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IMPLEMENTATION COMPLETION REPORT

THE KINGDOM OF LESOTHO

HIGHLANDS WATER PROJECT – PHASE 1A
(Loan 3393 - LSO)

December 13, 1999

Water and Urban 1
Eastern and Southern Africa
Africa Region

CURRENCY EQUIVALENT

Currency Unit	=	Loti (plural: Maloti (M))
US$1.00	=	M2.9 (1992), M3.3 (1993), M3.6 (1994), M3.6 (1995), M4.3 (1996), M4.6 (1997), M6.0 (1998)

FISCAL YEAR

GOL, LHDA, TCTA	=	April 1 - March 31

MEASURES AND EQUIVALENTS

1 millimeter (mm)	=	0.03937 inches (in) or 0.00328 feet
1 meter (m)	=	39.37 inches (in) or 3.28 feet
1 hectare (ha)	=	10,000m^2 = 107,584 sq. feet
1 kilometer (km)	=	0.62 mile (mi.)
1 square kilometer (km^2)	=	0.386 square miles (sq. miles)
1 million cubic meters (hm^3)	=	811 acre feet or 264 million US gallons
1 cubic meter per second (m^3/s)	=	353 cubic feet per second
	=	15,840 US gallons/minute

ABBREVIATIONS AND ACRONYMS

AfDB	= African Development Bank
CDC	= Commonwealth Development Corporation
CMA	= Common Monetary Area (Lesotho, Swaziland, Namibia and RSA)
DBSA	= Development Bank of Southern Africa
EAP	= Environmental Action Plan
EIA	= Environmental Impact Assessment
EIB	= European Investment Bank
EPP	= Emergency Preparedness Plans
ERR	= Economic Rate of Return
ESKOM	= Power Utility of the RSA
ESSG	= Environmental and Social Services Group, LHDA
GDP	= Gross Domestic Product
GIS	= Geographical Information System
GNP	= Gross National Product
GOL	= Government of Lesotho
IFR	= Instream Flow Requirements
JPTC	= Joint Permanent Technical Commission
LEC	= Lesotho Electricity Corporation
LHDA	= Lesotho Highlands Development Authority
LHWP	= Lesotho Highlands Water Project
MW	= Megawatt
NGO	= Non-Governmental Organization
OVTS	= Orange Vaal Transfer Scheme (RSA)
PoE	= Panel of Experts
RDP	= Rural Development Program
RIS	= Reservoir Induced Seismicity
RSA	= Republic of South Africa
RVP	= Regional Vice President
SACU	= Southern Africa Customs Union (Lesotho, Swaziland, Botswana, Namibia, RSA)
SAP	= System, Applications and Products
TCTA	= Trans Caledon Tunnel Authority (RSA)
UNDP	= United Nations Development Programme

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HIGHLANDS WATER PROJECT – PHASE 1A
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PREFACE

This is the Implementation Completion Report (ICR) for the Lesotho Highlands Water Project (Phase 1A) for which a Loan 3393-LSO, in the amount of US$110 million, was approved on July 23, 1991. The Loan Agreement was signed on September 16, 1991, and the Loan was made effective on May 15, 1992.

US$20 million of the Loan were cancelled on June 30, 1996 and US$16 million on October 15, 1998 due to (a) lower than anticipated levels of technical assistance to the Lesotho Highlands Development Authority, (b) faster than expected regionalization of some technical assistance positions (and hence a lower need for foreign exchange financing), and (c) the ineligibility (on procurement grounds) of certain contracts originally considered for retro-active financing. The Loan was closed on March 31, 1999 one year after the scheduled closing date of March 31, 1998. The last disbursement was made on August 31, 1999 and the balance US$5.1 million has been cancelled. Co-financing for the project was to be provided by the United Nations Development Programme, the African Development Bank, the European Union, the European Investment Bank, assorted export credit agencies, European commercial banks, various bilateral development agencies, the Commonwealth Development Corporation, the Development Bank of Southern Africa, and South African capital markets.

The ICR was prepared by Messrs. Arnaud Guinard, Team Leader/Pr. Urban Specialist, AFTU1, and Walter Schwermer, Consultant; it was reviewed by Mr. Jeffrey Racki, Sector Manager, AFTU1, and Ms. Pamela Cox, Country Director, AFCO1.

Preparation of this ICR was begun during a supervision mission in November 1998 and a completion mission in April/May 1999. It is based on materials in the project files, the Staff Appraisal Report, the Loan Agreement, and on the findings of the completion mission. The Aide Memoire of that mission is in Annex A. The Borrower contributed to the preparation of the ICR by preparing its own ICR, a summary of which is in Annex B. Comments of the Borrower and co-financiers have been considered in finalizing this ICR. Comments that could not be fully reflected in the text are also presented in Annex B.

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HIGHLANDS WATER PROJECT – PHASE 1A
(Loan 3393-LSO)

IMPLEMENTATION COMPLETION REPORT

EVALUATION SUMMARY

Introduction

1. The operation, for which Loan 3393-LSO was approved on July 23, 1991, is the first phase (Phase 1A) of the Lesotho Highlands Water Project (LHWP) which was identified in the 1950s and prepared in the 1980s to meet the growing demand for water in the heartland of the Republic of South Africa (RSA). In 1986, the Government of Lesotho (GOL) and RSA signed a Water Treaty to carry out LHWP over a 30-year period starting in 1990 with the ultimate aim to transfer 70m3/sec water from Lesotho to RSA. The Treaty commits RSA and GOL to implement Phases 1A and 1B of LHWP (transferring water to RSA in the amount of 18m3/sec and 12m3/sec, respectively) with the subsequent phases open to re-consideration. Implementation of Phase 1B, supported by a Bank Loan of US$45 million (Loan 43390-LSO), started in 1994.

2. The project was the largest public sector undertaking in Africa at the time of its inception, involving the construction of the highest dam in Africa and large capacity tunnels to transfer water from Lesotho to RSA. It was also the most significant transnational operation of its time in Africa, with implementation responsibilities spanning the two concerned countries. The Joint Permanent Technical Commission (JPTC), established as a bi-national body, was to safeguard the interests of both GOL and South Africa, while the main implementation agency, the Lesotho Highlands Development Authority (LHDA), was to be responsible for executing all project activities in Lesotho. In South Africa, the Trans Caledon Tunnel Authority (TCTA) was to be in charge of: (i) constructing the water delivery tunnel on the RSA side of the border, and (ii) arranging for the servicing of all loans related to the project's water transfer component. To help ensure that the operation met rigorous international standards, two Panels of Experts (PoE) were to be set up to review the design and monitor the project's construction components and its environmental and social components, respectively.

3. The Bank supported Lesotho's efforts to develop its water resources into export revenue by: (i) acting as executing agency for the UNDP-financed consultants who supervised the LHWP feasibility studies (1983); (ii) providing an IDA Credit of SDR 8 million (Credit 1747-LSO; 1986) for a Lesotho Highlands Water Engineering Project to assist in preparatory phase of LHWP; (iii) making an advance of US$750,000 under the Bank's Project Preparation Facility (PPF P356-LSO; 1988); (iv) and providing substantial supervision and technical expertise during the project's preparatory stage. In other parts of the water sector, an IDA Credit of US$6 million (Credit 887-LSO; 1979) supported a water supply project that involved seven small towns, and which was successfully completed in 1985.

Project Objectives and Components

4. ***Project Objectives***. The main objective of the project was to develop Lesotho's water resources and alleviate water shortages in RSA through the construction of dams, tunnels and controls as envisaged under Phase 1A of LHWP -- and thereby put in place the physical and managerial capacity for Lesotho to earn export revenues from the sale of water to South Africa. Additional objectives were to produce hydropower in order to reduce Lesotho's dependence on imported energy, and to make productive use of the project-generated export revenues by directing them to development-oriented programs. At the same time the project aimed at safeguarding environmental and resettlement as well as compensation aspects, ensuring dam safety and preparedness for emergencies, and preparing for later construction phases of LHWP for further water transfers.

5. ***Project Components***. The project was to finance Phase 1A of LHWP, covering all facilities required to permit transfer of 18 m3/sec water, and to have installed electricity capacity of 72 megawatt (MW). This included the construction of: (a) a 185 meter high and a 55 meter high double curvature arch dam at Katse and Muela, respectively, (b) a 45 kilometer long concrete-lined tunnel to transfer the stored water from Katse to Muela, (c) an underground hydropower station at Muela, (d) a 15 kilometer long delivery tunnel from Muela to the crossover point to RSA (not financed under the project but directly linked with the operation were additional 22 kilometers of delivery tunnel within RSA to transfer the project water to the Ash River in South Africa); (e) a 125 kilometer long 132 kilovolt transmission line connecting Muela substation to the Maseru load center; (f) about 200 kilometers of new access roads, including several bridges; (g) other project infrastructure such as work camps, staff housing, construction power supply, improvements in border crossing facilities, and rehabilitation of existing access roads; (h) environmental protection measures; (i) resettlement, compensation, and income restoration programs for project-affected persons; (j) dam safety programs, monitoring instrumentation, and development of an Emergency Preparedness Plan (EPP); (k) construction supervision; (l) technical assistance to LHDA and to GOL's delegation to JPTC; (f) five studies including two to prepare the next phase (Phase 1B) of LHWP, and (g) financing of LHDA operation and administration expenditures, and of staff training. An important element of the project was the creation of a Development Fund for channeling part of the project revenues (royalties and other project related income) to development-oriented programs in Lesotho.

6. ***Project Costs and Financing***. Project costs, including interest during construction, were estimated at Maloti 8.4 billion (US$2.4 billion). Financing of all costs related to the project's water transfer facilities and related components (supervision, environment, resettlement) were to be RSA's responsibility, in line with the Water Treaty. The hydropower investments were to be financed by Lesotho. At the time of appraisal, funding had been arranged from a number of bilateral and multilateral donor agencies, European commercial banks, export credit agencies, and capital markets in the Common Monetary Area (Lesotho, Swaziland, Namibia and RSA).

Implementation Experience and Results

7. ***Achievement of Project Objectives.*** The project achieved its main objectives of (a) developing the water resources in the highlands of Lesotho, by successfully completing the project's civil works, (b) generating export revenues from the delivery of water to South Africa, and (c) producing hydropower. It also met many of its environmental and social objectives although accomplishments in these areas have been uneven, and where they were realized, they usually experienced delays. The operation was successful in ensuring the safety of project dams, and it was the first Bank-supported dam project that developed an Emergency Preparedness Plan. Project studies and training prepared the ground for Phase 1B of LHWP, and they helped in establishing LHDA as an effective and sustainable organization. Some positive impacts were also achieved from investments supported by the Development Fund.

8. ***Implementation Timetable, Costs and Financing.*** Implementation of the project was completed with an overall delay of about nine months. Final project cost of US$2.6 billion exceeded appraisal estimates by about 9% in US dollar terms. The cost overrun was mainly due to increases in interest during construction and related financial expenditures, and because of the need to add some construction works. For a project of this size and complexity, the cost and time overruns are considered to be fairly negligible.

9. The project was financed largely as anticipated at appraisal, except for loans which were expected from the African Development Bank (AfDB) and the Commonwealth Development Corporation (CDC) to finance the project's hydropower component. AfDB withdrew from financing this component due to disagreement over the award of the main construction contract for the hydropower plant, while CDC pulled out because of the component's low rate of return.

10. ***Major Factors Affecting the Project.*** Factors with significant impacts on the project included political changes; labor unrest; difficulties in securing financing for the project's hydropower investments; concrete lining issues on the water transfer tunnel and on the delivery tunnel; and reservoir-induced seismicity. *Political changes* including the end of military rule in Lesotho and the establishment of majority government in RSA had a positive affect on the project by: (a) increasing the legitimacy of both governments in their interactions on the project; (b) refocusing RSA's attention on providing better access to water to the entire population; and (c) bringing new emphasis on regional development with LHWP seen as vehicle for regional integration and as a model for cross-national cooperation. *Labor unrest*, while overall not very significant, turned into a serious problem at Muela where a prolonged labor dispute culminated in violence and the killing of five workers. A judicial inquiry found that inadequate attempts at mediation and enforcement of the labor code, poor police training and procedures, and excessive force were the main causes of the incident. In response to the incident, LHDA has taken a number of measures to prevent a re-occurrence of similar problems. *Securing financing for the hydropower investments* took about 18 months after the withdrawal of AfDB and CDC. This delayed construction by a similar period which, in turn, was the main reason for the significant cost increase in this component, especially as it necessitated construction of the Muela by-pass to ensure timely water delivery to RSA. Moreover, the need to arrange alternative financing at shorter terms and higher interest rates than those

offered by AfDB and CDC, are at the heart of severe cash-flow problems that LHDA is currently experiencing. *Lining issues* arose during the construction of both the transfer tunnel and the delivery tunnel. Tender documents for the transfer tunnel had envisaged only 14% of concrete lining, with the result that the cost of the tunnel increased by about M350 million when it was determined that concrete lining was required for the entire tunnel, and when the contractor at the site could charge non-competitive prices. At the delivery tunnel, on the other hand, extensive testing indicated that lining the whole tunnel, as had been considered necessary, was not required, leading to considerable cost savings and early completion of the tunnel. *Reservoir Induced Seismicity (RIS)* measuring up to 3.3 on the Richter scale was experienced following the filling of Katse reservoir. The RIS was reviewed by the Engineering PoE who concluded that there was no adverse effect on the safety or operation of the project, but that monitoring needed to be enhanced. The RIS also impacted the villages adjacent to the reservoir, requiring repairs to and construction of replacement houses, and creating adverse publicity for the project.

11. ***Project Sustainability.*** Management, organizational and financial arrangements are in place and appropriate dam safety measures have been implemented to ensure the sustainability of the project's water transfer component. Sustainability is also likely for the Muela hydropower complex, but cash flow problems need to be resolved urgently together with the refinancing package needed to be able to service the debt associated with Muela.

12. The project's other infrastructure components, such as access roads, labor camps and staff housing are expected to be sustainable. However hand-over arrangements to communities and other public sector agencies - for example to the Ministry of Works in the case of project roads – are yet to be worked out. For some of the environmental components sustainability is less certain. Several programs like the establishment of reserves, are in early stages of implementation, while for others, such as soil conservation and watershed management, much more community involvement is required to make them sustainable.

13. Regarding the project's social investments, the resettlement program is likely to be sustained, and LHDA has transferred ownership of the houses to the beneficiaries. For the compensation program, LHDA has reserved the funds required to sustain the 50-year compensation program. However, long-term institutional arrangements for the delivery of the entitlements are yet to be established. Moreover, with this quasi-welfare program, there is the danger that the present pattern of dependency will continue over the 50-year timeframe. As regards the income generation and the rural development programs supported under the project, there is uncertainty whether they can be sustained. To make them sustainable, several of the programs would need to be redesigned with greater involvement of the beneficiaries. For the project's rural infrastructure and health program, suitable hand-over arrangements would need to be finalized and the concerned communities and Government agencies would have to build up capacity to operate and maintain them.

14. ***Bank Performance.*** Bank performance overall was satisfactory. In spite of its small contribution to project financing (less than 5% of project cost), the Bank was able to play a significant and catalytic role in designing the operation and during

implementation. Bank involvement also sent strong signals to international contractors and financial institutions indicating that the project was both feasible and desirable, and thereby helping in raising the large amount of financing required by the project. Moreover, by consulting with RSA's political majority while South Africa was governed under apartheid policies, the Bank helped establish broad political support for the operation; and Bank participation provided reassurance to both Lesotho and RSA that the two countries had an objective partner to help resolve conflicts if and when they emerged. During supervision, the Bank provided extensive and valuable technical support to project authorities, helping greatly to ensure that LHDA and JPTC gave increasing attention to the social and environmental issues which arose during project implementation. The Bank was also instrumental in getting appropriate decisions taken on several critical institutional issues, such as decentralizing some of LHDA's operations, and re-designing the governance structure of LHWP.

15. In hindsight, the Bank could have been more effective by insisting that the project's environmental impact assessment and the Environmental Action Plan be prepared in more detail and with greater participation of project-affected persons, before providing financial support. It could also have recognized earlier the importance of analyzing instream flow requirements, to ensure that the downstream effects of the water transfer would be more fully considered in project design. In addition, given the weak capacity of LHDA at the time of appraisal, it would seem that the Bank was too optimistic in its assumptions about the Authority's capabilities to fully design and implement the project's social and environmental programs in a timely manner. More consideration might have been given to involving and strengthening Government agencies already active in these areas.

16. ***Borrower Performance.*** LHDA's performance on the whole has been very satisfactory, especially if one considers the weak implementation capacity of the institution during preparation and start-up of this complex multi-purpose project, involving about one hundred engineering, construction and advisory contracts. During project preparation, LHDA took an active role in defining the project's technical assistance requirements and organizational arrangements, and it developed effective programs for training Basotho staff and enabling them to move into managerial positions. With the heavy emphasis on the project's engineering and construction aspects, LHDA initially did not give sufficient attention to the environmental and social facets of the operation. The programs were not fully designed at project inception, participation of affected populations was negligible, and capabilities within the organization to deal with these matters was especially underdeveloped. Implementation delays and the need to re-design these components were the result together with large numbers of grievance cases and criticism by NGOs. LHDA has fully recognized these shortcomings and has largely overcome them by making major remedial efforts, including organizational changes, staff increases and improved coordination with local communities and NGOs. The shift in emphasis has significantly benefited the design and early implementation of Phase 1B.

17. ***Assessment of Outcome.*** Project outcome is rated as satisfactory. The project's main objective, related to water delivery to RSA, has been fully met and is sustainable. The component's technical aspects were well conceived, planned, designed and executed, and with proper operation and maintenance the project investments can be expected to perform as intended. Problems in meeting objectives have been experienced

in several of the project's environmental and social components, where expectations have not always been met and where timely delivery has been a concern in several instances. These issues are being pursued under the ongoing Phase 1B. The Development Fund, similarly, did not fully achieve what was intended. To better target Fund resources a new facility, the Lesotho Fund for Community Development, was set up in March 1999. IDA will provide a US$4.7 million Learning and Innovation Loan which will finance technical assistance for the new Fund.

18. Regarding the project's economic performance, the overall economic rate of return (ERR) has been re-estimated at about 16.4%, approximately 1% higher than forecast at appraisal. For the water transfer component the re-estimated ERR is 16.8%, also about 1% above the appraisal estimate. For the hydro-power investments, on the other hand, the ERR is re-estimated at 3.1% only about half of the appraisal ERR of 6%. Other macro and micro economic project outcomes include: Phase 1A project activities and the economic spin-offs they generated accounted for about 14% of Lesotho's GDP in 1994, a peak construction year. They also accounted for some 40% of value-added in the building and construction sector, and provided about 18% of Government revenues which was a critical element in the Government's ability to turn the large budget deficit of the late 1980s into a surplus. Phase 1A generated some 22,000 person years of employment, some 10% more than was anticipated; and almost 300 additional jobs for Basotho nationals were created at LHDA.

Key Lessons Learned

19. A number of lessons which are important for future phases of LHWP have been learned and are reflected in the design of Phase 1B (details are in the main text). In addition, several lessons have been learned that are of broader significance. These include:

(i) The project demonstrates that the Bank can play a unique role and add significant value even where it finances only a small portion of project costs. In the present case, the Bank contributed less than 5% to project financing, but the parties involved, especially the governments of Lesotho and RSA, thought Bank participation to be crucial for ensuring that the project met sound economic, technical, dam safety and environmental standards, and for obtaining broad international support. The two governments also saw the Bank as a valuable independent partner which would give objective advice, and which could foster regional cooperation in an operation that depended so much on it. In addition, during project implementation, the Bank effectively advised on all project aspects, and was able to direct significant attention to the operation's environmental and social issues, which were in jeopardy of receiving inadequate consideration;

(ii) The project illustrates two factors that require careful consideration when designing and implementing transnational projects. First, there must be clear and equitable sharing of costs and benefits, and second, there needs to be a separation of governance and oversight functions from implementation. On the first issue, there was sometimes lack of clarity in Phase 1A, as to what share of the project's social and environmental programs was attributable to the water transfer component and should therefore be funded by RSA, and what share was of a general development nature and should be financed by Lesotho.

On the second issue, JPTC's involvement in routine decisions encumbered project progress, until its role and the role of LHDA were re-defined;

(iii) The project underscores the risks associated with establishing a new agency for implementing a particular project, especially a high-profile operation such as LHWP. Moreover, the project highlights that such risks are magnified if that implementing agency is assigned responsibilities that are only indirectly related to the project, that are normally the concern of other public sector organizations, and that require the continued support of government. Where it is contemplated to assign such responsibilities, there has to be a clear justification, activities/investments have to be consistent with existing government policies and standards, and there has to be an exit plan;

(iv) The project illustrates the benefits that can be derived from appropriate expert input into implementation. Both the engineering and the environmental Panel of Experts provided valuable recommendations that impacted on the design of these components and, in the case of the water transfer investments, resulted in significant cost savings; and

(v) Problems experienced in implementing the project's environmental and social program point towards the importance of advance planning, including the preparation of sound Environmental Impact Assessments (covering also instream flow requirements) and of Environmental Action Plans prior to project start-up, to ensure that these components get off to a timely and effective start. They also highlight that community participation is essential in component design and execution and that NGOs and the private sector have a crucial role to play especially in the development of sustainable income generation activities of affected persons.

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HIGHLANDS WATER PROJECT – PHASE 1A
(Loan 3393-LSO)

IMPLEMENTATION COMPLETION REPORT

PART I : PROJECT IMPLEMENTATION ASSESSMENT

A. Project Identity

Name	:	Lesotho - Highlands Water Project (Phase 1A)
Loan Number	:	3393-LSO
RVP Unit	:	Africa Region
Country	:	Lesotho
Sector	:	Water Supply and Energy

B. Project Background

1. ***Country and Sectors***. Lesotho is a small kingdom surrounded by the Republic of South Africa (RSA). The country has a population of about 2.1 million and a GNP per capita of some US$670. Most of Lesotho's 30,300 square kilometers of land area is mountainous and ill-suited for agriculture. The economy is characterized first by substantial dependence on RSA as a source of income, employment and foreign exchange, and second by a poor supply of exploitable natural resources.

2. The sole economic resource that Lesotho has in abundance is water. Less than 6% of Lesotho's water is consumed domestically, with the remainder running through RSA to the sea. RSA on the other hand is chronically short of bulk water. The shortage is severe particularly in the country's industrial heartland of Gauteng, some 400 kilometers north of Lesotho. Gauteng contributes about 60% to South Africa's GDP and comprises 42% of the county's urban population; but the region has only 8% of the total water run-off.

3. In the energy sector, Lesotho has imported practically all its electricity from RSA. The Government of Lesotho (GOL) has been strongly committed to reduce that dependence, and develop its own electricity generation capacity.

4. ***Project Genesis***. The potential for transferring water from the highlands of Lesotho to meet the growing demand for water in Gauteng, was identified during the 1950s. When water demand in Gauteng outstripped supply in the 1980s, the need for inter-basin water transfer became urgent. Following extensive studies of alternative transfer schemes, it was determined that the Lesotho Highlands Water Project (LHWP) was the least-cost solution to meet water demand in Gauteng. GOL and RSA accordingly signed a Water Treaty in 1986 to carry out the project. LHWP is divided into four phases to be implemented between 1990 and 2020 with the ultimate aim to transfer 70m3/sec water from Lesotho to RSA. The Treaty commits RSA and GOL to implement Phases

1A and 1B of the project (transferring water to RSA in the amount of 18m3/sec and 12m3/sec, respectively) with the subsequent phases open to re-consideration. Under it, RSA will (a) meet all costs of the transfer scheme; and (b) pay a water royalty to Lesotho in the amount of 56% of the cost savings realized by South Africa through implementing LHWP rather than the costlier next best Orange Vaal Transfer Scheme. While LHWP focuses mainly on water supply to RSA, Lesotho decided to use the project also as a vehicle to eliminate its dependence on RSA for its electricity supply.

5. ***Previous Bank Involvement.*** The Bank supported Lesotho's efforts to develop its water resources into export revenue by: (i) acting as executing agency for the UNDP-financed consultants who supervised the LHWP feasibility studies (1983); (ii) providing an IDA Credit of SDR 8 million (Credit 1747-LSO; 1986) for a Lesotho Highlands Water Engineering Project to assist in preparatory phase of LHWP; (iii) making an advance of US$750,000 under the Bank's Project Preparation Facility (PPF P356-LSO; 1988); and (iv) providing substantial supervision and technical expertise during the project's preparatory stage. In other parts of the water sector, an IDA Credit of US$6 million (Credit 887-LSO; 1979) supported a water supply project that involved seven small towns, and which was successfully completed in 1985. In the energy sector, the Bank's involvement had been limited to: (i) the execution of an energy assessment in 1984, and (ii) discussions with GOL on power sector issues during the preparation of LHWP.

C. Statement and Evaluation of Project Objectives and Design

6. ***Project Scope and Design Considerations.*** The project was the largest public sector undertaking in Africa at the time of its inception, involving the construction of the highest dam in Africa and large capacity tunnels to transfer water from one country to another. It was also the most significant transnational operation of its time in Africa, with implementation responsibilities spanning the two concerned countries. The Joint Permanent Technical Commission (JPTC), established as a bi-national body, was to safeguard the interests of both GOL and RSA, while the main implementation agency, the Lesotho Highlands Development Authority (LHDA), was responsible for executing all project activities in Lesotho. In South Africa, the Trans Caledon Tunnel Authority (TCTA) was in charge of: (i) constructing the water delivery tunnel on the RSA side of the border; and (ii) arranging for the servicing of all loans related to the project's water transfer component. To help ensure that the operation met rigorous international standards, two Panels of Experts were set up to assist in the design and monitoring of the project's construction components and of its environmental and social components, respectively.

7. ***Project Objectives.*** The main objective of the project was to develop Lesotho's water resources and alleviate water shortages in RSA through the construction of dams, tunnels and controls as envisaged under Phase 1A of LHWP -- and thereby put in place the physical and managerial capacity for Lesotho to earn export revenues from the sale of water to South Africa. Additional objectives were: (i) to produce hydropower in order to reduce Lesotho's dependence on imported energy; and (ii) to make productive use of the project-generated export revenues by directing them to development-oriented programs. At the same time the project aimed at: (a) safeguarding environmental and resettlement as well as compensation aspects of the Phase 1A operation, (b) ensuring dam safety and

preparedness for emergencies; and (c) preparing for later construction phases of LHWP for further water transfers. (Implementation of Phase 1B, supported by a Bank Loan of US$45 million (Loan 4339-LSO), started in 1994).

8. ***Project Components***. The project financed Phase 1A of LHWP, covering all facilities required to permit transfer of 18 m3/sec water, and to have installed electricity capacity of 72 MW. This included the construction of:

- Katse dam, a 185 meter high double curvature arch dam
- Transfer tunnel, 45 kilometer long concrete-lined tunnel to transfer the stored water from Katse to Muela
- Muela hydropower complex, a 72 megawatt underground hydropower station
- Muela dam, a 55 meter high double curvature arch dam
- Delivery tunnel, a 15 kilometer long partly lined delivery tunnel from Muela to the crossover point to RSA (not financed under the project but directly linked with the operation were additional 22 kilometers of delivery tunnel within RSA to transfer the project water to the Ash River in South Africa)
- Transmission line, a 125 kilometer long 132 kilovolt transmission line connecting Muela substation to the Maseru load center
- Access roads, about 200 kilometers of new access roads, including two large and three small bridges
- Other project infrastructure such as work camps, staff housing, construction power supply, improvements in border crossing facilities, rehabilitation of existing access roads, and communication systems.

9. The project also included: (a) environmental protection measures; (b) resettlement, compensation, and income restoration programs for project-affected persons; (c) dam safety programs, monitoring instrumentation, and preparation of an Emergency Preparedness Plan (EPPP); (d) construction supervision; (e) technical assistance to LHDA, and to the GOL delegation to JPTC; (f) five studies including two to prepare the next phase (Phase 1B) of LHWP; and (g) financing of LHDA operation and administration expenditures, and of staff training. An important element of the project was the creation of a Development Fund for channeling project revenues (royalties and project related SACU payments) to development-oriented programs.

10. ***Project Costs and Financing***. Project costs, including interest during construction, were estimated at Maloti 8.4 billion (US$2.4 billion). Financing of all costs related to the project's water transfer facilities and related components (supervision, environment, resettlement, etc.) were to be RSA's responsibility, in line with the Water Treaty. The hydropower investments were to be financed by Lesotho. At the time of appraisal, funding had been arranged from a number of bilateral and multilateral donor agencies, European commercial banks, export credit agencies, and commercial banks and capital markets in the Common Monetary Area (Lesotho, Swaziland, Namibia and RSA). In addition, funding was to be provided by GOL. The Bank Loan of US$110 million was to finance those elements of the water transfer component that related to detailed design work and construction supervision of Phase 1A; the five project studies; and technical assistance and training to LHDA in the fields of administration, engineering, environment, and finance. The Loan Agreement was amended in May 1997 to provide

US$6 million technical assistance financing for design work and legal and financial advice related to Phase 1B. Since debt service for all water transfer components was to be effectively met by RSA, Bank financing was on IBRD terms. The project was expected to be completed by December 1997.

11. ***Evaluation of Project Objectives and Design***. The project has been of great importance for GOL to achieve its economic and financial goals, which at project appraisal concentrated on: (a) increasing export and public revenues to reduce substantial public and fiscal deficits; and (b) enhancing business and employment opportunities within Lesotho to counter reduced employment prospects for migrant Basotho workers in RSA. It was also fully consistent with the Bank's strategy for Lesotho, which focused on deficit reduction, exploitation of economic opportunities presented by Lesotho's abundance of water, and creation of new development possibilities. The operation's objectives continue to be consistent with the Government's current macroeconomic and sector priorities. They are also in agreement with the Bank's present assistance priorities for both Lesotho and RSA centering on poverty reduction, human resource development, institutional capacity building, and regional co-operation. Moreover, LHWP is firmly grounded in the Bank's 1995 and 1998 Country Assistance Strategies.

12. The project's objectives have been clear and have remained unchanged throughout project implementation. However environmental considerations, and goals related to resettlement, compensation and income generation in the project area, increased significantly in importance as implementation progressed. Project design has been changed to respond to these developments. Design changes became necessary also in the main civil works components of the project as construction encountered some unforeseen problems (para. 59). In this context, the project's innovative feature of two Panels of Experts for construction and environmental/social matters, respectively, turned out to be very valuable.

13. In hindsight, it is apparent that complete and timely achievement of the project's environmental and social objectives was not fully realistic given the weak institutional capabilities in Lesotho and the level of preparedness of related project components at the time of appraisal. It is also apparent that at project start-up, LHDA was not sufficiently ready to implement a project of this complexity and that with its predominant focus on engineering and infrastructure, the Authority was not well positioned to carry out effectively the project's environmental and social programs. A project design which would have entrusted some of these components to strengthen Government ministries and agencies already active in these fields, might have helped to ensure that they would have received greater attention early on.

D. Achievement of Project Objectives

Summary Assessment

14. The project achieved its main objectives of: (a) developing the water resources in the highlands of Lesotho by successfully completing the project civil works; (b) generating export revenues from the sale of water to South Africa; and (c) producing hydropower. It also met many of its environmental and social objectives although

success in these areas has been uneven, and where it was realized, it was usually late. The project was successful in preparing the ground for phase 1B of LHWP. Some positive impact was also achieved from investments supported by the Development Fund.

15. Implementation of the project was completed about nine months later than originally scheduled. Final project cost of US$2.6 billion exceeded appraisal estimates by about 9% in US dollar terms. In Maloti terms, final costs were some 27% higher than forecast. The cost overrun was mainly due to increases in interest during construction and related financial expenditures (such as the cost of hedging all the foreign currency obligations entered into under the project's water transfer component), and because of the need to add some construction works. For a project of this size and complexity, the cost increases approved and time extensions granted are considered to be fairly negligible.

Civil Works Components

16. ***Water Transfer Investments***. The project successfully completed all civil works required under this component, including the concrete double curvature arch dams at Katse and Muela; the tunnel to transfer the stored water from Katse to Muela; the delivery tunnel from Muela to the crossover point to RSA; and construction of new access roads, rehabilitation of existing roads and provision of other infrastructure such as work camps, staff housing, communication systems and power supply. Associated tunnel construction within South Africa (not financed under the project, and implemented by TCTA) has also been completed.

17. Impoundment of Katse dam started during October 1995, and on January 22, 1998 the water transfer component was inaugurated by King Letsi III of Lesotho and President Mandela of RSA. The Katse reservoir filled by March 1998, is presently close to its full supply level and transferring 18.7 m3/sec water to RSA. By March 1999, Lesotho had earned Maloti 370 million (US$60 million, at March 1999 exchange rate) since water delivery started in January 1998.

18. Completion of Katse dam and the transfer and delivery tunnels was delayed by about nine months. Costs exceeded original contract prices by about 15%. The main reasons for the higher costs were unanticipated needs for: (a) concrete lining of the transfer tunnel; (b) deepening of the foundation of Katse dam; and (c) associated design changes during implementation, as recommended by the Panel of Experts financed from the IBRD Loan. Also adding to the cost was the decision to provide for a "preformed joint" to reduce uplift pressure below the central cantilevers of the arch and thus relieve possible stresses in the dam structure..

19. ***Muela Hydropower Complex***. The Muela hydropower station has been completed at its design capacity of 72 megawatt, and since October 1998 the plant is delivering electricity to the Lesotho Electricity Corporation. Some surplus electricity has been exported to South Africa. Power produced by the complex is expected to keep Lesotho self-sufficient in energy for the coming years.

20. Completion of the hydropower component was delayed for more than 18 months due mainly to difficulties in obtaining financing. The delay made it necessary to

construct a by-pass at Muela to ensure timely water delivery to RSA in line with Water Treaty requirements. This together with increased excavation requirements at the right abutment for stability and safety, and design changes during construction (such as the addition of post cooling and surge shaft shape) raised the final component cost by about 28% over original contract prices.

21. ***Other Infrastructure.*** The project completed some 295 kilometers of new access roads and several bridges; rehabilitated existing roads; improved border crossings; and provided required infrastructure at construction site such as work camps, staff housing, communication systems and power supply. New and rehabilitated roads were built to high design standards which will greatly facilitate tourism in the Phase 1A project area. Together with the project's feeder roads (para. 47) they have also enabled easier and cheaper access for the highland population to the lowlands, which has manifested itself in greater interchange between the highlands and the lowlands and reduced price differentials for goods and services between the two regions. The project's other rural infrastructure programs (paras. 46 and 48) have provided schools and clinics that were not accessible before or required several days travel to the lowlands.

Dam Safety and Emergency Preparedness

22. ***Dam Safety.*** The project took all measures required to meet the provisions of the Bank's Dam Safety Guidelines: (a) project authorities took care to engage world-renowned consulting engineering firms to assist in the design and to supervise the execution of all civil engineering structures; (b) an independent panel of leading engineering experts reviewed all engineering, technical and dam safety aspects (resulting in significant design improvements, increased safety, and cost saving measures); (c) well-known and competent construction firms from around the world executed the construction of the main project works carrying out good quality control in the process; (d) extensive monitoring instrumentation was installed and assisted immensely in monitoring safe behavior of the project structures; (e) LHDA set up a dam safety and surveillance section, and had the section's staff trained in instrument monitoring; and (f) operation and maintenance manuals have been prepared, and the Authority has on its workforce a group of well trained employees who are able to operate and maintain the project structures according to international standards. Continued professional training will however be needed, and LHDA's dam safety and surveillance section requires some further strengthening.

23. ***Emergency Preparedness Plan (EPP).*** EPPs for Katse and Muela have been well designed and are in place. They cover all relevant items, such as emergency identification and evaluation, preventive actions, notification procedures, communication system, inundation maps and warning systems; and they specify the responsibilities of the various concerned public agencies and personnel. The EPPs, completed simultaneously with the project's main structures, are the first prepared under a Bank-assisted dam project, making Phase 1A the first project meeting this requirement of the Bank's Revised Dam Safety Guidelines of 1996. The Plans are however, still to be tested with the public at large, as ongoing awareness activities have so far concentrated on public institutions in the area, such as police and clinics.

Environmental Protection

24. ***Environmental Action Plan (EAP).*** The original project design included an EAP concentrating on soil conservation and sedimentation, pilot watershed management, biological monitoring, environmental monitoring and cultural heritage involving 29 studies funded by the European Development Fund. The environmental impact assessment on which this program was based had been embedded in the feasibility study of LHWP as a whole, and was generic in nature. While meeting the Bank's environmental guidelines in effect at the time of project appraisal, it was not sufficiently detailed for Phase 1A and lacked some crucial elements such as public participation. An updated EAP was prepared in 1998 reflecting all Phase 1A impacts as well as new priorities and needs since project inception, and including more realistic implementation schedules. As a result of the uncertainty with the original plan, the majority of the component sub-projects are delayed.

25. Key environmental activities carried out under the project focus on: (a) environmental monitoring of construction activities and site rehabilitation; (b) soil conservation and watershed management; (c) environmental reserves; (d) biological resources; (e) archaeological sites; (f) palaeontological conservation; (g) water quality assessment and monitoring; (h) initiating instream flow assessment to examine minimum flow requirements at downstream locations; and (i) environmental awareness programs.

26. ***Regarding environmental measures related to construction activities***, specifications for environmental protection were included in all main construction contracts, monitoring was systematically carried out, and all sites were rehabilitated. The Environmental Panel of Experts (financed from the Loan) found no major problems with site environmental management or clean-up following accidental spills or mishaps. An independent audit of post construction environmental conditions is yet to be carried out.

27. ***Soil conservation and watershed management activities*** implemented under the project achieved limited success, as JPTC and LHDA could not reach full agreement on the objectives and scope of this sub-component. Two catchment-wide studies on the extent of soil erosion (involving satellite imagery and soil loss modeling) were eventually approved and implemented. Land use monitoring and aerial photographic surveys have however not yet started. And a proposal for a long-term program emphasizing community-based land use planning, education and technology-transfer on soil conservation is still to be approved.

28. ***The establishment of environmental reserves*** experienced considerably delay due to LHDA capacity constraints and the lack of local infrastructure The initial program was also inadequately funded. The component has been greatly expanded in the meantime and is now receiving considerable support with an almost ten-fold increase in its investment budget. It involves two nature reserves, a cultural development site and an environmental park, and has a strong focus on eco-tourism. Implementation is progressing well with the help of local communities, but at the time of the completion mission, only about 30% of the program had been achieved.

29. ***The project's biological program*** aimed to determine the effects of the operation on biological resources in the project area, reduce adverse effects, and increase knowledge of local fauna and flora. Achievements to date have been substantial: several areas have been protected, bird species have been mapped and monitored, bird flight diverters have been attached to power lines, effects of chemicals on wildlife are being monitored, rare plants have been collected and planted in a Botanical Garden established by the project at Katse, baseline biological surveys have been prepared and biological monitoring is being undertaken, effects of the tunnels on fish is being checked, studies have been completed on the Maloti minnow, and limnological conditions are being monitored.

30. ***The project's archeological objectives*** included protection of archeological sites against deleterious project impacts, and use of archeological resources for community and public awareness. A number of surveys and analyses were carried out under the project, and all significant archeological sites in the Phase 1A project area are believed to have been located and evaluated. Where necessary, they were excavated, and valuable material was removed to safety. A decision on establishing a display unit for the artifacts is still pending.

31. ***A palaeontological conservation component*** was included in the project after the feasibility study established presence of fossil remains in the sedimentary rocks within the project scheme area. A survey and assessment were prepared, and fossils were collected. As with the archeological component, a decision is yet to be taken on financing a display unit for the collected material.

32. ***The quality of water*** delivered to RSA is covered in the Water Treaty (para. 4), which requires GOL to ensure that the quality of water delivered to RSA is equivalent to the quality prior to project implementation. In line with this requirement, the project was to establish a long-term water quality database, monitor specific quality parameters, and establish local expertise in sampling, analysis and program management. The baseline study was completed in 1993. Water quality at construction sites has been monitored regularly and corrective action taken. Where necessary, routine water quality sampling is being undertaken by LHDA staff and analyses are being carried out by Rand Water - the client for the water delivered to RSA. The component was not fully effective in developing all necessary skills and facilities in LHDA, and the program was largely ineffective between 1993 and 1996 when LHDA carried out the work entirely on its own. Monitoring improved markedly in 1996 when Rand Water made its facilities and staff available for training and analysis.

33. ***Instream flow requirements***. The 1990 EAP did not acknowledged the need for investigating instream flow requirements (IFR). That need was, however, recognized as part of Phase 1B preparation and the current IFR study was initiated in 1997. The study includes both Phase 1A and Phase 1B of LHWP, and it is based on a detailed assessment of flow requirements at eight river sites below existing and proposed structures. The scope of the study includes social issues, public health, water supply and livestock use of the river, as well as various biological requirements. IFR estimates will be available later in early 2000. While the study will provide the monitoring parameters and basis for a

monitoring system, possibilities for changing the design of Phase 1A structures will be limited at this stage. However, it will be useful for Phase 1B and further phases.

34. ***Environmental awareness***. The EAP placed great importance on environmental awareness among various sectors of the public, with a target of reaching 18,000 people in more than 300 villages through public gatherings, radio broadcasts, videos and films, pamphlets and newspapers, and dramas. From 1992 to 1997, the awareness program was implemented with only an environmental officer and a technical assistant at LHDA's disposal. A number of meetings were held with highland groups and at schools, and pamphlets and a book were distributed, but detailed records on the activities have not been kept, and the great imbalance between the target and staff input raises doubts about the effectiveness of the program. Provision of funds by the European Union in 1997 led to the engagement of a resident program manager and an expatriate technical officer, and to the production of a master plan, an instructional video, as well as a video drama for the program and a radio serial. The overall objective of this sub-component is, however, still not being fully met.

Social Development

35. The project financed resettlement and compensation programs to recompense persons affected by it for lost income and assets. It also included an income restoration and rural development program to restore productive capacity of project-affected persons so that they might benefit from new opportunities created by LHWP. Specific sub-projects concentrated on: (a) production activities such as livestock, horticulture, fisheries and forestry; (b) rural infrastructure including roads, water supply and sanitation, rural electrification and tourism development; and (c) education and skills training. The project financed a public health program in the project area.

36. ***The project's involuntary resettlement*** program expected initially to resettle 173 households. In the end, inundation at Katse together with road construction activities and provision of other infrastructure, including power lines, required the resettlement or relocation of 294 households, three schools and a church. In addition, reservoir-induced seismicity at Mapeleng village resulted in the relocation of 63 of the 70 village households, with the remaining seven opting for replacement houses at the same location. Implementation of the program has been completed including the seven households under a power-line.

37. Replacement houses provided under the project are of higher quality than the original homes of the resettled households. But insufficient advance planning left little room for involvement of project affected persons in the design of housing specifications; and scant attention was paid to local customary practices that integrate functionality with esthetics. A key limitation of the program was the requirement that households resettle within the project area, a limitation which has been removed under the ongoing Phase 1B.

38. ***The project's compensation program*** comprised individual entitlements, mainly for the loss of land, and compensation for the loss of communal assets, mainly communal grazing areas. For individuals, the project established 3,260 entitlements to compensate for the loss of about 78 hectares of agricultural land. The initial plan was to provide grain

as annual compensation payment for a period of 15 years with the expectation that the project's rural development program would then provide adequate income earning possibilities. The program was amended in the context of Phase 1B preparation and now grants entitlements for 50 years. It also currently provides an option of land-for-land exchange, and an option of annual payment in cash instead of grain. For communal grazing areas, a fodder entitlement was initially created for a period of five years. At the end of this period it was assumed that with the establishment of grazing associations under the rural development program, the quality of range would be restored to pre-impact levels and thereby obviate the need for continued fodder delivery. This assumption has been abandoned as sufficient new grazing areas were not established during Phase 1A implementation (para. 42), and the compensation period has been extended to 50 years, the same as for individual entitlements.

39. After some initial start-up problems, the compensation program is now operating satisfactorily, but the 50 year duration of payments together with the de-linking of compensation from income generation has created a quasi welfare and entitlement culture. As a result, few beneficiaries have opted for land-for-land exchange, and even for land that was acquired only on a temporary basis, the initial owners are now reluctant to re-occupy the fields for fear that they lose their entitlements. An additional problem with the program is the lack of information on the long-term transaction cost for running a 50-year undertaking of this sort.

40. Fodder deliveries to compensate for lost communal grazing areas encountered some quality problems, and the program has recently been shifted to cash compensation. Under the new arrangement, communities are however required to prepare sustainable development proposals to obtain such compensation. Preparation of viable proposals is experiencing some start up problems, but this shift will help in mainstreaming participatory development planning with the local communities, and in building local capacity for planning, implementing and managing long-term development programs.

41. ***The project's income restoration and rural development program*** was designed to enable project-affected persons to reconstruct lost sources of livelihood and to allow host communities to avail themselves of the program to improve their standard of living. Pursuant to this objective, the program was structured on the following three axis: production, education, and infrastructure.

42. Regarding *production*, the project provided for livestock and range management, mountain horticulture and field crops, fisheries, village forestry and land-use planning. To manage uncontrolled grazing the project had some success in establishing grazing associations increasing the number of members to 1,258 in the project area, and it introduced improved breeds of livestock, especially cattle. The project also increased the members participating in the horticulture/field crops intensification program by 35 to 45, focusing on the production of seed potatoes, cabbages, fruit trees and maize. As regards fisheries, ten villagers have been trained in subsistence fishing, and a feasibility study on trout farming in Katse reservoir is being completed.

43. The impact of these activities on living standards in the project area has been limited as the programs suffered from significant delays and a supply-driven approach

characterized by inadequate market analysis, insufficient involvement of the private sector in project design, limited understanding of the comparative advantage of the highlands economy, and lacking evaluation of the different schemes during implementation.

44. Initial attempts to establish a village forestry program with the Ministry of Agriculture were not successful. After CARE took over in 1996, 75 village committees were created and 109,000 trees have been planted, with a survival rated reported at 60%. The land-use planning program was designed to provide orderly development in the scheme area. Ten plans have been prepared covering 45 villages, but there is no tangible output to show on the ground.

45. Regarding the project's *education* program, skills training at the rural development center in Thaba Tseka constituted a central component of the Phase 1A income restoration strategy. While 1,146 project-affected persons have attended courses at the center, there is weak evidence to support that these trainees are actually using the acquired skills in some gainful activity. The model of on-campus training was too supply driven and ill-adapted for adults with family obligations. In recognition of this, LHDA is now changing its role in this area from producer to facilitator of training. This shift will enable the Authority to restructure the program to be more responsive to the needs of affected persons.

46. The project's rural *infrastructure* program focused on investments directed towards construction communities, village water supply, sanitation, feeder roads electrification and tourism. Infrastructure investments in construction communities were designed to accommodate the influx of workers into the community. An additional objective was to extend the facilities to neighboring villages so that these villages might benefit from efficiencies that such infrastructure would provide. The latter objective was not achieved because the siting of construction sites was not driven to build on such efficiencies, as most of them were far from villages. Construction communities delivered however markets, schools, crèches, community halls including offices, water supply and other local community infrastructure such as bus stops. Village water supply was expected to be provided to both resettled households and host communities. Due to cost overruns the program has so far covered only 40% of the intended 143 villages. Rural sanitation aimed at enhancing water quality and improving health in the highlands. By the time of the completion mission, only 15% of the intended villages had been provided with the proposed facilities. Discussions are on-going between JPTC and LHDA to complete both the water supply and sanitation programs.

47. The rural feeder roads program delivered 95 kilometers of roads, two vehicular bridges and two footbridges. Rural electrification targeted villages in proximity of existing power sources located at construction sites and camps. The program never took off, however, since the high cost of operation and maintenance after the project construction phase rendered it economically unviable. Tourism investments similarly never got started due to the lack of a promoter. The only significant achievement to date is the development of two information centers. Yet in view of the unique tourism opportunities created by Katse reservoir, this element of the project is now being re-vamped with possible support from the African Development Bank; and a Katse zoning

project is being tendered to provide guidelines for a comprehensive tourism development program.

48. ***The project's public health program*** aimed at strengthening health services in the project area and addressing health problems associated with the arrival of the construction work force. Achievements include the staffing of three health teams, installation of a trauma unit at the Leribe hospital, establishment of contractor clinics, organization of 14 village-based nutrition groups, and provision of latrines and of pipe-born potable water at 30 and 20 schools, respectively. The health teams carried out several health campaigns; the trauma unit alone admitted some 8,600 patients over a five year period and treated 11,900 cases on an outpatient basis; and awareness campaigns were organized against communicable diseases. As regards occupational health and safety policy, 25 fatalities were recorded during construction, a remarkable record given the magnitude of the project. On the other hand, many minor injuries occurred due to weak adherence to personal protection procedures; and 12 persons have been reported drowned in Katse lake and two electrocuted in the scheme area despite an extensive community accident prevention program.

49. ***Monitoring***. Under the Water Treaty, LHDA is required to monitor the social and economic impacts of the project on the affected people. A program has been initiated involving a household survey which is complemented by participatory monitoring and evaluation. The survey is conducted annually covering one third of the affected population on a rotating basis. While the absence of reliable baseline data has made it difficult to determine accurately the complete impact of the project, the surveys have been helpful in tracking trends.

Institution Building

50. LHDA's capacity to manage the project and operate project facilities has dramatically improved during project implementation. Staff has been strengthened and quality has been upgraded, where necessary, to meet project requirements; more than 500 staff have been trained; and expatriates in managerial positions have almost completely been replaced by Basotho staff. Overall, the share of expatriates in LHDA's work force has been reduced from 16% in 1990/91 to less than 4% at present.

51. To assist LHDA in preparing for the time of operating the project's water transfer and hydropower components, an Organization and Manpower Study was carried out using IBRD Loans funds. Together with a subsequent Transformation Project initiated by LHDA the study provided the basis for a major restructuring of the institution in 1998, and re-orienting LHDA from an engineering to a service-oriented organization. The reorganization of LHDA also resulted in clearer lines of decision making, increased accountability, and better performance measurement. Problems resulting from excessive centralization of LHDA in Maseru, especially of its Environmental and Social Services Group, have been addressed through the establishment of four field office branches in the project area.

52. The structural relationship between the LHDA and the JPTC has been unwieldy and slowed project progress. JPTC, responsible for monitoring project implementation,

was set up to safeguard the interests of both GOL and RSA. With South Africa being liable for all costs of the project's main component (i.e., all water transfer investments), but having no say in day-to-day management, the JPTC became the organ through which to exercise some control over project expenditures - especially those with ambiguity as to whether they were attributable to the main project component or whether they were of a general development nature. This led to the JPTC's involvement in routine decision-making, micro-management, delays, and cumbersome procedures due to the need to get agreement among the parties on relatively minor issues. To streamline implementation in the future, a new governance structure has now been agreed upon in the context of Phase 1B. Under it, JPTC retains ultimate accountability but shifts more to policy formulation and strategic functions, and to monitoring of key outputs and outcomes, while LHDA has been given a clearer mandate for project implementation within agreed limits

53. The project study on Management Accounting and Information Systems helped in the on-going effort to establish an effective accounting system and performance indicators. However, it focused on activity-based costing which could not be readily applied. Therefore both LHDA and JPTC refined the principle of cost allocation approach that was finally adopted. The study also assisted in the creation of improved management reports. More remains to be done in developing user-friendly reports, strengthening monitoring, establishing adequate databases, and integrating appropriate monitoring and performance indicators in management reports. To deal with some of these issues, LHDA has adopted and implemented the SAP system (Systems, Applications, and Products in Data Processing) as the organization's single computer system for core business and administrative processes. LHDA is producing financial statements and is being audited by independent auditors in a regular and timely manner.

Development Fund

54. Another objective of the project was to make productive use of the project-generated export revenues by directing them to community-driven development projects. A Development Fund was established for this purpose in 1992, but problems quickly emerged on reaching agreement on Fund management and organization. Once deposits were made into the Fund and available for projects in 1995, the lack of transparent criteria and procedures became significant bottlenecks. In 1995/96, the Fund was restructured and re-directed towards poverty-focused development projects. About 240 projects were approved at a total cost of Maloti 215 million and have been or are being completed. They cover a variety of investments, mainly roads, bridges, clinics, markets and small dams.

55. The projects financed by the Development Fund fostered public investment in the rural areas, increasing access to public services and creating significant short-term employment. However, a number of problems such as inadequate criteria for project approval and for poverty targeting, as well as poor construction quality and inadequate operations and maintenance, hampered the effective use of the Fund resources. After a lengthy consultation process involving all key stakeholders, a new fund, the Lesotho Fund for Community Development, was set up in March 1999. The new Fund , which will receive 40% of the revenues generated by the project (60% will go into general Government revenues to make up for the removal of SACU funding and to meet other

financing requirements), will be managed by a multi-stakeholder independent board that will include representatives from GOL, NGOs, communities, parastatals and the private sector. Fund operations, including project selection criteria, have been established; and the hiring of a professional management team has been initiated. To foster effective management of the Fund and to pilot a national poverty survey, IDA will provide a US$4.7 million Learning and Innovation Loan which will finance technical assistance for the Fund.

E. Major Factors Affecting the Project

56. ***Political Changes.*** When the project was appraised in 1990, Lesotho was ruled by a military government, and South Africa was governed under the apartheid system. Namibia had just become independent. The Bank had sought and received assurances from the African National Congress (ANC; in exile in Lusaka) and from the Namibian government that there would be no objection to the project. In 1993, military rule ended in Lesotho; and in 1994 RSA held its all-race elections which brought a new government under ANC leadership into power. These developments had a positive affect on the project by: (a) increasing the legitimacy of both governments' interactions on the project; (b) refocusing RSA's attention on providing better access to water to the entire population (so that it was not primarily driven by demand growth in the industrial and white consumers sector, but also seen as a way to increase water availability for those without access); and (c) bringing new emphasis on regional development with LHWP seen as vehicle for regional integration and as a model for cross-national cooperation. The present governments of RSA, Lesotho, and Namibia have all endorsed the project.

57. ***Labor Unrest.*** While the number of days lost due to strikes (about 1.5%) has been low for a project of this magnitude, labor problems have affected project implementation and resulted in changing LHDA's approach to labor issues. Most labor problems related to pay disputes; inexperienced labor unions; charges of racism, of unequal treatment of domestic and foreign workers, and of insufficient promotion of Basotho workers; high expectation by the workforce, divide and rule policies by some contractors, inadequate enforcement of Lesotho labor laws due to understaffing and inexperience of the Department of Labor, and inadequate industrial relations monitoring in construction contracts. One prolonged labor dispute (at the Muela construction site) culminated in violence and an incident on September 14, 1996 when Lesotho Mountain Police shot and killed five workers. The main issues in the run-up to this event were the lack of a labor union at the site; the rise to prominence of a radical worker representatives committee that made unreasonable demands; the absence of labor law enforcement; a legalistic approach to problem resolution by the employer; and an ill-equipped police force using excessive force. At the insistence of the Bank and civil society groups, the Government instituted a judicial inquiry which found that inadequate attempts at mediation and enforcement of the labor code, poor police training and procedures, and excessive force were the main causes of the incident. To better deal with labor issues, LHDA now requires that contractors employ industrial relations experts, and that supervising engineers provide industrial relations monitors. In addition, LHDA has considerably increased contractors' obligations on hiring (including the need to hire unskilled workers from a list of affected persons), on training, on provision of meals, and on health and

safety. Moreover, it has strengthened its own industrial relations unit, and is helping the Department of Labor to improve its capacity.

58. ***Muela Financing***. Disagreement between LHDA and the African Development Bank (AfDB) over the award of the main construction contract at the Muela hydropower complex led to the decision by AfDB to withdraw from financing this component. In addition, because of Muela's low rate of return (para. 75), Commonwealth Development Corporation (CDC) pulled out of financing this component. These decisions and the time required to secure financing from other sources were the main reasons for the one and one half year delay in completing this part of the project. The delay, in turn, was the main reason for the significant cost increase in this component, especially as it necessitated accelerated construction of the Muela by-pass to ensure timely water delivery to RSA in accordance with the Water Treaty. Moreover, the need to arrange alternative financing at shorter terms and higher interest rates than those offered by AfDB and CDC, are at the heart of the cash-flow problems that the hydropower component is currently experiencing (para. 63).

59. ***Need for Concrete Lining of the Transfer Tunnel.*** In the pre-tender period opinions diverged as to the length of concrete lining necessary in the transfer tunnel. The Panel of Experts recommended that tender documents be prepared on the assumption that the whole length of the tunnel would be concrete lined, and suggested that provision be made for partial deletion of the lining during construction. This recommendation was not implemented and the tender document only made provision for 14% of the tunnel to be lined. The decision to delete all lining prior to tendering proved costly as the contractor at the site could charge non-competitive prices once the necessity of additional lining arose during construction. The result was a delay in transfer of water by about one year and a cost increase of Maloti 350 million.

60. ***Lining Issues at the Delivery Tunnel.*** There was great concern about the durability of the Clarens sandstone formation for the 15 kilometer long delivery tunnel through the sandstone. Exploratory adits at the Muela powerhouse and Hololo crossing indicated soft sandstone that was likely to degrade, while a comprehensive testing program showed that the Clarens sandstone was generally sound and stable and did not require extensive permanent tunnel supports, thus, greatly reducing the concrete lining. This extensive testing program, undertaken right in time, resulted in considerable cost savings as compared to the pessimistic overall lining proposal, and it led to timely completion of the work.

61. ***Reservoir Induced Seismicity (RIS).*** RIS measuring up to 3.3 on the Richter scale was experienced following the filling of Katse reservoir. The RIS was reviewed by the Engineering PoE who concluded that there was no adverse effect on the safety or operation of the project, but it did recommend enhanced monitoring which LHDA has implemented. However, the RIS impacted adversely the villages adjacent to the reservoir, requiring the construction of replacement houses at Mapeleng village and substantial repairs to houses in other villages, and creating adverse publicity for the project.

F. Project Sustainability

62. The operational plan presently being implemented for the project's ***water transfer component*** is adequate to ensure the sustainability of the benefits reaped from this component. Management, organizational and financial arrangements are in place to operate and maintain the facilities; appropriate dam safety measures have also been implemented, and commitment to the effective operation of the component is high in both Lesotho and RSA.

63. Sustainability is also likely for the Muela ***hydropower complex***, but there are a number of financial issues that need to be sorted out. LHDA, is not in a position to service the debt associated with Muela, and to pay outstanding contractor bills. (Servicing the substantially larger debt related to the water transfer investments is the responsibility of RSA through its agent, TCTA.) LHDA's cash-flow problems, stemming mainly from the decision by AfDB and CDC to withdraw from Muela financing (para. 58), are particularly severe in the current financial year when Maloti 350 million need to be paid. GOL is presently reviewing various alternatives to assist in reducing LHDA's financial burden, but considerable additional financing will be required to enable LHDA to restore its financial soundness. There is the additional problem that the Lesotho Electricity Corporation (LEC) to which the generated power is sold, suffers also from a poor financial situation and has not yet paid LHDA for its electricity. And finally there is the issue of energy pricing. LHDA's electricity charges, which are based on a 1993 power sales agreement, are considerably above the rates of ESKOM, the RSA power utility, and are therefore not sustainable.

64. The project's ***other infrastructure components***, such as access roads, labor camps and staff housing are expected to be sustainable. However, some roads are still being maintained by the contractor, and hand-over arrangements to the Department of Works will be completed only after Phase 1B has been implemented. Since the roads have been built to high standards, operations and maintenance cost to the Government will be significant once maintenance becomes the responsibility of the Public Works Department, and providing adequate O&M budgets may become an issue. Finding a resolution to this problem is now receiving attention from GOL with support from the Development Bank of Southern Africa which has been a major financier of these investments.

65. Water quality monitoring under the project's ***environmental program*** is likely to be sustainable. For the other environmental components, sustainability is less certain. Several components such as the establishment of reserves, are in early stages of implementation, while for others, such as soil conservation and watershed management, much more community involvement is required to make them sustainable. In addition, for sustained management of the environmental reserves and the fisheries program, it will be essential to develop greater institutional capacity.

66. Regarding the project's ***social investments***, the resettlement program is likely to be sustained. But LHDA has yet to transfer ownership of the houses to the beneficiaries -- who continue to demand repairs and other improvements to be carried out by the Authority – and needs to set a cut-off date. For the compensation program, LHDA has

reserved the funds required to sustain the 50-year compensation program. However, long-term institutional arrangements for the delivery of the entitlements are yet to be established. Moreover, with such a quasi-welfare program, there is the danger that the present pattern of dependency could continue over the 50-year time frame. To avoid this, the compensation program needs to better integrated with effective income restoration and rural development activities.

67. There is considerable uncertainty as to whether the income generation and the rural development program supported under the project are sustainable. For the production program it would be necessary to develop a new strategic approach based on the comparative advantage of the highlands, greater involvement of the beneficiaries and the private sector in program design, and better assessment of market constraints and of possibilities to reduce them. Education efforts must similarly be re-designed in line with real employment opportunities and better use of existing training institutes. And for investments made in rural infrastructure, sustainability will require that LHDA finalize arrangements with concerned Government agencies and local communities to hand over the facilities, and that the agencies and communities are strengthening or, where necessary, developing their capacity to operate and maintain them.

68. For the public health program, sustainability will similarly depend on the ability to integrate the project health facilities and teams into the national health delivery system. In the longer-term, it will also depend on the Government's ability to implement a system of user fees to cover costs and move away from the present process of subsidized health delivery. Sustainability of the Development Fund will largely depend on the effectiveness of the new management and organizational arrangements now being put in place (para. 52).

G. Bank Performance

69. Bank performance was overall satisfactory. In spite of its small contribution to project financing (less than 5% of project cost), the Bank was able to play a significant and catalytic role in project design during all initial phases including identification, preparation, and appraisal. The Bank provided both technical and financial support which sent strong signals to international contractors and financial institutions indicating that the project was both feasible and desirable, and thereby helping in raising the large amount of financing required by the project. Bank involvement furthermore provided comfort to international investors that the project would be meeting high standards.

70. The Bank's participation helped in strengthening regional co-ordination, and by consulting with RSA's political majority while South Africa was governed under apartheid policies, the Bank also helped establish broad political support for the operation. Moreover, Bank participation provided reassurance to both Lesotho and RSA that the two countries had an objective partner to help resolve conflicts if and when they arose.

71. During supervision, the Bank provided extensive and valuable technical support to project authorities, helping greatly in ensuring that LHDA and JPTC gave increasing attention to the social and environmental issues that arose during project implementation.

The Bank was also instrumental in getting appropriate decisions taken on several critical institutional issues, such as decentralizing some of LHDA's operations, and re-designing the governance structure of LHWP. Bank-internal supervision reporting was, however, not fully satisfactory. All missions prepared detailed and comprehensive aide-memoires, and they kept management and stakeholders well informed on project progress and problems, but Project Status Reports (Form 590) were not prepared for more than three years.

72. The Bank could have been more effective by insisting that the project's Environmental Impact Assessment and the Environmental Action Plan be prepared in more detail and with more participation of project-affected persons, before providing financial support. It could also have recognized earlier the importance of analyzing instream flow requirements, to ensure that downstream effects of the water transfer would be more fully considered in project design. Given the weak capacity of LHDA at the time of appraisal, it would seem that the Bank was too optimistic in its assumptions about the Authority's capabilities to fully design and implement the project's social and environmental programs in a timely manner. More consideration might have been given to involving and strengthening the capacity of Government agencies already active in these areas. This would have enabled better participation in the planning, design and implementation stages and it would have helped these agencies to later successfully take over the project facilities.

H. Borrower Performance

73. LHDA's performance on the whole has been very satisfactory, especially if one considers the weak implementation capacity of the institution during preparation and start-up of this multipurpose project, involving about one hundred engineering, construction and advisory contracts. During project preparation, LHDA took an active role in defining the project's technical assistance requirements and organizational arrangements, and it developed effective programs for training Basotho staff and to enable them to move into managerial positions. With a heavy emphasis on the project's engineering and construction aspects, LHDA did not give sufficient attention to the environmental and social facets of the operation during early project implementation. The programs were also not fully designed at project inception, participation of affected populations was negligible, and capabilities within the organization to deal with these matters was especially underdeveloped. Implementation delays and the need to re-design these components were the result together with large numbers of grievance cases and criticism by NGOs. LHDA has fully recognized these shortcomings and has largely overcome them by making major remedial efforts, including organizational changes, staff increases and improved coordination with local communities and NGOs. The shift in emphasis has significantly benefited the design and early implementation of Phase 1B.

I. Assessment of Outcome

74. Project outcome is rated as satisfactory. The project's main objective related to water delivery to SAR has been fully met and is sustainable. The technical aspects were well conceived, planned, designed and executed and with proper operation and maintenance can be expected to perform as intended. Regarding hydro-power

development at Muela, physical objectives have been met, but some financial issues are yet to be resolved (para. 63). Problems in meeting objectives have been experienced in several of the project's environmental and social components, where expectations have not always been met and where timely delivery has been an issue in several instances. For the latter components sustainability is also not always certain, an issue that is being pursued under the ongoing Phase 1B. The Development Fund, similarly, did not fully achieve what was intended. To better target Fund resources a new facility, the Lesotho Fund for Community Development, was set up in March 1999. IDA will provide a US$4.7 million Learning and Innovation Loan which will finance technical assistance for the new Fund.

75. Regarding the project's economic performance, the overall economic rate of return (ERR) has been re-estimated at about 16.4%, approximately 1% higher than forecast at appraisal. For the water transfer component the re-estimated ERR is 16.8%, also about 1% above the appraisal estimate. For the hydro-power investments, on the other hand, the ERR is re-estimated at 3.1% only about half of the appraisal ERR of 6%. Due to its small size relative to the water transfer component, the Muela power complex has only a small impact on the economic rate of return of the project as a whole.

76. There are two major reasons for the significant reduction in the ERR for the Muela component: first, the 30% fall in the real price of electricity from ESKOM (due mainly to over-capacity), has made the Muela electricity relatively more expensive than foreseen at appraisal; and second the delay in implementing the component and the cost increases associated with that delay (para. 20), has made the Muela operation more costly than had been expected.

77. The re-estimated ERR for the water component is higher than forecast at appraisal although costs increased above appraisal estimates, and water demand has been lower than expected (largely because of the drought in 1994/95 and the water usage restrictions imposed as a result). However, the impact of these factors on the component ERR has been more than off-set by the increase in the value of project water to consumers. This increase stems from the higher water prices introduced in response to the 1994/95 drought and as a result of demand management measures undertaken by RSA to bring prices closer to their economic value. The investments made under the project continue also to be the most cost-effective alternative among various possible water transfer schemes, especially if one considers that some of the Phase 1A construction has been undertaken with Phase 1B in mind.

78. Other macro and micro economic project outcomes include: Phase 1A project activities and the economic spin-offs they generated accounted for about 14% of Lesotho's GDP in 1994, a peak construction year. They also accounted for some 40% of value-added in the building and construction sector, and provided about 18% of Government revenues which was a critical element in the Government's ability to turn the large budget deficit of the late 1980s into a surplus. Royalties of Maloti 370 million earned to date from the project have however been less than expected at appraisal, largely due to the fall in the real price of electricity (based upon which variable royalties are adjusted), and because of a hydrology that yields lower royalty revenues than forecast at appraisal. In contrast, project revenues generated from the project under the Southern

Africa Customs Union have been higher than what was expected at appraisal, amounting to Maloti 760 million to date. Phase 1A generated some 22,000 person years of employment, some 10% more than was anticipated; and almost 300 additional jobs for Basotho nationals were created at LHDA. The project also created some Maloti 100 million in demand for supplies from Basotho companies, and Maloti 85 million in sub-contracting opportunities and consultancy contracts. The latter were below expectations in part because of a lack of competency in the Basotho business sector, and since there were no incentives for contractors to rely on Basotho firms. Significant efforts to address these issues are being made under Phase 1B, and they seem to be paying off already.

J. Future Operations

79. Future operation of Phase 1A will receive continued and extensive attention under the ongoing Phase 1B project. At project closing LHDA had in place the organizational and staffing arrangements, and had drafted operating manuals and procedures to effectively operate and maintain the project's water transfer and hydro-power components. A dam safety surveillance section had been set up and an adequate emergency preparedness plan had been developed. A number of financial issues were however yet to be resolved to ensure the future performance of the Muela hydro-power complex (para. 63).

80. Regarding the future operation of the project's other infrastructure investments and social and environmental programs, LHDA is now developing an operating plan, including appropriate hand-over arrangements to communities and concerned Government agencies. Several of the programs, which are yet to be completed, are being carried over into Phase 1B which focuses on ensuring that their continuation, where justified, will be pursued in a sound manner.

K. Key Lessons Learned

81. A number of lessons which are important especially for future phases of LHWP have been learned together with several lessons that are of broader significance. They have been integrated into the design of Phase 1B.

82. The *broader lessons* are:

(i) The project demonstrates that the Bank can play a unique role and add significant value even where it finances only a small portion of project costs. In the present case, the Bank committed less than 5% to project financing, but the parties involved, especially the governments of Lesotho and RSA thought Bank participation to be crucial for ensuring that the project met sound economic, technical, dam safety and environmental standards, and for obtaining broad international support. The two governments also saw the Bank as a valuable independent partner who would give objective advice, and who could foster regional cooperation in an operation that depended so much on it. During project implementation also, the Bank demonstrated that it added significant value in spite of its small financial contribution. It effectively advised on all project aspects including the ones financed by others, and it was able to direct significant attention to the operation's

environmental and social issues which were in jeopardy of receiving inadequate consideration;

(ii) The project illustrates that two factors require careful consideration when designing and implementing transnational projects. First, there must be clear and equitable sharing of costs and benefits, and second, there needs to be a separation of governance and oversight functions from implementation. On the first issue, there was sometimes lack of clarity in Phase 1A, as to what share of the project's social and environmental programs was attributable to the water transfer component and should therefore be funded by RSA, and what share was of a general development nature and should be financed by Lesotho. On the second issue, JPTC's involvement in routine decisions encumbered project progress, until its role and the role of LHDA were re-defined (para. 52);

(iii) The project underscores the risks associated with establishing a new agency for implementing a particular project, especially a high-profile operation such as LHWP. Moreover, the project highlights that such risks are magnified if that implementing agency is assigned responsibilities that are only indirectly related to the project, that are normally the concern of other public sector organizations, and that require the continued support of government. Where it is contemplated to assign such responsibilities, there has to be a clear justification, activities/investments have to be consistent with existing government policies and standards, and there has to be an exit plan. Under Phase 1A, better employment conditions offered by LHDA resulted in a drain of capacity from Government as many employees were recruited from Government ministries and agencies. Now that LHDA is trying to transfer some of the project investments and programs to other Government entities, there is also reluctance by employees to return to their previous units. What is more, the agencies and communities expected to take over the investments/programs, are hesitant to do so since they were not always sufficiently consulted and because they are uncertain about the financial implications and their ability to finance future operation and maintenance;

(iv) The project illustrates the benefits that can be derived from appropriate expert input into implementation. Both the Panel of Experts on the water transfer component and the Panel of Experts advising on the project's environmental and social programs provided valuable recommendations that impacted on the design of these components and in the case of the water transfer investments resulted in significant cost savings; and

(v) Problems experienced in implementing the project's environmental and social program point towards the importance of advance planning, including the preparation of sound Environmental Impact Assessments (covering also instream flow requirements) and of Environmental Action Plans prior to project start-up, to ensure that these components get off to a timely and effective start. They also highlight that community participation is essential in component design and execution and that NGOs and the private sector have a crucial role to play especially in the development of sustainable income generation activities of affected persons.

83. The relevant *lessons particularly for the next stages of LHWP* include:

Lessons related to contracting and contractor relations

- the need to include in all works contracts enhanced provisions for environmental management and monitoring, local contractor development, training of local professional staff including engineers, labor relations, health and safety standards, and employment of affected communities.

- the desirability of separating bid prices from contractor financing (the Phase 1A policy where bidders were asked to submit a combined bid and financing offer, rather than a cash price and separate financing, proved to be a less than optimal solution);

- the advantage of arranging pre-bid meetings with potential bidders and local contractors and suppliers to enhance local participation; the benefit of breaking contracts into smaller units and of simplifying bidding documents to foster such participation; and the need for a better dialogue between LHDA and the local business community, and for enhanced information flow and monitoring of local involvement;

- the advantage of awarding construction supervision contracts for major resource projects to the project design firms in order to ensure continued liability, design assumptions, criteria and coordination, and continuity of service; and

- the benefit of dealing with contractor claims in a timely manner, and of establishing a disputes resolution board to avoid costly litigation and arbitration;

Lessons related to the design of works

- the importance of identifying at the feasibility stage the potential of reservoir-induced seismicity, and of determining the villages that might be affected by it, and of early installation of measuring instruments and conducting of public information campaigns in the area;

- the desirability of providing for concrete lining from the outset for all future water tunnels of LHWP, where conditions so warrant;

- the need for full integration of construction and resettlement activities;

Lessons related to social and environmental matters

- the need to focus on affected persons and not on households for resettlement and compensation purposes (working with households as the unit of analysis has proven to be problematic due to frequent fragmentation of households as a function of marriage, breakup, etc.);

- the advantage of providing more options to individuals and communities for resettlement and compensation, and of better targeting households for income restoration;

- the value of effective complaint management through field teams and an appropriate conflict resolution mechanism;

- the importance of partnering with communities in the design of social project components, and of continued in depth consultation with communities in implementation and monitoring;

- the importance of preparing prior to implementing any further phase of LHWP, a detailed Environmental Impact Assessment and a comprehensive Environmental Action Plan directly related to the activities of that phase with full participation by affected communities and NGOs.

Lessons related to management and organization

- the necessity to nurture at LHDA an organization and culture that is service-oriented and responsive to community needs; and

- the need to strengthen management and project selection procedures of the Development Fund, and to provide for greater community involvement in identifying projects to be supported by the Fund.

- The value of putting in place management systems that effectively respond to the complexities of the project with its wide spectrum of activities and its unique governance structure.

LESOTHO
HIGHLANDS WATER PROJECT
(Loan 3393 - LSO)

PART II: STATISTICAL TABLES

Table 1. Summary of Assessment

A. Achievement of Objectives	Substantial (✓)	Partial (✓)	Negligible (✓)	Not applicable (✓)
Macro policies	✓			
Sector policies		✓		
Financial objectives		✓		
Institutional development		✓		
Physical objectives	✓			
Poverty reduction		✓		
Gender issues				✓
Other social objectives		✓		
Environmental objectives		✓		
Public sector management	✓			
Private sector development				✓
Other (capacity building)		✓		

B. Project Sustainability	Likely (✓)	Unlikely (✓)	Uncertain (✓)
	✓		

C. Bank performance	Highly satisfactory (✓)	Satisfactory (✓)	Deficient (✓)
Identification		✓	
Preparation assistance		✓	
Appraisal		✓	
Supervision	✓		

D. Borrower performance	Highly satisfactory (✓)	Satisfactory (✓)	Deficient (✓)
Preparation		✓	
Implementation		✓	
Covenant compliance		✓	
Operation		✓	

E. Assessment of Outcome	Highly satisfactory (✓)	Satisfactory (✓)	Unsatisfactory (✓)	Highly unsatisfactory (✓)
		✓		

Table 2. Related Bank Loans/Credits

Loan/Credit title	Purpose	Year of Approval	Status
Preceding/Concurrent Operations*			
Lesotho Water Supply Project (Credit 887-LSO)	To provide water supply to about 20,000 new consumers in seven towns and improve service to 21,000 existing consumers; to strengthen the Water and Sewerage Branch of the Ministry of Water, further develop Lesotho's water resources, and assist in employment creation.	1979	Closed
Lesotho Highlands Water Engineering Project (Credit 1747–LSO)	To develop Phase 1A of Lesotho Highlands Water Project from the engineering to the construction stage. In particular, the operation aimed at: (i) developing detailed designs for all project components and refining the optimization of the hydropower component; (ii) undertaking further geological investigations; (iii) preparing bid documents and criteria for evaluating bids; (iv) providing technical assistance and training to help establish and develop the Lesotho Highlands Development Authority (LHDA); and (v) assisting LHDA in securing financing for Phase 1A.	1986	Closed
Following Operations			
Lesotho Highlands Water Project – Phase 1B (Loan 4339-LSO)	To put in place the physical and managerial capacity for Lesotho to transform its principal natural resource of abundance – water – into export revenues that can be applied to poverty reduction and economic stability while (i) protecting the environment and mitigating any adverse social and environmental impacts and (ii) maximizing the local development spin-offs of the project in Lesotho; and to assist South Africa in developing its lowest cost alternatives for supply of water to the Gauteng Region.	1998	Active
Lesotho Community Development Support Project (LIL)	To demonstrate the effectiveness of a demand-driven approach to supporting community development through a multi-sectoral special fund; and to strengthen Lesotho's capacity to monitor the scope and trends of poverty in the country.	2000 expected	Negot-iated

Table 3. Project Timetable

Steps in Project Cycle	Date Planned	Date Actual/Latest Estimate
Identification	05/85	05/85
Preparation	05/86	09/86
Appraisal	11/89	04/90
Negotiations	02/91	05/13/91
Board Presentation	07/10/91	07/23/91
Signing	09/16/91	09/16/91
Effectiveness	12/15/91	05/15/92
Project Completion	12/31/97	09/30/98
Loan Closing	03/31/98	03/31/99

Table 4. Loan Disbursements – Cumulative Estimated and Actual
(US$ million)

Bank FY	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Appraisal estimate	24.2	16.5	16.4	17.6	17.2	16.2	1.9	0.0
Actual	0.0	22.3	11.5	11.5	10.4	5.5	7.2	0.5
Appraisal estimate cumulative	24.2	40.7	57.1	74.7	91.9	108.1	110.0	110.0
Actual cumulative	0.0	22.3	33.8	45.3	55.7	61.2	68.4	68.9
Actual as % of estimate	0%	55%	59%	61%	61%	57%	62%	63%

Date of final disbursement: August 31, 1999
US$20 million was cancelled on June 30, 1996; US$16 was cancelled on October 15, 1998. The remaining balance of US$5.1 was cancelled at loan closing.

Table 5. Key Indicators for Physical Achievements

Component	Physical Key Indicator	Achievement
WATER SUPPLY AND HYDRO POWER		
Project Works in Lesotho		
Katse Dam and Reservoir	185m high concrete arch type dam at Katse with an active reservoir storage capacity of 1,519 million m^3.	Completed
Transfer Tunnel	45km tunnel with a diameter between 4.35m and 4.85mwith an average flow capacity of $30m^3$/sec.	Completed
Delivery Tunnel	15km tunnel segment up to the RSA border with a 5m diameter and an aver. flow capacity of $30m^3$/s.	Completed
Northern Access Road	95km paved road from Pitseng to Katse dam site.	Completed
Southern Access Road	56km of gravel road from Thaba Seka to the Katse dam site.	Completed
North End Access Road	6km of new road and 47km upgraded road to Hlotse, Hololo, Muela, and Ngoajane.	Completed
Rehabilit. of Existing Access Roads	Rehabilitation of 124km of existing roads.	Completed
Construction Villages at Katse and Butha Buthe	Services incl. water supply, sewerage, electricity, roads, public and commercial buildings, services to stands and houses.	Completed
Roads and Border Crossings Facilities	Constructing, equipping, operating and maintaining project-related border crossings and maintaining existing roads used by the project; constructing a bridge at Caledonspoort and houses and border post buildings at Maputsoe and Caledonspoort.	Completed
Construction Power	66km of 132kv steel towers, 32km of 66kv, 37km of 33kv, and 4.5km of 11kv lines; 10 substations.	Completed
Communications System	Telecom facilities to all sites	Completed
Hydropower component	Underground power station with72 MW capacity of 3 units, 125km of 132kv transmission lines, a substation, and a 55m high concrete arch dam at Muela with a storage capacity of 7.13 million m^3.	Completed
Project Works in RSA		
Delivery Tunnel North	Two sections: the Caledon tunnel of 10.1km and the Ash tunnel of 11.8km. (implemented by TCTA of RSA; not financed under the project).	Completed
ENGINEERING AND SUPERVISION SERVICES		
Construction Supervision and detailed design	Civil works, Ketse and Muela dams, transfer tunnel , delivery tunnel, other infrastructure , and hydropower facilities.	Completed
INSTITUTIONAL SUPPORT FOR LHDA AND CONSTRUCTION SKILLS TRAINING		
Support to LHDA	Institutional development and strengthening of LHDA: engineering, finance, accounting, environment, human resource development; International panels of experts: dam safety, environment through provision of technical assistance; training for LHDA staff in engineering, finance, accounting, environment and general management.	Completed

Construction Skills Training	Provision of training for Basotho basic construction skills.	About 400 persons trained
ENVIRONMENTAL PROTECTION, COMPENSATION AND RURAL DEVELOPMENT		
Environmental Protection	To protect and enhance vegetative cover in the watershed above project dams; to mitigate the negative impacts on flora, avi and fauna; to preserve sites of historic or cultural significance; to protect and enhance water quality and wetland ecology, and to protect public health. Sub-projects supported concentrate on: soil conservation and sedimentation; watershed management; biological monitoring; public health; cultural heritage; environmental monitoring.	Program partially implemented; work is still on-going; design parameters being changed to reflect more comprehensively all project impacts and new priorities.
Resettlement and Compensation Program	To resettle and compensate persons affected by the project for lost income and assets; to replace lost access to infrastructure in the project area; and to compensate for lost community assets.	Resettlement completed with the exception of seven households; compensation for lost income will be provided over 50 years; replacement of lost community assets completed except for grazing areas where work is still on-going.
Rural Development	To restore productive capacity to persons affected by the project; to enable them to exploit new economic opportunities created by the project. Project-supported programs concentrate on *production (l*ivestock and range management; mountain horticulture and field crops; village forestry; fisheries, land use planning), *education* (incl. rural training), *infrastructure* (rural roads; village water supply and sanitation; rural electrification; construction communities; visitor centers and tourism).	Production programs are still being implemented; so are the education and rural development programs (1,146 persons have been trained; 95km of feeder roads constructed or rehabilitated, water supply and sanitation delivered to 40% and 15%, respectively, of intended village; electrification has been cancelled; tourism has yet to take-off; construction communities infrastructure completed.
Studies	An organization and manpower study; a study on management accounting and information systems; an assessment of the operational and financial aspects of the hydropower component; and optimization and environment studies related to the project's follow-up Phase 1B.	All studies completed; provided the basis for (a) significant changes in LHDA organization, and in accounting and information systems, and (b) electricity sales arrangements by LHDA; studies on Phase 1B helped in the design of that Phase.
GOL Representation on the JPTC	To assist, guide and advise the JPTC.	Completed
Development Fund	Setting up and operation of a Development Fund to finance development projects using project related income accruing to GOL.	Fund has been set up and 240 projects were financed.

Table 6. Key Indicators for Developmental Impact

Component	Dev. Impact Indicator	Value	
		SAR Target	Actual
Water transfer and Hydro Power generation	- Amount of water delivered (cumulative by 3/99; in m3 million) - Power generated (Feb. 1999; MW) - Royalties and SACU revenues earned (cumm. by 3/99; in M mill.) contribution to GNP contribution to Gov. revenues - Re-estimated rate of return - Person years of employment generated	1,390 64 905 5% 20% 16% 20,000	580 47 1,130 4.5% 18% 17% 22,000
Institutional Strengthening	- Reduction in expatriate staffing of LHDA - LHDA (engineering, financial management, environment, dam safety, etc.)	N/A N/A	Reduction from 16% in 90/91 to 4% More than 500 staff trained; departments generally well functioning; O&M incl. dam safety effective for future operation
Environmental Protection	- Effectiveness and sustainability of various project activities	N/A	Several programs such as water quality monitoring , and establishing nature reserves is progressing well and sustainable; others are yet to take off
Resettlement and Compensation	- Number of households successfully resettled - Effectiveness of compensation in maintaining/improving welfare of affected persons	173 All project-affected persons to at least maintain their standard of living	294 Target was met, though with some difficulties in early implementation
Rural Development	- Effect of various project activities (production; education; income generation; infrastructure) on standard of living and welfare of affected population	Standard of living/welfare of affected population expected to improve; target not quantified	Better access to lowlands, shorter traveling times, reduction in consumer prices, improved health services, increased water supply and sanitation achieved in much of the project area; but income generation programs so far had limited impact
Development Fund (DF)	- Effectiveness of DF management - Impact of investments supported	N/A N/A	Fund management has not been fully effective, a new fund is being established DF has financed projects worth Maloti 215 million; impact has not been measured

Table 7. Studies Included in Project

Study	Purpose as defined at appraisal/redefined	Status	Impact of study
1. Organizational Review and Training Assessment	To review its existing organizational structure with a view to determining its adequacy for starting with implementation of the operational phase and at the same time with the design phase of Phase 1B; to assess LHDA's efforts in training Basotho staff to take over the positions presently filled by expatriates.	Completed	The study together with the subsequent Transformation Project provided the basis for a major restructuring of LHDA in 1998; expatriates have been reduced from 16% to 4% of LHDA's staff.
2. Review of Management Accounting and Information System	To review of the appropriateness of its management accounting system, including its information system; to review the existing management accounting system and LHDA's information system in terms of correctness of posting, efficiency, timeliness and abstraction and compilation of information.	Completed	The study helped in strengthening LHDA's accounting and financial management systems; it assisted particularly in improving activity-based accounting , and in developing more useful internal reports
3. Assessment of Operational and Financial Aspects of the Hydropower Component	To establish arrangements for (a) recovering the capital costs of Muela through appropriate tariffs; (b) providing LEC with adequate incentive to use Muela output and recover revenues from power consumers; and (c) allocating the financial risks of events affecting Muela output.	Completed	The study and its 1997 up-date recommended the operating arrangements adopted between LHDA and LEC, and the powers sales agreement signed in 1994.
4. Phase 1B Environmental Impact Assessment (EIA)	To carry out a detailed EIA of Phase 1B and to formulate an Environmental Impact Statement (EIS) by identifying and quantifying the probable impacts, and recommending ways to mitigate these impacts.	Completed	The EIA led to the preparation of an appropriate Environmental Action Plan prescribing the actions required to mitigate adverse Phase 1B environmental impacts and to provide environmental enhancement.
5. Phase 1B Optimization	To review all available documentation pertaining to Phase 1B, the projected Matsuko weir and the Mohale reservoir, and physically reconnoiter the area to confirm, or recommend additional investigations for potential alternatives of, the most likely location, timing, and configuration to follow Phase 1A and fulfill the objectives outlined in the Water Treaty between Lesotho and RSA.	Completed	Study provided valuable input into final decisions on alternatives, location selection, and the timing of implementation actions.

Table 8A: Project Costs

Component	Maloti (million)		US$ (million)	
	Appraisal Estimate	Actual/Latest Estimate 1/	Appraisal Estimate	Actual/Latest Estimate 2/
A. Civil Works and Equipment				
Water Transfer	1,682.0	3,452.1	649.0	956.5
Hydropower	514.0	781.8	135.0	161.7
Other Infrastructure	350.0	781.6	198.0	185.1
Sub-total	**2,546.0**	**5,015.5**	**982.0**	**1,303.3**
B. Engineering & Constr. Supervision				
Water Transfer	216.0	525.4	83.0	148.2
Hydropower	75.0	105.0	29.0	26.5
Other Infrastructure	75.0	94.3	29.0	20.0
Sub-total	**366.0**	**724.7**	**141.0**	**194.6**
C. LHDA Costs				
Technical Support, Training & Studies	160.0	347.7	62.0	88.8
Operation & Administration	202.0	433.7	78.0	110.7
Sub-total	**362.0**	**781.4**	**140.0**	**199.5**
D. Environmental Protection, Compensation, Rural Dev.	172.0	354.6	67.0	76.3
E. GOL Representation to JPTC & other GOL Cost	75.0	68.4	28.0	17.5
BASE COSTS	**3,521.0**	**6,944.6**	**1,358.0**	**1,791.1**
F. Contingencies				
Physical Contingencies	385.0		149.0	
Price Contingencies	2,142.0		296.0	
Subtotal	**2,527.0**		**445.0**	
TOTAL PROJECT COSTS	**6,048.0**	**6,944.6**	**1,803.0**	**1,791.1**
Interest During Construction	2,393.0	3,802.9	611.0	849.7
TOTAL FINANCING REQUIRED	**8,441.0**	**10,747.5**	**2,414.0**	**2,640.8**

1/ From unaudited March 31, 1999 LHDA accounts and estimated cost to completion
2/ Actual costs in Maloti have been translated into US$ using average exchange rates in effect during the various project years

Table 8B: Project Financing

(US$ million)

Source	Appraisal Estimate	Actual/Latest Estimate
I. Donor Agencies		
IBRD	110.0	68.9
UNDP	0.3	1.9
AfDB	50.0	0.0
EU	57.0	54.9
EIB	20.0	20.0
CDC	36.1	5.3
Bilaterals	117.8	52.5
Subtotal	391.2	203.5
II. Export Credit	411.0	381.3
III. European Comm. Banks	67.0	78.1
IV. GOL Contribution	57.2	50.1
V. CMA Funding	1,488.4	1,927.8
TOTAL FINANCING	**2,414.8**	**2,640.8**

Table 9. Economic and Financial Evaluation

Economic Rate of Return	Estimates at Appraisal	Estimates at Completion
Water Transfer Component	16%	17%
Hydropower Component	6%	3%
Total Project	15%	16%

Table 10. Status of Legal Covenants

Agreement	Section	Covenant Class(s)	Present Status	Description of Covenant	Comments
Loan	3.02 (C) & 4.01 (B)	05	C	Employ an engineering panel of experts	In compliance
	4.03 (B)	05	C	(1) Take out insurance acceptable to IBRD; (2) Employ insurance experts acceptable to IBRD and submit their recommendations to IBRD.	In compliance
	5.01	01	C	Maintain adequate accounts and have them audited by auditors acceptable to IBRD	In compliance
	5.02	02	C	Pay guarantee fee to GOL.	In compliance
	Schedule 4, para. 1	05	C	(1) Conduct Muela financial and operational study and pass to IBRD for review; (2) Implement study recommendations; (3) Agree financial performance targets.	Completed
	Schedule 4, para. 2	05	CD	(1) Conduct organization and manpower study and furnish recommendations of IBRD; (2) Implement recommendations of study, taking the Bank's comments into account.	Completed after delay
	Schedule 4, para. 3	01	CD	(1) Conduct management accounting and furnish recommendations of IBRD; (2) Implement recommendations of study, taking the Bank's comments into account.	Completed after delay
	Schedule 4, para. 4	03	C	Proceeds of loan to be utilized only for contracts approved by JPTC.	In compliance
	Schedule 4, para. 5	10	C	Introduce computer based accounting and treasury system.	Completed
	Supplemental Letter 1, GOL Budget	04	C	(1) GOL to finance costs of its representation on JPTC; (2) GOL share of rehab. & maintenance of roads and border crossing; (3) GOL share of environmental, compensation & rural development costs; (4) GOL share of LHDA's admin. costs.	In compliance
	Supplemental Letter 2, Development Fund	05	C	(1) Agree royalty payments; (2) Apply sound management/account procedures; (3) Audit of fund; (4) Furnish audited report to IBRD; (4) Publish audited accounts.	In compliance, but new Fund is being set up under Phase 1B

Present Status:
C = Covenant complied with
CD = Complied with after delay
CP = Complied with partially
NC = Not complied with

Covenant Class:
1. Accounts/audit
2. Financial performance
3. Project funds
4. Counterpart funding
5. Management aspects
6. Environmental covenants
7. Involuntary resettlement
8. Indigenous people
9. Monitoring and reporting
10. Implementation
11. Budgetary allocation
12. Regulatory/institutional action

Table 11. Compliance with Operation Manual Statements

Statement number and title	Description and comment on lack of compliance
1. OMS 2.36 – Environmental Aspects of Bank Work	The project and the Bank were in compliance with OMS 2.36, the directive relevant for the operation at the time of appraisal (April 1990). Operational Directive 4.00, Annex A, "Environmental Assessment" was issued before appraisal, in October 1989, but it did not apply to the project. (OD 4.00, Annex A was operational only for projects that had not reached the Initial Executive Project Summary stage by October 15, 1989.) The project would not have met the standards of the new OD. In particular, 29 environmental and social studies and surveys were carried out during project preparation; however they did not add up to a full Environmental Impact Assessment as required by OD 4.00, Annex A.
2. OD 4.00, Annex B – Environmental Policy for Dam and Reservoir Projects	The project and the Bank were overall in compliance with OD 4.00, Annex B. In particular, the requirement that the appraisal mission "include environmental specialists to assess the environmental analysis" and the proposed mitigation measures, was met, together with obligations on establishing an independent panel of environmental experts, and an environmental unit in the project implementing agency. Also met were requirements on including environmental clauses in bidding documents. However the responsibility to have adequate and strong expertise in LHDA's environmental unit was not adhered to at all times.
3. OMS 3.80 – Safety of Dams	The project and the Bank were in compliance with OMS 3.80, especially the requirements on an independent panel of experts, on establishment of a safety unit in the implementation agency , and on operation and maintenance arrangements. The project also meets the condition of the revised 1996 OD 4.37 "Safety of Dams" regarding the preparation of an emergency preparedness plan.
4. OMS 2.33 – Social Issues Associated with Involuntary Resettlement in Bank-Financed Projects	The project and the Bank were generally in compliance with OMS 2.33. However, the requirement of a well prepared resettlement plan was not entirely met as the number of households to be resettled was initially estimated to be lower than was found to be necessary. Also, the quasi-welfare program put into place with annual compensation over 50-years for lost land, is not in line with the OMS's stipulation that "care must be taken that to avoid implanting in the minds of the settlers the idea that they have become permanent wards of the State."
5. OD 7.50 – Projects on International Waterways	The project and the Bank complied with this directive, especially the notification requirements to riparian countries and obtaining their "no objection" to the project.

Table 12. Bank Resources – Staff Inputs

Stages of Project Cycle	Staff-week Actual	Amount US$('000)
Through pre-appraisal	155.2	318.1
Appraisal - effectiveness	122.2	275.6
Supervision	192.4	501.0
Completion	11.0	43.0
TOTAL	480.8	1137.7

Table 13. Bank Resources - Mission

Stages of project cycle	Month/ Year	No. of persons	Weeks in field	Specialties represented	Performance ratings IS	DO	Types of problems
Through Appraisal	May 90	6	3	FA, So, En, Ec, La, O	N/A	N/A	N/A
Appraisal through Board approval	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Supervision 1	Dec., 91	2	2	FA, Ec	1	1	EN
Supervision 2	Sep. 92	3	1	Ec, FA, En	1	1	EN
Supervision 3	Mar. 93	3	1	Ec, FA, So	2	1	PMP, PP
Supervision 4	Oct. 93	4	1	En, So, FA, O	2	2	EN, II, PMP
Supervision 5	Feb. 94	6	3	En, O, So, FA, WR, Env.	2	2	CC, EN, II, PMP
Supervision 6	Oct. 94	5	3	Ec, O, En, RD, So	2	2	EN, II, PP
Supervision 7	Mar. 95	6	2	En, Ec, So, O	S	S	EN, II
Supervision 8	Oct. 95	9	2	Ec, DS, En, So	S	S	EN, PMP
Supervision 9	Mar. 96	5	2	Ec, En, So	S	S	EN, II
Supervision 10 (and pre-appr. of Phase 1B)	Nov. 96	12	3	Ec, En, So, Env, DS, WR	S	S	EN, LP, II,
Supervision 11 (and appraisal of Phase 1B)	Jun. 97	7	3	Ec. En, So, Env, La	S	S	II, LP, EN
Supervision 12	Dec. 97	5	2	Ec, So, La, En	S	S	EN
Supervision 13	May 98	3	2	Ec, DS, IS, Ec	S	S	EN, II
Supervision 14	Nov. 98	4	2	Ec, IS, So, Env	S	S	ENV, II
Completion (and superv. of Phase 1B)	Apr. 99	9	2	Ec, FA, So, En, IS, La	N/A	N/A	N/A

Staff Skills:
Env = Environmental Specialist
Ec = Economist
O = Oper. Officer/Proc. Specialist
DA = Dam Specialist
RD = Rural Dev. Specialist
IS = Institutional Specialist
WR = Water Resources Specialist
En = Engineer
So = Sociologist
La = Lawyer

Performance Ratings:
1 – Minor or No Problems
2 – Moderate Problems
3 – Major Problem
S – Satisfactory
HS – Highly satisfactory
U – Unsatisfactory

Type of Problems:
LP: Labor Problems
CC: Compliance with Legal Covenants
EN: Environment (incl. social issues)
PMP: Project Management Performance
PP: Procurement Progress
II: Institutional Issues

LESOTHO HIGHLANDS WATER PROJECT
PHASE 1A (LOAN 3393-LSO)

World Bank Completion Mission
May 1999

AIDE-MEMOIRE

A World Bank Mission visited Lesotho (April 28- May 12, 1999) and South Africa (May 13-14, 1999) to carry out the completion of Phase 1A of the Lesotho Highland Water Project. The mission was composed of Messrs./Mme. Arnaud Guinard (Team Leader), William Moler (Engineering), Cyprian Fisiy and Radhika Srinivasan (resettlement and rural development), John Ambrose (Environment), Stefan Klasen (economic and financial aspects), Kam Chetty (Evaluation and Monitoring), Mpoy Kamulayi (Lawyer) and Walter Schwermer (ICR preparation).

The mission met with the Minister and the Principal Secretary of Natural Resources, the Principal Secretary of Development Planning, the Attorney General of the GoL, the Director General of DWAF, JTPC, TCTA, DBSA, LHDA senior management and staff as well as representatives of local NGOs in Lesotho and GEM in South Africa. The mission also briefed the European Delegation in Maseru. The mission visited the various project sites May 1-3, 1999. It wishes to express its grateful thanks for the excellent cooperation and assistance it received during its visit.

This Aide-Memoire summarizes the main findings and recommendations of the mission and is subject to confirmation by Bank Management upon the mission's return to Washington.

Preparation of the Implementation Completion Report.

The World Bank Loan (Ln 3393-LSO) for Phase 1A was officially closed on March 31, 1999. As agreed during the November 1998 mission, LHDA initiated the preparation of its own Implementation Completion Report (ICR) and shared a draft of this report with the mission during its visit. This draft includes a compilation of the preliminary contributions and assessments from the various branches and sections of LHDA. The mission wishes to commend LHDA for the intensive efforts made to produce a comprehensive document, especially on social and environmental aspects. The mission also believes that after it has been finalized, this document will provide a good basis for preparing an Operating Plan for Phase 1A to help ensure sustainability of project investment and apply key lessons learned to improve the implementation of Phase 1B.

It was agreed that after further refinement, internal review and consultation with JPTC, LHDA would finalize its ICR and submit it for information to the Bank not later than June 15, 1999. It was also agreed that LHDA would provide an Executive Summary of its ICR (not exceeding ten pages) that will be incorporated in the Bank's final ICR. This summary will include a presentation of achievements, findings, performance assessment and lessons learned.

On the basis of its own assessment of the various components of the project and review of the draft LHDA's ICR, the mission will start preparing the Bank's ICR upon its return to Washington. Before finalizing its report, the Bank will share it with GOL, DWAF, LHDA, JPTC, TCTA as well as co-financiers for their comments. Official comments will be incorporated in the Bank's final ICR.

Present Status and Key Tasks to be Completed under Phase 1A.

Although the World Bank Loan for Phase 1A has now been closed, a number of activities and programs remain to be completed or undertaken together with a comprehensive exit strategy.

Engineering and Construction

Phase 1A engineering and construction of the LHWP is basically complete. The water transfer component of the project was officially inaugurated on January 22, 1998. The third and final unit of the 72 MW Muela Hydropower Complex was brought on line on December 18, 1998 and was officially inaugurated on January 22, 1999.

Katse Reservoir is currently at approximately El 2050, about three meters below its full supply level (FSL). About 18.7m /s of water is being transferred to South Africa via the Transfer Tunnel, Muela Hydropower Complex, Muela Reservoir and Delivery Tunnel. The Muela powerhouse is presently generating 47 MW of power. Generation is below capacity due to low water transfer to South Africa at the present time.

All engineering and construction contracts are essentially complete. The only remaining activities are related to a small number of "defects liability" matters of the hydropower components and the settlement of construction claims.

The total value of Phase 1A engineering and construction contracts at the end of January 1999 was M4, 897, 081, 490, which is M764,777,608 or 18.5% more than the total original contract amounts. M4,694,832,018, or 98% of the forecast cost at completion, has been expended. The main reasons for cost overrun were: (a) concrete lining of the Transfer Tunnel; (b) deepening of the foundation for the Katse Dam and associated design changes during construction; (c) delay in obtaining funding of the underground powerhouse at Muela; (d) acceleration of the construction of the Muela Bypass in order to meet water transfer obligations; and (e) staffing adjustments by all the construction supervision consultants to accompany changes in the construction schedule.

There are 81 unresolved claims submitted by the contractors totaling M217, 862,397. Some 56 claims are still being negotiated, 13 are disputed and notification has been given of intent to start the arbitration process.

Resettlement, Compensation and Rural Development.

Resettlement and the delivery of physical infrastructure is almost completed except for the seven households under the transmission lines in the Muela FOB jurisdiction (contract 136). A final decision on the replacement of the housing units needs to be taken as soon as possible and the decision implemented by June 30, 1999.

The major remaining issue on compensation is the non-delivery of group compensation for loss of communal assets for the last year. The insistence that communities should prepare viable business plans has proven to be a major bottleneck. The mission recommends that FOB managers, working with technical specialists drawn from both the HQ and the field, create task teams to identify and facilitate investments within the communities. The approach should aim at mainstreaming participatory development planning with the communities.

On the Rural Development Program (RDP), the emphasis has been on delivering outputs, but limited impact has been achieved on the ground. The mission recommends that a comprehensive evaluation of the RDP be carried out

a) to determine the comparative advantage of the highlands;
b) to identify local needs and stimulate the internal market;
c) to facilitate an enabling environment for the involvement of the private sector;
d) to assess possibilities of reducing market obstructions while strengthening market channels and access to credit;
e) to elicit the informed participation of affected groups in the RDP; and
f) to enhance institutional arrangements for implementation and support services.

Based on the findings of this evaluation, the RDP should be revamped.

Very few new grievances have been reported since the last mission. However, the analysis of resolved and pending grievances has not been carried out. ESSG will finalise this analysis and provide a timeframe for the resolution of all grievances.

Environment

A natural environment and heritage plan (NEHP) was prepared in 1990 and included a number of recommended project activities for implementation. The plan was prepared on the basis of the 1986 feasibility study of the entire Lesotho Highlands Water Project. The feasibility study concentrated on the impacts of Phase 1A and Phase 1B as well as on the possible impacts of Phases II and III. There was no dedicated comprehensive EIA carried out for Phase 1A such as the one carried out for Phase 1B in 1996/97.

In the absence of a dedicated EIA for Phase 1A, the NEHP was not able to rigorously reflect all of the impacts that occurred. A great deal had been learned over a period of eight years and this led to the preparation of a revised NEHP in 1998. The revised plan essentially maintained the same objectives, but ensured that it truly reflected all of the impacts of Phase 1A. The NEHP has incorporated new priorities and needs that have arisen since inception of the initial NEHP in 1990; it has estimated more realistic schedules for programs and has developed hand-over procedures where appropriate. As a result of uncertainty with the original plan, the majority of recommended projects in the plan were delayed. The revised NEHP includes 17 projects under the NEH section of ESSG. Eight of these are currently being implemented and nine are in the planning stage.

Critical to the future development of the Katse area is the Katse reservoir zoning project which has recently gone to tender. This project, when complete, will provide the basis for future development of the area. The mission recommends that zoning be extended to cover the Mohale area as well to ensure that development scenarios for Katse are prepared within a framework of the entire Phase 1 LHWP area.

The nature reserves project is progressing well. Along with the fisheries (ongoing) and tourism (planned) programs, it will provide the catalyst for sustainable tourism development that could make a significant contribution to improved economic and social conditions in the region. Of major concern will be the institutional arrangements for managing the reserves (four in total) once development has been completed, and for fisheries management on Katse dam. Planning is currently being conducted to determine hand over procedures to GOL agencies. It will be important that these agencies have the capacity, including the appropriate resources and trained personnel, to ensure sustainability of these two projects.

One of the eight projects of Phase 1A in the planning stage is a post construction site audit. An independent audit of post construction environmental conditions will be conducted. The audit is critical to ensuring that all construction sites have been rehabilitated to contract specifications and that construction has not resulted in delayed impacts or impacts that may occur in the future. The Muela platform site which is the proposed site of the Muela Museum and environment centre, was examined for contamination, and apart for some local oil contamination which was not considered serious, the site is generally

Economic Impact and Financial Aspects

The mission carried out a preliminary economic re-evaluation of the project. The results can be summarised as follows:

- When combining the water transfer with the hydropower component the rate of return is estimated at 16.5%, even thought the hydropower component just carries a rate of return of 3.1%.
- LHWP remains a the least cost option and continues to compare favorably with its alternatives.

- Royalties (M370 million) and SACU revenues (M760 million) have boosted the revenues of GOL.
- In 1998, Phase 1A accounted for about 13.6% of Lesotho's GDP, and some 35% of value-added in the building and construction sector. In addition, it provided some 27.8% of government revenues.
- Phase 1A generated 22600 person years of labor for Basotho workers, some 10% more than expected, yielding some M400 million in wages paid.
- M68 million in sub-contracts went to Basotho businesses as did some M16 million in consultancy contracts.

Monitoring and Evaluation

Impact monitoring and evaluation of the affected people will continue for at least the next fifteen years to measure compliance with the Treaty obligations. LHDA will examine the various M&E programmes to decide on their life span and plan and budget for their effective implementation.

At the technical level the socio-economic impact evaluation programme comprises two sub-programmes: formal socio-economic surveys, and participatory monitoring and evaluation of affected communities. The programme is envisaged to continue for a maximum of 15 years; however the current plans end in 2003 and the consultant has been secured for the first component of the programme. The programme for the next five years includes: a 100% household survey for the 1998/1999 year and a 33.3% representative sample survey each year until year 2002/2003. A PME of all affected communities will be conducted annually until year 2002/2003. The LHDA M&E unit will need to develop clear plans and institutional arrangements to implement the monitoring and evaluation programme for the remaining years.

The key programmes that would need to be monitored include:

- the key environmental programmes such as water quality, downstream river regime, soil conservation and biological monitoring;
- critical engineering elements; and
- social programmes such as the compensation, effectiveness of RDP and income restoration programmes.
- Economic impact (macro and micro) and labor relations.

Maintenance and Operation

LHDA's Maintenance and Operations Branch has arrangements in place for the operation and maintenance of key facilities such as the Katse Dam and the Muela Hydropower Complex. Memoranda of Understanding have also been completed with several GOL ministries concerning project investments to be transferred to them. LHDA has ensured that project investments are included in the public investment program and public agencies are closely involved. However, LHDA has not yet prepared a comprehensive Operating Plan for the various components of the project detailing the organizational, management and funding arrangements

for future operations of the different project investments and programs. To help ensure sustainability of these investments and programs, the mission requests that such a plan be prepared by July 31, 1999 and include handing-over arrangements of project assets and programs to concerned GOL ministries and project area communities, where applicable.

LESOTHO HIGHLANDS WATER PROJECT
IMPLEMENTATION COMPLETION REPORT (ICR)
(LOAN 3393- LSO)

PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

A. Introduction

1. This is the Implementation Completion Report (ICR) for Phase 1A of The Lesotho Highlands Water Project for which a loan 3393- LSO in the amount of US$110 million was approved on 23rd July 1991 and became effective on 15th May 1992. A total of US$20 million was cancelled on June 30th, 1996 and US$16 million cancelled on October 15th, 1998 due to, inter alia, the ineligibility (on procurement grounds) of certain contracts originally considered for retroactive financing and the lower than anticipated levels of technical assistance to the Lesotho Highlands Development Authority.

2. The Credit was closed on 31st March 1999 after a one-year extension from the original closing date of March 31st 1998. While work is continuing on Phase 1B, it is an opportune moment to take stock of how implementation of Phase 1A went and to draw lessons learned therein which can be applied to subsequent phases.

B. Background

3. An assessment made by Republic of South Africa of the water demand and supply for the Witwatersrand industrial heartland revealed that new and economical sources of water beyond its borders would need to be investigated in order to meet the projected increased demand by both the industrial sector and increasing household needs. The projected increase in annual demand for water in the industrial heartland was expected to increase from 979 million m3 in 1980 when the population was 5,8 million to 3,803 million m3 per year in year 2010 when the population is expected to have increased to about 12 million. The transfer of water from Lesotho under Phase 1A of the Lesotho Highlands Water Project (LHWP) was expected to secure additional supplies of water to the Vaal Dam in South Africa until year 2004; Thereafter additional supplies from Mohale Dam under phase 1B would be sufficient to meet demand until about year 2010.

4. The Government of Lesotho had for some years been seeking means of earning external revenue by harnessing and exporting its abundant water resources and also save foreign exchange by developing hydo-power locally and thus reduce Lesotho's dependence on imported energy.

5. In view of this double coincidence of needs, the two countries were prompted to resuscitate the studies that had been initiated in the 50's but subsequently abandoned, relating to the then called Oxbow Water Scheme.

6. **Following extensive studies of alternative transfer schemes, the options were eventually narrowed down to two** hypothetical schemes, namely the *Lesotho Highlands Water Project (LHWP)* and the *Orange Vaal Transfer Scheme (OVTS)*. Both projects would involve the harnessing of the Senqu/Orange river albeit at different locations.

Redirecting the southward flow of the Senqu River in the northward direction within the Lesotho highlands would permit the water to flow into the Vaal river catchment area by gravity. Under the OVTS scheme, the water would be harnessed at a point outside Lesotho's borders and would require substantial electrical power for pumping the water to reach the Vaal river catchment area.

7. Based on the computation of the operating costs of each scheme, the conclusion was that the OVTS scheme would be twice as expensive as the LHWP. For the two countries to opt for the LHWP, it was decided to share the resultant cost savings in the ratio of 56% to Lesotho and 44% to South Africa.

8. The Treaty on the Lesotho Highlands Water Project between the Government of Lesotho and the Government of the Republic of South Africa whose purpose is to provide for the establishment, implementation, operation and maintenance of the project, was signed in Maseru, Lesotho on 24th October 1986.

C. Institutional Arrangements

9. The implementation of the Project is managed on behalf of the Lesotho Government through its Ministry of Natural Resources by the Lesotho Highlands Development Authority (LHDA) while those sections which lie in South Africa are managed on behalf of the South African Government through its Department of Water Affairs and Forestry by the Trans-Caledon Tunnel Authority (TCTA). The TCTA is also responsible, on behalf of the Government of South Africa, for the servicing of all loans raised for those elements of the Project related to the transfer of water to South Africa.

10. The Joint Permanent Technical Commission (JPTC) comprising of three delegates and three alternates from each country has been established to monitor the activities of both the LHDA and the TCTA and to safeguard the provisions of the Treaty.

D. Statement of Project Objectives and Components

11. Project Objectives: The main objectives of the Lesotho Highlands Water Project (LHWP) are to transform Lesotho's principal natural resource of abundance - water - into export revenues from South Africa and to produce hydropower to reduce Lesotho's dependence on imported energy. Specifically, the Project aims at carrying out the necessary physical investments, providing institutional support, safeguarding environmental and compensation aspects of Phase 1A of the Lesotho Highlands Water Project (LHWP), preparing for construction of further phases and setting up a development fund to channel revenues from the Project to development oriented programmes. In addition each party would have the opportunity to undertake ancillary developments in its territory, including;

- The provision of water for irrigation, potable water supply and other uses
- The development of tourism, fisheries and other projects for economic and social development and.
- The development of other projects to generate hydro-electric power.

12 Project Components : The Project was originally designed to include five phases implemented over a period of 30 years and expected to transfer about 70 m^3/s of water to the Witwatersrand region in South Africa. Phase 1A of the project is designed to deliver 18 m^3/s and at appraisal had the following main components; *Engineering studies and supervision services, advance infrastructure, Katse and 'Muela dams, transfer and delivery tunnels, hydropower plant and appurtenances, institutional support for the LHDA, environmental protection, compensation and rural development, studies, development fund, roads and border crossings.* The final design of Phase 1A reflects some alterations from the original design; For example, Sentelina head pond was later changed to the present 'Muela dam.

(a) **Engineering studies and supervision services:** Construction supervision and detailed design of the civil works estimated at a total of 11,275 man months (m/m) covering the dam at Katse and the transfer tunnel (7,565 m/m), delivery tunnel (1,200 m/m), infrastructure (1, 460 m/m), and hydropower facilities (1,050 m/m).

(b) **Advance infrastructure :** Construction of 120 km of paved roads and 80 km of gravel roads providing access to project sites; One bridge between Lesotho and the RSA and one bridge across the main reservoir as well as three smaller bridges on the access roads; other advance infrastructure such as work camps, staff housing, power supply and telecommunications systems; improvement to border crossing facilities and rehabilitation of existing roads in Lesotho to cater for wear and tear of those roads which would be carrying project related traffic.

(c) **Main civil works** [at appraisal]

(i.) **Katse dam and reservoir:** Construction of a 182 m high concrete arch type dam at Katse and appurtenant works with an active reservoir storage capacity of 1,519 million M3; intake structure to a transfer tunnel and water discharge structures for subsequent phases of the LHWP;

(ii) **Transfer Tunnel:** Construction of a 48 km tunnel *(subsequently reduced to 45 km length*) with a 4.85m diameter and a 90 m high multilevel intake tower. The tunnel diameter reduces to 4.35m where concrete lining is required, with an average flow capacity of 30 m3/sec to accommodate water to be transferred in this Phase as well as in Phase 1B;

(iii) **Delivery Tunnels:** Construction of a 16 km portion of the delivery tunnel in Lesotho with a 5.0m diameter and an average flow capacity of 30 m^3/s to accommodate water deliveries in Phase 1A and 1B of the LHWP. In addition, and though not financed under the project but directly linked with the operation, were an additional 22 kilometers of delivery tunnel within South Africa to transfer water to the Ash river in South Africa.

(iv) **Hydropower plant and appurtenances:** Construction of an underground power station with 72 MW installed capacity of 3 units, 125 km of 132 KV double circuit transmission line; a substation (8 bays), and a 55m high concrete arch dam at 'Muela with an active storage capacity of 0.5 million

M3. The civil works would be constructed in a manner to provide the possibility of increasing the generating capacity with the implementation of Phase II of the LHWP.

(d) **Institutional support for The LHDA**

The support included;

- Institutional development and strengthening of LHDA in the fields of engineering, finance, accounting, environment and human resource development; access to international panels of experts (POE) in the fields of engineering (including dam safety) and environment through provision of technical assistance (3,200 m/m); training for LHDA staff in engineering, finance, accounting, environment and general management.

- Construction skills training through provision of training for Basotho on basic construction skills.

(e) **Environmental protection, compensation and rural development**

(i) **Environmental Protection:** Implementation of actions to protect and enhance vegetative cover in the watershed above the dam, to mitigate the negative impacts on flora and fauna; to preserve sites of historic or cultural significance, to protect and enhance water quality and wetland ecology, and to monitor and reinforce the Government Ministry of Health in establishing regulations and policies in the Project area.

(ii) **Compensation program:** Implementation of a program of actions to compensate persons affected by the project for lost income and assets, and to replace lost access to infrastructure in the Project area.

(iii) **Rural Development:** Implementation of a program to restore productive capacity to persons affected by the Project and to enable them to exploit new economic opportunities created by the Project, including actions to promote environmental awareness.

(f) **Studies:** Carrying out of an **organization and manpower study**, a **management accounting study** related to the operational and financial issues of the hydropower component, and optimization and environment studies related to Phase 1B.

(g) **Development Fund**: Setting up and operation of a development fund for the receipt of Project related income accruing to GOL to promote economic development in Lesotho.

(h) **Roads and Border Crossings:** Constructing, equipping, operating and maintaining Project related border crossings and rehabilitation and maintenance of existing roads in Lesotho resulting from Project-induced increases in traffic.

E. Evaluation of Project Objectives and Components.

(13) **Overall assessment of Project objectives :** The main objectives of the Project have been achieved. The quality of the engineering work was of high standard as attested by the Panel of Experts. Prestigious awards by regional civil engineering associations were received in respect of some structures.

(14) The Katse Dam, in particular, represents one of the most spectacular feats of engineering. The Dam is one of less than thirty double curvature concrete arch dams in the world. It is the highest dam in Africa and is one of the ten largest concrete arch dams in the world in terms of its volume.

(15) A 185 m high dam (originally planned to be 182 m high) has been built in a very sparsely populated area. The displacement of people was comparatively small, a total of seventy-one households only had to be removed from the Katse shoreline.

(16) The successful commissioning of Phase 1A, which is now delivering the planned 18 m3/s of water to the Vaal river system and generating power for Lesotho marks a great achievement. The highlands communities now benefit from good access roads, construction power and communication networks. Finally, technology transfer has been imparted to local consulting firms and LHDA staff and has enabled the LHDA to successfully implement Phase 1A of the Project.

(17) **Water Delivery:** The Project's Phase 1A objectives have been achieved. The objective of harnessing the surplus water of the Senqu/Orange River and its tributaries and delivering required quantities of water to the Republic of South Africa has been successfully attained and is sustainable. The first delivery of water commenced on 8th January 1998.

(18) **Generation of hydroelectric power:** The 72 MW 'Muela hydropower station became commercially operational in December 1998.

(19) The LHDA has in place a highly trained and motivated team dedicated to the operations and maintenance of both the water delivery and hydropower generation and facilities. This team enjoys backup support from LHDA headquarters. The LHDA has standardised on the SAP R/3 (Systems Application Products), an enterprise resource planning (ERP) system for the integrated management of the business processes required in the maintenance and operations of the facilities.

(20) **Ex Post Economics and Impact of Phase 1A on Lesotho's Economy:** Ex post rate of return for both water transfer and hydropower components is calculated at 16.5%. As of May 1999, Lesotho has received M370 million in royalties (about US$60 million), M760 million in SACU revenues (US$122 million); created employment opportunities of 22,600 person years for Basotho people at a total value of M400 million in wages. Additional benefits include business opportunities for Basotho companies valued at M68 million. The associated increase in economic activity boosted tax revenues of the Lesotho Government and generated 18% of the Government's total

revenues. At the peak of construction, the Project accounted for about 14% of Lesotho's GDP, and approximately 40% of value-added in the building and construction sector.

F. Evaluation of Project components

21. **Engineering studies and supervision services:** These were all carried out successfully. The appraisal report estimated that about 7,565 man-months of *supervision services were supplied for the Katse dam and transfer tunnel.* This compares with the estimate of 5,355 man-months at contract award.. Regarding *the delivery tunnel* the figures for the appraisal, the contract award and the actual are 1,200 (appraisal), 1,399 (contract award) and 1,525 (actual) man-months respectively. At appraisal it was estimated that a total of 1,050 man-months would be required for *supervision of the hydropower facilities;* This figure was reduced during contract award to 754 man-months but the actual turnout at 1,040 man-months was much closer to the appraisal estimate. The implementation of the project involved several optimization studies, conceptual, tender and detailed design. Though this was a very complex engineering project, the designs and supervisions services have ensured the delivery of a project of world class standard.

22. **Advance infrastructure:** The advanced infrastructure component was a pre-requisite before the main civil works could continue (given the topography and state of development of roads and utilities in the project area). A total of 101.5 km of paved roads (*planned 120 km*), 106 km of gravel roads (*against the planned 80 km*), 2 bridges (*as against 1 planned*) between Lesotho and RSA (Maputsoe and Caledonspoort), 1 bridge *(as planned*) across the Katse reservoir as well as 3 access bridges were constructed as planned. Other advance infrastructure constructed as per plan include; residential camps, power lines and work camps.

23. **Katse Dam and reservoir:** The height of the Katse dam was increased from the original design height of 182m to 185m high due to the deepening of the foundation. It is a concrete arch dam with storage capacity of 1,950 million M3 (*as against the original 1,519 million*) and associated works have been constructed at Katse.

24. **Transfer tunnel:** The length of transfer tunnel was reduced from 48km to 45km with the Katse intake tower being located 3km upstream from the original location and was completed on schedule.

25. **Delivery tunnel:** The 16 km delivery tunnel segment in Lesotho with a diameter of 5.0 m and an average flow capacity of 30 m^3/s to accommodate water deliveries in Phase 1A and 1B of the LHWP was successfully completed ahead of schedule.

26. **Hydropower plant and appurtenances:** The construction of an underground power station with 72 MW installed capacity of three units and a 45m high concrete arch dam at 'Muela with a storage capacity of 0.5 million M3 were completed as per plan. The station was commissioned in December 1998.

27. **Institutional support for the LHDA:** Support was extended to LHDA through various technical assistance contracts in the fields of engineering, finance, accounting,

environment and human resource development; international panels of experts (POE) in the fields of engineering (including dam safety) and social and environment issues regularly visited the project sites. LHDA staff received training in various disciplines and management information systems were strengthened. The success of the support programme is evidenced by the fact that locals have gained the necessary skills and experience largely to replace the original expatriate staff complement; At senior management level, four of the General Managers are locals with three of them having been recruited from within. The two Deputy General Managers are both local and almost all the branch managers are local as well.

28. **Construction Skills Training:** A Rural Skills Training Centre was established at Thaba-Tseka. A total of 783 people went through the training and the majority of them were successfully placed with the different contractors. The training centre was later adapted to provide skills in sewing, knitting, building, plumbing and poultry production. Income generation plans were developed for 370 seriously affected households, taking into account their needs and preferences.

29. **Environmental Protection:** The LHDA drew up an Environmental Action Plan (EAP) which was divided into three parts viz. The Compensation Plan (including resettlement), the Rural Development Plan and the Natural Environment and Heritage Plan (initially including Public Health). Construction monitoring and all advance infrastructure works were rehabilitated; detail mapping of Phase 1A catchment land facets was carried out; various programmes in biological conservation have been and are being implemented. Two nature reserves (at Bokong and Tsehlanyane) are being established. Archaeological, paleontological and cultural heritage sites at Liphofung are being conserved and protected.

30. **Compensation, Resettlement and Relocation:** Regarding compensation for loss of arable land less than 0.1 ha, annual grain payments have been paid since 1988 and in the 1990' s the nutritional value was improved by adding beans. For larger arable land one-off lump sum cash payments were paid between 1989 and 1991. Compensation for loss of communal assets through fodder deliveries was effected between 1994 and 1997 following the approval of the Compensation Plan in 1990. Thereafter the period of payments has been increased from 15 years to 50 years following the approval of the new 1997 Compensation Policy. A revised policy includes options for lump sums or annual cash payments geared towards developmental projects. Replacement of all housing and associated structures impacted by project construction and inundation were successfully completed before inundation (110 and 118 housing units were constructed under the advance infrastructure and power lines respectively). Under the Katse shoreline replacement housing, 126 housing units and two schools in six villages were relocated. Due to reservoir induced seismicity at Mapeleng, 921 houses in ten villages were repaired and reinforced and 93 replacement houses were constructed.

31. **Rural Development:** The rural development project includes agricultural production, rural infrastructure and skills training. On the rural infrastructure component, performance has been good. Regarding the skills training component, performance has been moderate while on the agricultural production component performance has been moderate to unsatisfactory. Out of 121 villages in the Katse local catchment 60 villages have been supplied with potable water, 1,306 households out of 3,357 have been provided with Ventilated Improved Pit latrines (VIP). Thirty-one schools out of fifty-nine have been

provided with potable water and sanitation facilities. The programmes are still on-going to cover the rest of the villages and schools.

32. A notable positive feature of the project's rural development programme is that while a relatively small number of people were directly adversely affected by project construction activities, yet the rural development programme covered a far large number of households in addition to those directly affected.

33. **Studies : An Organization and Management (O & M) study** was carried out over a two year period from 1994 to 1996. The primary focus of the Organization and Manpower Study was to prepare LHDA to meet its future requirements effectively and efficiently and to advise upon the structural and cultural transformation that was required to enable it to achieve its objectives. The study also addressed the transitional issues that LHDA could face in moving from a construction and engineering organization responsible for various phases of the LHWP, to an operating utility which is itself directly engaged and responsible for the operation and maintenance of completed phases of the Project. In implementing the recommendations of the O & M study, the LHDA launched a Transformation Project which resulted in a new LHDA Vision and Mission. Furthermore the application of the O and M Study recommendations has ensured that LHDA has a new organization structure that is relevant to its current needs in the implementation of Phase 1B with the establishment of the Operations and Maintenance activities, the application of community driven environmental and social services programmes, and the continuity of the construction and engineering activities of Phase 1B. The development of an LHDA leadership model has contributed to an increased performance from LHDA staff. Specific areas that the desired leadership model centers on are *people centred empowerment, delivery of performance, commercial and business orientation, pioneering and forward looking (visionary).*

34. **A management accounting study,** financed by the World Bank was commissioned primarily to ensure that the Treaty and Loan Agreement reporting requirements could be achieved. The study was expected to result in a comprehensive cost allocation approach and the development of key performance indicators. The study focussed mostly on Activity Based Costing (ABC) approach which could not be readily applied to the LHWP business processes. Subsequently, the LHDA and the JPTC together developed and refined principles underlying the cost allocation approach to be used.

35. **A management performance audit** of LHDA was carried out in 1995 by the JPTC. The main objectives were to assess compliance with the Treaty and Order, review the effectiveness of the LHDA's management, management systems and procedures, and investigate specific areas and processes such as auditing, appointment of consultants, contract administration, implementation of RDP and the recruitment process. The study identified a number of weaknesses, many resulting from defects in corporate governance, and apparent in such areas as long term strategic planning, the budgeting process, the structure of the organization, flow of information, performance management systems and procedures and lack of office/management infrastructure. The study also acknowledged that several initiatives had been launched by the LHDA to address certain weaknesses including financial reporting and recording and also identified areas of strength such as high morale in some departments. Some of the recommendations of the study included the re-organisation of the LHDA around three core businesses, with focus on the end customer, the adoption of process rather than functional thinking, tight management control systems with

appropriate performance contracts at senior staff levels and suitable job descriptions for major positions. The study also notes the critical role played by JPTC in such areas as cost allocation, improved financial reporting, the improved quality of the Request for Proposals (RFPs) and contracts procedures. The impact of the study, in addition to other performance improvement initiatives, has enabled the LHDA to streamline its management systems and deliver effectively in Phase 1A and to use the experience gained to better plan Phase 1B.

36. **Development Fund:** The Government of Lesotho established a Development Fund in 1992 whose main aim was to ensure that the project's royalties are effectively used to promote economic development in Lesotho. During its first two years of operation (1995/96 - 97) the development account disbursed more than M152 million to support rural infrastructure projects involving about 1,100 km of rural roads, 210 small dams, 60 foot bridges and a number of forestry and soil conservation activities. In addition, a limited number of relatively larger investments in the Government's Public Sector Investment Programme (about M40 million) have been supported including the development of a water resources management strategy and ceramics and mohair projects. From lessons learned in the first years of operation, the Fund has been restructured to respond to the needs of the communities and national public sector investment priorities. The Fund is now known as the *Lesotho Fund for Community Development* (LFCD).

37. **Roads and border crossings:** A total of 1,13.3 km of roads were rehabilitated, and 2 border crossing facilities at Caledonspoort and Maputsoe were constructed and equipped. They are all currently operational.

G. Project Financing and Strategy

38. **Project Cost and Financing Plan :** The total Phase 1A project cost was estimated at M8.441 or US$2.414 billion during appraisal of the project in 1991. Thus the World Bank's loan for US$110 million accounted for about 5.5% of the total project cost. The project was to be financed 64% from Common Monetary Area (CMA) funding and 36% from international funding. The details on the financing plan for phase 1A are given in the attached table. The plan reflects the break down as follows;

Table 1: LHWP: Financing Plan for Phase 1A

Financing Plan

	Expressed in US$ million Equivalent	Expressed in Maloti million Equivalent [1]	Percentage
International funding			
Donor Agencies & Bilaterals	391.2	1,459.5	16.2
Export Credit Agencies	411.1	1,533.8	17.0
European Comm. Banks	67.0	250.0	2.8
Sub-total	869.2	3,242.9	36
CMA Financing			
RSA and Lesotho sources	1,545.6	5,766.5	64
Total Funding	**2,414.8**	**9,007.9**	**100**

[1] *A weighted average exchange rate of US$1 to M3.730903 for the years 1992 to 1999 has been used.*

39. Financing Strategy : The LHWP was commenced at the time when South Africa was politically isolated and subject to international economic sanctions, therefore in order that borrowings could ultimately be guaranteed by South Africa, the ultimate borrower, without financiers having the embarrassment of direct contact, a sophisticated trust mechanism was put in place. The key element of the financing strategy was to procure full project funding at the lowest possible cost. The guiding principle has been a target of an average cost of funding of not more than 15%. This strategy has succeeded as explained in the section on achievements below.

H. World Bank Performance.

40. Overall, the involvement of the World Bank during the preparation and implementation stage of Phase1A of the Lesotho Highlands Water Project has been highly beneficial, as it has helped LHDA to implement this complex project sucessfully.

Project Financing

41. Though its contribution was relatively small (5.5% of total project financing), the World Bank's contribution as a catalyst was enormous. Its involvement created confidence amongst the funding agencies. The Bank also facilitated, amongst other areas of collaboration, the involvement of an internationally renowned and independent tender evaluation team for Phase 1A main works contracts.

Technical assistance

42. Regarding the engineering works, the Bank always stressed the need to conduct detailed geotechnical investigations at the main works sites in order to reduce the construction risks during the implementation stage. The Bank also ensured that each periodic review by the Panel of Experts included not only an engineer but experts from other disciplines.

Supervision Missions

43. Project implementation was regularly and closely supervised by the Bank. Throughout the implementation of Phase1A, the Bank assigned a supervision team that visited the Project twice a year, mostly designed to coincide with the visits of the Panel of Experts. The involvement of the supervising missions was helpful as they closely monitored the physical and financial progress as well as the social and environmental issues of the Project.

Environmental Issues

44. On environmental and social issues, the supervision missions pointed out the lack of comprehensive environmental clauses in the specifications and tender documents which led to difficulty in enforcing adherence. Early in implementation the focus was on engineering and physical aspects. The later shift towards emphasis on environmental and social issues should have come earlier to ensure that these issues were addressed to the same level or in tandem with the engineering and construction programme.

Aides Memoire

45. Aides Memoire were of high quality and pointed out areas of achievement and areas of concern. Key areas to be addressed with a time frame were highlighted and this helped to speed up resolution of problems and flagged critical issues that needed to be addressed by LHDA and both governments to facilitate efficient and effective completion of the Project's programmes.

Panel of Experts

46. The Bank's decision to approve the appointment of an experienced Panel of Experts at an early stage was appropriate. The Panel of Experts, both in the engineering and environment disciplines, were appointed to monitor the implementation of the Project and advise in resolving implementation issues. This has enhanced quality control and helped optimise the costs.

Project Benefits

47. The Bank played a crucial role in ensuring that the benefits accruing from the project implementation are well managed for the good of the citizens of Lesotho through creation of the development fund, *The Lesotho Fund for Community Development* (LFCD).

Continuity of the Task Team Members

48. While in general the input by the Bank has been of immense benefits as stated above, nevertheless it could have been even higher had it not been for the high turnover of the Bank's personnel dedicated to the Project's supervision. For some of the environment and social programmes, fresh staff meant fresh inputs, while for others it meant loss of continuity. Furthermore, the World Bank prioritized some environment and social programmes over others.

I. The Borrower's Performance.

49. Overall, the borrower's performance during the preparation and implementation stages of Phase 1A of the LHWP has been good. The various Treaty and loan agreements covenants have been honoured.

50. The institutional arrangements which were put in place provide a good forum for the implementation of this bi-national Project in a satisfactory manner for the benefit of both countries. The JPTC monitored the implementation of the activities of both LHDA and TCTA and safeguarded the provisions of the Treaty very well.

51. Through transformation and restructuring the LHDA has satisfactorily tackled the issue of improving its technical and managerial performance in the programmes' implementation.

52. LHDA participated in the various engineering studies and services performed during the project preparation stage which resulted in refining Phase 1A of the Lesotho Highlands Water Project to its final completed stage.

53. The earlier studies, including the feasibility study, enabled Lesotho and RSA jointly to implement Phase 1A of Lesotho Highlands Water Project.

54. LHDA engaged experienced consultants to undertake engineering, environmental and social studies and designs for various engineering, environmental and social programmes.

55. The Disputes Review Board (DRB) concept was introduced in 1993 for Katse dam and in 1994 for the Transfer and Delivery Tunnels respectively. The intention was to ensure settlement of contractual claims without going to costly arbitration. The LHDA has implemented acceptable DRB recommendations.

56. As far as the implementation of the Environmental Action Plan is concerned, the performance has varied from satisfactory to unsatisfactory. There are, therefore, areas of performance and of non-performance, as well as factors attributed to each. At a broad level, implementation started in response to construction activities, especially those tied to the engineering programme. Thus, the programmes slipped behind as the main focus was to catch up with engineering programme implementation which was ahead at the time of EAP preparation (1988– 90). Therefore environmental programmes tied to engineering activities would tend to show more achievements than those which started at various later stages. An additional consideration is the intricacies involved in social and environmental issues. The pace at which a project implementing agency would like to move invariably is affected by the pace of the communities in which the project is to operate.

J. Key Lessons Learned.

(i) In order to ensure effective delivery , management of programmes should strictly enforce proper planning with target output indicators, timing, performance monitoring and evaluation, and corrective action where necessary.

(ii) Training and capacity building for LHDA staff managing the programmes should be emphasised .

(iii) In Phase 1A a significant amount of local costs was funded out of foreign funding. At the time it could be argued that the cost of borrowing abroad was cheaper, but in hindsight additional costs of forward cover have not resulted in much savings. The consequences are even more severe for the hydropower station where the cost of cover is unsubsidised and more expensive. Regarding the engineering programmes, it is important to ensure continuity between design and construction supervision by retaining the services of the same consultant whenever possible.

(iv) All engineering studies contracts must contain detailed and project specific as well as global environmental components.

(v) Participation of all affected parties should be promoted as early as the project conceptualisation stage to ensure sustainability of the facility at the end of construction. Provision should be made very early on for detailed documentation and steps to be taken with regard to handing over of completed LHWP assets to GOL departments, other agencies and the communities.

(vi) Detailed geotechnical investigations should be mandatory in all tender design contracts and disclosure of the results should be provided to tenderers in tender documents. Where doubt exists as to interpretation of the results, the tender documents should provide for the worst case scenario with well-defined options to change should actual conditions encountered improve (e.g. transfer tunnel lining).

(vii) An independent and internationally renowned Panel of Experts provides a good audit of the design and delivery of the programmes. They should be used continuously between design and delivery/construction stages and in all future phases, including infrastructure studies.

(viii) Technology transfer from expatriates to locals should be through structured training programmes coupled with professional institution guidelines. It should be managed with clear and measurable and/or verifiable expectations upfront. The success of the transfer largely depends on commitment from both parties.

Comments on the World Bank's ICR on Phase 1A of the LHWP

1.0 General Comments

1.1 Sustainability of Operations

The LHDA is also concerned about the sustainability of operations hence current efforts to ensure that project operated assets and facilities handed over to government institutions or the village communities are operated on a sustainable basis.

The Bank's ICR , in hindsight, expresses the view that a better design of the project "would have entrusted some of the components to Government ministries and agencies already active in those fields."

The view of LHDA has always been that it is in the long term more effective to adopt an **integrated approach** rather than a decentralized delivery of the project's operations. This approach would also have, as a prerequisite, **a clear exit plan**. The LHDA's view is therefore that " *There is need for full integration of all affected parties in the planning, design and construction of all infrastructures and facilities to ensure sustainable operation and maintenance*". This lesson is being taken over within the context of phase 1B and further phases. Particular emphasis is placed on, inter alia, appropriate institutional arrangements.

An important consideration is that at the time of project design and implementation there were deficiencies in capacity across several sectors in the country, including the Government ministries. Within this context therefore the LHDA does recognize that Government agencies should have been strengthened to develop the capacity to be able to participate effectively in the planning, design and implementation and to later successfully take over the facilities while ensuring that LHDA can successfully execute the programmes with well defined and coordinated exit plan.

1.2 Project Objectives

The LHDA's view is that the project objectives as stated in that appraisal report are basically at the project output level of *the logical framework.* It is important that these are correctly stated at the much higher level of project purpose. Within this context the primary purpose of the LHWP can be stated as follows;

Project's purpose

"T*o harness the Lesotho highlands water into a sustainable development resource for the improvement of quality of life in Lesotho and South Africa"*

Project's outputs

In order to achieve its purpose the project is designed to deliver on, inter alia, completion of civil works, generation of export revenues and generation of hydropower and delivery of the agreed upon environmental and social objectives.

Project's activities

In order to achieve the above stated outputs, the project was designed with activities that included, studies, engineering and construction supervision, raising of finance, provision of technical assistance, institution building and training of staff and other activities.

Against this background, the purpose of the implementation completion report (ICR) is therefore to assess the performance of the project at the output level.

1.3 Environmental Impact Assessment (EIA)

The LHDA would like to highlight the fact that before the *Environmental Action Plan* (EAP) could be implemented, detailed investigations meeting standards for environmental assessment at the time were carried out. Feasibility study of the project could not have ignored such an important element of project design. The contentious issue has always been the extend to which these investigations were actually documented in a systematic manner and lack of or slow implementation of environmental mitigation measures. This however does not negate the fact the EAP was actually informed by the findings of the Environmental Impact Assessment (EIA).

2.0 Specific Comments

For convenience, the bulk of our comments are directly made on the text itself. These include corrections of the typographical errors, restatement of some phrases to provide better clarity on our perception and interpretation of policy, issues, and concepts.

Below we only highlight some of these corrections;

Preface

2.1 Second paragraph

We have included the concept of *"localization"*, in addition to *"regionalisation"* of some technical assistance.

We have also highlighted the fact that during actual implementation there were certain changes in the source of financing of the project.

2.2 Paragraph 10 page (iv)

One of the difficulties the project encountered was not in securing finance *per se* but in securing **concessionary finance.**

2.3 Para 13 page (v) see also para 66 page 16 - Social Investments

At the time of the preparation of the ICR, the LHDA had transferred ownership of the houses the people who were resettled. The outstanding issue was that of legally transferring leasehold to the owners as this process takes a long time but the houses themselves have been handed over.

2.4 Para 16 page (vi)

Our view is that the programs were adequately designed however there were shortcomings in the actual implementation.

2.5 Para 32 page 8 - The water quality component.

The reference to the period between 1993 and 1996 could be deleted without changing the import of the statement. It is a fact that the component has not been effective in developing all the necessary skills and facilities and that LHDA continues to outsource the analysis of the water samples. The current initiatives to redress this include option of using the facilities of the National University of Lesotho was they have developed that capacity.

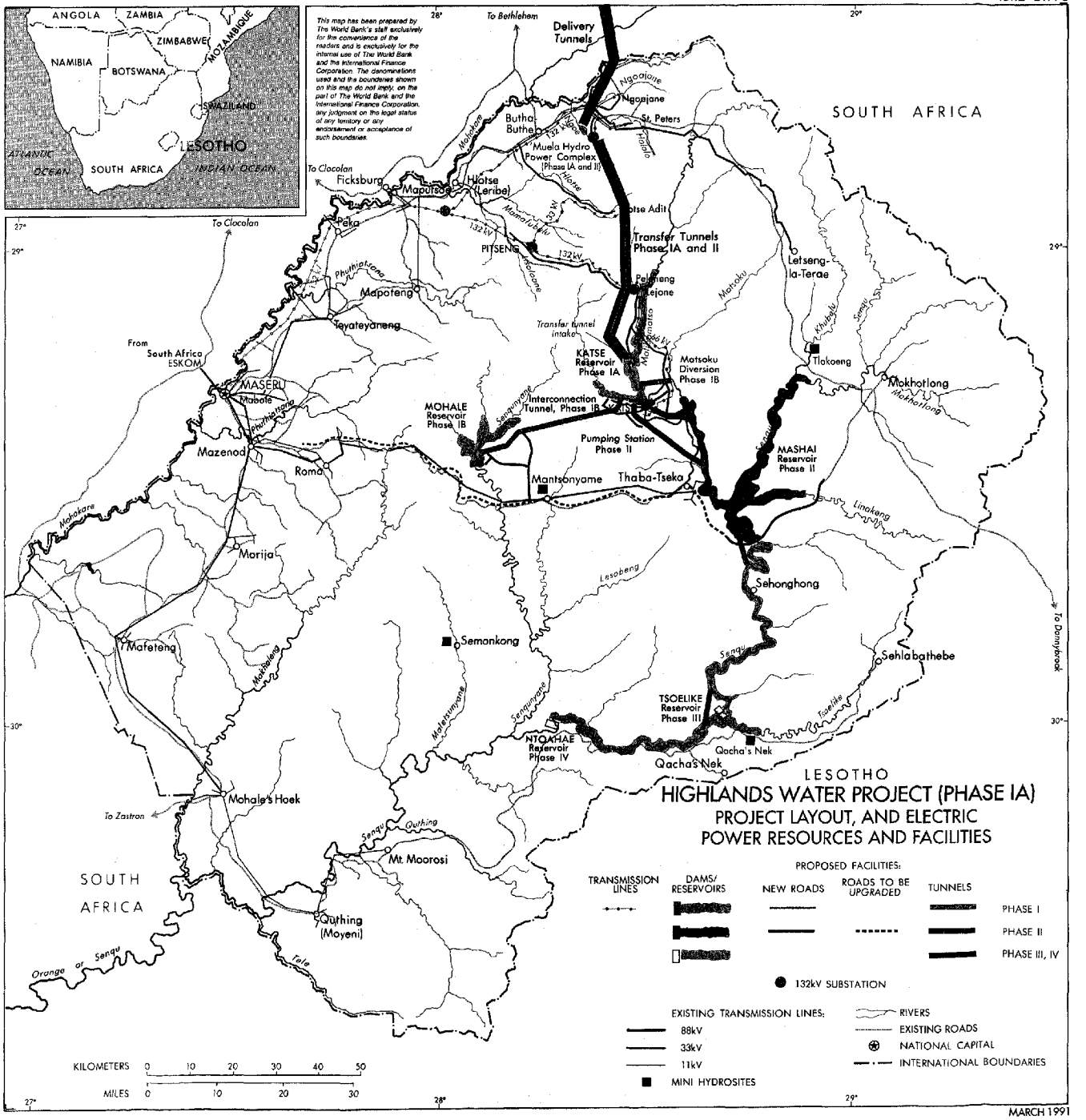
2.6 Para 83 page 21 - Lessons

The LHDA notes that an important lesson is to include, amongst other things, a sound policy on employment of affected communities and not just "selection of labour" as stated in the ICR.

2.7 Table 1: Summary of Assessment - page 24

We note that the Bank has rated the LHDA's performance in "Covenant Compliance" as "satisfactory". While we also note that this may have ben due to delays related to the Organization and Manpower study and the Management Accounting study, the LHDA would wish to see a reconsideration of this rating for two main reasons viz.

- The compliance with legal covenants in Phase 1A was in general particularly faster and
- As stated in the LHDA's ICR the Management Accounting study focussed mostly on *activity based costing* (BC) approach, which could not be readily, applied to the LHWP processes. It was against this background that the LHDA and the JPTC (now LHWC) to develop and refine principles and methods which will better address the objectives of cost allocation.


ANGOLA
ZAMBIA
ZIMBABWE
MOZAMBIQUE
NAMIBIA
BOTSWANA
SWAZILAND
LESOTHO
ATLANTIC OCEAN
SOUTH AFRICA
INDIAN OCEAN
This map has been prepared by The World Bank's staff exclusively for the convenience of the readers and is exclusively for the internal use of The World Bank and the International Finance Corporation. The denominations used and the boundaries shown on this map do not imply, on the part of The World Bank and the International Finance Corporation, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.
SOUTH AFRICA
To Bethlehem
Delivery Tunnels
Ngoajane
St. Peters
Butha-Buthe
Muela Hydro Power Complex (Phase IA and II)
To Clocolan
Ficksburg
Maputsoe
Hlotse (Leribe)
Hlotse Adit
Peka
PITSENG
Transfer Tunnels Phase IA and II
Letseng-la-Terae
Phuthiatsana
Mapoteng
Teyateyaneng
Transfer tunnel intake
KATSE Reservoir Phase IA
Matsoku Diversion Phase IB
Tlokoeng
Mokhotlong
From South Africa ESKOM
MASERU
Maseru
MOHALE Reservoir Phase IB
Interconnection Tunnel, Phase IB
Pumping Station Phase II
MASHAI Reservoir Phase II
Mazenod
Roma
Mantsonyame
Thaba-Tseka
Morija
Sehonghong
Semonkong
Mafeteng
Sehlabathebe
TSOELIKE Reservoir Phase III
NTOAHAE Reservoir Phase IV
Qacha's Nek
Mohale's Hoek
To Zastron
Mt. Moorosi
Quthing (Moyeni)
To Dimbyboek
LESOTHO
HIGHLANDS WATER PROJECT (PHASE IA)
PROJECT LAYOUT, AND ELECTRIC POWER RESOURCES AND FACILITIES
PROPOSED FACILITIES:
TRANSMISSION LINES
DAMS/ RESERVOIRS
NEW ROADS
ROADS TO BE UPGRADED
TUNNELS
PHASE I
PHASE II
PHASE III, IV
132kV SUBSTATION
EXISTING TRANSMISSION LINES:
88kV
33kV
11kV
MINI HYDROSITES
RIVERS
EXISTING ROADS
NATIONAL CAPITAL
INTERNATIONAL BOUNDARIES
KILOMETERS 0 10 20 30 40 50
MILES 0 10 20 30
MARCH 1991