told them I had come for the meeting and told me that they had not been informed about the meeting. They had either departmental or sports meetings to attend. At this point I was really getting discouraged, but Mr. O advised me to ask Mrs. L to fix the appointments for me, as she was the head of the biology department and a member of the administration board. He felt that she would be in a better position to know ahead about the other meetings and give me the appropriate dates on which we could fix ours. I took the advice and approached Mrs. L, who told me to wait until after the 17th of February, by which time she anticipated that all the departmental and sports meetings would be over. She also promised to talk to the principal about my problem in order to make my meetings more official. I had to go to Lesotho before this time but hoped to be back by the 17th. We exchanged phone numbers and thought that it would be the best way to communicate as Mrs. L also acknowledged that we could not depend on the secretary to deliver messages. We fixed the next appointment for the 18th of February, which was a Thursday.

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I could not be back from Lesotho on time and was not able to keep the only appointment that the teachers themselves had managed to keep. After this I could not get anything done, as there was a series of cancellations of my meetings for one reason or another. Time was running out and I became genuinely concerned; the few times that I went to Kayamandi, I felt ignored and the women were still hostile towards me. At this point I was beginning to regret having chosen to do action research; I felt that if I had chosen to do an interpretive study I would not have had to depend so much on the cooperation of teachers. I also began to doubt Mrs. L: was she a friend or was she acting against me? Why did she have to cancel the meetings all the time if she really wished me well? I began to think along racial lines:

> Is it possible that Mrs. L does not wish me well because I am black? How could I have forgotten her reaction in that first workshop? She did seem genuinely happy about the project afterwards, but can I trust her? Would she willingly have helped me if I had been white instead? If that is the case, why then are these fellow black women so hostile towards me; is it because I am a Mosotho and not a Xhosa? The men are so nice to me and seem to want the project to be a success. Are they really interested in the project and its benefits or would they be doing this more out of compassion?
>
> Journal Entry, 13th March.

On further visits to the school, the other teachers were still unapproachable and I wondered what had caused this attitude as I tried to be as nice to them as I could. I had a lot of questions to which there seemed no answers. My reflections in my Journal entry of 28th March were:

> Can we really depend on teachers as agents of transformation in this country? Is there any hope of teachers being curriculum designers as Curriculum 2005 expects them to with these attitudes they reflect? Teachers are used to being given finished curriculum material to implement; how can they be expected suddenly to become curriculum designers? How can teachers be empowered when they do not want to take part in activities that may lead to their professional development?

These questions were really worrying to me: what is the future of education in South Africa? Towards the middle of April, my morale was really low, and I did not want to have anything to do with the school; that is when I decided that my research had failed. At around the same time, Professor Schreuder became interested in my progress and invited me to talk about it. I related my story and frustrations to him, telling him that I felt that the teachers' attitudes were getting in the way of my

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research and that I planned to change the topic as I felt that the research had failed. After hearing me out, Prof. Schreuder agreed with me that I abandon my attempt to introduce SWAP into the school. Instead of giving it all up, he advised me to look into the attitudes of the teachers and the causes behind them; we both felt that this would be an exciting issue to explore. I talked to my supervisor about my change of plans, and he also felt that I should not force an outcome of the SWAP project. He pointed out that in most collaborative studies there were normally contrasting views and assumptions between university researchers and the teacher participants. He advised me to think back on the assumptions I had before doing the research and relate them to the context. We agreed that my problems were that of gaining access and that I document my experiences and frustrations about gaining access and make that the new focus of my study. I felt enthusiastic again and looked forward to going to Kayamandi High School once more.

With this renewed energy, I started jotting down all the possible barriers that may have blocked my research endeavour. I went back to my journal and interview results to look at the themes that had emerged since I had started getting involved with Kayamandi High School both in my work with the learners and the teachers. Possible reasons that occurred to me included the following:

Ethnic problems i.e. race, language: what role could belonging to a different ethnic group and speaking a different language play, given the history of South Africa?

Gender issues: could being a woman have anything to do with the different treatment I got from the male and the female staff?

Professional jealousy: did teachers feel I was using them to get my degree while they would not benefit much from having participated in the study?

Little interest in the community: does the fact that most of the teachers do not originate from Kayamandi and may not have the interests of the community at heart have any role to play?

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Viability of SWAP: could the problem be with SWAP itself which was said to have "failed in the white schools" and is now being brought to Kayamandi?

Temporary teachers and rationalisation that is taking place at present: were some of the teachers not interested in joining because they did not have job security?

The negative effect of Bantu Education: what role did Bantu Education play in disempowering teachers from taking any initiative to do things themselves?

The situation that exists in most black schools: could teachers still be struggling to deliver basic education and therefore perceive SWAP as an extra burden?

I decided to go back to the school and talk to those teachers who were friendly, to find out why in their perception the project had failed to take off. Prof. Schreuder had advised me to be as casual as possible, chat to the teachers individually but not prepare any form of interview schedule, carry no piece of paper, nor try to record what they said. In these discussions I just listened and later wrote down what I had heard and observed in my journal.

The first person I was able to talk to was Mr. X, whom I met at a mutual friend's barbecue. The setting was casual enough and I decided to use the opportunity. He wanted to know when we would be starting the project as, according to him, some of the teachers were still interested in the project and had been waiting for me. I was surprised by this and told him so. The problem as he saw it was that of communication; teachers never got to know when I planned to meet them. He gave me a somewhat different picture from what I had of the situation. About the hostility that I felt from some of the women, he told me that they also behaved that way to other teachers, especially the male staff. He did not think that this had to do with my not being Xhosa speaking and he also somehow ruled out the gender issue. I still had a very strong feeling though, that being a woman played a significant role as I got a totally different treatment from the male staff. I still wanted to get other people's perceptions about this one. He described Mrs. L, whose sincerity I was beginning to doubt, as a "very nice, hard-working and open person who accommodates

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innovations". He said that she was certainly very supportive of my project. As a head of department she was very inspiring to members of her department; he was certain that she could encourage her teachers to join the project. He mentioned however, that there was a power struggle going on between her and the head of the geography department. Taking part in the project might be intimidating to the latter and might raise issues that she might feel would challenge her position and he did not think that she would encourage her teachers to take part. He advised me to identify those teachers who were willing to work with me and give the project another try. As I reflected on our conversation later I could not help wondering:

> Could this be the reason why this woman behaves so strangely towards me and ignores me the whole time? This is one of the people who had mentioned that she did not think she would be able to join the project, as she would not have time due to the nature of her work. She told me that as a head of department she had a lot of administrative matters to attend to, but is Mrs. L not a HOD too? How could this internal conflict affect my research? I am beginning to feel that there are a lot more of these internal conflicts that may affect my work. Is there a possibility that I may have blown things out of proportion about Mrs. L; how could I have developed such a different perception about her? This should be a lesson that my own attitude may have also got into the way of the research. Much as some of the teachers may have their own problems, I have to deal with my own attitude if I want to get a correct picture of the situation; otherwise I will make wrong assumptions and conclusions.
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> Journal Entry 01/05/1999.

I decided to get the views of other teachers and made appointments with two of them for Wednesday, the 3rd of May 1999. On the agreed day both teachers were not at school and had not even bothered to inform me. However, I decided to forget about these two and move on. Fortunately I met Mr. T, a temporary teacher, who had also been quite enthusiastic about joining the project. When I interviewed him, he had not been sure if his 3 month-contract would be renewed for 1999, but he was definite that if he were successful, he would join the project. As we talked, he blamed me for not having turned up for that first appointment to which Mrs. L had managed to summon teachers and said that afterwards communication became a problem; the teachers never got to know of my appointments. Most of the announcements were made in the staffroom where most of the teachers, including him, did not spend their time; they only went there for meetings. He did not think that the teachers were as busy as they claimed and told me that what he had noticed about some of them was that they were

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good at making promises they could not fulfil. When I asked him how he thought we could solve the problem of communication, he suggested that I still keep Mrs. L as the contact for the following reasons: she was reliable and trustworthy; she was a member of the management committee and; she could use her position as a HOD to encourage members of her department to join. My later journal reflections included the following:

> What a start! Can I really depend on these people who do not respect appointments and other people's time? I admit that I am also to blame for that day that I never turned up. I could have phoned, but I just assumed that since the other appointments had failed this one would be no different, but I had been wrong. At the same time we have to move on. Mr. T also differs with me about Mrs. L. I must really try to be more open and give her the benefit of the doubt. He thinks that Mrs. L is still the most appropriate contact, but how long do I have to wait until the teachers are completely free? Why have so many of my appointments, that I arrange in such good time always been cancelled at the last minute? I understand that teachers have a lot of obligations at school and I do not want to tamper with the school's matters but isn't there a way in which I can be squeezed into the busy schedule?
>
> Journal Entry, 03/05/1999

The other person that I talked to was Mr. M, my first contact at the school. From our conversation I learnt that he was also frustrated by the amount of work he and the few other hardworking teachers had to do. He had introduced a lot of innovations and got little if any support from other staff members. For instance at that moment he had agreed to talk to me for 10 minutes as he had to move between his office and the computer room where students from the University of Stellenbosch were helping the pupils with computer skills. Since he was the one who invited them to the school, he had to take full responsibility alone; no other teachers, not even the Mathematics teachers bothered to help! I told him of my frustrations and that I felt like dropping the project. He sympathised with me but begged me not to drop the project. I told him that I did not want to tamper with the school's programme but that unfortunately some of my appointments were cancelled because emergency meetings called by the administration clashed with mine. He promised to support me in a move to set aside a day when I could hold my workshops that would be honoured even by the administration. This excerpt comes from the entry that I made that day, the 5th of May, 1999.

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> There is indeed a culture in the school that is not conducive to development. If teachers cannot support each other, how can I expect them to work with me? Mr M is a deputy principal and one would think that as a part of the school leadership he would have some influence on the teachers; why is this not the case? Could it be that all the authority lies only with the principal and, if this is so, what role does he play in organising his teachers and making sure that work is shared equally?

This lack of cooperation among the teachers was beginning to emerge as a block to any kind of innovation in the school. In my mind I went back to the conversation that I had with Mr. X on the 1st of May when we were discussing the feelings I had about the women being negative towards me; he told me that they behaved that way even towards the administrators. This was strange to me as I felt that the principal's authority should count for something if the school was supposed to run successfully. At the same time at that introductory workshop in November, 1998, Mrs. L had told me that they had attended my workshop only because they had been instructed to do so by the principal, and I could sense a lack of interest that confirmed this. This was the reason I had decided not to involve him in my future interactions with teachers, lest they felt forced to attend my workshops.

As I talked to teachers, issues kept coming up that made me want to dig deeper in order to get a more coherent picture of the situation. Despite these problems, with the support I had been promised so far, I had gained strength and felt that indeed I must give the project a try. I felt that I only had to identify those teachers who wanted to work with me and get it running as soon as I could.

I had made an appointment with Mrs. L for the 9th of May. At the agreed time and place I found Mrs. L waiting for me. She seemed genuinely happy to see me and I wondered how I had ever doubted her. When I asked for her opinion of what had gone wrong, she was certain it was not due to any failing on my part. The main reason she felt things had not gone as planned was time. In 1998, when the teachers agreed to join the project, they had thought that they would have time as they were supposed to stay at the school until 3.00 p.m. according to the new regulations of the Department of Education. It had turned out that the extra hour was not to be free as they had anticipated; teachers had been given additional work. In the past, the school

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was not run properly, but this year they were under pressure from the Department of Education to improve. Basic things like teachers' punctuality and classroom management for example were to be enforced more strongly. The intervention of the Department of Education also put teachers under a lot of pressure to improve examination results. Subject advisers visited the school from time to time and teachers were really kept on their toes. She felt that a project like mine did not have a good foundation at the school yet; teachers were just not ready at that moment. She mentioned as an example the SAILI project that was also running at the school, which she said, faced similar problems to mine.

Another issue that she brought up was the lack of commitment from the teachers. When I told her about my plan to drop the project and other teachers' suggestions that we should give it another try, she said I should be careful not to waste my time as "teachers are good at making promises they cannot fulfil". When I told her my feelings about the female staff, she was surprised because she experienced the opposite; she got on better with the women than with the men. However, she remembered an unusual case that involved a Mosotho woman (Mrs. X), who had recently joined the staff. She said that among the female staff there were two groups, the group that was originally from Kayamandi and the Kayelitsha group (a black township between Cape Town and Stellenbosch). When Mrs. X arrived she became friends with the Kayamandi group but then the friendship stopped after some time and was replaced by a tension that even came up in meetings. She described Mrs. X as a dynamic person who was full of new ideas, unlike her counterparts. When she raised a good point, the other women would be critical until it was dismissed. Her feeling was that the other women felt threatened by Mrs. X, who was more flexible and innovative, as she was more exposed and experienced than her colleagues who had been born in Kayamandi and worked there and nowhere else. Mrs. L felt that this negative reaction to Mrs. X was because she was so active and innovative that her colleagues feared that she would disturb their peace and expose their unwillingness to change. Mrs. L had given me a lot of useful information on which I later reflected. At this point I was beginning to feel I was getting to understand the background to my problems. Mrs. L had just verified the feeling I had that teachers were not ready, that they were still grappling with very basic things, and that getting involved in the

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project would only be perceived as a burden and not as an empowering activity. From the discussion it had also become clear to me that the problem was not really with SWAP as such, but as Mrs. L had pointed out, any kind of innovation had little chance of succeeding in the school then. I decided to talk to Mrs. X and made an appointment with her for the 11th of May.

I met Mrs. X as agreed. She really made a good impression on me. Mrs. L was right about her; she was an inspiring, lively, confident and optimistic person. She told me that she had heard that I wanted to do my research at the school, and wanted to know what had gone wrong. I told her it was what I was trying to find out and that maybe she could help me. From our conversation I learnt that she had 11 years' teaching experience and had obtained her Teachers' Diploma at Bethel College of Education in Transkei, where she majored in accounting and business economics. After her training she had taught in 6 different schools because her husband, a minister of the Seventh Day Adventist Church, had been transferred six times. Before she came to Kayamandi she taught in Queenstown. She explained her experiences at the school, which confirmed what Mrs. L had told me. She told me that even though her colleagues rejected her ideas, she was not put off but worked with any teacher who was willing to work with her or the pupils. She also thought that her colleagues, who she said still taught Bantu Education, and were very proud to be locals, hid their ignorance and lack of experience behind an arrogance. She advised me to identify those teachers who really wanted to work with me and volunteered to join the project herself. From the number of projects she had done with the learners, she had realised that they liked doing practical work and felt that it was unfair to deny them this opportunity. In her teaching, she tried to make her subject as practical as possible and designed projects that would take the learners into real-life situations like visiting banks and interviewing managers.

Mrs. X was to be my new contact at the school. She promised to get the interested teachers together and set a suitable time for me to address them as a group. I was really confident this time that the project would go ahead and promised to call her to arrange a meeting.

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This last part of phase II of my research journey is about the problems I encountered even after I had found a new contact who was very motivated and determined that we succeed. Mrs. X had given me the number of her mobile phone at which I was to contact her. I had tried to contact her several times both on this number and at the school to make an appointment to see her. I managed to get her on the morning of the 25th when she told me I could see her on that same day. When I got to the school slightly after 2.00 p.m. she had assembled a group of six teachers. For the first time since the introductory workshop in November 1998, I was able to talk to a group of teachers. Some of them claimed they were busy but Mrs. X told them that she was also busy but had had to make time. In this meeting Mrs. X mentioned the three things that teachers should ask themselves: firstly, do they think the project is useful and do they like it; secondly, how can they make the project accessible to their students and the community; and lastly, how can their involvement in the project develop them professionally as teachers? She believed that if one became actively involved in any activity one came out of it a changed person. As I sat there and listened to her, I could understand why other teachers despised and felt intimidated by her; she was running the whole show so well and everybody was listening intently as she talked. There and then we managed to set a date for our next meeting, which was to be the following Tuesday, 1st of June at 2.00 p.m.

For this meeting I photocopied a chapter out of the book by Davies and Day entitled *Vanishing Waters*. It is about the water crisis and cites cases from various countries; South Africa and specifically, Cape Town included. It had made quite an impact on me and I hoped it would have the same effect on the teachers. I also planned to discuss briefly environmental education as a response to the environmental crisis, the transformation in education that was taking place in South Africa and the ways in which environmental education overlapped with the new curriculum. I also planned to discuss action research as the research method we were going to use. At that time I was reading a lot about action research and looked forward to engaging in it as I felt that it was by far the most suitable way of involving teachers in activities that would make them reflect on their work with the hope of improving it and empowering them professionally. Everything seemed to be turning out so well and I was pleased.

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On Monday the 31st of May, the day that preceded the meeting, I decided to take the photocopies of the agenda of the meeting to the school personally. Mrs. X was not at school, but I met Mrs. L who did not know about the meeting but informed me that since it was the last day of the month and teachers had just got their salaries, the school would be out earlier than normal the following day. The purpose of this was to give teachers time to attend to their private matters and prepare for examinations, which were to start on Thursday, the 3rd of June. I decided to postpone my meeting to the same day and left the message with Mrs. L but also promised to call Mrs. X.

I could only get Mrs. X on the 3rd of June after several attempts to reach her. She did not think coming to school that day was a good idea. Teachers were busy with examinations; besides they had voted just the previous day and there was still a lot of excitement about this. We agreed that we cancel this one but hold at least one meeting before the winter vacation.

My journal entry reads:

> There seem to be a lot of obstacles every time I feel I am finally getting something done; shall I really be able to get to talk to the teachers? Shall I meet the deadline at the rate at which things are moving? Maybe I made a good decision when I decided to forget about initiating the project? Even though I see the possible benefits of action research, I am beginning to feel it is not a good idea to choose this research method when one has limited time and is not based at the site of the research. If only the teachers could allow me at least to address them once, I will make the best of it and maybe they would want to get more and then things would take off from there.
>
> 03/06/1999

I was losing hope but decided to be patient. I talked to Mrs. X on the evening of the 10th to find out if she thought we could still have a meeting before the vacation. At this time people were busy once again marking examinations and I did not think it would be a good idea to go to the school. Mrs. X had the same feeling and we agreed that it would be better to postpone our activities to the second semester. I felt relieved and told myself that I should never lose hope. I therefore stayed as optimistic as possible and concentrated on writing my thesis.

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5.3 Phase III

July 1999

Immediately after the schools reopened, on the 27th of July, I went to the school and met Mrs. X who dropped a bombshell. She had talked to the teachers who had been interested in joining the project to find out how they could organise themselves better to get the project going. Most of them taught Standard 10 and still had a lot of work to cover for the examinations; they therefore felt that they would not have time for the project. I assured her that I no longer intended doing the practical part and that our meetings would only be theoretical discussions and that I would need only an hour of their time per week. She promised to inform the teachers about this and tell me their response as soon as she could. She also felt that we should persevere.

Another major obstacle that hindered me further was the impending national strike involving all departments of the public sector; teachers were also to take part. Among other things salary increases were the issue and a settlement could not be reached, as the government's offer was less than what COSATU demanded. Nobody knew how serious the strike would be, but people were taking the necessary precautions. For the teachers, this meant working hard in order to cover the syllabus so that when examinations approached, they would have done most of the work. There was a defiant mood at the school and people's emotions were high; I did not want to add to their frustrations so I decided to wait. Mrs. X felt the same way. At this point I finally admitted to myself that I would not get anywhere this way. I decided that it would be better not to force matters and instead to continue with my original plan of investigating the obstacle that had blocked my way. An excerpt from my journal entry reads:

> I have gained a lot of insight into research and the associated problems. I may have failed to get my message across but I have not failed the lesson. My research has not failed; if there is a way in which it has passed, it is through me. It has brought a lot of insight into matters associated with doing research with people and each experience has been accompanied by a lot of growth. I will come out of this process a better and wiser person and will write my story.
>
> 22/08/1999

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Some time after this, with the issue of the strike still dominating the news, I decided to visit the school. I still had to find out about the history of the school and take a few pictures. I was not really keen to do this and kept postponing the visit until I reminded myself that my negative attitude would not do anything to improve the situation but, could only make matters worse. The school did not have any records of its past and I had to depend on a secondary source, Mrs. L had suggested that for this I could talk to a teacher who lived in Kayamandi and had taught at the school since the early 1990s.

On the 13th of September I set off to the school and met my old friends who were happy to see me. I also met some of the women who continued to act as if we had never met before. Mrs. L took me to Mrs. M's class; I was not sure what reception to expect and I was a little worried but received a warm welcome. I introduced myself and explained to her how I would like her to help me; she was willing to help me and we agreed to meet on Friday, the 20th of September. I left the place feeling that I liked Mrs. M and felt bad about my prejudice earlier. I thought that she was one of the lively teachers at the school and seemed to like her job, I felt that she was one more person who could be an asset to the school.

On Friday, the 20th of September, I met Mrs. M in her class; she happily related the history of the school, as she knew it. She spoke with a lot of vigour and I could see that she was doing what she enjoyed, even though at times when she talked about the events that had touched her, she became quite emotional. It was as if by recalling all the instances she was reliving the past, during which she had fought so bravely to reach the stage where she was. What she told me about the school is summarised in Section 2.6.1

I was still doing a lot of reading on Bantu Education and Teacher Education in South Africa. I was gaining a lot of insight on how the system had disempowered teachers and specifically black teachers by making them instruments of policy and taking away from them control over their work. Hartshone (1992) wrote it so well; one could not help but sympathise with the victims of Bantu Education. I was beginning to understand the teachers and their behaviour and my perception and attitude towards them changed incredibly. This I discussed with Mrs. X on one of my visits to the

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school. She was happy that I had come to this realisation. All in all she said that teachers had been through a lot of pain in the past. They had had high expectations of the present government and felt betrayed that their grievances were not being heard. They regarded their profession as important and were doing their best to survive the pressures they were under but they felt that their input did not match the returns especially in terms of remuneration. She quoted incidences of violence among the teachers as indicating the accumulated frustrations among the teaching personnel. She pointed that teachers were insecure and attributed the causes to, among other things teacher appraisal, and high expectations from the department, the administration, parents and pupils. Undisciplined students who became quite unruly and had no respect for their teachers further harassed teachers. Another source of pressure on the teachers, she said, was the common Matric paper which demanded even more from the teachers, who had to try harder to raise the learners to the level of the paper.

She pointed out that teachers needed more support than they were getting. She felt that in-service training could be helpful if the manner in which most of the programmes were run could be improved. According to her, the SAILI project that was running at the school had little value because of the co-ordinators who did not take the context and the background of the teachers into consideration. She felt that the programme did not address the real needs of the teachers and treated the school as an ideal one in an ideal setting. Though it had been running for some time, nothing much had changed in the way teachers taught.

5.4 Summary

This chapter is about my research study at Kayamandi High School which started in November 1998. I have divided it into three phases. Phase I, which includes the introductory workshop, whose purpose was to negotiate access with the participants; the interviews from which I gained a distinct feeling that my study was feasible. Phase II is about the problems I encountered when I tried to implement my study which influenced my decision to change my research focus. Phase III is about further experiences that made me implement my decision and my growth as a researcher.

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CHAPTER 6

DISCUSION OF FINDINGS

6.1 The interviews

From the interviews, it can be concluded that teachers have different perspectives of both the environment and environmental education. The relationship between the two and ecology also does not seem to be clear to them. The methods employed to teach ecology do not comply with the practical nature of the subject. Teachers depend on the prescribed textbook and the syllabus as their main guides and resources and teaching is largely confined to the classrooms. The reason for this may be that in their training teachers were not exposed to ecology, and for those who were, it was only as part of their general biology course. None of the teachers had any training in teaching ecology specifically. This is in contrast with what Reddy (1994) and Wagiet (cited in Reddy, 1994) found in their studies; they found that 83% and 71% of their participants had some exposure to ecology during their teacher education. Presumably these two researchers were working with teachers who had been trained under a different education department. Being classified as "coloured", they had gone through a more privileged education system than the teachers of Kayamandi High School. What is surprising, however, is that none of the participants in my study mentioned their lack of exposure to ecology, both in terms of content and teaching methodology, in either their academic or professional training as handicapping them in the teaching of ecology.

Another issue of concern that came up in the interviews was the lack of fieldwork by teachers, a deficiency which may be attributed to the teachers' lack of training in this method of teaching and to the culture of the school (which I discuss later in this chapter). As Hale (1986:182) says, most teachers recognise that ecology is a field-based subject but they do not provide learners with adequate field experience. Further, the ecological investigations undertaken by some Kayamandi teachers who claim to be doing fieldwork are very shallow and are mainly restricted to the school surroundings which, they view as the local environment.

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Reasons given for not doing fieldwork include lack of resources, overcrowded classrooms, time constraints with regard to short periods, teacher work loads and exam-orientated syllabus. Fido and Gayford (1982:27) argue that the most important factor determining the amount of fieldwork students are exposed to is the attitude and the interest of the teacher. As one teacher mentioned, ecology does not form a very important part of the syllabus and this may be one of the reasons why teachers do not take it seriously. The question of examinining also plays a very important part in determining both the content and the methods of teaching employed. Haberman (1992:11) says that all schools offer four curricula and these are: what is in the textbook; what the teachers actually teach; what students learn and the fourth, which is also the dominant one, is what is included in examinations. He further says that this is the area where teachers have little control, as testing is in the hands of experts. As examinations mostly put emphasis on factual knowledge, even though fieldwork is such an invaluable method of teaching, it is largely ignored. Schreuder (1993:1) explains, "teachers discover very early in their careers that pupils will still pass examinations even if they do not do fieldwork".

Some of the teachers mentioned pupils' lack of interest and discipline as reason for not doing fieldwork. However, this may be because there are so few opportunities for pupils to do things that stimulate their interest. On the contrary one teacher, when interviewed (see Section 5.2, page 59), said that the pupils were very keen to learn new things and enjoyed taking part in the projects she organised which involved practical work outside the classroom. This teacher even commented that the pupils needed to gain confidence in the teacher. Pupils, she said, needed motivated teachers who made their subjects practical so that they were more appealing to the pupils. I share the views of this teacher; as mentioned in Section 3.6 the learners were very excited about SWAP and did most of the work on their own. From my personal experience as a teacher, I feel that most of the concerns mentioned by the teachers are legitimate but not insurmountable. I agree with O'Donoghue (cited in Reddy 1994) who said that the reasons given by teachers tended to be a defensive justification for not doing fieldwork, an avoidance reaction behind which there were other more deep-seated beliefs and practices. Teachers having been through a system that never stressed the importance of these practical teaching strategies in their own education,

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would not see the value of employing them in their own teaching, as they had still passed without them.

The teachers' inadequate training seems to be compounded by their lack of any form of in-service training (INSET). If in their pre-service training teachers had not been trained to teach ecology, the provision of INSET courses in ecology would have assisted them to cope better with teaching the subject.

6.2 Issues that emerged during the last two phases of the study

From the informal interviews and discussions I had with teachers about obstacles that arose to the study as it had been planned, it was revealed that though some of the problems might have been with the project itself, there were other contextual issues. The greater obstacles seemed to have been communication breakdown, time constraints, the culture of the school and teacher training. These are discussed below.

SWAP (see Section 3.5.1) has been described as having the potential of assisting in the transition from the present academic and content-based curriculum to a more practical outcomes-based curriculum. Schreuder (1997:462) argued that after participating in SWAP teachers were equipped to develop more appropriate and relevant curricula and that education in such schools had improved. Schreuder (1993:5) further said that the process of integrating the project into the curriculum presented fewer problems than anticipated and that the project had evoked very positive attitudes. While it might have been relatively easy to launch SWAP in some schools with it being easily adopted by teachers, this was not the case in my experience with Kayamandi High School teachers. Fullan (1991:47) warns that in any initiative for change, "the uniqueness of the individual setting is crucial; what works in one situation may or may not work in another". My frustrations and ultimate failure to implement a SWAP-related project at the school can be attributed to several factors which all stem from the relevance or irrelevance of the project to the needs of teachers. What became important to me in the end was to investigate why SWAP with all its potential benefits for teachers was received with such lack of enthusiasm in Kayamandi High School.

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Hargreaves (1994:12) says, "At the heart of change for most teachers is whether it is practical, will this change work in this context, for these teachers...?" The issue of practicability, as Hargreaves says, also has to do with "whether the change fits the context, whether it is line with the teachers' interests and whether it helps or harms their interests". I came to learn from the difficulties that I experienced when I tried to implement my project that, even though the project was so obviously important in its capacity to address the issue of water pollution which was so evident in the Plankenbrug River, it did not meet some of the more pressing needs of the teachers in the Kayamandi context. The fact that the pupils liked working with SWAP did not necessarily lead to the teachers also adopting it; they had more pressing concerns. The project came to be perceived as an extra burden on top of the demands made on the teachers by the Education Department and the administration of the school to improve their work.

Some of the questions that Fullan (1991:37) proposes teachers should ask about any change that is initiated from outside are: does the change address any important need, and is there evidence that the practice worked elsewhere and achieved results? Apart from being perceived as a problem, some of the teachers did not believe in SWAP. As mentioned in Section 5.1.1, one teacher pointed out that SWAP had been running in the schools in Stellenbosch for many years but rivers were no cleaner. Even though I tried to rectify this perception of the purpose of SWAP and my project, this initial lack of belief in the project can be said to have further contributed to the apathy of teachers. It is possible that even before teachers attended the introductory workshop, they may have already decided that they were not going to join the project as they felt that it was a waste of time. The fact that the project did not meet some of the important needs of teachers came up as I was talking to teacher, Mrs. L., who confirmed that teachers were not ready for the project. She said that teachers were still trying to improve basic things like classroom management, punctuality in class and assessment skills, to mention but a few. The project then could have been perceived as too costly in terms of time and input while not promising much in return. This raises a question of how change can best be initiated. As an outsider, I was concerned about the problems of water pollution and felt that it was important to do something about it. This top-down approach, however, has been problematic. At the

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same time, can teachers and schools be left to their own devices and programmes until they come up with development initiatives themselves? Strategies of change, balancing top-down intervention and bottom-up aspiration, are more influential than I realised when I planned my study.

6.2.1 The culture of the school

One of the issues that could have militated against the implementation of the project was the culture of the school. Hargreaves (1994:166) distinguishes four types of teacher culture, namely individualism, collaboration, "contrived collegiality" and "balkanisation". The culture of the teachers at Kayamandi High School can be described as having aspects of individualism and balkanisation. The former was evident in situations where some teachers worked alone in the confinement of their classrooms and only came to the staffroom for meetings. Balkanisation in teaching, according to Hargreaves (1994: 213), occurs when "teachers work neither in isolation nor with most of their colleagues, but in smaller sub-groups within the school". Even though I did not get deep enough to identify all the various sub-groups that existed among the staff, I was able to identify a few. These were the more formal ones like the subject departments and the informal ones that were formed along lines of gender (women teachers forming cliques), place of origin - the Kayamandi group, the Khayelitsha group and the outsiders.

The dominance of the balkanised culture posed serious problems to the development of collaboration initiatives among the teachers. As Hagreaves (1994:214) says, once balkanised cultures are established, members become permanently attached to their groups and identify themselves more with them than as teachers of the same school. Interactions among staff members belonging to different sub-groups seemed to be rare and this inhibited cooperation among staff members. One example of this was the case of Mrs. X (see Section 5.2) whose innovative ideas were rejected just because she was considered an outsider and did not have support among her colleagues. The tensions that seemed to exist between the HODs of geography and biology (see Section 5.2) could be cited as another example. As I was mainly involved with members of these departments, I came to realise that very little interaction if any occurred between these two departments, even though some members belonged to

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both the departments. I did not get as closely associated with the HOD of geography as with the head of biology due to the fact that the former had indicated earlier that she would be unable to join the project. The HOD of biology, on the other hand, had been enthusiastic about the project and had promised to encourage members of her department to participate in it. This shows how much influence those in leadership positions have in the process of change. The attitudes of these two teachers towards the project played a significant role in determining the consequent participation of members of their departments. From further interactions and discussions I had with the HOD of biology, I learnt a lot about how she worked with members of her department. She encouraged them to work together and offered support and guidance when necessary. By being open to members of her department, she found, they were also keen to share experiences and reflect on their work with the aim of improving it. I found that she was hardworking and dedicated to her role and encouraged this spirit in members of her department. This culture of cooperation and collaboration, however, did not permeate the whole staff, and the two departments seemed to be run along very different lines. Therefore, even though the culture of the school could not be said to be collaborative, there were pockets of collaboration which only needed to acknowledged and supported to permeate the whole staff. The general lack of support and cooperation among the teachers made it difficult for them to cooperate with me as an outsider. This non-collaborative culture could also be said to have contributed to the lack of support for the project.

What I also realised was that the principal offered very little support to his teachers. The principal plays a big role in determining the culture and climate of the school. According to Pannell and Alexander (cited in Shongwe 1992) a climate for change in a school is necessary to effect change. Robinson (1994:254), said that many principals do not provide the necessary leadership and support to allow for curriculum innovation and that this disempowered even the most enthusiastic teacher. He is supported by Fullan (1991:137) who says that for any innovation to succeed in the school, the administration has to support it, and that the interest of the teachers alone is not enough. From what I observed, hardworking teachers were frustrated and seemed to have very little if any support from the principal (see Section 5.2). Without the much needed support of the principal, even those motivated teachers could be

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easily discouraged. As I mentioned in Section 3.6, even though I had been working with SWAP in the school for some time, the principal was not aware of this. Even after I had informed him of my decision to work with the teachers, he never once asked me about my progress and did not even know whether the project had succeeded or not.

6.2.2 The background of the teachers

There seems to be a high correlation between the culture of the school and the way teachers were socialised into the teaching profession. The extent to which teachers are disempowered during their training is discussed in sections 2.5 and 2.5.1. It was speculated that this could be due to the technocratic approach to teacher training which emphasises, among other things, mastery of subjects and teaching methods without preparing teachers adequately to cope with the complexities of teaching and learning. Teachers were not prepared to be in control of their work and have always had to depend on experts to tell them what to do and give them curricula to teach. It was argued that the majority of South African teachers, especially black teachers, have been through a system which was not interested in developing professionals but instruments of policy. Being products of Bantu Education themselves, teachers had been through a process of teacher domination and transmission modes of teaching. When they later joined the teaching profession themselves, these practices had been so inculcated that teachers questioned neither their practice nor whose interests they served.

In this passive state, teachers never had to take any initiative to do things themselves. The study demanded that teachers reflect on their work and take responsibility for their own professional development, a critical exercise that had never been part of their outlook. Teacher development had always been a matter that was conducted for them by professionals without them being encouraged and sufficiently prepared to be actively involved in the process. Perhaps my innovation would have been taken seriously if I had been working in association with an authority the teachers recognised or under the Department of Education. I also think that if after getting involved in the project the teachers could get some sort of certification, they would have been more interested in participating in the study.

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6.2.3 Teachers' workloads and remuneration

As mentioned in the last chapter, one of the reasons that teachers gave for their failure to participate was the amount of work they had to do in the time available. Teachers were under pressure to meet the increasing requirements of the Education Department (see Section 5.2). One teacher mentioned that much more was expected from the teachers than before, and that the extra time that they had thought they would have was spent trying to meet these demands. Because of this she felt that my project had come at the wrong time for the school. The demands that the syllabus and examinations put on teachers also came up as a challenge to the implementation of the project. Ultimately teachers did not have time to dedicate to extra work.

The scope of teachers' work generally and especially teachers in black schools is very broad and the conditions under which they work are not satisfactory. Not only are they expected to do their job effectively in the classroom, but they are also supposed to deal with needs like discipline and a general lack of respect for teachers (sections 2.6 and 5.3). It was argued that teachers also had to be accountable to all stakeholders in education, including pupils and their parents, who most of the time did not understand the problems that teachers faced. The work of teachers has intensified incredibly but they work under very stringent conditions. This, as one teacher mentioned (see Section 5.2), was frustrating to teachers who felt that their profession was not taken seriously. Failure of the pupils to perform well in examinations was taken as proof that teachers were not doing their work. The teachers' plea for salary increases, was met by resistance from the government. This treatment demotivated teachers and made them less committed to their work. This demotivation could be one of the reasons teachers did not want to be involved in any activity that they felt would only increase their workload while it did not contribute to their remuneration.

6.3 The choice of action research as a method of study

Walker (1990:58) mentions that action research in South Africa can draw on the experiences of places like Britain, Australia and America. She warns, however, that it should be recognised that such work developed in a totally different context from that of South Africa in terms of "teacher autonomy, better working conditions and situations less contested and volatile than those of South Africa". Much as the

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method could be said to be most appropriate in black schools, where it has the capacity of engaging teachers in critical investigation of their practice, Walker (1990:61) says that in the context of Bantu Education it "needs to be part of a much wider process of addressing curriculum analysis and change". This provides a challenge to action research in the South African context but does not rule out the possibility of the method to contribute to better classroom practice. Another limitation of action research, despite its strengths, is the one pointed out by Altrichter (1993:53). He points out that while one of the strengths is its ability to integrate teaching with research, this could be very demanding and is incompatible with the existing working conditions of teachers and with the culture they work and live in. This happens to be the case with Kayamandi High School in contrast to the more favourable culture described above. As I mentioned earlier, the culture of collaboration is not well developed in the school and the dependence of action research on collaborative interactions among teachers, could render it unproductive.

My experience with trying to implement action research of a participatory kind at the school also made me question the appropriateness of the method for an M.Ed. study which had to be completed within a specific time. Ashwell (1997:2) says that action research requires a great deal of negotiation with participants. She points out that this is especially the case with black teachers, due to the constraints under which they have to work. Strong relationships of trust have to be established in order for this kind of research to succeed. I only had a few months in which to do my research after which I was supposed to start writing my thesis. This meant that I did not have enough time to establish strong relationships of trust. Another obstacle was that I did not spend as much time at the research site as I needed to in order to meet the requirements of action research. I went to the school at most twice a week and my visits were brief. To the teachers I was just an outsider - not their partner in research. I would recommend that for M.Ed. purposes, action research, where the practitioner researches his or her teaching with the aim of improving it , may be more useful and less demanding instead.

This brings me to the criticism of my approach to action research. Altrichter (1993:43) says that action research is considered ethical if the "research design,

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interpretation and practical development produced by it have been negotiated with all parties directly concerned with the situation under research." The manner in which I conducted my research was not democratic from the beginning; I did not involve the teachers in the initial steps of action research as was supposed to have happened. I did the planning alone and did not give teachers a chance of identifying the issue that they would have liked to investigate but I set my own inquiry. Even though I was also concerned with engaging teachers in reflection and action and; and though the issue I had decided to investigate was important and relevant, it was not one of the most pressing issues to the teachers at the time. My own interests (completing my studies) were paramount and dominant from the very beginning. Any attempts that I could have made to democratise the process could still not make the teachers feel they owned the research. This is always the dilemma in doing research of a collaborative nature where there are usually conflicting interests between teacher practitioners and university-based researchers. This dilemma is pointed out by Feldman (1993:343) who claims that it is almost impossible to have equitable collaboration between university researchers and teachers as they often have different goals when they take part in this kind of partnership.

The assumptions about change that I took into my research can also be challenged. As I mentioned earlier, when I embarked on my study, I wanted to contribute to change, but did not have a clear understanding of change. My view of change as a linear process showed a lack of understanding of change as a complicated process involving a lot of negotiation and commitment from all the concerned parties. As Janse Van Rensburg (1996:70) says, "Most new action researchers enter the research situation with a set of positivistic assumptions about the nature of change..." I believed that change could be planned and results foreseen and predictable; the twist of events that took place however opened my eyes to the complex nature of change.

Through my involvement in an M.Ed. degree and my research study, I have grown from a novice researcher with no clear understanding of what research and particularly research with people entails. All the experience of frustrations and unintended outcomes contributed to my growth and professional development. At one point I felt that my research had failed because it had not worked out the way I had planned it but,

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later I began to accept and understand that in action research one does not have to control the direction and the outcome of one's research but should let these emerge during the course of the study. My research has not failed, it has succeeded by contributing to my own growth and professional development. From the rich experience I had during my research endeavor, not only has my view of change and research changed, but also my view of social reality as complex, dynamic and constructed.

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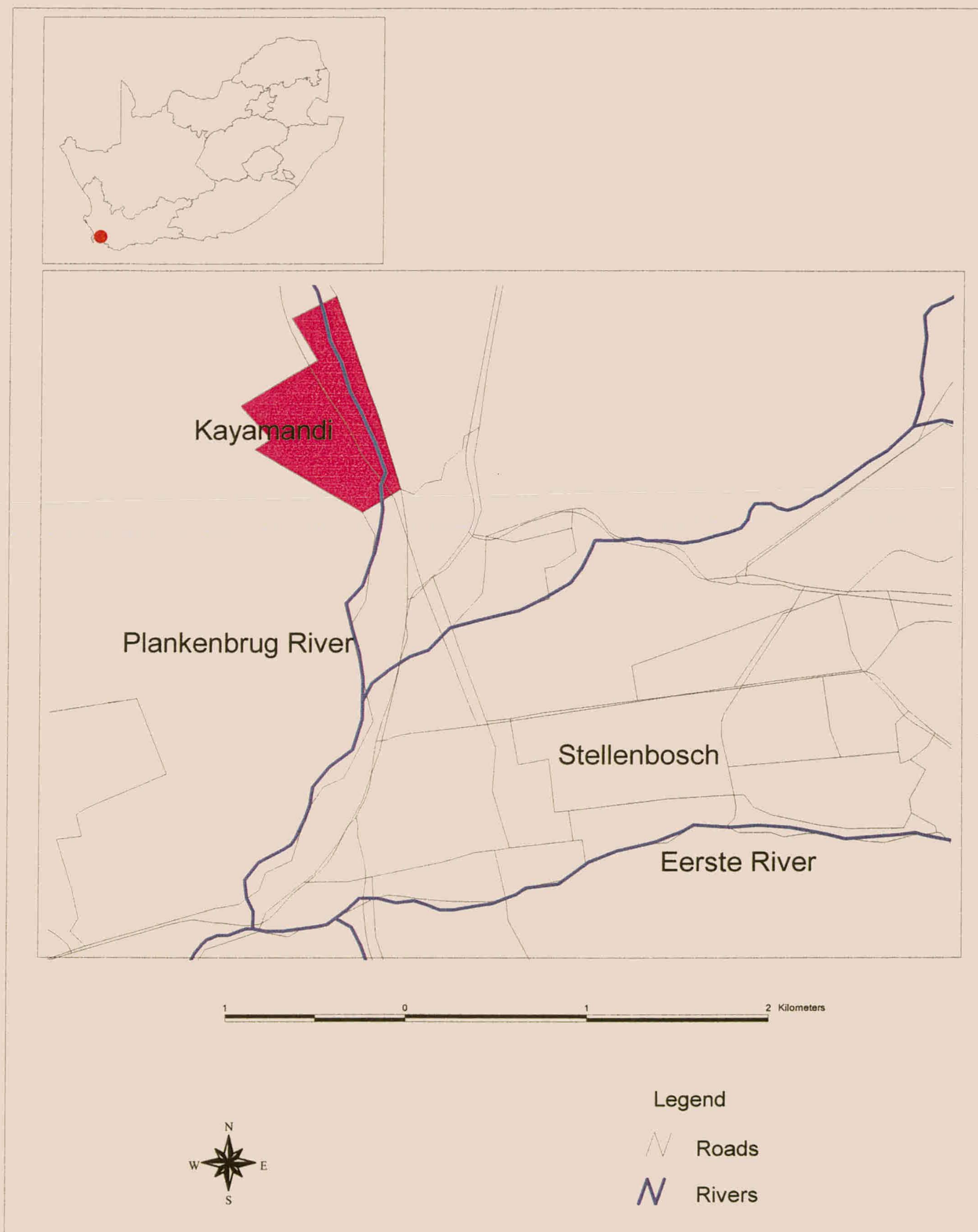

Appendix 1: Orientation of the study area (Kayamandi) in relation to the Plankenebrug River, 1999.

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Appendix 2 TBILISI PRINCIPLES

Guiding principles for effective environmental education adopted at the Tbilisi Inter-Governmental conference on environmental education held in Tbilisi, Russia in 1977.

Environmental education should:

1. consider the environment in its totality – natural and built, technological and social (economic, political – historical, moral aesthetic);
2. be a continuos lifelong process, beginning at the pre-school level and continuing through all formal and non-formal stages;
3. be interdisciplinary in its approach, drawing on the specific content of each discipline in making a holistic and balanced perspective;
4. examine major environmental issues form local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas;
5. focus on current and potential environmental situations while taking into account the historical perspective;
6. promote the value and necessity of local, national and international cooperation in the prevention and solution of environmental problems;
7. explicitly consider environmental aspects in plans for development and growth;
8. enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
9. relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
10. help learners discover the symptoms and real causes of environmental problems;
11. emphasise the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
12. utilise 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.

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Appendix 3 LETTER TO THE PRINCIPAL OF KAYAMANDI HIGH SCHOOL

EEPUS
Department of Didactics
University of Stellenbosch
P/Bag X 1
Matieland 7602
6th November 1998

Dear Sir

I wish to ask for permission to do research at your school with some of the teachers. I am a M. Ed. student at the University of Stellenbosch. I intend to work with biology and geography teachers to investigate the possibilities of integrating the local environmental issue, pollution of the Plankenbrug River, into the teaching of ecology using the Schools' Water Action Project (SWAP) as an environmental education process. I do this research study as a partial fulfilment of my studies.

I plan to carry out the study in the form of workshops conducted at the school starting from January 1999 to May 1999.

I will appreciate it if you could inform the concerned teachers about the matter on my behalf and arrange a suitable date for me to address them personally.

I hope that my request is accepted and I thank you in advance.

Yours faithfully

Bontle Mokotso.

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Appendix 4 BIOGRAPHICAL QUESTIONNAIRE

1. What subjects do you teach?

....

2. How long have you been teaching?

....

3. What classes do you teach?

....

4. What are your qualifications and where did you obtain them?

....

....

5. Which resources do you normally use when teaching Ecology?

....

....

....

6. Do you do any kind of fieldwork or projects when teaching Ecology? ....

   a) If not, give reasons. ....

....

....

....

b) If yes, please give examples and explain briefly

....

....

....

7. Have you ever been involved in any in-service training courses regarding Ecology?

....

....

8. What are the most important/pressing environmental issues in Kayamandi?

....

....

....

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Appendix 5 SEMI-STRUCTURED INTERVIEW

DATE OF INTERVIEW : ....

NAME OF INTERVIEWEE : ....

SUBJECTS TAUGHT :

....

TIME STARTED : .... TIME ENDED :

....

1. a) What are your qualifications and how long have you been teaching?

   b) Did you do any Ecology studies in your academic and professional education?

2. Have you ever been involved in any in-service training courses regarding Ecology?

3. What is your main reference and guide for teaching Ecology?

4. Do you do fieldwork or projects when teaching Ecology?

   a) If yes give examples.

   b) If no, what are your reasons?

5. Do you experience any difficulties when teaching Ecology especially when doing practical work? Please explain.

6. a) Do you ever use the local environment when teaching Ecology?

   b) Do you see the benefits of using the local environment compared to taking excursions?

7. Lately Environmental Education has received a lot of attention nationally and internationally. The media, especially the television, discusses environmental issues from time to time.

How do you view and understand Environmental Education?

8. What do you see as the most pressing environmental issues in Kayamandi?

9. Would you be interested in taking part in this research project?

10. The research is supposed to take form of a series of workshops in the first term of 1999; when do you think is the most suitable time for holding these workshops? weekends, afternoons, etc.