

**A REVIEW OF ENVIRONMENTAL ASSESSMENTS  
UNDERTAKEN FOR PHASES 1A AND 1B  
OF THE LESOTHO HIGHLANDS WATER PROJECT**

**by**

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Submitted in partial fulfilment of the academic requirements for the degree of Masters  
of Environment and Development, at the Centre for Environment and Development,

University of Natal

Pietermaritzburg

2000

## TABLE OF CONTENTS

ABSTRACT .....	i
PREFACE .....	iii
ACKNOWLEDGMENTS .....	iv
LIST OF ABBREVIATIONS AND ACRONYMS .....	v
<b>CHAPTER 1: INTRODUCTION .....</b>	<b>1</b>
1.1 Introduction .....	1
1.2 The large dams debate .....	2
1.3 Water supply in southern Africa .....	7
1.4 The Lesotho Highlands Water Project (LHWP) .....	9
1.5 Objectives of this study .....	9
1.6 Methodology .....	11
1.7 Overview of the dissertation .....	11
<b>CHAPTER 2: A REVIEW OF THE DEVELOPMENT OF ENVIRONMENTAL ASSESSMENT REQUIREMENTS .....</b>	<b>12</b>
2.1 Introduction .....	12
2.2 International trends in environmental legislation .....	13
2.3 The development of environmental legislation and assessment in Lesotho .....	17
2.4 The development of environmental legislation and assessment in South Africa .....	18
2.5 The World Bank's environmental policies and procedures .....	20
2.5.1 The World Bank EA procedures .....	21
2.5.2 The current World Bank's position on EA .....	26
2.6 Environmental policies of the Development Bank of Southern Africa (DBSA) .....	31

<b>CHAPTER 3: THE LESOTHO HIGHLANDS WATER PROJECT (LHWP)</b> . . . . .	<b>32</b>
3.1 Introduction . . . . .	32
3.2 History of the Lesotho Highlands Water Project . . . . .	32
3.3 The LHWP Treaty . . . . .	35
3.3.1 Purpose and benefits of the LHWP . . . . .	35
3.3.2 Key aspects of the treaty . . . . .	36
3.3.3 Signing and Commencement . . . . .	42
3.4 Overview of the LHWP . . . . .	42
3.4.1 Description of the scheme . . . . .	42
3.4.2 Implementation of the scheme (Gleick 1998, LHDA1996) . . . . .	46
3.4.3 Overview of studies undertaken . . . . .	47
3.4.4 Overview of current studies . . . . .	62
<b>CHAPTER 4: FIELD FINDINGS</b> . . . . .	<b>64</b>
4.1 Introduction . . . . .	64
4.2 Methodology . . . . .	65
4.2.1 A qualitative questionnaire . . . . .	66
4.2.2 Group interviews . . . . .	66
4.2.3 Key informants . . . . .	67
4.2.4 Limitations . . . . .	67
4.3 Description of the study area . . . . .	68
4.4 Infrastructure in the study area . . . . .	68
4.4.1 Water supply . . . . .	68
4.4.2 Roads . . . . .	69
4.4.3 Educational facilities . . . . .	70
4.4.4 Health facilities . . . . .	69
4.4.5 Electricity . . . . .	70
4.4.6 Transport . . . . .	70
4.5 Economic and agricultural activities . . . . .	70
4.5.1 Livestock . . . . .	71
4.6 Sources of income . . . . .	75
4.6.1 Women's economic roles . . . . .	76
4.7 Land . . . . .	77
4.8 The Malimabatso River . . . . .	79

4.9	Compensation for community losses and impacts .....	82
4.10	Other LHWP related grievances by community members .....	85
<b>CHAPTER 5: DISCUSSION .....</b>		<b>88</b>
5.1	Introduction .....	88
5.2	LHWP feasibility study (1983-1986) .....	88
5.3	The decision to proceed with the LHWP .....	91
5.4	Subsequent studies .....	92
5.5	Phase 1A EA and its compliance with WB standards .....	97
5.6	Phase 1B EA (1986-1997) .....	98
5.7	The decision to proceed with LHWP .....	100
5.8	Unresolved issues .....	103
5.9	Instream Flow Requirements .....	109
<b>CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS .....</b>		<b>111</b>
6.1	Conclusions .....	111
6.2	Recommendations .....	113
<b>CHAPTER 7 : REFERENCES .....</b>		<b>118</b>
<b>APPENDIX 1</b>		
<b>APPENDIX 2</b>		
<b>APPENDIX 3</b>		
<b>APPENDIX 4</b>		
<b>APPENDIX 5</b>		
<b>APPENDIX 6</b>		
<b>APPENDIX 7</b>		

## ABSTRACT

The construction of large dams has become a contentious issue throughout the world. Environmentalists, human rights activists, NGOs, academics and local communities have all contributed to the debate. On the one hand, proponents have highlighted the role of dams in alleviating poverty, improving the quality of life of communities, and their positive impact on local and national economies. Opponents of large dams have argued that the negative impacts on the environment and local communities outweigh any perceived benefits.

Methods for assessing the environmental impact of large projects have been used since the 1970's. By 1988 most of Europe had adopted methods such as environmental impact assessment for evaluating the impact of proposed projects. These procedures aim to inform decision makers and authorities of the potential impact that a proposed project may have. World financial institutions, such as the World Bank, have also adopted the use of these assessment methods as part of their evaluation of projects that are seeking funding.

This research establishes the environmental standards and requirements that were in place internationally, nationally and regionally, during the planning, design and implementation of Phase 1A and Phase 1B of the Lesotho Highlands Water Project. The products of the environmental investigations during successive phases of the project (1986-1999) are assessed to establish whether the parties involved conform to these standards. In addition, the research highlights affected communities' experience of the project implementation, as well as the impact of the project on their lives.

The research suggests that in the early phases of the Lesotho Highlands Water Project (feasibility and Phase 1A), studies failed to meet environmental assessment standards and requirements. Studies undertaken during Phase 1B represent a considerable improvement and conform more closely to World Bank standards. Although the participation of interested and affected parties has improved, there still appear to be areas of major concern to affected communities. The study highlights

the need for greater transparency during the assessment phase of projects, and in particular, more effective involvement of the local communities. Future environmental assessments of this nature are likely to be subject to more stringent requirements including the systematic assessment and quantification of downstream impacts and the incorporation of the costs of all impacts in the project costs. Further phases of the Lesotho Highlands Water Project will therefore need to demonstrate environmental sustainability in the long term.

## PREFACE

This research was carried out at the Center for Environment and Development, University of Natal, Pietermaritzburg, under the supervision of Dr Nevil Quinn.

The research is original work by the author and has not been submitted in any form for any degree or diploma to any University. Whenever there is use of others' work, it is duly acknowledged in the text.

## ACKNOWLEDGMENTS

I wish to express my appreciation to the following people:

Dr Nevil Quinn for his guidance, motivation, encouragement and friendship. Thank you very much for believing in me and giving me the confidence to complete this research. During the few months that I spent under your guidance I learnt a lot and gained research skills that I will use for the rest of my life.

LHDA staff, in particular, Mr David Nkalai for all the wise advice.

Sechaba Consultancy, particularly David Hall.

The Chiefs of the Ha-Leaooa and Machoabeleng and community members for their corporation and willingness to talk honestly about their views and perceptions of the LHWP, and for opening their homes to me during the field research.

CEAD staff for the support, patience and encouragement, particularly Mrs Marion Jordaan and Kerry Roberts .

Michael Horswell and David Catherine for their technical assistance.

And especially, Sithembiso for being an inspiration when I was down and low.



## LIST OF ABBREVIATIONS AND ACRONYMS

CEC	Council of European Communities
DANIDA	Danish International Development Agency
DBSA	Development Bank of Southern Africa
DWAF	Department of Water Affairs and Forestry
DNIDA	Danish International Development Agency
EDF	Environmental Defence Fund
EIA	Environmental Impact Assessment
EA	Environmental Assessment
EAP	Environmental Action Plan
EMP	Environmental Management Plan
GOL	Government of Lesotho
HCSAG	Highlands Church and Solidarity Action Group
ICOLD	International Commission on Large Dams
IDA	International Development Agency
IEC	Important Environmental Components
IEE	Initial Environmental Examination
IEM	Integrated Environmental Management
IEMP	Initial Executive Project Summary
IFR	In-stream Flow Requirement
IRN	International River Network
IUCN	International Union for the Conservation of Natural Resources
JPTC	Joint Permanent Technical Commission
LCN	Lesotho Council of Non-Governmental Organisations
LHDA	Lesotho Highlands Development Authority
LHWP	Lesotho Highlands Water Project
MIGA	Multilateral Investment Guarantee Agency
MOS	Monthly Operational Summary
NES	National Environmental Secretariate
NEAP	National Environmental Action Plan
NEP	National Environmental Policy
NEP	National Environmental Plan
NEPA	National Environmental Policy Act
NGO	Non-governmental Organisation
NORAD	Norwegian Agency for International Development
OD	Operational Directives
ODA	Overseas Development Administration
OECD	Organisation for Economic Cooperation and Development

OED	Operations Evaluation Department
OP	Operational Policies
PHASE 1A	Katse Dam
PHASE1B	Mohale Dam
PPF	Project Preparation Facility
RDP	Rural Development Program
RDP	Rural Development Plan
RESU	Regional Environmental Sector Unit
SADC	Southern African Development Community
SECAL	Sector Adjustment Lending
SEA	Strategic Environmental Assessment
SIA	Social Impact Assessment
SIDA	Swedish International Developing Agency
TCTA	Trans-Caledon Tunnel Authority
TOR	Terms of Reference
TM	Task Manager
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
US	United States
UN	United Nations
USAID	United States Agency for International Development
UNEP	United Nations Environmental Program
UNCED	United Nations Conference on Environment and Development
WBGC	World Bank Group Countries
WB	World Bank
WC	World Commission
WCD	World Commission on Dams

## CHAPTER 1: INTRODUCTION

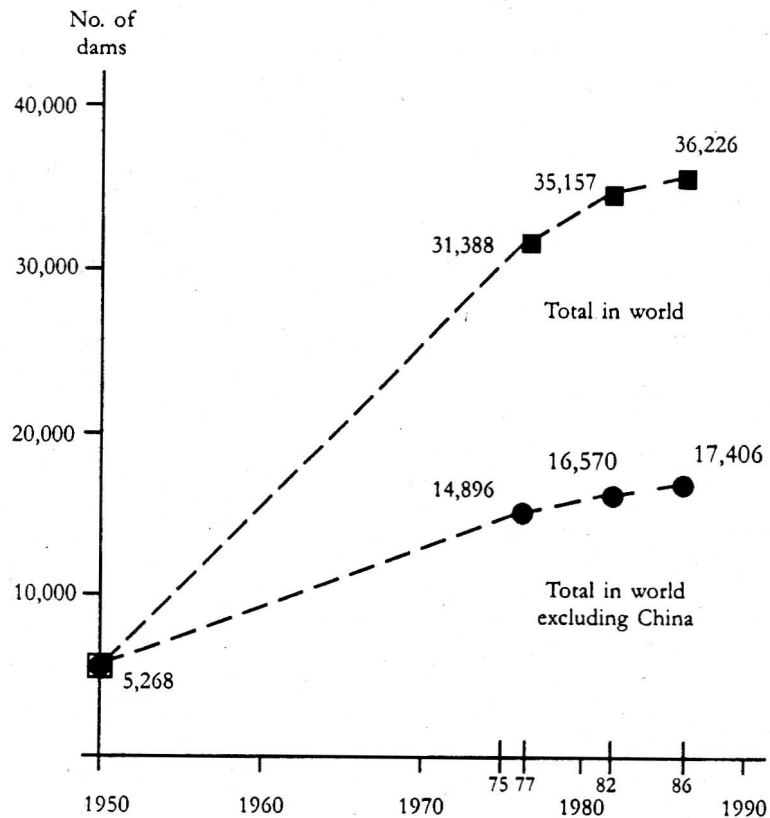
### 1.1 Introduction

Eight thousand years ago, the Sumerians were the first nation of dam builders, creating an irrigation based civilization between the Tigris and the Euphrates rivers (Joyce 1997). Subsequent history and particularly the industrialisation period, saw the rise and advocacy of big dams as a sign of prosperity, and the growth of political nationalism. McCully (1996) argues that to many, big dams have been "*potent symbols of both patriotic pride and the conquest of nature by human ingenuity*". These sentiments perhaps encouraged the late Indian Prime Minister Jawaharal Nehru to boast of dams in India as the new "*temples of development*" (Joyce 1997). However, post-industrialisation has brought with it environmental awareness and concerns about the impact of large dams on both the well being of people and the environment. Since the 1950s, considered by many to be the peak of the 'big dams' era, perceptions of dams and dam building have been changing. Dams that were once symbols of development, today represent for some critics and affected communities, environmental and social devastation instead of progress (Joyce 1997). Dams have thus become a source of contention amongst scholars from various disciplines, interested parties, affected communities as well as various non-governmental organisations (NGOs) throughout the world.

The original reason for the construction of dams was to improve the quality of human life, by providing clean water for consumption, irrigation and flood control, and electricity generation. Considered from this perspective, dams have brought many benefits, but the adverse effects of river impoundments, such as, disruption of ecosystems, the down stream impacts on natural resources, forced resettlement of people and the spread of water related diseases have resulted in environmentalists and concerned citizens voicing their objections against the construction of large dams. The benefits and detriments of large dam construction have today locked opponents and proponents of large dams in a heated debate of their value, need and role in water resource management (McCully 1996, Joyce 1997, Gleick 1998).

## 1.2 The large dams debate

Since 1950 more than 35 000 large dams have been constructed worldwide (ICOLD 1988), and by 1995 some 305 major dams had been built (Mermel 1995). The International Commission on Large Dams (ICOLD) defines large dams as dams with height of 15 metres or more. If dams between 10 and 15 metres high, have a crest length more than 500 metres, a spillway discharge of more than 2 000 cubic metres, or a reservoir volume of more than one million cubic metres, they are also classified as large dams (Oud & Muir 1997). Major dams are defined as dams with either; a height of more than 150 metres, a volume of more than 15 million cubic metres, a reservoir volume of more than 25 billion cubic metres, or an electricity generation capacity of more than 1000 MW (Oud & Muir 1997). Figure 1.1 depicts the number of dams constructed between 1950 and 1986 (McCully 1996).



**Figure 1.1:** The number of large dam building between 1950 and 1986 (McCully 1996)

In the United States of America, growing awareness of the ecological and social impacts of large dams has resulted in a re-evaluation of national thinking and even policy concerning the construction of large dams. In an address to the 1996 International Dam Summit, former Commissioner of the U.S. Bureau of Reclamation,

one of the largest dam construction and water and power agencies in the world, Daniel Beard<sup>1</sup> (1996) stated;

*"The opportunity for construction of new, large dams in the United States is now extremely remote, if not non-existent. In my view, we are starting down a similar path throughout the world. The time when large dam projects are a realistic answer to solving water problems is now behind us. The world is moving toward a new era. We are slowly replacing the dam-building era with an era where sustainable water resource management is the guiding principle."*

The actions of Bruce Babbitt, the U.S. Secretary of the Interior provide further evidence of this trend. In what has been described as a 'sledgehammer' tour of the United States (Babbitt 1998), the Secretary of the Interior has taken a lead in reversing the past. In a recent address<sup>2</sup> the Secretary of the Interior gave the following explanation;

*"Starting last June 17, I hoisted a sledgehammer to mark the removal of four dams, opening 160 miles of the Menominee River flowing between Wisconsin and Michigan. In September I visited the two Elwha River dams which the Administration plans to remove to restore one of the fabled chinook salmon runs of the river. Then on December 17, I took my sledgehammer to punch open the 55 year old, 260-foot Quaker Neck Dam on the Neuse River, opening 925 miles of fish spawning habitat. And in July I took my first crack at breaking up McPherrin Dam to restore chinook salmon to Butte Creek and, a day later used the sledgehammer to breach Oregon's Bear Creek Dam.*

*Every stop on this dam-busting tour attracts enormous local, regional and national attention. I believe that huge public interest reflects a deep, widespread understanding that America overshot the mark in our dam building frenzy. In this century, dams that were clearly justified for their economic value gradually gave way to projects built with excessive taxpayer subsidies, then justified by dubious cost/benefit projections.*

*The public is now learning that we have paid a steadily accumulating price for these projects, in the form of fish spawning runs destroyed, downstream rivers altered by changes in temperature, unnatural nutrient load and seasonal flows, wedges of sediment piling up behind structures, and delta wetlands degraded by lack of freshwater and salt water intrusion. Rivers are always on the move and their inhabitants know no boundaries; salmon and shad do not*

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<sup>1</sup> "Creating a Vision for Rivers for the 21<sup>st</sup> Century" Address at the International Dam Summit, Nagaragawa, Japan, 14 September 1996.

<sup>2</sup> Address to the Ecological Society of America, Baltimore, Maryland, United States of America, 4 August 1998.

*read maps only streams.*

*The clang of the sledgehammer is one of the oldest sounds known to man. Yet now, at the end of the 20<sup>th</sup> century, we are using it to ring in an entirely new era of conservation history, moving beyond preservation or protection to a deeper, more complex movement - the affirmative act of restoration."*

Decommissioning of dams has not been limited to the United States, in France for example, the Saint-Etienne-du-Vigan Dam on the Upper Allier River, the main tributary of the Loire River was dynamited on 24 June 1998. This was the first time that a dam operated by the French state-owned electricity utility Electricité de France has been destroyed in an effort to restore salmon habitat. In other parts of Europe, such as Norway and Sweden, almost all free flowing rivers are now legally protected against dam building (McCully1996).

Throughout the world, public opposition to the construction of impoundments has been steadily growing. In the last decade there have been numerous examples of resistance to large dams:

- France's Serra de la Fare Dam on the Loire River which was scrapped in 1994 because of local people's resistance toward the project (Dharmadhikary 1998)
- The last two phases of the James Bay project in Quebec were suspended after considerable resistance by the indigenous people (Dharmadhikary 1998)
- The campaign against Thailand's Nam Chaon Dam led to the indefinite postponement of the dam project (Dharmadhikary 1998)
- USA anti-dam movements are campaigning for the removal of several dams which has resulted in the Quaker Neck Dam on the Neuse River in the State of Maine being demolished in 1998. There are current efforts to remove the Hoffman Dam on the DesPlaines River in Colorado. The Matilija Dam on the Matilija Creek in California is to be removed, and also in California the Englebright Dam on the Yuba River is to be decommissioned (Brink & Lammers 1999).
- India's Sardar Sarovar (Narmada) project in Gujarat and also the Dihang, Subansiri and Tipaimukh dam projects are currently stalled by anti-project

movements, and their resumption is pending on the court case outcome (Iyer 1998)

- During the late 1990's the Lesotho's Highlands Water Project also faced criticism with local communities and international NGOs are calling for a halt to the construction of the second Phase 1B because of unsatisfactory social and environmental impacts caused by the first phase Katse Dam (EDF 1995)

In 1988 an international conference of concerned citizen groups developed the San Francisco Declaration (Appendix 1). This declaration specified criteria and considerations for ensuring sustainability in the construction of large dams. Subsequently the Manibeli Declaration in June 1994, called for a moratorium on World Bank funding of large dams (Appendix 2). The declaration was endorsed by 326 groups in 44 countries. Public criticism of World Bank funding of large dam projects led, in part, to an internal evaluation of large dam projects (1960-1995) conducted by the World Bank Operations Evaluation Department (OED) in 1996 (McCully 1997).

This study found that 90% of the dams they reviewed met the standards that were applicable at the time, although only a quarter of these schemes would have conformed to current, more stringent World Bank policies (Figure 1.2). It was also argued that in 74% of the cases, mitigation of the negative social and environmental impacts, would have been economically justified and financially feasible (Dorcey 1997). The primary conclusion of this study was the World Bank OED's "*conditional support for the construction of large dams, provided that they strictly comply with Bank guidelines and fully incorporate the lessons of experience*" (Dorcey 1997). A subsequent review of this report (McCully 1997) was highly critical of the evaluation.

Delegates at the first International Meeting<sup>3</sup> of People Affected by Dams demanded an immediate international moratorium on the building of large dams through the Declaration of Curitiba (Appendix 3). In response to the growing need to review large

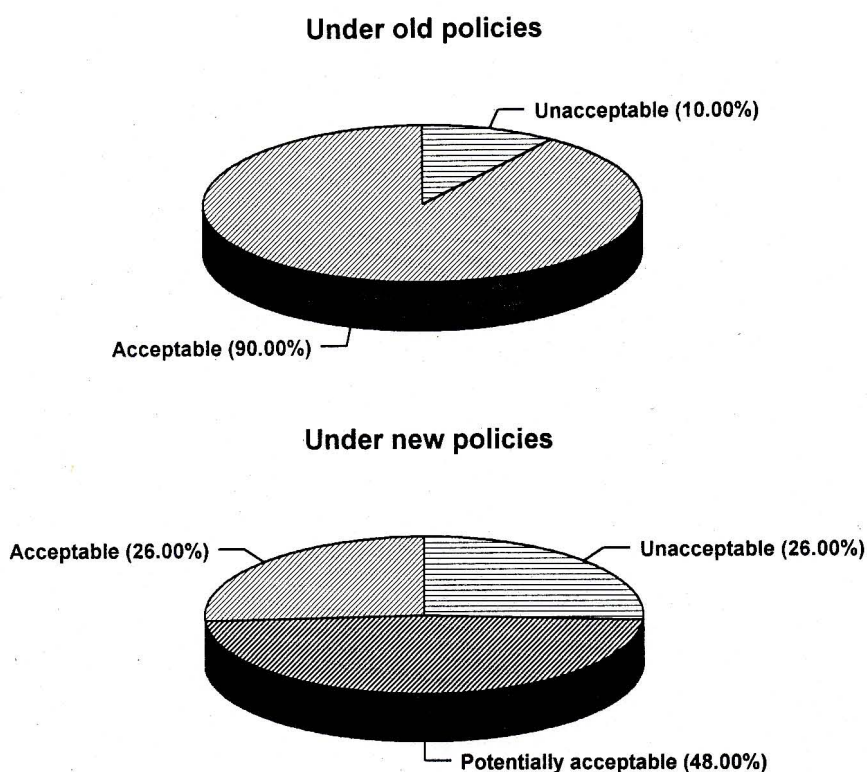
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Curitiba, Brazil, 11 to 14 March 1997

dam projects, the World Bank and the IUCN convened a joint workshop<sup>4</sup> (Dorcey 1997). At this workshop, large dam proponents and opponents met and shared their views about each other's position. According to a report in *The Economist*<sup>5</sup>, it was concluded that,

*"If an International Commission were created to set standards, if everybody affected by a dam were involved in the planning process, if the option of building a dam were weighed against all alternatives, if all the costs were accounted for, and if everyone benefited from the dam,... then it could go ahead"*



**Figure 1.2:** Impact of large dam projects as evaluated according to old and new World Bank policies (Dorcey 1997)

Thus one of the major recommendations of this workshops was the establishment of a World Commission on Dams. On February 16, 1998 the World Commission on Dams (WCD) was launched with two broad goals:

- *To review the development effectiveness of dams and assess alternatives for*

<sup>4</sup> Large Dams: Learning from the past, looking at the future, April 11-12, 1997

<sup>5</sup> Dam builders and dam busters, *The Economist*, 19 April 1997



*water resources and energy development*

- *To develop internationally accepted standards, guidelines and criteria for decision-making in the planning, design, construction, monitoring, operation and decommissioning of dams.*

According to McCully (1997), NGOs involved in the process marked the launch by demanding that aid agencies and governments cease the building of large dams until the Commission's recommendations are fully implemented. However, the World Bank indicated that it will only do so if directly requested by the World Commission on Dams (WCD). Other funders, such as the Swedish aid agency SIDA, stated that it would wait until the release of the WCD report before making any changes to its lending practices.

More recently the Walker Creek Declaration<sup>6</sup> has been formulated (Appendix 4), establishing 'Living Rivers', an international coalition for the restoration of rivers and communities affected by dams, by means of dam decommissioning, removal or re-operation. The Declaration has been endorsed by many organisations in several countries.

### **1.3 Water supply in southern Africa**

As a region, southern Africa is characterized by water scarcity "*the region as a whole is water poor, and increasingly facing water shortages*" (Pottinger 1999a). Southern Africa is classified as either an arid or semi-arid region, with an uneven distribution of rainfall (DWAf 1986), often necessitating inter-basin water transfers. Fifteen major rivers are shared by two or more countries with 26 currently proposed major water-transfer schemes, such as; the Batoka Gorge Dam of Zimbabwe and Zambia, Epupa Dam of Namibia and Angola, Okavango Pipeline Project of Namibia and Botswana, Komati Basin Project of South Africa and Swaziland, Mepanda-Ncua Dam of Mozambique and Lesotho Highlands Water Project of Lesotho and South Africa (Pottinger 1999a).

The region's biggest water user is agriculture, and farming in southern Africa

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<sup>6</sup>

California, United States of America, 25 July 1998

consumes more water than any other sector. Agriculture consumes 80% of Mozambique and Zimbabwe's water, 66% of Namibia's water is consumed by this sector and 50% in both Botswana and South Africa. Domestic and industrial water demands are only 15% (Pottinger 1999a). The water scarcity problem is being made worse by human population growth and economic development taking place in the region, as the race towards economic prosperity in southern Africa will put more pressure on increasingly scarce resources. This is echoed by the current Environmental Affairs and Tourism Minister when he gave his views about the South African water situation, "*with the projected population growth and economic development rates, it is unlikely that the projected demand on water resources in South Africa will be sustainable*" (Predrag 1999). According to the U.N Population Fund, it is projected that there will be water scarcity in South Africa within the next 10 years (Predrag 1999).

The planning and implementation of water projects in southern Africa is thus an attempt by the governments of southern Africa to combat projected water scarcity and also meeting current water needs. Proper management of the water resources in southern Africa is an urgent need if future generations are to have water. Sustainable water planning is defined as "*the ability of human society to endure and flourish into the indefinite future without undermining the integrity of the hydrological cycle or the ecosystems that depend on it*" (Pottinger 1999a). It is this basic principle which underlies the recent revision of water law in South Africa (National Water Act, Act No 36 of 1998). This legislation recognizes and makes allowance for water for basic human needs as well as the environment (the Reserve). Zimbabwe has also recently introduced similar legislation (Pottinger 1999b).

Another element associated with sustainable water planning, is for southern African authorities to encourage water demand management. Pottinger (1999a) defines this as "*the systematic conservation of water or power resources. Includes a number of changes to the demand side of the equation, including efficiency innovations, the reduction of waste through policy or pricing, retrofitting buildings to save energy, and fixing leaking water pipes*" (Pottinger 1999a). This approach calls for a reduction in water use and the more efficient and economical use of water. As stipulated in the

Guidelines for South Africa's water planners "*reducing the growth in demand can result in postponing large infrastructure requirements and will thus result in significant financial saving*" (Pottinger 1999b).

Many approaches to implement sustainable water management, such as the introduction of appropriate tariffs, other demand management approaches, and the establishment of environmental flows, are being implemented in southern Africa. However, concern is still expressed that these initiatives will not be enough, and sooner or later large infrastructure will be required to store and transfer more water for the development regions of southern Africa.

#### **1.4 The Lesotho Highlands Water Project (LHWP)**

The Lesotho Highlands Water Project was proposed in the 1950s and the idea was developed when an apartheid government ruled South Africa. The Lesotho Highlands Water Project (LHWP) consists of a multiple-phased water transfer and hydro-power generation scheme that will include a number of impoundments on the Senqu river and its tributaries. Ultimately the impoundments will be linked by a series of tunnels that will deliver water to the Vaal river system in South Africa. Lesotho signed the treaty with the then South African government on the 24<sup>th</sup> October 1986, shortly after the government of Lesotho had been overthrown by the military. The treaty recognises the principle of sovereignty of Lesotho and also the benefits that Lesotho is going to derive from the project. South Africa's legitimate financial interests related to the assured supply of water are also safeguarded by the treaty.

Phase 1A construction began in 1991 and was completed in 1997 and consists of Katse Dam on the Malimabatso River, a transfer tunnel and a delivery tunnel. The system began supplying water to South Africa at the beginning of 1998. Phase 1B consisting of Mohale Dam has entered the construction phase and is due for completion by 2003.

#### **1.5 Objectives of this study**

The above introduction has highlighted the growing debate regarding the construction of large and major dams in sustainable water resource management. However, it has

also noted the likelihood of acute water shortages in the future, possibly even despite the introduction of demand management strategies. If the construction of large dams is found to be the only means of securing future water supplies, then it is likely that the feasibility studies for such projects will need to demonstrate sustainability in all respects. The Lesotho Highlands Water Project is a project which commenced in the last decade of the millennium, in a global environment with well established environmental and social impact assessment guidelines. To what extent has this project conformed to these guidelines, and how sustainable is it? What are the learning experiences which have been highlighted in the large dams debate and which should be carried forward into this project, particularly if future phases are authorised?

This dissertation attempts to contribute to the debate by reviewing aspects of the LHWP and providing recommendations which will enhance the sustainability of the project. The objectives of the dissertation are defined as:

- (i) Review the development of national and international environmental legislation, procedures and guidelines with respect to feasibility studies for large dam developments.
- (ii) Document the actions taken in feasibility planning for the LHWP, with particular reference to social and environmental impact studies.
- (iii) Undertake a brief reconnaissance study with an affected community to record perceptions and opinions regarding the process and outcome of Phase 1A of the LHWP.
- (iv) Evaluate the extent to which the initial (Phase 1A) and current (Phase 1B) phases of the project conformed to national and international procedures and guidelines.
- (v) Provide recommendations for future phases of the project which may be required to enhance sustainability, and if possible, provide ameliorative actions for the current phase of the project.

## **1.6 Methodology**

This dissertation represents a review based on available documentation relating to the LHWP. Initially, international and regional standards are considered with a view to establishing criteria against which to evaluate the products of the environmental studies undertaken during successive phases of the LHWP. On the basis of this exercise, World Bank criteria were selected and each of the studies was evaluated. The comprehensiveness of this evaluation was limited by the availability of documentation, particularly that relating to reviews of studies and descriptions of consultation and public participation. Some documents requested from LHDA were not made available. In addition to the review-based approach, limited field work was undertaken in order to record the perceptions of a community affected by the construction of Phase 1A. The methodology adopted for this component is discussed further in Chapter 4.

## **1.7 Overview of the dissertation**

This chapter has provided an introduction to the international debate concerning large dams. Recognising that in water scarce countries there may be no alternative to dams as a means of water supply, this chapter highlights that in all large projects of this nature, the sustainability of such initiatives will have to be shown conclusively and the environmental and social impacts of the project will have to be satisfactorily ameliorated. Chapter 2 traces the development of global environmental legislation, highlighting the emerging assessment requirements for large dam projects. Chapter 3 provides an overview of the LHWP, summarizing key actions in the planning and implementation phases. This chapter also briefly reviews the content of the major publications of the LHWP. Chapter 4 documents the findings of the reconnaissance study based on interviews with two affected communities. Chapter 5 comprises a discussion and evaluation of the findings of the study, while Chapter 6 presents the conclusions and recommendations arising from the project.

## CHAPTER 2: A REVIEW OF THE DEVELOPMENT OF ENVIRONMENTAL ASSESSMENT REQUIREMENTS

### 2.1 Introduction

Over the last few centuries economic development in the world has had environmental consequences. In the words of Naude (1995), *“for most of history, the environment has been an issue of little concern to governments. Whenever agricultural or industrial activity damaged the environment, as was frequently the case, this was considered an unavoidable product of economic development”*. Over the last three decades, economic and social developments have been expanding at a considerable pace. This focus on economic success has often led to the depletion of natural resources, particularly in regions where the environment has had little or no legal protection.

One attempt at identifying common solutions by the nations of the world was the Rio de Janeiro Conference on Environment and Development<sup>7</sup>. This summit produced a blue-print document calling nations to engage in development that would take into account the well being of the environment in all aspects of development. In this document, the concept of sustainable development was promoted; it called for development that meets present human needs yet ensures the availability of resources for future world citizens. The need to assess the acceptability of a development initiative as well as its sustainability was identified as an issue, and it was recognised that tools and guidelines to measure, judge, and to inform the sustainability of development had to be devised. One of the tools commonly used today in both developed and developing countries is Environmental Impact Assessment (EIA). Section 2.2 provides an overview of international trends in the formulation of environmental legislation, particularly with respect to requirements for environmental assessment.

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The United Nations Conference on Environment and Development (UNCED), often referred to as the Earth Summit, held in Rio de Janeiro in June 1992.