Republic of Zambia

Integrated Water Resources Management and Water Efficiency (IWRM/WE)

IMPLEMENTATION PLAN

Volume 1: Main Report (2007-2030)

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PRESIDENTIAL STATEMENT

The Zambia Integrated Water Resources Management and Water Efficiency Implementation Plan (IWRM/WE) marks a major milestone in the management of our country's water resources. The plan is particularly relevant at a time when Zambia and the Southern African region are faced with challenges of effective water resources management coupled with the emerging uncertainties associated with effects of climate change on water resources. In the last 15 to 30 years, many parts of the country have experienced droughts and floods, and these have led to loss of lives and livelihoods and left thousands of people homeless.

The development of this Plan was agreed upon by Heads of States at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, which confirmed the importance of water and its critical relationship to all other development issues and reinforced the importance of achieving the Millennium Development Goals (MDG's).

In January 2007, I launched the Fifth National Development Plan (FNDP) for the period 2006 to 2010 and the vision 2030, a roadmap aimed at ushering Zambia into a prosperous middle-income nation by the year 2030. The theme of the FNDP is *"broad based wealth and job creation through citizenry participation and technological advancement"*. The FNDP focuses on agricultural development as the engine of income expansion in the economy. I am convinced that agriculture offers the best potential to improve livelihoods and combat poverty. In this regard, we must recognize water as the catalyst for development.

My Government is therefore pleased to launch the IWRM/WE Implementation Plan whose vision is to *"achieve equitable and sustainable use, development and management of water resources for wealth creation, socio development and environmental sustainability"*.

This Implementation Plan will provide a long-term implementation framework for water related programmes in the FNDP and should thus be viewed as a powerful tool to guide the implementation these programmes and the national budget in a coordinated and integrated manner in order to maximize economic efficiency, environmental sustainability and water use equity. Government is committed to the implementation of this plan through the creation of an enabling policy, legislative and institutional framework and the commitment of public resources. I urge the private sector, local communities and other stakeholders to own and participate in the implementation of this plan, as water affects every one of us.

May God prosper our country, Zambia.

Levy Patrick Mwanawasa, SC
PRESIDENT OF THE REPUBLIC OF ZAMBIA

FOREWORD

The Management of Water Resources in Zambia has remained a big challenge, as the list of challenges facing the sector is numerous. Its management has been complicated by the belief by many Zambians that the country has abundant water resources. Water, like every resource, is finite and needs to be managed sustainably to benefit the present and future generations. The Ministry of Energy and Water Development recognizes the important role water plays in improving agricultural productivity and livelihoods, and other uses such as domestic use, mining, manufacturing, hydropower generation and environmental use. An increased population and an awakening, growing economy have resulted in increased demand for water from each of these sectors.

In recognition of this, the Ministry in collaboration with the Zambia Water Partnership has developed this Integrated Water Resources Management and Water Efficiency Implementation Plan. The goal of the plan is *"sustainable water resources management and development with equitable provision of water in adequate quantity and quality for all competing users, at reasonable cost, with security of supply under varying conditions, supporting economic growth and improving livelihoods."* The preparation of the implementation plan has built on reforms within the water sector, which emphasised strengthening the framework for water resources management through an integrated water resources management approach.

The development process of the Plan benefited from extensive consultations at national level, consultations through the FNDP process and high level water related government institutions. In further consultations, stakeholders at the catchment, district, provincial and sectoral level were engaged to bring out priority issues to be tackled in this Implementation Plan. At the catchment, district and provincial level, government departments, traditional leaders, civil society and ordinary citizens participated in the consultative process. Other consultations included the sector coordination meetings of the water sector advisory group (SAG)

Hon. Kenneth Konga, MP
MINISTER-MINISTRY OF ENERGY AND WATER DEVELOPMENT

ACKNOWLEDGEMENTS

The Permanent Secretary, Ministry of Energy and Water Development wishes to acknowledge the contribution and support of various actors[1] in the Integrated Water Resources Management planning process. Special thanks are due the Planning and Economic Division, Ministry of Finance and National Planning for their role integrating the Plan into the FNDP; the Zambia Water Partnership for facilitating the process; the PAWD Core Team for leading and directing the project; the PAWD Project Secretariat; the School of Mines, University of Zambia for hosting the project; the IWRM Plan Drafting Team for their specific contributions, the various stakeholders and communities who participated in the consultations, the Consultants for their contributions, the Water Resources Action Programme, the Water Sector Advisory Group, Global Water Partnership Southern Africa for technical support and guidance, and to CIDA for funding the project.

Peter Mumba
Permanent Secretary- **MINISTRY OF ENERGY AND WATER DEVELOPMENT**

1 For full list of contributors, refer to back page of document.

ABBREVIATIONS AND ACRONYMS

ADCs	Area Development Committees
CUs	Commercial utilities
DISS	Department of Infrastructure and Support Services
DWA	Department of Water Affairs
FNDP	Fifth National Development Plan
GWP	Global Water Partnership
GWPO	Global Water Partnership Organisation
IWRM	Integrated Water Resource Management
MDG	Millennium Development Goals
MEWD	Ministry of Energy and Water Development
MLGH	Ministry of Local Government and Housing
NDCC	National Development Coordinating Committee
NDP	National Development Plan
NWASCO	National Water Supply and Sanitation Council
PAWD	Partnership for Africa's Water Development
PDCC	Provincial Development Coordinating Committee
RDCs	Resident Development Committees
RWSS	Rural Water Supply and Sanitation
SAG	Sector Advisory Group
UWSS	Urban Water Supply and Sanitation
WASHE	Water Sanitation and Health Education
WDC	Ward Development Committee
WE	Water Efficiency
WRAP	Water Resources Action Programme
WSS	Water Supply and Sanitation
WSSD	World Summit for Sustainable Development
ZWP	Zambia Water Partnership

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EXECUTIVE SUMMARY

Introduction

One of the targets agreed by Heads of State at the 2002 World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa, was that nations should prepare National Integrated Water Resources Management and Water Efficiency Plans (IWRM/WE Plans) by 2005. It was acknowledged that to achieve the Millennium Development Goals (MDG's) sustainable water resources management is critical especially for eradicating extreme poverty and hunger, ensuring environmental sustainability and improving health conditions.

Water resources have generally not been well managed resulting in problems such as inadequate supplies to meet various needs, pollution, inadequate information for decision making, inefficient use of the resource, inadequate financing and limited stakeholder awareness and participation. Internationally, there is acceptance that these problems can be addressed through applying the principles of integrated water resources management (IWRM). The process of integrated water resource management is now well established in international practice. It is largely concerned with balancing the trilogy of economic efficiency, social equity and environmental sustainability. The approach rests on the three pillars of an enabling environment, the institutional framework and management instruments.

With support from the Canadian International Development Agency (CIDA), the Global Water Partnership (GWP)through the Partnership for African Water Development (PAWD Project), supported a number of countries in preparation of IWRM/WE Plans. GWP-Southern Africa specifically provided guidance, technical support and capacity building to Zambia during the process.

In 2004, the Zambian government, through the Ministry of Energy and Water Development (MEWD), with facilitation of the Zambia Water Partnership (ZWP), began developing an Integrated Water Resources and Water Efficiency Plan for sustainable management of the country's water resources.

Plan development process

The formulation of the plan drew upon various initiatives and plans from several sectors within the country and the southern Africa region. A team of seven multi-disciplinary experts, coordinated by the PAWD project Core Team, drafted the IWRM/WE Implementation Plan under the leadership of the Ministry of Energy and Water Development.

Government began water sector reforms in the 1990s in a bid to address key issues constraining effective development and management of the sector. This resulted in the adoption of the National Water Policy, which emphasised strengthening the framework for water resources management through an integrated water resources management approach. This led to the formulation and implementation of the Water Resources Action Programme (WRAP). This programme addressed issues related to a weak legal and institutional framework, limited human resources capacity, inadequate hydrological data and information systems, inadequate stakeholder participation and weak provisions for addressing international waters.

Further, the call at the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, for all countries to *"develop integrated water resource management and water efficiency (IWRM/WE) plans by 2005"* gave Zambia more impetus to continue the formulation of the integrated water resource management plan through the WRAP. In view of the fact both the WRAP and IWRM/WE process were aimed at achieving the same objectives, government decided to harmonise the WRAP and IWRM/WE plan initiatives. An IWRM/WE plan discussion document was then prepared. This document drew upon several initiatives

focusing on managing water resources in an integrated way. The discussion document was presented to stakeholders for discussion at a stakeholders meeting held in Lusaka in August 2005, which included cooperating partners, academia and the private sector. The document was further presented to a stakeholder consultative meeting for the FNDP in Lusaka in September 2005 and a national workshop for directors of water-related government ministries and their heads of planning, held over 7-11 January 2007, in Ndola. At the Ndola workshop, a decision was made to reformulate the plan into an integrated water resources management and efficiency implementation plan for the water sector based on the FNDP which had just been launched by his Excellency, the President of Zambia.

The discussion document went through further consultative processes for stakeholders at the catchment, district, and provincial levels. The consultative process was intended to bring out priority issues that should be addressed in the Implementation Plan. To this end, consultative workshops were held in four locations to cover five catchment areas, namely, for the Upper Zambezi catchment in Mongu; the Luangwa catchment in Chipata; and the Tanganyika-Chambeshi and Luapula catchments in Kasama. Government departments, traditional leaders, civil society and ordinary citizens participated in the consultative process. These consultations were valuable and brought out issues critical to the development and management of water at sectoral, provincial and catchment level. In addition, the consultations ensured that all the water-related sectors and stakeholders agreed on the appropriate linkages and coordination mechanisms required during the implementation of the programmes outlined in the FNDP.

Other consultations that fed into the IWRM/WE plan preparation included coordination meetings of the Water Sector Advisory Group (SAG) and the technical meetings of the SAG sub-committees, which include water resources and environment, water supply and sanitation, water resources infrastructure, capacity building, monitoring and evaluation.

Scope of the IWRM/WE Implementation Plan

The IWRM/WE Implementation Plan is an inter-sectoral plan with proposed interventions to support the four main priority drivers of Zambia's economic development identified in FNDP 2007-2010 as agriculture, tourism, mining and industry/manufacturing. Being a national level plan, it will, through an integrated approach, lay a foundation for the enhanced planning, development and management of water resources and for their utilisation. The intention is to advance the development objectives identified in the National Long Term Vision 2030 as well as making progress towards meeting the Millennium Development Goals (MDG's).

The IWRM/WE Implementation Plan addresses issues raised and prioritised by stakeholders. These have been classified into the following broad IWRM change areas:

- Enabling environment: policies; legislation; financing and incentive structures;
- Institutional roles: creating an organisation framework; and institutional capacity building;
- Management instruments: water resources assessment; plans for IWRM; efficiency in water use (water demand management); social change instruments; conflict resolution; regulatory instruments; economic instruments; and information exchange; and
- Infrastructure for water resources management and development: monitoring stations, water and wastewater treatment plants, dams, wells, canals, hydro-power plants etc.

The four broad areas above fall within the programmes incorporated in the Fifth National Development Plan. The change areas are also in line with the Southern African Development Community's (SADC) Regional Strategic Action Plan for Integrated Water Resources Development and Management which calls for the implementation of IWRM principles. The IWRM/WE Plan will thus serve as an implementation plan for the FNDP and MDG's water-related programmes.

Priority issues and programmes and projects

The identified key issues and problems were analysed and grouped into clusters namely;

- policy, institutional and legal framework,
- water resources information,
- institutional and human resources development,
- water resources demand, supply and infrastructure economics and financing,
- water and environment,
- managing international waters and
- advocacy, public involvement and awareness.

In-depth analyses of issues in the clusters led to the conclusion that insufficient water resources management has had a significantly negative impact on economic growth, poverty reduction and the environment in general

To enhance integration and strategic focus, the priority issues identified were organised into four strategic programmes that align with the Water Sector Advisory Group's inter-sectoral sub-committees. This approach is expected to ease coordination and monitoring of the implementation of the projects from local to cabinet level. These strategic focal areas include:

- water resources management,
- water resources infrastructure development,
- water supply and sanitation, and
- monitoring, evaluation and capacity building.

The IWRM/WE Implementation Plan seeks to address challenges of managing water resources within the board areas identified above and in accordance with the priorities identified. Priority issues are detailed within appropriate sections of the plan. IWRM projects were identified on the basis of the strategic focal areas.

IWRM Implementation Plan Strategies

The vision of this plan is:

"To achieve equitable and sustainable use, development and management of water resources for wealth creation, socio economic development and environmental sustainability by 2030"

The goal of the IWRM Implementation Plan is:

"Supporting economic growth and improving livelihoods through sustainable water resources development and management with equitable provision of water in adequate quantity and quality for all competing groups of users, at reasonable cost, with security of supply under varying conditions".

Financing

The total cost of executing the IWRM/WE Plan is estimated at K 2,485 billion. The plan will be financed through a number of sources namely domestic resources, external grants, limited borrowing (both internally and externally), public private partnerships, regional and international financing initiatives. To achieve effectiveness, financing from various sources will be channelled following mechanisms that government has initiated under its financial management reforms namely fiscal decentralisation and the sector wide approach.

Implementation Mechanisms

This IWRM/WE Implementation Plan (2007-2010) is intended to support the implementation of the water-related programs in the current and future National Development Plans, using an IWRM approach. It will involve stakeholders from various sectors emanating from government, private, non-governmental organisations, academic and community based organisations. The responsibilities of the implementing entities are indicated in the implementation schedule in Annex 1. The Water Sector Advisory Group will undertake overall coordination. MEWD will also lead the execution of the Communication Plan as part of the IWRM/WE Implementation Plan in order to provide information and raise awareness of the Plan for building support for implementing the activities and in the interest of coordination and cooperation.

Monitoring and Evaluation

In order to assess the achievements of IWRM initiatives, a monitoring and evaluation framework has been elaborated which includes indicators of success. The monitoring of progress will be a continuous process that will feed into the periodic evaluation of the impact of integrated water resources management on the:

- Status of water resources country-wide;
- Trends in water supply and availability;
- Impact on peoples livelihoods; and
- Status of implementation of the plan and other similar frameworks.

The national monitoring framework that includes the Ministry of Finance and National Planning, Central Statistical Office (CSO) and the Ministry of Energy and Water Development will need closer collaboration in order to monitor water resources effectively.

The plan will be reviewed regularly in order to respond to the ideals of the FNDP and the National Long Term Vision.

CHAPTER 1: INTRODUCTION

1.1. Overview: Integrated Water Resources Management /Water Efficiency Plan

The World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa in September, 2002 confirmed the importance of water and its critical relationship to other development issues that underlie efforts to achieve the Millennium Development Goals. A key target agreed at the conference and endorsed by the Heads of State was for countries to prepare national integrated water resources management and water efficiency plans by 2005.

The process of integrated water resource management is now well established in international practice. It is largely concerned with balancing the trilogy of economic efficiency, social equity and environmental sustainability. The approach rests on the three pillars of an enabling environment, the institutional framework and management instruments. The process of developing this plan has drawn extensively on international best practice.

In Zambia, the planning, management, development and utilisation of water in a sustainable way has not been effectively undertaken. Progression towards integrated water resources management (IWRM) was intensified with the initiation of the Water Sector Reforms and the 1994 National Water Policy, which both advocate for implementation of IWRM. The Integrated Water Resources Management/ Water Efficiency (IWRM/WE) Implementation Plan is a tool which will bring together the various multi-sectoral initiatives and serve as the guide to stakeholders for implementing various initiatives related to integrated water resources management. Further the Plan is expected to contribute to the realisation of optimal benefits to the environment and to the welfare of the population.

The IWRM/WE Implementation Plan has been developed with support from the Partnership for Africa's Water Development (PAWD) Project which was being implemented by the Ministry of Energy and Water Development (MEWD) with the facilitation of the Zambia Water Partnership. The IWRM/WE Implementation Plan presented in this document represents a synthesis of the aspirations of the Fifth National Development Plan, outputs of the Water Resources Action Programme (WRAP) and the situation analysis and stakeholder consultation carried out during development of the plan. The aim is to provide a unified implementation plan that will support both the reforms of water resources management as well as all other inter-related/multi sectoral aspects of IWRM and water efficiency, in a coordinated, effective and efficient manner. The IWRM/WE Implementation Plan will thus serve as a single reference document for implementers in government; the private sector; non- governmental organisations; development and cooperating partners and the general public on priority water-related interventions to support the socio-economic growth of Zambia.

The IWRM/WE Implementation Plan developed was undertaken within the national planning framework. The pillar of national planning is the development of five yearly National Development Plans (NDPs). Government, informed by multi-stakeholders consultations, formulate the NDP. There are also other initiatives being undertaken by government and stakeholders that have a bearing on IWRM and where implementation needs to be harmonised and guided under a common framework for effective coordination. Within this context, the IWRM/WE Implementation Plan has been developed to bring together water/ IWRM related plans into an implementation framework. In the context of Zambia, the IWRM/WE Implementation Plan will therefore be an implementation plan for the Fifth National Development Plan (FNDP) up to 2010 and provide important input into future NDPs.

The Plan seeks to take account of several external factors that strongly influence the water sector. These include diseases such as HIV, AIDS, cholera and malaria, the levels of investment in the sector and the level of importance the public attaches to the sector.

The Implementation Plan is outlined in ten chapters. Chapter 1 highlights the general framework of the IWRM/WE Implementation Plan and sets the national policy framework within which the plan was developed. This chapter also outlines the specific scope of the plan. A situation analysis of water-related/ IWRM issues in Zambia is presented in Chapter 2. In the third chapter the issues identified are outlined. Chapter 4 sets the strategic focus of the IWRM/WE Implementation Plan based on the national development framework and IWRM issues raised and details the Vision, Goal and Strategic Objectives of the Plan. Chapter 5 is dedicated to the presentation of the proposed actions of the Plan. The financing mechanisms and implementation mechanisms are presented in Chapters 6 and 7 respectively. The risks that may affect implementation and mitigation measures are presented in Chapter 8. In Chapter 9 the monitoring and evaluation framework for the plan is outlined. Lastly but not the least, Chapter 10 outlines the communication plan. Note that a summary version of this document is available as Volume 2.

1.2. National Development Planning Framework

The IWRM/WE Implementation Plan is a medium-term planning instrument that is linked to the overall planning framework through the National Development Plan and the National Long Term Vision (NLTV). It is the intention of the Zambian government to improve economic development and citizen's wellbeing through efficient and effective planning. Since the reintroduction of central planning, a framework, which encompasses short, medium and long-term strategic planning, has been defined. It is a comprehensive framework that encompasses all planning aspects including national, sectoral, provincial and district planning as well as budget execution.

The national long-term planning instrument Vision 2030 or NLTV, prepared in collaboration with all stakeholders, sets the long-term vision for Zambia. The NLTV sets forth the horizon for developing the medium-term plans and also provides the "gravitational pull" for achieving long-term objectives. It outlines, in broad terms, the plausible course of action to be taken towards the achievement of the country's long-term objectives and targets. It broadly reflects what Zambians aspire to achieve by 2030 and the options they feel will realistically get them there. The NLTV is reflected in the current NDP and will continue to be reflected in subsequent NDPs. This is made possible by the fact that the NLTV is set in a long-term strategic context that the NDP will successively aspire to achieve through its medium-term strategic approach.

The long-term plan is operationalised through the NDP, a medium-term planning instrument, which contain specific policies, programmes and projects, predominantly targeted towards poverty reduction. The current NDP the Fifth National Development Plan (FNDP) will be implemented from 2006 to 2010. The FNDP has been designed to ensure that it is result-based, formulating national development strategies within a realistic annual and medium-term budget process.

In order to improve expenditure planning, management and tracking systems, a Medium Term Expenditure Framework (MTEF) is developed in collaboration with line ministries, the donor community, and civil society. The MTEF is based on the medium-term framework established under the NDP and the medium-term resource envelope (both government and external).

In the short-term, the annual budget is the primary instrument for effecting expenditures for the NDP programme cycle. The annual work plans and budgets provide the critical link for the NDP to other frameworks such as the MTEF, and sector plans. The Sector Investment Plans are the medium-term capital budget, or developmental budget, and the annual national budget's capital expenditures will be derived from the sector investment plans. The NDP is, therefore, a medium-term growth, employment creation and poverty reduction strategy, which is linked to the Zambia Vision 2030, the MTEF, sector plans, provincial and district medium-term development plans, and the annual budget. **Figure 1** illustrates these relationships.

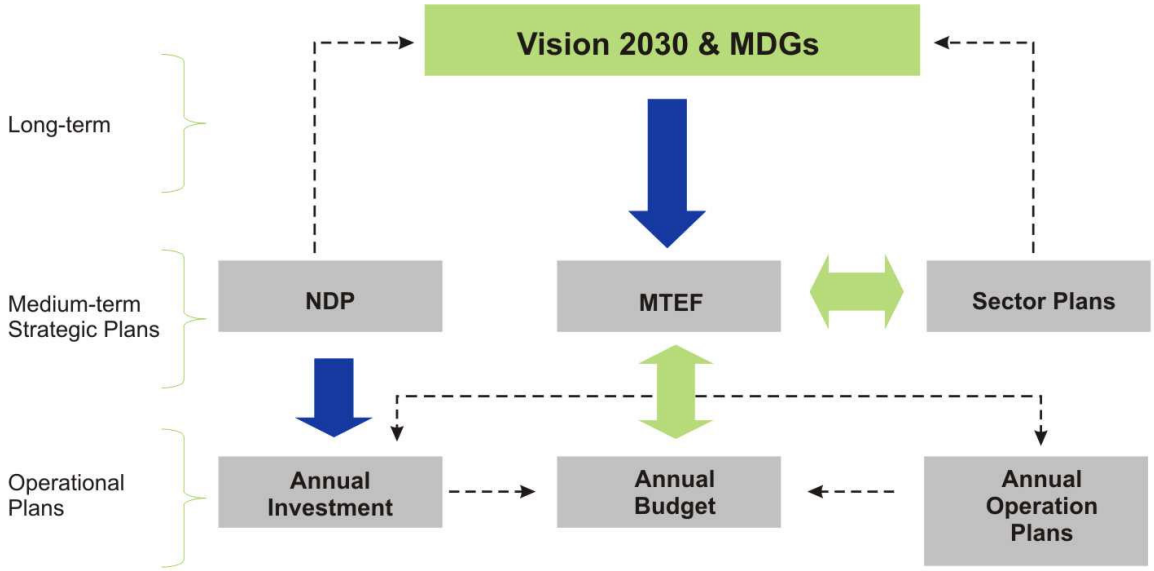


Figure 1: National Development Planning Framework

In line with the policy of decentralisation, and in reaffirming government's commitment to broad based consultations, planning and the subsequent budgeting process, designed and adopted within the Medium Term Expenditure Framework (MTEF), will be extended to the district level. In this regard, the development of subsequent National Development Plans will strongly be influenced by the district strategic plans.

Currently, the environment is conducive for implementing IWRM since the country is moving from a centralised, control-oriented system of planning, development and economic management to a form of governance characterised by decentralisation, participation of stakeholders in policy-making and in resource management.

1.3. Plan Development Process

The development of the IWRM/WE Plan goes as far back as the early 1990s when government initiated a water sector review in a bid to address key issues constraining effective development and management of the sector. This process resulted in the adoption of the National Water Policy, which emphasised strengthening the water resources management framework through an integrated water resources management approach.

The National Water Policy was intended to promote sustainable water resources development with a view to facilitating adequate, equitable and good quality water for all users at acceptable costs while ensuring security of supply under all conditions. Consequently, this resulted in the formulation and implementation of the Water Resources Action Programme (WRAP). This programme was aimed at addressing issues related to the weak legal and institutional framework, limited human resources capacity, inadequate hydrological data and information systems, inadequate stakeholder participation and weak provisions for addressing international waters.

The call at the World Summit on Sustainable Development (WSSD), for all countries to *"develop integrated water resource management and water efficiency (IWRM/WE) plans by 2005"* gave the country further impetus to continue the formulation of the integrated water resource management plan through the WRAP. In 2003, another international process under the Partnership for Africa's Water Development (PAWD) Project was initiated by the

Canadian government to support the development of IWRM/WE Plans in developing counties. In 2004 the Zambia Water Partnership through the Partnership for Africa's Water Development Project started to facilitate the development of the IWRM/WE plan.

In view of the above processes, Government decided to harmonise the two initiatives of WRAP and PAWD in the development of an IWRM/WE plan. Government in collaboration with the Zambia Water Partnership (ZWP) through support from the Partnership for Africa's Water Development (PAWD) Project produced a discussion document that built on a number of initiatives to manage water resources in an integrated manner. This document was discussed and reviewed at a stakeholders meeting held in Lusaka in August 2005. The document was further reviewed during consultations for the FNDP in September 2006. It was further taken to the national stakeholders through the national workshop for Directors of water-related government ministries and their heads of planning, held from the 7th to 11th January 2007, in Ndola. This workshop marked a critical stage in the consultation process and kick-started the bottom-up consultative process from catchment, to provincial to sectoral level. Other stakeholders at the national level included cooperating partners, the private sector as well as academia. At the Ndola workshop, a decision was made to reformulate the plan into an integrated water resources management and water efficiency implementation plan based on the FNDP, which had just been launched by his Excellency the President of Zambia.

During the consultation process, stakeholders at the catchment, district, provincial and sectoral level were engaged to bring out priority issues that would be tackled in the implementation plan. To this effect, consultative workshops were held in the five catchment areas which included Upper Zambezi Catchment-at Mongu; Luangwa Catchment-at Chipata and Tanganyika, Chambeshi and Luapula Catchments at Kasama covering four provinces. These consultations brought out critical issues and the constraints of managing, using and developing water resources at sectoral, provincial and catchment level. In addition, the consultations ensured that all the water-related sectors and stakeholders arrived at appropriate linkages and coordination mechanisms required for the implementation of programmes outlined in the FNDP. Government departments, traditional leaders, civil society and ordinary citizens participated in the consultative process at the catchment, district and provincial levels.

Other consultations at the national level included the sector coordinaton meetings of the Water Sector Advisory Group's (SAG) sub-committees (water resources management, water supply and sanitation, water resources infrastructure and capacity building, monitoring and evaluation).

The formulation of the IWRM/WE Implementation Plan has also drawn upon various initiatives and plans from other sectors and from regional processes under the SADC umbrella. Key among these are:

- The Fifth National Development Plan;
- The National Rural Water Supply and Sanitation Programme;
- The Water Resources Action Programme including stakeholder consultations at national and provincial levels; situation analysis; Draft Water Action Plan (June, 2005); and Implementation of Integrated Water Resources Management in Zambia programme with components to support the transitional phase, and implementation of the new water act once enacted;
- The Water Sector Support Programme with three components namely rural water supply and sanitation, peri-urban and low cost housing water supply and sanitation and integrated water resources management;
- The National Environmental Action Programme;
- The National Environmental Policy Situation Analysis;
- The National Irrigation Policy and Strategy;
- The National Water Resources Master Plan;
- The Southern Africa Water Vision; and

- The SADC Regional Strategic Action Plan.

IWRM related issues and actions raised in these documents have been incorporated and harmonised in the IWRM/ WE Implementation Plan. The development of this plan has been overseen by the PAWD Core Team (a multi-sectoral Team) and the drafting undertaken by a team of multi-disciplinary experts.

1.4. Scope of the IWRM/WE Implementation Plan

The IWRM/WE Implementation Plan is an inter-sectoral plan with interventions to support the four main priority drivers (as identified in the FNDP 2006-2010) of Zambia's economic development namely: agriculture, tourism, mining and industry/manufacturing. Being a national document, it will lay a foundation for the enhanced planning, development and management of the water resources and utilisation through an integrated approach.

The IWRM/WE Implementation Plan addresses issues that have been raised and prioritised by stakeholders. These have been classified to fall into the following broad IWRM change areas:

- Enabling environment – policies, legislation, financing and incentive structures;
- Institutional roles- creating an organisation framework and institutional capacity building;
- Management instruments- water resources assessment, plans for IWRM, efficiency in water use (WDM), social change instruments, conflict resolution, regulatory instruments, economic instruments and information exchange; and
- Infrastructure for water resources management and development – monitoring stations, water and waste water treatment plants, dams, wells, canals, hydro-power plants etc.

"Infrastructure for Water Resources Management and Development" has been included here in view of the fact that there are serious inadequacies in infrastructure affecting the effective management of the country's water resources.

Programmes indicated in the Fifth National Development Plan fall within the four broad areas mentioned above providing a vertical linkage to the to the plan which will be used as an implementation plan for FNDP and MDG's water-related programmes. These areas of intervention are also in line with the SADC Regional Strategic Action Plan for Integrated Water Resources Development and Management, which calls for implementation of IWRM principles. The Regional Strategic Action Plan for IWRM identifies the following seven main problems to which SADC countries are compelled to give urgent attention if IWRM is to be achieved:

- Weak legal & regulatory frameworks;
- Institutional strengthening;
- Inadequate information acquisition, management & dissemination:
- Awareness& public participation;
- Sustainable development polices;
- Infrastructure; and
- Public participation.

The Zambia IWRM/WE Implementation Plan seeks to address these issues within the broad areas identified above in accordance with the priorities identified.

CHAPTER 2: SITUATION ANALYSIS

2.1. Brief on Zambia

Zambia is a land locked country, located in Southern Africa between 8° 20' and 18° S latitude and 22° 00' and 33° 45' E longitude and is surrounded by eight neighbouring countries, namely; Angola, Botswana, Democratic Republic of Congo, Malawi, Mozambique, Namibia, Tanzania and Zimbabwe. See Figure 2.

The country has a relatively large land surface, with a total area of 752,972 square kilometres and lies on the Central Africa high plateau with an average altitude of 1 200m above sea level. The rift valley formations in the eastern and southern parts of the country have produced escarpment systems and valley troughs. The most famous of the escarpment systems is the Muchinga Escarpment.

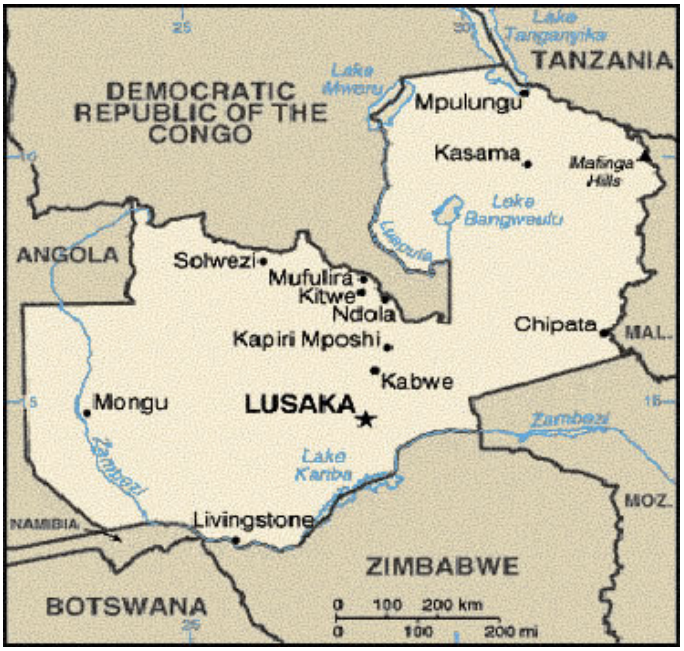


Figure 2: Map of Zambia

The population, which is predominantly Christian, is currently estimated to be about 11.7 million with an annual growth rate of about 2.9 percent. The population is projected to be 12.4 million in 2010 and 13.4 million in 2015. The projected rural population is 7.5 million in 2005, 8.0 million in 2010 and 8.7 million in 2015. The population size by Province as of 2000 when the last Census was conducted is shown in Figure 3. The average population density in 2000 was 13.1 persons per square kilometre; but there were wide variations in population density from province to province, ranging from 4.6 to 6 persons per square kilometre in North-western and Western provinces to about 50-64 person per square kilometre in the Copperbelt and Lusaka provinces. Generally, the country is sparsely populated with an overall density of 16 people per square kilometre (CSO, 2000). The population density is higher in many localised areas due to immigration and urbanisation.

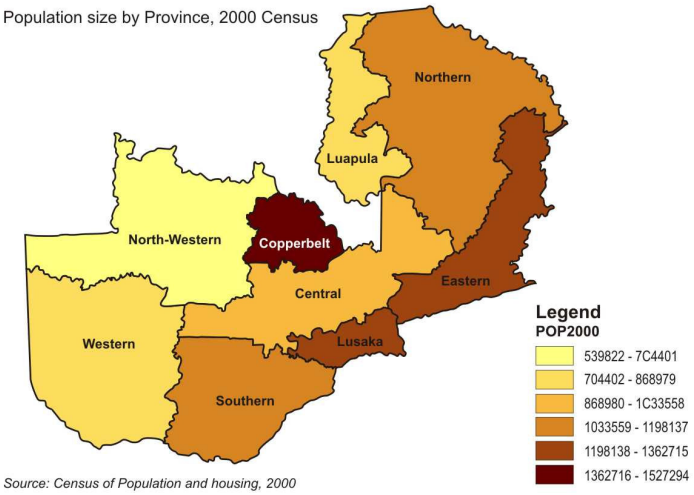


Figure 3: Population by Province

The country is endowed with a number of valuable resources such as copper, cobalt, zinc, lead, coal, emeralds, gold, silver, uranium, water, forests, wildlife and fertile land. The exploitation of these resources does not significantly contribute to poverty reduction as Zambia remains one of the low-income countries in Africa.

2.2. Economic Conditions

At independence in 1964, Zambia, with per capita income in excess of US $750, inherited a strong economy, which was primarily based on mining. At that time the United Nations classified Zambia as a medium-income country. Nonetheless, the country had poor socio-economic infrastructure and low human capital.

Over the last two decades, Zambia's economic performance has declined, in real terms, with per capita income falling to less than half (US$300) in 2000. However, the economy has stabilised since 2001 and begun to grow. Thus by 2004 the real Gross Domestic Product (GDP) had grown from 3.6 percent in 2000 to 5.4 percent in 2004. In relation to the targets indicated in **Table 1**, the set target was achieved. In 2004, the per capita income was estimated at US$450. However, real GDP growth rates have fluctuated between 2 and 5% over the last five years. Inflation and interest rates have shown a declining trend over the same period.

Zambia embarked on economic reforms with tight monetary and fiscal polices from the late 1990's. Among the country's reform strategies is the thrust to diversify the economy, especially towards agriculture and tourism. Currently, agriculture contributes about 22% of the country's GDP. However, this figure fluctuates depending on rainfall patterns as the irrigation potential is not fully exploited, and the country is vulnerable to periodic droughts and floods. The floods of the 2007/2008 rainy season are a case in point.

The performance of the Zambian economy improved considerably during the period of the implementation of the Poverty Reduction Strategy Paper (PRSP) and the Transitional National Development Plan (TNDP) from 2002 to 2005. Real GDP growth averaged 4.8 percent per year, up from an annual average of 2.2 percent in the preceding four years. Growth actually exceeded the 4 percent target identified in the PRSP/TNDP (Table 1). The improvements in performance represented a marked reversal of the economic stagnation experienced during the 1990's. Per capita income grew at 2.3 percent annually. The positive growth trends are due largely to several factors which include favourable global economic conditions and the overall impact of the economic reforms that started in the early 1990's. The renewed rapid expansion of mining as a result of re-capitalisation and new investments following the privatisation of state owned mines, buoyant prices on the world commodity market and construction have been the key drivers of growth.

Table 1: Key Macroeconomic Targets: 2003-2008

	2003	2004	2005	2006	2007(P)	2008(P)
Real GDP Growth Rate	5.1	5.4	5.1	6	6	6
Inflation Rate (end period)	17.2	17.5	15	10	5	5
Inflation (annual average)	17.2	17.5	15	10	5	5
Nominal GDP (K'billion)	20,479	25,916	31,956	36,669	41,162	46,238
Current Account Deficit Including grants (% of GDP)	(7.5)	(4.8)	(4.3)	(2.7)	(2.9)	(1.4)
Domestic Borrowing (% of GDP)	5.2	2.2	1.6	1.6	1	0.5
GIR months of Import Cover	1.3	1.2	1.7	2	3	3

Source: Ministry of Finance and National Planning

This growth however has not translated into any substantial decline in income poverty at household level. This is partly because economic growth has been driven by a small number of highly capital-intensive sectors, whose expansion has not created income opportunities necessary for broad-based poverty reduction.

2.2.1. Trade and Industry

Zambia's trade policy recognises that export promotion is key to the expansion of domestically manufactured goods. Thus, the key issue is the establishment of a fair domestic and foreign trade regime that facilitates trading to take place on a common set of agreed rules as opposed to discretion and one that does not stifle domestic production and employment. Export opportunities in markets that give Zambia preferential treatment for its exports such as the European Union, USA, China, COMESA and SADC region are being pursued. Increasing exports would require increased production of good quality products.

There is a drive to attract investors to boost all aspects of the economy but mainly in tourism, agriculture, hydropower, mining and manufacturing. Increasing hydropower production, processing /value added for export particularly of agricultural products (such as cotton, coffee, cashew nuts, groundnuts, paprika, sugar and fruits) and mining products (such as copper, marble and gemstones) as well as setting up processing free trade zones, is receiving special attention.

The increase in manufactured outputs is expected to create increased demand for raw materials. For instance, increased agriculture products will be required and thus more land and water needed. With industrial growth, it is expected there would be a commensurate increase in demand for water and an increased risk of pollution. Equally, increasing trade and industry requires increasing hydropower. This will require securing large quantities of water to meet the demands of hydropower stations. Water infrastructure coupled with an effective management framework will thus be necessary to meet the growing water demands and that would cope with these challenges including that of environmental management.

2.2.2. Poverty

Poverty is pervasive in Zambia and the majority of the population live in income deficit situations and suffer from other deprivations such as little access to and poor quality of social services. In general, poverty is more prevalent in rural areas (83% of the rural population) in comparison to the urban areas (56% of the urban population). Lately, poverty has rapidly increased in urban areas due to failing industries and subsequent rising unemployment. Provinces with extreme poverty include Western, Northern, Luapula, and Eastern provinces, while Lusaka, Copperbelt and Central provinces have lower incidence of poverty by comparison. The areas of extreme poverty are characterised by high prevalence of material deprivations in terms of food and nutrition, health, education and literacy, safe water and sanitation, and clothing and shelter. The poverty situation intensifies resource overuse and its degradation.

2.2.2.1. Income Poverty Levels

In spite of the PRSP and positive growth trends during the last few years, Zambia is yet to register significant declines in income poverty levels. According to the Living Conditions Monitoring Survey (LCMS) IV of 2004, as many as 68 percent of the population fell below the national poverty line, earning less than K111 747 per month. **Figure 2** shows that poverty levels fell slightly in 2004 compared to 1998 when poverty stood at 73 percent. The

depth[2] and severity of poverty also remain high despite the slight decline since 1998. At the national level, the depth of poverty dropped to 36 percent from 40 percent in 1998, while the severity of poverty declined to 23 percent from 26 percent in 1998. Extreme poverty (covering people earning less than K78 223 per month) fell from 58 percent in 1998 to 53 percent in 2004[3]. The declining depth and severity of poverty was driven primarily by rising per capita consumption amongst the poorest non-farm households. This represents a deviation from the experiences of 1991-1998, during which time non-farm poverty rose rapidly.

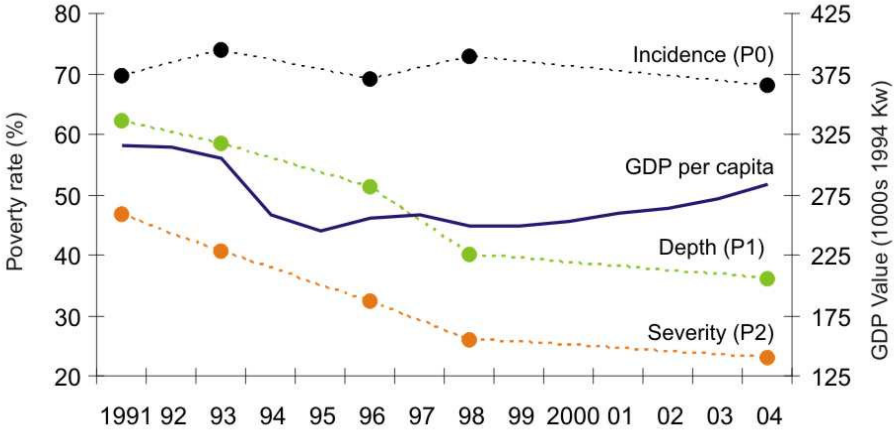


Figure 4: Growth and Poverty Trends at National level, 1991-2004

Source: Central Statistical Office

Note: These official poverty estimates are based on the Priority Surveys (1991, 1993) and Living Conditions Monitoring Surveys (1996, 1998, and 2004). GDP per capita is based on National Accounts.

Changes in poverty during 1998-2004 were evenly distributed across rural and urban areas. **Table 2** shows that poverty in rural and urban areas declined by 5 percent and 3 percent, respectively. The incidence of poverty in the rural areas fell from 83 percent in 1998 to 78 percent in 2004, while poverty in urban areas declined to 53 percent in 2004 from 56 percent in 1998. Rural incidence of extreme poverty fell from 71 percent in 1998 to 65 percent in 2004. In urban areas, the incidence of extreme poverty declined by 2 percent from 36 percent to 34 percent. Although almost all provinces recorded some declines in poverty incidence, important gains were made in certain provinces like the Copperbelt and Eastern provinces. The incidence of poverty declined the most in Eastern Province, where it fell by 11 percentage points to 70 percent in 2004 from 81 percent in 1998. This was followed by the Copperbelt, which recorded a 9 percentage points decline in poverty incidence to 56 percent in 2004 from 65 percent in 1998.

[2] The 'incidence' of poverty (or headcount) measures the number of people falling below the poverty line irrespective of how far from the poverty line they are. So people lying far below the poverty line and those just beneath it are counted equally. In order to adjust for the fact that some people lie far below the poverty line it is necessary calculate the 'poverty gap' or what is alternatively referred to as the 'depth' of poverty. This measure gives a greater weight to the poorest of the poor. Along similar lines, the 'severity' of poverty (or the 'squared poverty gap') attaches even greater weight to the poorest of the poor.

[3] [3] Extreme poverty is measured by taking a lower poverty line that reflects the minimum requirements of food spending and excludes some of the items included in the national 'basic' poverty line.

Table 2: Changes in Poverty levels from 1998 to 2004 in Zambia

	Population (1000s)		Incidence (P0) %		Depth (P1) %		Severity (P2) %	
	1998	2004	1998	2004	1998	2004	1998	2004
National	10,183	10,954	73	68	40	36	26	23
Rural	6,359	6,662	83	78	49	44	34	30
Small-scale farms	-	-	84	79	50	45	35	31
Medium/large-scale farms	-	-	73	73	38	36	25	22
Large-scale farms	-	-	-	37	-	-	-	-
Non-farm households	-	-	79	69	48	36	35	24
Urban	3,824	4,292	56	53	23	22	13	12
Central	1,019	1,136	77	76	44	43	31	28
Copperbelt	1,823	1,661	65	56	31	24	19	13
Eastern	1,304	1,514	81	70	46	40	31	27
Luapula	701	863	82	79	47	42	32	26
Lusaka	1,526	1,534	52	48	22	19	13	10
Northern	1,237	1,407	82	74	45	41	31	27
North-Western	549	654	76	76	41	40	27	26
Southern	1,268	1,360	76	69	42	35	28	22
Western	756	826	89	83	57	53	42	38

Source: Central Statistical Office

Note: These official poverty estimates are based on the Priority Surveys (1991, 1993) and Living Conditions Monitoring Surveys (1996, 1998, and 2004). GDP per capita is based on National Accounts.

In terms of incidence of poverty among various strata, **Table 2** shows that the rural small-scale farmers had the highest incidence of poverty at 79 percent with 66 percent being extremely poor. This was followed by rural medium-scale farmers where poverty incidence was 73 percent. In the urban areas, the highest incidence was among the low cost households at 58 percent. In terms of the status of poverty, high levels of poverty continue to be associated with more remote provinces such as Western Province (83 percent), Luapula (79 percent), and North-Western Province (76 percent). The incidence of poverty was lowest in more urbanised regions like Lusaka (48 percent) and the Copperbelt Provinces (56 percent). While the proportion of the population living in poverty did not vary much among the provinces, there were quite significant variations in terms of the proportion of the population living in extreme poverty across the provinces. The rate of extreme poverty varied from 29 percent in Lusaka Province to 64 percent in Luapula Province. Incidence of extreme poverty was also high in rural areas where two thirds of the population was extremely poor compared to only one third in the urban areas. Figure 5 shows the incidence of poverty by province in 2004.

In terms of each province's contribution to the national incidence of poverty of 68 percent, Figure 6 shows that Northern Province contributed the most (16 percent), followed by Copperbelt and Eastern provinces (both 14 percent). The severity of poverty is more acute among rural than urban households. In the rural areas, it was estimated at 17 percent, while in urban areas it was estimated at 9 percent.

The preceding analysis indicates that poverty remains concentrated in rural areas. The majority of rural households in Zambia depend on consumption of own produce. Therefore, the high poverty levels in rural areas could be as a result of not having adequate food by the majority of households there. The rural areas have poor infrastructure and marketing systems while labour productivity among the small-scale farmers is quite low.

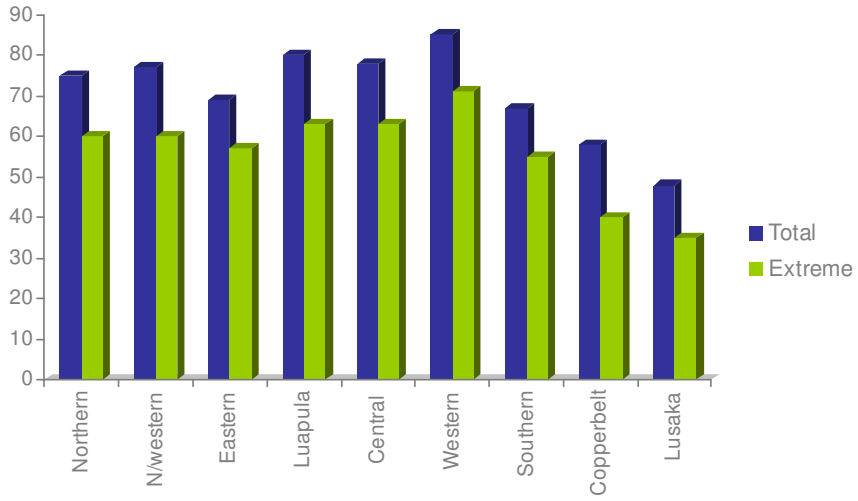


Figure 5: Incidence of poverty (%) by province in 2004 in Zambia

Source: Living Conditions Survey Report 2004, CSO

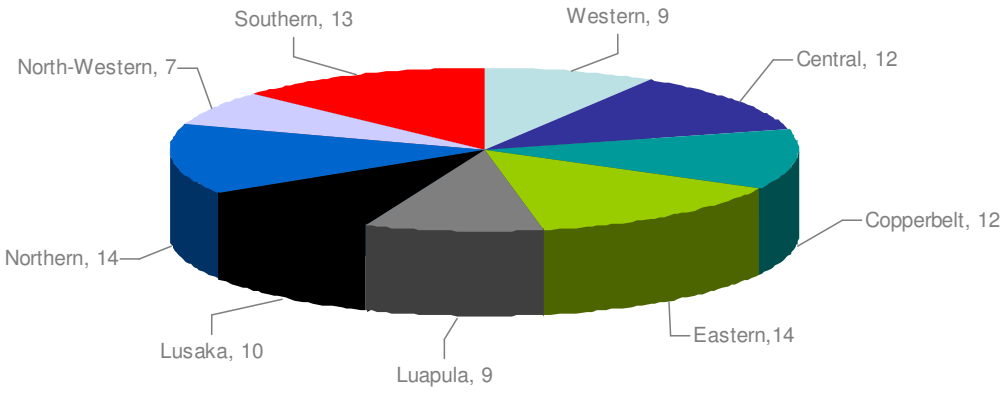


Figure 6: Provincial contributions to National Poverty, 2004

Source: Living Conditions Report 2004, CSO

The persistently high-income poverty observed in 2004 is in sharp contrast to the rapid acceleration in economic growth experienced since 1999. This implies that the country's improved economic performance over recent years has not translated into significant declines in poverty. There are several important factors that may explain the persistence of high poverty levels. They include the changing structure of growth, which during the period 1998-2004 was largely driven by the improved performance of the mining and construction sectors. Agriculture, upon which the majority of poor people depend, did not perform particularly well over the recent years, with wide fluctuations in production and a relatively low average growth rate. This reflected considerable variation in weather patterns as well as inadequate infrastructure and generally poor market access. Much of the growth that has taken place has been driven by cash crops such as cotton and tobacco, which are concentrated in specific areas of the country. This may explain why poverty incidence is still the highest among the rural small-scale farmers.

The changing structure of growth has also influenced the provincial distribution of poverty. The collapse of the mining sector during the late 1990s may explain why the population of the Copperbelt has declined dramatically. This, together with subsequent mining growth, may account for the sharp decline in poverty experienced in the Copperbelt Province, and the rapid increase in the population of the North-Western Province, where new mining growth has been taking place. The decline in poverty in the Eastern Province may be the result of strong growth of such agricultural commodities as cotton and tobacco that are grown in the region. Of interest, as seen from Table 2, is that the predominant rural areas have higher a poverty rate where the majority of the population is engaged in agriculture. In addition, the high levels of poverty are in Northern, North Western, Western and Luapula provinces. These provinces have relatively better availability of water resources, but there is very little infrastructure, which reveals that these resources are not being adequately utilised for socio- economic gain and thus having an impact on the well-being of the people in these regions and rural areas in general. The government has seen this as an economic development opportunity, which will be developed through the programme of provision of social and economic services to rural development.

2.2.2.2. Non-Income Poverty

There are several non-income or social dimensions of poverty that are also important for household welfare. For instance, education indicators have improved over recent years, with increases in primary school enrolment and a decline in drop-out rates. For instance, gross enrolment ratios (GER) for Grades 1 to 9 rose from 75.1 in 2000 to 104.6 in 2005 while net enrolment ratios (NER) rose to 92.3 percent from 68.1 in 2000. Significant improvements have also been made in school completion rates. In 2000, the completion rate was 63.6 percent and increased to 72 percent in 2004. These improvements partly reflect the introduction of free primary education in 2002.

Despite the improvements noted above, there are still a number of outstanding challenges that must be addressed. Adult literacy stands at only 55.3 percent and has remained unchanged since 1990. Furthermore, the provision of education services is unevenly distributed in favour of urban households. Less than half of the rural adult populations are literate, while primary and secondary school enrolment rates are lowest in the more remote Eastern, Western and Luapula provinces. Additionally, the quality of education has not matched the levels achieved in terms of access.

Health indicators have also shown some improvement since the early 1990s. Both rural and urban infant mortality fell considerably between 1990 and 2000 and is projected to decline further. Furthermore, according to recent estimates, the adult prevalence of HIV/AIDS has fallen from 20 percent in 1998 to 16 percent in 2002. However, adult HIV/AIDS prevalence remains twice as high in urban areas as in rural areas, and women are 40 percent more likely to be infected than men. Maternal mortality also worsened during 1996-2002. These indicators confirm that recent changes in household welfare have indeed been ambiguous and that poverty is particularly severe, especially once non-income dimensions are taken into account. Although still relatively high, childhood mortality indicators have shown signs of decline. Under-five mortality was 197 deaths per 1,000 live births in 1996 but fell

to 168 deaths per 1,000 live births in 2001-2002. As in other indicators, childhood indicators are better in urban compared to rural areas.

Although some progress is being made, a high proportion of the Zambian population, estimated at 47 percent, has no access to safe drinking water, especially in the rural areas. The majority of the rural population access their water from lakes/rivers and unprotected wells, which are not safe. Each year, unsafe water, poor sanitation and hygiene cause several deaths.

Finally, environmental degradation has reached alarming proportions. The country's forests are under tremendous pressure, with wood harvesting for fuel and timber and the clearance for agriculture and human settlement being some of the primary causes. In the last decade, environmental degradation, especially deforestation and wildlife and fish depletion, has become particularly severe and threatens sustainable economic growth and the survival of the poorest populations.

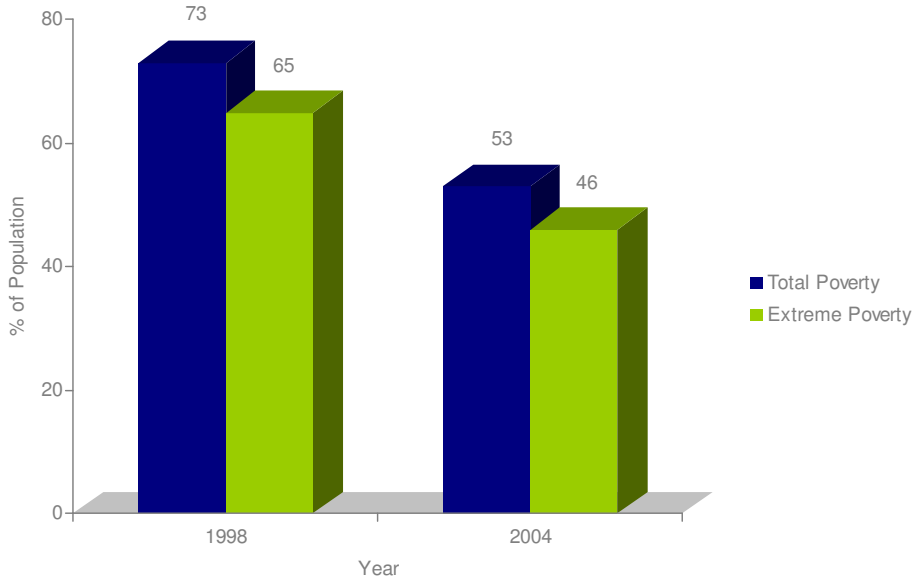


Figure 7: Incidence of Poverty 1998 and 2004

Source: Central Statistical Office

2.3. Water and the MDG's

The Millennium Development Goals (MDG's) were agreed upon by the international community in 2000 with access to safe drinking water as one of the 18 objectives. The improvements in access to water can only be guaranteed by concerted and rational management of water resources. The World Summit on Sustainable Development (WSSD), reinforced this relationship. The WSSD Plan of Implementation builds on the MDG's and because water plays a critical role in achieving all the MDG's, specifies that countries should prepare national Integrated Water Resource Management and Water Efficiency Plans by 2005.

Water bears a direct relationship to poverty reduction and plays a critical role in achieving all the MDG's goals. However, poor people lack access to water for consumption and productive activities and, in order to tackle poverty and meet the MDG's, sustainable water management needs to take centre stage. The priority of the water sector for the Zambian government is expressed in the FNDP (2006-2010). The objective of 'water resources management' in the FNDP recognises that effective development of Zambia's water resources is fundamental to poverty reduction.

The financing gap is one of the major challenges that the country is facing in fulfilling its commitments in meeting the MDG's. Other challenges to meeting the MDG's in the water sector are:

- An uneven population distribution, which makes it costly to supply water to sparsely populated areas, an increasing population and difficult settlement patterns;
- Urbanisation and geographical factors such as decentralisation;
- The extent of poverty in different regions;
- Inadequate information on water and sanitation;
- Weak drivers at national level for IWRM;
- Inadequate resources mobilisation and coordination; and
- Inability to retain skilled personnel.

The government and the people's expectations for achieving the MDG's, are high. The government's 2005 MDG status report suggests that Zambia could potentially achieve the targets, if water sector reforms and strategies that provide an enabling environment are implemented. Success would also be enhanced through the effective implementation of pro-poor policies and programmes. Serving the poor in a sustainable way also requires that the institutions concerned operate on a sound technical and financial basis especially to empower the commercial utilities as well as the local authorities. The momentum of government and other water institutional commitments need to be maintained especially where they relate to sector financing and cost recovery.

2.4. The Water Situation

2.4.1. Water Potential

The current water potential in the country is enough to meet the present water demand of a population of 11 million. However, most of the country's water resources need to be developed if they are to meet the demand for different productive uses in all areas. The poor distribution of surface water in many parts of the country especially the southern half results in local shortages. Access to sufficient and clean water is critical to the general development of the country, as it contributes to wealth creation, poverty reduction and disease prevention.

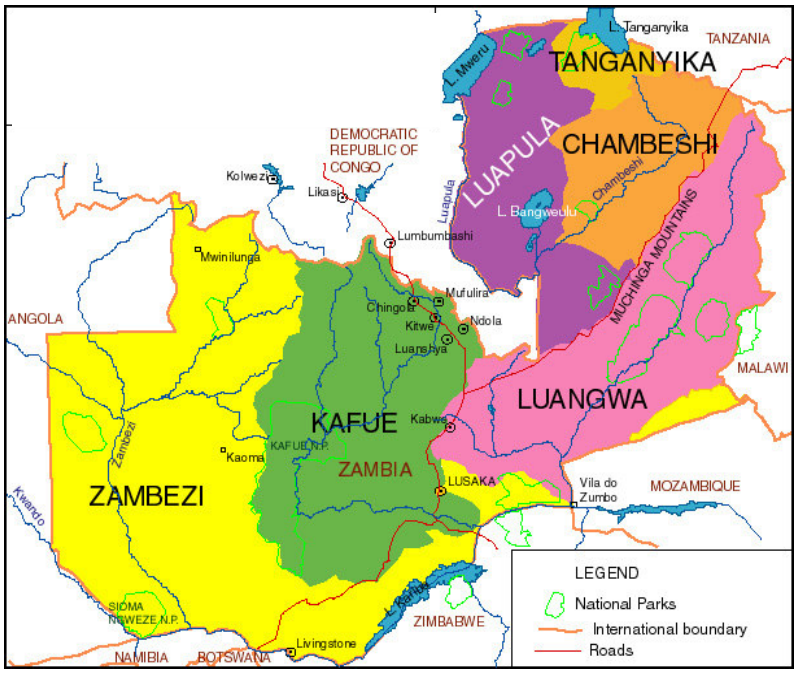


Figure 8: River Basins of Zambia

Much of Zambia's surface water is confined to the major rivers and lakes which include the Zambezi, Kafue, Luangwa, Luapula and Chambeshi. Significant lakes include the Bangweulu, Mweru, Tankanyika, Mweru-wa-ntipa and the man made lakes of Kariba and Itezhi-tezhi as shown in Figure 8.

Most of Zambia's surface water is generated within the country. It is only the Zambezi River that receives substantial quantities from other countries (see Table 3).

The population of Zambia increased from 9,885,591 in 2000 (CSO, 2000) to an estimated population of over 11 million in 2006. This increase in population and economic activities has consequently led to an increase in water demand, which has not been matched by water resources development to ensure improved access to water. For instance the Kafue River on the Copperbelt is threatened by pollution, while, in the middle and lower catchments there is an increase in competition between different uses which may lead to conflicts of interest.

2.4.2. Rainfall Situation

Zambia lies in the tropics and gets moderate rainfall averaging 1000 mm per annum. The rainfall ranges from 600 mm in the south to over 1400 mm in the north. Most of the rain falls in the wet season between October and April. This means, river flows in the country experience seasonal variations with peaks between March and April. The lowest flows are experienced between October and November.

There are also annual variations in rainfall. For instance, the 1977/78 rainfall season was the highest recorded in recent years, but it was followed by over a decade of below normal annual rainfall. After this, there was a relatively good hydrological year in 1989/90. In 1990/91, the hydrological year was relatively bad resulting in one of the exceptionally severe droughts. Subsequent hydrological years fluctuated below normal until 1997 when this changed to above normal, although punctuated by below normal rainfall seasons in 2002 and 2004. Figure 9 below shows the annual rainfall variation from the 1975/76 to the 2005/06 hydrological year. The country is therefore prone to extreme meteorological events.

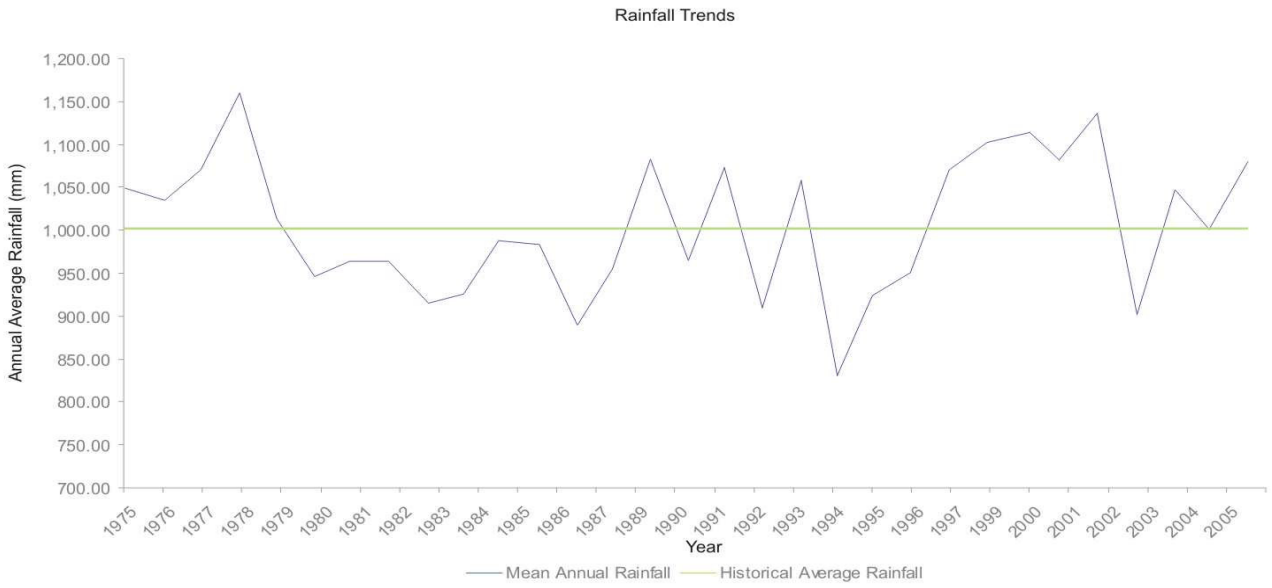


Figure 9: Annual Rainfall Variation

The main source of renewable water in Zambia is rainfall. Most of this water is lost back to the atmosphere through evapo-transpiration. The quantities lost depend on the way the existing climatic conditions affect the hydrological cycle and consequently the run-off, which in turn make the forecasting of floods and droughts difficult. The average annual evapo-transpiration is estimated at 1,574 mm and ranges between 1,394 mm and 1,892 mm (DWA/JICA, 1995). This means, the country has a precipitation deficit of 100 to 1,100mm per year based on potential evapo-transpiration. Evapo-transpiration leads to high water losses especially from large reservoirs and lakes. This means only about 3 to 12 percent of the rainfall can be considered as renewable water.

2.4.3. Surface Water Resources Potential

Surface water potential is relatively well understood and the annual total renewable potential for Zambia has been estimated to be just over 100 km3 with the Zambezi River, at the confluence with Luangwa River, contributing over 60 percent of the runoff. In a high rainfall hydrological year, the annual runoff can be as high as 130 km3 per year. On the other hand, it can be as low as 68 km3 in a severe drought year. However, the variations in the annual runoff depends on the rainfall, the figures given above are based on probable discharge that can be achieved in 95 days and 335 days in a year (i.e. Q95 and Q335) respectively. Most of the surface water flows correlate with the variation in the rainfall with high flows during the rain season and low flows during the dry season.

Table 3: Percentage Contribution of each river system

River Catchment	Total Catchment Area (Km2) (Area Outside Zambia)	% Contribution to Surface Water Potential	Annual Run-Off (Km3)
Tanganyika	15,856	1.73	1.99
Kafue River	156,995	8.40	9.88
Chambeshi	44,427	7.62	8.75
Luangwa	144,358 (3,264)	19.44	22.32
Luapula	173,396	26.25	30.14
Zambezi	268,235 (418,814)	36. 36	41.75
Total for Zambia	803,267 (422,078)	99.80	114.83

Source: Department of Water Affairs

Between the 2000/01 and 2005/06 hydrological years, the average runoff was around 100 km3 with the highest in 2000/01 and the lowest in 2001/02. This means that no serious droughts where experienced during this time though 2001/02 was relatively bad with some areas experiencing droughts.

The SADC region generates about 600 km3 per year of renewable water and out of this (excluding Congo) Zambia generates about 100 km3 per year. This means that the country is relatively better placed in terms of available water potential. However, most of this water is found in the southern half of the country where it is confined to the three major rivers of the Zambezi, Luangwa and Kafue. On the other hand, the northern part of the country has a relatively denser network of rivers.

In both cases, lack of water development has restricted access to areas where the water is needed for various activities. At the same time most countries to the south of Zambia are increasingly becoming water stressed and have started looking north for possible sources of water. Since most of the water in Zambia is not developed to meet the economic and social needs, the country will be at a disadvantage when these projects are implemented.

Until the country develops its water resources, it will always get reduced benefits from its water resources. It is disheartening to note that Zambia uses just below 40 percent of its waters. However, only about 8 percent of this water is used for consumptive uses like irrigation, industrial and domestic water supply. This situation needs to be addressed through the sustainable development and utilisation.

2.4.4. Water distribution in the country, population growth and economics

The Kafue river basin is one of the most developed basins in Zambia. While the annual renewable resource is only about 10 percent of the national average renewable resource, it supports about 40 percent of the population of Zambia. Almost all the major industries are found in the basin including the largest hydropower generation

station. This is the largest single use of water in the Kafue Basin. Other river basins such as in the Lunsenfwa , Kaleya and most catchments around Lusaka are increasing experiencing water stress due to increasing and competing water demands due to increasing economic activities such as agriculture .

2.4.5. Groundwater Situation

Groundwater is a major source of water in many parts of the country. It sustains river flows during the dry season for perennial rivers and streams and can contribute from between 30 and over 90 percent of the total flows. Due to lack of data, it is difficult to assess accurately the groundwater potential of the country. The current estimates are taken as a fraction of the rainfall and are assumed to be the annual exploitable water. This water is found in many aquifers that cover most of the country making it one of the most well distributed water sources.

The average renewable groundwater potential is estimated to be 49.6 km3 DWA/JICA (1995). This is based on an average of 8 percent of the rainfall. It is usually assumed that the variation from year to year is very small. Until now, no significant sign of groundwater depletion has been observed. However, some aquifers like the Lusaka aquifer are slowly coming under serious threats from pollution as much of the aquifer is exposed to seepage from pit latrines, septic tanks and unplanned quarrying of construction material. There is also a threat of over-pumping in specific areas such as Lusaka, Ndola and some farming areas. In mining areas, large quantities of groundwater are discharged into the surface water. Although this water may be beneficial as it augments river flows there are concerns with its quality. Information on the status of ground water is inadequate due to poor information collection. The lack of regulation of groundwater in the current water legislation has contributed to the inadequate management.

2.4.6. Water Demand and Use

Water demand can be defined as the volume of water of a specified quality that is required to meet a user requirement. In Zambia, most water is used for hydropower generation, which is a non-consumptive use. The rest of the water is used for consumptive uses that includes agriculture, industry and domestic water supply, which includes drinking water. The last national assessment of water demand and use was carried out between 1992 and 1995 as part of the preparation of the National Water Resources Master Plan (MEWD/JICA, 1995).

The total water demand in Zambia is just under 40km3. Of this, 36 km3 per year or an average of 1,150m3/s is used for hydropower generation. Out of the remaining 3km3 per year, agriculture uses about 77 percent of the water to irrigate about 100,000 hectares (446,100ha by 2015). Industries throughout the country use 7 percent and the rest is used by domestic water supply and other uses. Since the assessment in 1995 there has been no significant increase in the water use mainly because is the resources are still to be developed. This is however, likely to change as irrigation, mining, industry and manufacturing are expanding and more hydropower stations are planned and commissioned.

Currently, land and water are managed separately by various agencies in spite of the close inter-linkages between them. This has resulted in conflicting land-related decisions being made. For example, a groundwater recharge area may be allocated for residential development. These weaknesses in planning would be overcome by adopting an IWRM framework as the catchment management plan, developed for a certain area, would be the guiding instrument for all stakeholders to follow. Other natural resources directly related to or dependent on water resources include forests, wildlife, fisheries, aquatic species, and wetlands. Their demands and uses have not been determined.

2.4.7. Water Efficiency

Over the last few years some parts of the country have started to experience water shortages especially in the dry season. Though other parts have enough water, the seasonal variation and the effects of climate change can have devastating effect on the available water resources. Water efficiency plans are part of this plan because they are important in water resources management. Improving water efficiency is meant to improve the benefits derived from all water resources. In this context, water efficiency involves the application of water demand management. This encourages a change of behaviour through information exchange, economic incentives like metering of domestic and bulk uses, tax relief and water recycling/reuse. In farming for instance, suitable technology can improve irrigation water use efficiency depending on how water is applied. Changing from flood irrigation to centre pivot can greatly reduce the quantity of water applied for the same crop yield. Other tools used to promote water efficiency include pricing and tariffs, incentives, public awareness and subsidies. In Zambia, there has been no clearly defined policy or strategy that encourages water efficiency. There is also limited awareness, application and appreciation of water demand management (WDM).

Approximately 77 per cent of the water for consumptive use in Zambia is used for irrigated agriculture. Flood irrigation which is highly inefficient is used widely. Practices of WDM in agriculture for large- and small-scale farmers are emerging. The main drivers for efficient water use are water charges, energy charges, increased crop yield due to improved water application and scarcity and competition for water in areas such as the Kafue Flats, Kaleya and Lunsemfwa catchments. Some of the technologies used include drip irrigation and centre pivots. The Water Board has been instrumental in advocating for water demand management by considering the water use and allocation equity issues when making decisions on water rights. The water supply utilities have high unaccounted for water and limited metering of their customers. Efforts are however being made to rehabilitate water pipes and install meters. The National Water Supply and Sanitation Council (NWASCO) monitors the performance of the water utilities which includes their water efficiency. The hydropower sector is also striving to improve water efficiency by rehabilitating power plants by installing more efficient turbines.

Industries can also adopt water efficient methods in their processing. This not only reduces the quantity of water used but can also contribute to improving water quality discharged into the environment An example is the installation of boiler condensers to condense steam and return the condensate for reuse in the process while at the same time reducing evaporation. Cleaning can use a lot of water and some of the replacement technologies use compressed air.

Overall water re-use and rainwater harvesting is not widely practiced in the country.

Apart from the “water use efficiency”, a major challenge is also to address “allocation efficiency”.

The importance of water efficiency is that the water saved can be used in other economic or social activities and unnecessary costly investment for new infrastructure can be avoided, hence contributing to the overall growth and well being of people and the environment.

2.4.8. Emergency Situations

Floods and droughts can result in a number of emergencies. However, emergencies may escalate to disasters as a result of extreme hydrological events. Emergencies have varying impact on communities depending on the level of poverty, number of people living in flood and drought prone areas and the available infrastructure and systems for flood control and protection. Mitigation measures for control and protection or a combination of these factors can be implemented. Although something can be done about floods and droughts, climate change has further complicated understanding of the phenomena. This calls for improved planning and better risk management.

Planning for floods and droughts should form part of overall planning as their effect is usually crosscutting. In Zambia the major water-related disasters relate to floods and droughts.

The effect of climate change has made droughts and floods to be come recurrent. It has been observed, through modelling predictions, that the SADC region will generally get less rainfall especially the south eastern parts while the rainfall intensities would increase. This is likely to extend into Zambia.

2.4.9. Floods

Floods can result in disaster, death, and destruction that adversely affects the economy. However, not all flood impacts are negative, for example floods deposit fertile soils as they recede and they can also help in flushing out undesirable pollutants resulting in higher crop yields. Water must be stored or conserved during a time of plenty (floods) for use in a time of shortage (droughts) through development of infrastructure such as dams.

Land degradation in Zambia is becoming a major concern and in most areas this results in an increase in surface evaporation and rainwater runoff thereby reducing retention time and resulting in floods because infiltration is reduced.

Box 1: Zambia 2006-2007 Floods

During 2006/2007 season 41 districts out of 72 in all nine provinces were affected by floods. Floods had adverse impact on all the sectors with infrastructure, water and sanitation being severely affected in most districts. The impact on infrastructure had an adverse multiplier effect on other sectors such as health, education and agriculture. Of the total flood affected population of 1,443,563 only an estimated 295,148 people require immediate food aid amounting to 7,084 MT of cereal for two months (March and April, 2007).

From the 41 districts assessed, 29% reported high malaria prevalence rates while 32% reported high diarrhoea prevalence rates. There was no change observed in ARIs. Availability of Insecticide Treated Nets (ITNs) and community level health campaigns were the main attributes for the low malaria prevalence. Despite the observed low rates of diarrhoea prevalence, there is a high risk of water contamination due to faecal matter. The assessment established wide spread use of unprotected shallow wells which are the main water source for most households. Furthermore these shallow wells are at risk of being contaminated due to poor sanitary facilities for human waste disposal.

The impact of floods on education in terms of attendance rates was mainly attributed to damaged infrastructure such as bridges, culverts, classroom blocks and toilets. The most affected districts reported 40 to 50% reduction in attendance. Infrastructure damage due to floods was mainly in the high rainfall areas of Northern and North-Western provinces and was mostly on community-managed infrastructure projects like community schools, bridges and culverts. Some roads have been rendered impassable due to flooding. Impact on health infrastructure was low in all assessed districts. Some mobile clinics have been suspended due to impassable roads.

Protection of people and property from water-related hazards is still very low in Zambia. This is made worse by the fact that there is little or no mechanism to forecast and provide an early warning of extreme hydrological events in specific areas. There is an urgent need to develop a real time reporting mechanism that integrates land use, hydrology and meteorology. Further, the impact of floods on health needs to be fully understood to minimise malaria epidemics and other water-related diseases like cholera and typhoid.

Flood control measures are very limited in Zambia. In order to effect the measures there is a need to identify and map all flood prone areas and to integrate these hazards in the overall plans of an area. This should be supported by an effective early warning system. At the moment there are very few structures that have been constructed for flood control. It is very important that after identifying and mapping flood areas, structures, like levees should be constructed to protect some areas. Improved flood routing through dams can also help to reduce the impact of floods.

In some parts of the country, especially those areas that are not flood-prone, people are not usually prepared and in most cases are adversely affected by floods. There is a need to involve these people in all efforts of flood management.

Although technology such as satellites and radars are available to help in the measurement of rainfall intensity and measurements of the extent of flood inundation, their use in Zambia is very limited. Capacity needs to be built

if flood forecasting is to improve. Since it will take some time to develop these sophisticated technologies, the measurement of stage (water levels of rivers), lakes, or reservoirs needs to be strengthened and data transmission improved to real- or near-real time data transmission. This must be supported by clearly defined protocols on early warning.

During the consultation process for the Integrated Water Resources Strategy for the Kafue river basin, measures like the seasonal shifting from the flood plain to higher ground, the construction of storm drains in towns and traditional rituals of praying to request a reduction in the severity of the floods are some of the measures practised to reduce flood vulnerability in the Kafue Basin.

2.4.10. Droughts

Drought is a result of low rainfall, reduced discharge and low groundwater levels sustained over a sufficiently long time. Droughts can be categorised broadly as meteorological, hydrological, or agricultural. In Zambia, this distinction is not usually understood. A meteorological drought is simply a prolonged period of below normal precipitation. A hydrological drought is a prolonged period of below average discharge in rivers, low stage in reservoirs, lakes, aquifers, and soil moisture. An agricultural drought is the prolonged shortage of soil moisture in the root zone, leading to crop water stress.

Over the years, the country has experienced a number of droughts of varying magnitude. The droughts of 1991/92, 1994/95, 1997/98 and 2001/02 worsened the quality of life for vulnerable groups such as subsistence farmers (M de Wit, 2006). The 1990/1991 drought was one of the worst, resulting from a combination of all the three main types of droughts. It caused a disruption of the social and economic equilibrium in the country. Water supply for domestic use was inadequate, hydropower production was interrupted and the production of the staple food maize declined. Figure 10 shows the impact of drought on maize production. The consequence of the low production is the need for the government to provide relief food. This situation could be mitigated by among other measures having water infrastructure such as dams and irrigation systems to supplement rainfall.

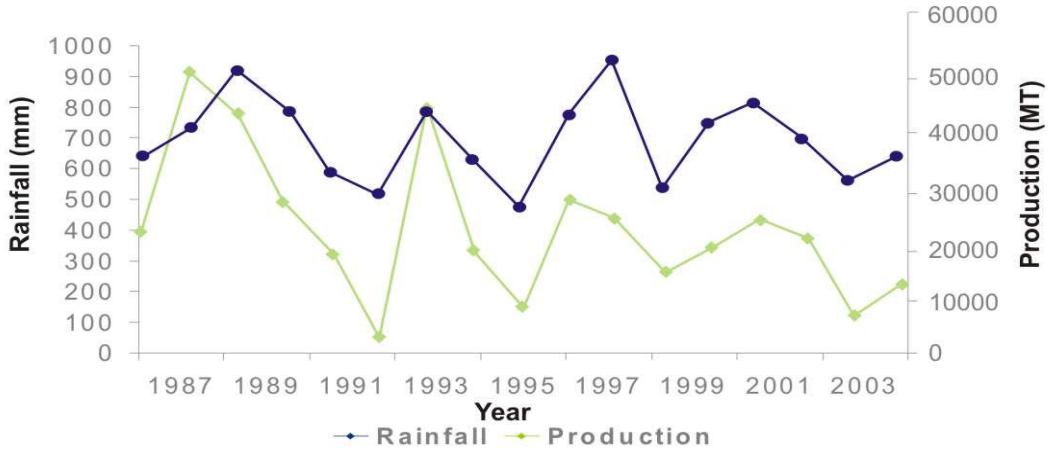


Figure 10: Rainfall and maize production for Southern Province

Source: M de Wit, 2006.

One of the ways to mitigate droughts is to store water when it is available and use it when it is in short supply. Rain water harvesting, recycling of water and the use of water-saving technologies is still very low. Employing

adaptive measures of conservation farming and the growing of drought resistant crops to support food security is still very low.

Limited capacity in rainwater harvesting and harnessing runoff exists at the moment. There is a need to accelerate the development of water harvesting and storage infrastructure if the effects of droughts are to be minimised.

2.5. International Shared Watercourses

Zambia is a riparian state of two major river basins: the Zambezi, and the Congo. Managing these shared rivers calls for an approach that reduces the opportunity for conflict and encourages cooperation in attaining equity and the benefits associated with the management, utilisation and development of the resource.

Zambia has signed and ratified several agreements pertaining to the management of shared watercourses. These include the Zambezi River Authority (1987), Lake Tanganyika Convention (2003) and the Revised Protocol on Shared Watercourses in the Southern African Development Community (SADC) (2004). For these to be effective, the country has an obligation to domesticate the agreements. A SADC project under implementation, the ZACPRO 6.2 project has a major objective to create an organisation for the management of the shared water resources of the Zambezi river basin. An agreement to create this organisation, the Zambezi River Commission (ZAMCOM) has already been developed and signed by all riparian countries except Zambia.

Shared groundwater resources are now increasingly considered along with shared surface water resources because of increasing demands on all water resources, and the impacts of the excessive abstraction of groundwater.

In order to improve the management of international waters, it is important to understand both the surface and ground water potential through standardisation of assessment methods so that all the countries have the same understanding of the quantity and state of the water resources to ensure that there is sustainable utilisation. This means an integrated approach to the management of the resource at international level. Competition is increasing for the utilisation of water especially around the Victoria Falls and the Kariba Dam complex. This area is important for tourism and hydropower generation respectively. Initiatives have been undertaken to create bi-lateral and multi-lateral cooperation to help in the management of water resources. These include the Zambezi River Authority (ZRA) and the Zambezi River Commission (under formulation) respectively. Within the region, SADC has played an important role by providing a framework for cooperation.

The present water resources management structure in Zambia does not adequately support the effective management of international waters. There is therefore an urgent need to strengthen the legal framework to include international waters, the institutional capacity to address issues such as data and information exchange, water allocation and water rights issues. It is important to put in place a management system that will increase the benefits derived from the shared water resources while addressing the issue of equity. The understanding of equity is one of the challenges in international water resources management.

Zambia needs to build capacity in negotiation skills, better understanding of international law and cooperation, diplomacy and indeed international water resources management principles.

2.6. Environment and Natural Resources Management

A natural synergy exists between IWRM and environment/natural resources management in the existing policy and proposed strategies of the Ministry of Tourism, Environment and Natural Resources (MTENR). The 1994

National Environmental Action Plan (NEAP), the National Biodiversity Strategy and Action Plan of 1999 all highlight the need for adopting sustainable policies aimed at integrating environmental concerns into the social and development planning process, maintaining ecosystems, essential ecological processes and the biological resources of the country. These ideas are further emphasised in the National Decentralisation Policy, 2003 and the Fifth National Development Plan.

All the above strategies and policies highlight the fact that sustained economic growth cannot take place without environmental conservation and sustainable use of resources, for which a supporting national policy is crucial. The government recently adopted a National Policy on Environment (NPE) as an umbrella policy for the welfare of the nation's environment so that socio-economic development can be achieved effectively without damaging the integrity of the environment or its natural resources. The National Policy on Environment (2008) has many parallels in approach to IWRM.

Key environmental concerns in Zambia have been identified as water pollution and inadequate sanitation, soil degradation, air pollution in the Copperbelt towns and wildlife depletion (fish and game). Other issues of concern include; deforestation, invasive alien species management and vulnerability to climate change.

2.6.1. Water Pollution and inadequate Sanitation

Surface and ground water resources are threatened by pollution from dumping of solid waste and release of dissolved substances including heavy metals as well as oils from industrial activity, into rivers, wetlands and aquifers. Cement waste, molasses and bagasse, soap stock textile sediment sludge, petroleum, paint and lime sludge from industries in Lusaka, Kafue and the Copperbelt, all continue to find their way into water systems through direct discharge, seepage or overflow to underground and surface watercourses. The Kafue River is one of most threatened by industrial activity and residue from agriculture run off. The limited knowledge of pollution and resultant effects and constraints in resources makes it difficult to solve the problems of hazardous solid waste management. Generally, many local authorities have capacity difficulties, which prevent the institution of more sustainable waste management systems. Inspections and compliance monitoring activities carried out by ECZ in Lusaka and other provinces indicate that most district councils have no designated disposal sites.

On the Copperbelt, the discharge of effluent with sediments from the mining industry continued to compromise the quality of water as well as threaten the Kafue river base due to sedimentation. The water contains dissolved major elements of calcium, magnesium, copper and cobalt emanating from acid mine drainage. This contamination directly affects most water treatment plants drawing from the river through increased cost of water treatment chemicals and process materials.

Water contamination problems are more acute in the peri-urban areas than in the rural areas. High population densities in urban areas leading to smaller plots and consequently very short distances between latrines and open yard wells or hand pumps present considerable risk to subterranean and surface pollution of water. Residents in all informal settlements principally use unimproved pit latrines as their means of human waste disposal.

2.6.2. Soil Degradation

Soil degradation in Zambia is localised to certain areas. Five provinces, namely Central, Eastern, Lusaka, Southern and Western, are highly susceptible to soil degradation as they are more severely affected by desertification and drought than the other provinces. Soil degradation is mainly due to poor agricultural practices such as the excessive use of pesticides or fertilisers and poor land use practices. Areas with a high population density such as the Copperbelt are also affected. This results in erosion of topsoil, eventually in reduced ability to produce agricultural products. The situation of soil degradation has been aggravated by the recurrent droughts

that the country has experienced. Noting that the human population in Zambia is dependent on agriculture, these factors undermine social economic development, and continue to deepen the poverty crisis.

To manage this problem, government has prepared a National Action Programme that provides a framework for incorporating long-term strategies to combat desertification. Some of the strategies being promoted by government are soil and water conservation and conservation tillage.

2.6.3. Air Pollution

Air pollution is localised in Zambia and mainly felt in and around fertiliser manufacturers, cement manufacturers, lime producers as well as around petroleum production facilities (ECZ, 2000). On the Copperbelt where mining activity has picked up again, air pollution is mostly felt in areas near Nkana mine smelter in Wusakile and in Mufulira. In areas affected by air pollution in Kitwe, there is little or no vegetation, especially in the direction of prevailing winds, where 'acid rain' has continued to damage the vegetation. Residents living close to the Kitwe smelter continue to be exposed to ambient SO2 concentrations in excess of the World Health Organisation (WHO) and Zambian 24-hour SO2 guidelines. Annual concentrations also tend to occur above the WHO guidelines Sulphur dioxide (SO2) and dust from the smelter aggravates the health of the elderly and those with existing pulmonary (lung) diseases (Munyati, 2005). High emissions of sulphur dioxide into the atmosphere from the Mufulira smelter have been blamed for desertification in Kankoyo, an extensive high density residential area.

2.6.4. Wildlife Depletion

The majority of Zambia's wildlife is contained within the extensive forest and wildlife protected areas. Close to 40% of the country is under protected areas set aside as national parks, game management areas, and local and national forest reserves, to protect the country's biodiversity. The enforcement of natural resource management laws has generally been difficult. Government departments entrusted with managing biodiversity are constrained by the shortage of staff, inadequate operational budgets and institutional conflicts. Government's austere spending measures in past years has compounded the resource constraints of the wildlife protection agency the Zambia Wildlife Authority.

Threats to wildlife include illegal harvesting, unregulated harvesting of both fish and wildlife resources. Other serious threats include habitat destruction (especially deforestation for fuel-wood and land conversion to agriculture). Conversion of land to agriculture especially in wildlife corridors has tended to reduce wildlife habitats and led to increasing human wildlife conflicts

Generally, all major fisheries are believed to be over fished. The fish ban that is effective from December to March of the following year, instituted for fish stocks to recover, is difficult to enforce because of capacity problems in the Fisheries Department. Few stock assessments have been carried out in the recent past and reported fish catch levels are considered unreliable.

Under wildlife, numbers of key species continue to decline, a serious threat to the developing wildlife-based tourism industry. A major weakness in the management of national parks and GMA's is inadequacies in the database on key habitats, species numbers, their protection and major threats. Data is scanty and gaps deter any meaningful determination of trends in the status of the wildlife and habitats. Any management scenarios planned for the wildlife estate would be well supported by the development of data and effective monitoring systems.

2.6.5. Deforestation

Deforestation is the widespread removal and disappearance of vegetation resulting from the clearing of trees for agricultural expansion, unsustainable fuel wood collection and illegal settlement. The annual rate of deforestation

in Zambia ranges from 250,000 and 300,000 hectares per year with an annual forest decrease factor of 0.5% on average (PFAP, 1998). However, accurate estimation of the deforestation rate in the country has been constrained by the lack of an updated inventory of forest resources. The licensing system also does not provide a reliable tracking system to estimate forest loss through harvesting. Deforestation is degrading the headwaters of most of Zambia's rivers. It is perceived that this causes an increase in surface run off resulting in localised flooding, a reduction in dry season flows and a reduction in groundwater recharge which in turn reduces the amount of water available. Illegal settlements on river banks has also contributed significantly to depletion of forests with far reaching consequences such as declining water levels because of siltation, loss of aquatic life as a result of disturbance of ecosystems and reduction of water quality due to pollution.

The use of GIS and satellite images in determining the loss of forest cover during the implementation of the IWRM plan should be promoted. Similarly, the IWRM plan should encourage integrated conservation and utilisation of forest resources on the major water courses, especially in the head water areas.

2.6.6. Invasive Alien Species Management

Invasive alien species (IAS) are defined as species, subspecies or lower taxa introduced outside their natural past or present distribution and whose introduction and/or spread threaten biological diversity. IAS's are a global threat to conservation of biodiversity through their proliferation and spread, displacing or killing native flora and fauna and affecting ecosystem services.

Zambia has several IAS's. Those commonly known are the invasive plant species. An ECZ study on invasive alien plants control and prevention in Zambia (ECZ, 2004) revealed that the invasive alien plants affect many sectors including agriculture, water and transport. Invasive plants associated with aquatic regimes in Zambia include the aquatic water hyacinth or the Kafue weed (Eichhornia crassipes) and Kariba weed (Salvinia molesta), the semi-aquatic mimosa pigra and the terrestrial lantana camara (GRZ, 1999). Aquatic weeds have had a particularly negative impact on the wetland habitat.

In the Lochinvar National Park situated on the extensive Kafue Flats and adjacent to Kafue River on the southern side has been invaded by mimosa pigra. The significance of this invasion is that it has excluded the native fauna and flora from the most productive and special areas of the Lochinvar National Park and the Kafue Flats with significant impact on biodiversity as well as tourism and livestock grazing.

Additionally, Mosi-oa-Tunya National Park has also been invaded by lantana camara, This IAS has invaded the woodlands, the riparian areas and the unique mist forest below the Victoria Falls. Lantana camara is steadily altering the structure of the vegetation around and below the falls and thus affecting the flora as well as the fauna of this unique area.

The Zambezi and Kafue rivers have been affected by the water hyacinth (eichhornia crassipes) and Kariba weed (salvinia molesta) which has affected hydropower production, fishing and navigation. Although not quantified in Zambia, the IASs are known to utilise a considerable amount of water thus impacting on the availability of water resources. Therefore, the control of IAS's is important in the management of the country's river basins.

2.6.7. Vulnerability to Climate Change

Climate variability has been a major influence on the available water resources in any particular place. The adverse effects of climatic change have affected the performance of sensitive economic sectors such as water, agriculture, energy, health, among others in Zambia. This ultimately affects the overall economic development and livelihoods. The vulnerability and adaptation (V&A) assessments conducted by the United States Country Study Programme (USCSP) in 1998 for Zambia which also focussed on water sector concluded that the water

sector is very sensitive to climate change (MTENR, 2007). The people living in semi-arid parts of the country's agro-ecological Region I (southern parts of Western and Southern provinces), which is considered a drought-prone/risk area, experience severe water shortages during summer. An assessment of historical rainfall patterns in this region revealed a decreasing trend of annual rainfall in recent years. Because of droughts, there has been disruption in the water flow of most rivers and streams in this ecological region I.

The Zambian government has made considerable efforts to respond to natural calamities resulting from climate change. The National Disaster Management Policy provides a legal framework for management and response to natural disasters such as floods and drought. Similarly, government has formulated the National Adaptation Programme of Action (NAPA) to deal with climate change.

The capacity of various stakeholders needs to be strengthened to adapt to climate change and foster adaptive capacity among the most vulnerable groups. The IWRM plan will respond to the aspirations of National Disaster Management Policy and NAPA in dealing with issues related to water sector vulnerability to climate change.

2.6.8. Environmental Water Requirements

In almost all recent legislation and policy documents, the environment as a water user is well addressed, notably in the draft Water Resources Management Bill (2006). The identification of specific ecosystem requirements in terms of quantity and quality of water and consideration, within the context of allocation, is a fundamental component of IWRM. However, the practical implications and actions required by these directives are a much more complex issue. Quantitative determination of environmental requirements, such as instream flow requirements (IFR) associated with dam operation, is a complex and site and data specific undertaking. A complete lack of directive or guidelines on these determinations is a recipe for inaccuracy in estimation and potential conflict. Conflict can be created by the over-allocation rights to user groups or stakeholders within a basin. Some specified methodologies for these types of determination, suitable to the Zambian environment, will be required to guide catchment councils in water allocation determination. There are various methods already defined to estimate environmental flows in rivers such as: hydrological index methods, hydraulic rating methods, habitat rating methods and holistic methods (HR Wallingford, 2003). Exploring what type(s) of methods are most appropriate to the Zambian context will need to be evaluated and in the long-term, local research should be carried out to refine and adapt the appropriate methodologies.

Aquatic water quality standards are another crucial gap in the present environmental management framework. With no standards set for aquatic water quality, there is no benchmark to clearly specify polluted natural waters. This is of critical importance to effluent standards, which are at present set strictly on a single national standard, and do not take into account the nature and sensitivity of the natural environment that effluent is being discharged into, or how many other industries in the same area are discharging effluent into the same watercourse. With aquatic water quality standards, effluent levels could become basin/area specific and be designed around maintaining the specified acceptable quality in the open water bodies.

In addition to the more well-known issues related to environmental requirements associated with surface water, are those associated with groundwater. Given the complexity and uniqueness of evaluating groundwater requirements of natural systems, it is currently unlikely that a specification of methodologies similar to surface

water will be feasible. However, specific reference to considering ecosystem requirements of groundwater and impacts of various allocation scenarios on groundwater dependent ecosystems (GDEs) will be a critical component of allocation determinations and basin water balance assessments. Although complex, practical examples of the assessment of environmental groundwater requirements related to planned groundwater development schemes, are available in the region[4] and can guide effective inclusion of these issues in allocation assessments and from which the country could formulate a working system for groundwater.

2.6.9. Environmental Impact Assessment

The Environmental Impact Assessment (EIA) process is a fundamental aspect of realising the vision of IWRM, by providing a guide to ensure all types of developments consider impacts on water resources prior to their implementation. The EIA as a development-planning tool improves project outputs by preventing, minimising, mitigating or compensating for adverse environmental impacts. Although Environmental Impact Assessment is a legal requirement for many developments, the recommended content of EIAs should fully reflect IWRM precepts and balances. Improved awareness and capacity in terms of IWRM in regulatory institutions, such as the Environmental Council of Zambia, tasked with the review and acceptance of EIAs, will be vital as it will help to identify the likely environmental consequences of a particular course of action and to ensure protection of the water resource and environmental sustainability. Another issue identified in relation to the EIA process at present in Zambia is limited community participation in the EIA process. Although there is clear emphasis on community involvement as part of the EIA process, in the actual application this is often limited by inadequate real understanding of what a given project's impacts and proposed mitigation plans may mean. Grass roots education and increased awareness of IWRM within the EIA process will be crucial in advancing stakeholder involvement and ownership.

2.7. Water Quality

The use of any water depends on the quantity and quality of water available at any one time. In Zambia, most of the water resources are still pristine, but this is changing in areas like Lusaka and the Copperbelt where industrial activities such as mining, agriculture and manufacture have started posing a big threat to the water resources through pollution. It is a fact though that there is very little information on water quality. What is clear is that most of the water is threatened by pollution from some of these industries. This is exemplified by the proliferation of aquatic and terrestrial weeds, death of aquatic life, smell of water and its general appearance. Some rivers such as the Luangwa River have high sediment loads that impact on water quality but generally, sedimentation in major rivers is not routinely monitored.

Water quality has been a major concern on the Kafue River, mainly because the river supports most of the country's economic activities such as mining, agriculture and industry. The basin supports over 40 percent of the population of Zambia. As a result, pollution pressure has increased especially in mining areas, and in agriculture and industrial areas such as Kafue and Mazabuka were the high nutrient load in the river resulted in the proliferation of aquatic weeds. On the Copperbelt, heavy metals such as copper, manganese and lead have been detected in many rivers and streams. DWA/JICA (1994), observed that most of these metals settle before they

[4] Botswana Department of Water Affairs, 2004, Maun Groundwater Development Project: Phase 2, Final Report, 332 pp. Gaborone.

reach the Lukanga swamps reducing the concentration in the water flowing downstream. This situation has remained stable for a long time and it is hoped that this will be maintained.

Ground water quality is also a major concern in localised areas particularly in urban and peri-urban areas. For instance, the groundwater resources of Lusaka are at risk of pollution due to inadequate piped sewerage systems, which have resulted in an increase of the use of septic tanks.

It has been observed that, other areas are also coming under increasing threat of pollution from sources that include leaching of chemicals from agriculture land, industrial effluents, sewage effluents, garbage disposal and land degradation. These are usually localised to an area but their cumulative impact on the resources needs to be further studied.

The mandate to monitor water quality is with the Department of Water Affairs and is supported by the 1948 Water Act, while, the mandate for pollution control is with the Environmental Council of Zambia. So far, this arrangement has worked fairly well, but there is a need to strengthen coordination. The draft Water Resources Management Bill proposes that the functions of pollution control and water quality monitoring, fall under one body.

2.8. Water–Related Sector Analysis

2.8.1. Tourism

The tourism sector in Zambia has experienced rapid growth in recent years with foreign exchange earnings and employment in this sector doubling over a 6-year period from 1995 to 2000 (MTENR, 2005). The potential of tourism in Zambia lies in the uniqueness of certain resources such as cultural artefacts, heritage sites and monuments including other natural attractions such as wildlife, rivers, lakes, waterfalls. The country's vision of the tourism industry is to contribute to the economic well being and enhanced quality of life for Zambians through government led, private sector driven, quality product development that are consistent with the protection of the unique natural resources and cultural heritage within tourism policy framework (MTENR, 2005). In this sector, Zambia has envisaged two major considerations as intervention measures at national and zone (local management subunits) levels with the main focus being on infrastructure rehabilitation and development. Arising from its potential and wide range of participation in the economy, tourism has the potential to be among the largest industries in the development of the economy. Zambia has one of the largest protected areas in Southern Africa, with protected areas amounting to 30% of the total national land area. Of this amount, 8% are National Parks and 22% are Game Management areas (Figure 11).

The major tourist attractions such as the national parks are found in areas that have been declared as Protected Areas where human settlement and other land uses are not permitted. This has helped to preserve the abundant wildlife spreading over 19 National Parks and 34 Game Management areas and the water resources that provide water to wildlife and other uses.

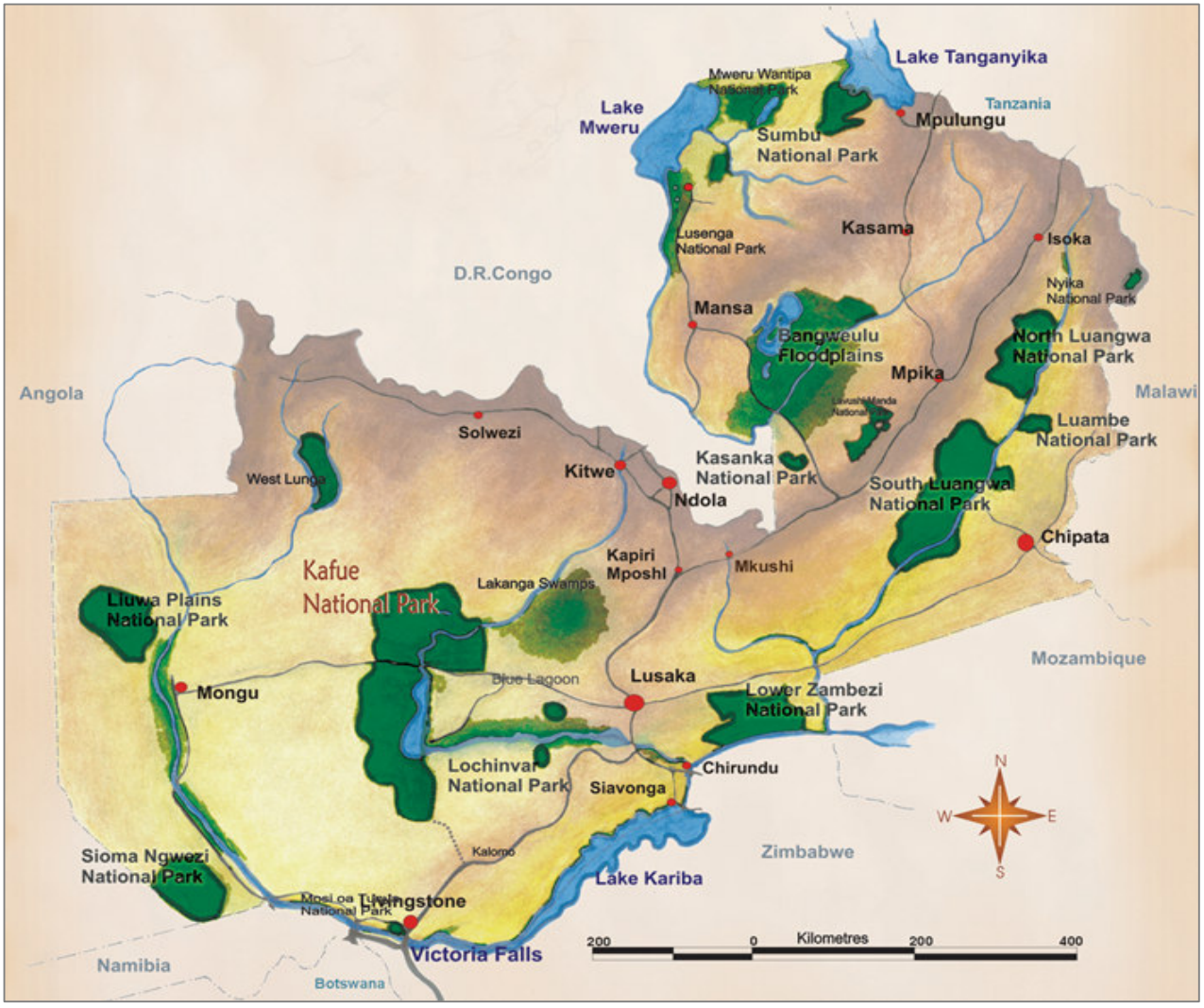


Figure 11: National Parks of Zambia

Many prime tourist sites in the protected areas are near watercourses. The impact of tourism development on water resources include water pollution from uncontrolled solid waste disposal and effluents from bathing water and sewer systems from the hotels and other camping sites constructed near the rivers and lakes. Similarly, in sensitive areas where structural planning has not been effectively done, there is a danger of over-exploitation.

2.8.2. Energy Sector

The energy sector is presently the major user of water resources in Zambia through hydropower generation. Although often considered a 'non-consumptive' user of water resources, the environmental impacts of hydroelectric dams and the high rates of evaporative losses of water indicate that the sector is a very significant user. Ninety four percent (94%) of Zambia's electricity power capacity of 1800 MW is generated from hydropower. Due to the economic growth in the country, mostly attributed to mining, there has been an increase demand for electricity such that the national demand is reaching the available supply. This is causing power shortages which are expected to increase further if additional electricity is not made available. According to the National Water Resources Master Plan (MEWD/JICA, 1995), the national demand for electric power is expected to total 2,380

MW. To increase power generation the government is promoting private sector investment in large and mini hydropower stations to develop the country's total usable hydropower potential of 6000 MW.

Some of the issues that have emerged in hydropower generating areas such as the Kafue flats and Lunsenfwa catchments include the increasing competing demands between hydropower and agriculture, the regulation of water releases and consideration of environmental flows. IWRM has been recognised by the government as a means to improve water management to meet the needs of hydropower and those of other users.

2.8.3. Mining Sector

The mining sector's significance to IWRM is primarily due to its release of water to natural waterways, through de-watering activities. It also has an impact on the environment and water resources through pollution. Konkola Copper Mine for instance discharges approximately 600 000 m3 of water per day into the Kafue River. The scale and extent of serious environmental impacts, particularly on water resources, by mining operations has been well documented, and is being addressed in some crucial areas by major programmes, such as the Copperbelt Environment Project. Currently the project is dealing with the contamination of groundwater with lead, which is a major problem in Kabwe. Other environmental problems include the deforestation of the Kafue basin on the Copperbelt. Deforestation has been attributed to increased population due to presence of mines, which attracts job seekers to the area.

The impacts of large quantities of water released into river systems as a result of de-watering activities are significant both in terms of negative impacts (water quality, dewatering of local aquifers and associated wetlands/dambos, changes in river hydrology) as well as positive impacts (increased flows allowing increased water abstraction downstream).

The mining sector is currently undergoing renewed expansion and growth as old mines expand and new mines open up, which has been supported by high copper prices on the international market. The regulation of mine effluents and the sectors impact on the environment however needs strengthening.

2.8.4. Water Supply and Sanitation

The Ministry of Local Government and Housing (MLGH) has overall responsibility of domestic/ municipal water supply and sanitation. The water sector reforms separated the executive and regulation of water supply and sanitation services. The provision of public water supply and sanitation services has since been transferred from the Department of Water Affairs and Local Authorities to commercial water utilities. There are also individual private service providers and companies such as ZESCO and Zambia Sugar that service their own employees. The water utilities and private service providers are regulated by the National Water Supply and Sanitation Council (NWASCO). NWASCO regulates all aspects of water supply and sanitation from the storage facilities through to the consumers.

Government requires a total of US$ 360 million over 10 years to meet the water and sanitation needs of the population, with US$ 336 million for infrastructure development while US$ 24 million will go towards sector development. However, there is inadequate budgetary provision for water supply and sanitation and during the FNDP the allocation is stagnant at 2% of national budget. Increased attention to sanitation, hygiene education, sector development, advocacy and citizen participation are required.

Another challenge is the need for reliable baseline data to use as benchmark to measure progress. It is difficult to measure the progress in access to water supply and sanitation in the absence of baseline data. Various documents define safe water, sanitation and access differently resulting in varied access statistics.

2.8.4.1. Domestic Water Supply

The 2000 census conducted by the Central Statistical Office (CSO, 2000) indicates that at national level 49.1% of households in Zambia had access to safe water. Further that 86.1% of urban households had access to safe water compared with 29.5% of rural households. The coverage by province is shown in Figure 12 and **Table 4** highlights the coverage from 1990 to 2005.

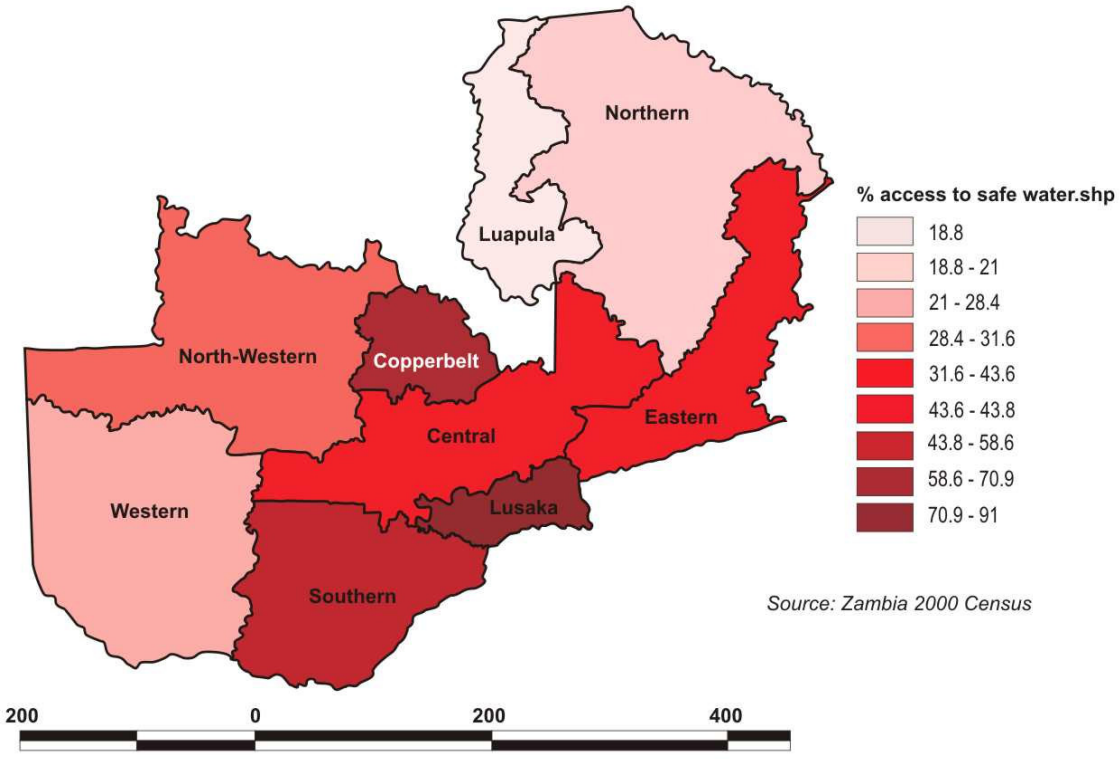


Figure 12: Households with Access to Safe Water

The estimated coverage for 2005 is based on the Living Conditions Monitoring Survey of 2002/2003, updated with estimates regarding coverage from the projects which have been implemented in the intervening period. This assessment indicates that in 6 out of 9 province's coverage for water was less than 50%, and the rural provinces, Luapula, Northern, Western and North-western have relatively low water supply coverage at 30% or less (see Table 4).

Table 4: Summary of Access to Safe Water Supply in Zambia, 1990 – 2005

	1990		2000		2005	
	Population ('000)	Coverage (%)	Population ('000)	Coverage (%)	Population ('000)	Coverage (%)
Zambia	7,759	73	9,886	49. 1	11,563,212	53
Urban	2,949	85	3,433	86. 1	4,025,010	86
Rural	4,810	58	6,452	29. 5	7,538,202	37
Provinces						
Central	772		1,001	43. 8		
Copperbelt	1,458		1,564	70. 9		
Eastern	1,005		1,306	43. 6		
Luapula	564		767	18. 8		
Lusaka	991		1,376	91. 0		
Northern	926		1,245	21. 0		
N/Western	438		577	31. 6		
Southern	966		1,199	58. 6		
Western	639		757	28. 4		

Source: CSO, 2000. Zambia in Figures; CSO, 2004. Selected Socio-economic Indicators; CSO, 2004. Population Projections Report.

The National Water Supply and Sanitation Council (NWASCO) estimate the national urban water supply coverage at 73% in 2005 (NWASCO, 2006). The disparity between CSO and NWASCO is due to the parameters used to define coverage. There is need to harmonise these two perspectives.

2.8.4.2. Sanitation

There is an overall perception by many stakeholders that while water supply development at the community and urban level has advanced significantly on many fronts, the related issue of sanitation has tended to lag behind. Enhancing the incorporation of sanitation with water supply development will be important to improving water resource protection. Sanitation appears already to be a key issue at the community level. For example in the thirteen compounds covered under the PROSPECT Project (CARE), water was always the number one priority, with sanitation consistently the second or third priority. Some innovative ideas, such as pay toilet and shower facilities in markets, are building on the community interest. Ensuring sufficient incorporation of sanitation in water sector planning will be an important IWRM challenge.

Sanitation in its various forms plays an important role in keeping the integrity of both water and the environment. Unless the provision of sanitation services is improved, water sources and the environment will in some cases suffer damage that is almost impossible to reverse. Low sanitation coverage continues to be a challenge. Sanitation coverage is still low in rural areas. It stands at 13% compared to 41% for urban areas (Table 5). In order to ensure improved sanitation, households in rural areas should be encouraged to have appropriate sanitation facilities such as pit latrines. Similarly, bold steps need to be taken to avoid polluting groundwater

sources. Options for centralised sanitation systems in rural areas need to be explored while operating standards for septic tanks need to be set and adhered to.

Table 5: Summary of Access to Sanitation in Zambia, 1990-2005

	1990*		2000*		2005**	
	Population ('000)	Coverage (%)	Population ('000)	Coverage (%)	Population ('000)	Coverage (%)
Zambia	7,759	23	9,886	14. 9	11,563	23
Urban	2,949	54	3,433	39. 2	4,025	41
Rural	4,810	5	6,452	2. 1	7,538	13

Note:
* Sanitation estimates have been worked out on basis of CSO (2000) definition of sanitary facility (i. e. Flush toilet and VIP latrine)
** Rural coverage uses "sanplat" as proper sanitation facility

The various definitions of sanitation in the sector makes it difficult to measure progress towards the MDG's. The definition in the Water Supply and Sanitation Act restricted sanitation to excreta wastewater disposal. It excludes solid waste, industrial waste, and storm water. It is different from the way it is used in the FNDP where solid waste is included. There is need to capture all types of sanitation in the IWRM/WE Implementation Plan. In this regard, the harmonisation of laws and regulations is required.

In order to meet the desired goals of the water and sanitation services, there is a need for harmonisation in the water sector through integration of different stakeholder institutions and actors, and the implementation of common approaches.

According to CSO (2000), only a flush toilet and ventilated improved pit latrine are regarded as proper sanitation facilities. Based on this facility, the 2000 national census indicates that only 14.9% of the entire population of Zambia had access to proper sanitation facilities. In the rural areas the corresponding figure was only 2.1% and with 39.2% in urban areas. Some health officials are of the view that in rural areas, where space is not limited and latrines are constructed far from dwelling places, even an ordinary pit latrine should be regarded as a proper sanitary facility, and should be included in the assessment of sanitation coverage. Even worse than with respect to water supply, information on sanitation facilities is not readily available from one source. Thus, estimates of access to sanitation facilities particularly in rural areas are confounded by poor information and lack of agreement on definition of what is a proper sanitation facility. Access to sanitation facilities is summarised in **Table 5**. It is evident that a very large part of the rural population does not have access to proper sanitation facilities. This presents a challenge not only in terms of investment support, but also health education to raise awareness among the communities.

The year 2008 has been declared as World Sanitation Year. This declaration should lead to increased provision of resources for improving the coverage of service provision.

Sanitation in terms of solid waste management is also a major concern. Solid waste management is the responsibility of local authorities. The collection and management of waste is inadequate thus causing a threat to groundwater, particularly in peri-urban areas.

Wastewater treatment plants are mostly overloaded and unable to effectively treat the sewerage which emanates from domestic as well as industrial processes. The effluents thus do not meet the ECZ standards and this leads to pollution of water sources such as in Lusaka, Kafue and the Copperbelt areas.

For IWRM, the definition of sanitation should be broad. It should also include solid waste, industrial waste and storm drainage.

2.8.4.3. Peri-urban Water supply and Sanitation

Between 40-80% of the urban population reside in peri-urban areas and informal settlements. These areas are characterised as being unplanned making the provision of services difficult. There have been areas with a high incidence of diarrhoeal diseases due to contamination of water sources. Efforts, such as promoting community management of their water sources, have been initiated to improve on the local management of water and sanitation facilities.

In an effort to assist the utilities improve service delivery to peri-urban areas, Statutory Instrument 65 of 2001 established the Devolution Trust Fund (DTF) to finance projects that would service peri-urban areas. However, the fund only became operational in 2002, with objectives of maximising funds going directly to the beneficiaries, while ensuring professional input, transparency and accountability. The DTF's investment of under K2.0 billion is funded by government grants and external support. These funds are then disbursed to Commercial Utilities (CUs) that meet the set criteria's for accessing the funds. By 2006, DTF had assisted in enabling about 40,000 peri-urban poor people gain access to safe drinking water.

The challenges in the provision of water and sanitation services include high production costs, unaccounted for water, vandalism of infrastructure, run down water distribution pipes and overloaded sewerage systems and low willingness-to-pay, especially in peri-urban areas. The growing political will to pay for the services had increased business confidence and increased economic activity, which presented growth opportunities for the water sector. However, utilities are currently unable to finance their operations sustainably and major external resource intervention is required to finance rehabilitation of WSS infrastructure.

A monopoly in the supply of the chemicals for water treatment remains a concern as it has been very costly to obtain the chemicals. Zambia has only one supplier of these items and utilities are not allowed to order directly from outside the country. The idea of a chemical bank needs to be revisited.

Vandalism of infrastructure in low-income areas is common and worrying. The Zambian Police have been involved in fighting it and community awareness and education has been initiated in affected areas. Improved service may reduce vandalism.

2.8.5. Health and Water-related Diseases

It is a known fact that access to clean water helps to prevent illness and reduce treatment costs. Water is also used for various purposes such as food production and maintaining a healthily environment which sustain the wellbeing and health of human beings.

The provision of health services is the responsibility of the Ministry of Health and is regulated by the Public Health Act Cap 295. Many health problems could be mitigated and costs reduced through the effective monitoring of water quality and the provision of clean water and adequate sanitation.

Following the implementation of health reforms, some improvements in the general health indicators for Zambia have been seen. For instance, life expectancy at birth improved slightly, the infant mortality rate and under-five mortality rate declined. However, maternal mortality and the incidence of malaria have remained moderately high. (See Table 6 on the next page)

Table 6: Selected Health Indicators 2001-2003 in Zambia

Indicator	2001	2002	2003
Infant Mortality rate (per 1000 live births)	87	95	85
Under Five Mortality Rate (per 1000)	145	168	136
Maternal Mortality (per 100,000)		729	729
Malaria Incidence (per 1000)	394	377	428
Life Expectancy at Birth	52	52	52

Source: Ministry of Finance and National Planning, 2004. Second PRSP Implementation Progress Report July 2003 – June 2004

Malaria remains a major public health problem in Zambia, accounting for nearly 40 percent of all outpatient attendances and 50 percent of cases among children under-five years of age. It is estimated that malaria is responsible for nearly 4 million clinical cases and 50,000 deaths per year, including up to 20 percent of maternal mortality. By 2003 malaria was the most commonly reported illness at 37% of all reported illness and caused the largest proportion of deaths (23%).

Schistosomiasis (bilharzias) is also prevalent in rural districts especially those close to lakes and rivers. There is need to strengthen the current water management/ environmental health approaches to combating these water-related diseases.

HIV/AIDS prevalence rate was 16% for the population aged 15 to 49 years old in 2000. It threatens the country's economic development and has the potential to continue diminishing social and economic development. The HIV and AIDS epidemic is as much a development concern as it is a health and gender concern. In 2002, the government put in place the National AIDS Council (NAC) through an Act of Parliament as the national mechanism to coordinate and support the development, monitoring and evaluation of a multi-sectoral national response to HIV. The National HIV/AIDS/STI/TB Policy of 2005 provides the direction and mandate for the national response. As this is a cross cutting issue, programs have been put in place to mitigating the impact of HIV and AIDS for the water sector by creation of HIV/AIDS campaigns and support to those infected. The loss of skilled personnel is a major concern in the effort to have the capacity to manage water resources.

Diarrhoea accounted for 6.9 % of the illness reported in 2003. The incidence of diarrhoea is high in the age group 0-4 years age group. It accounted for 15.4% of illness in this group. The prevalence in diarrhoea can be linked to inadequacies in safe water supply, sanitation and hygiene education. Although hygiene education programmes are being incorporated in water and sanitation programmes to raise awareness about diseases and to promote positive hygienic practice, more effort in this area is still needed. This is critically important where the prevalence of HIV/AIDS is high, both in terms of the use of water, and in terms of its relationship with health and poverty in the affected households and communities.

The number of diseases that afflict the people usually lead to reduced productivity in the water sector as productive time is spent on sick leave or attending to sick relatives. Disease also reduces life expectancy leading to the loss of trained professionals that are required for managing the sector.

2.8.6. Agriculture and Irrigation

Agriculture in Zambia is more dependant on rainfall than on irrigation. Despite the many benefits of irrigation, very little has been achieved. Irrigation is poorly utilised due to attitudes and perceptions that it is very expensive and

thus only for the more affluent. Therefore, if irrigation is to be the main stay of agriculture in the country, considerable support would be needed, especially for small and medium scale farmers.

Food shortages occur during drought years and bumper harvests in good rainfall years. Livestock is also highly affected during drought years. Out of the total land area of 752,612 km2 approximately 420 000 km2 (42 million ha) is suitable for arable use. However, only 14% or 5.8 million ha is presently cultivated. The land suitable for irrigation is estimated at 423, 000 ha (Ministry of Tourism, Environment and Natural Resources, 2004).

The current area irrigated in Zambia is estimated at 100 000 ha comprising approximately 52 000 ha under formal (commercial) and 48 000ha under informal (subsistence) farming (Ministry of Agriculture, Food and Fisheries 2001). Agricultural water supply relates to irrigation, livestock and aquaculture. Its quantitative “use” in forestry and open fisheries has not been addressed.

The challenges of providing water for irrigation include unfavourable geographical conditions, inadequate finance for investment, insufficient skills and information, inadequate market services and infrastructure. Despite these challenges, there are a number of opportunities which include the abundant water and land resources, including the liberalised local and regional markets for marketing of agricultural produce, albeit with some restrictions and tariff barriers in the developed economies at the international level.

In order to enhance the use of water for irrigation, provision of an enabling environment for irrigation development is critical including facilitating the harmonisation of activities of all players to yield maximum benefits. Government has in 2007 established an Irrigation Fund for small-, medium- and large-scale farmers who can obtain loans at concessionary rates. The government is also promoting irrigation in peri- urban areas (areas within a radius of 50km from an urban centre). With these initiatives the demand for water will thus increase and there is an urgent need for infrastructure development as well as for reliable information on the status of ground and surface water in order to ensure equitable allocation and sustainable utilisation.

A very significant aspect as well as potential point of conflict in advancing IWRM relates to the agriculture sector and its relationship to water resources management. A series of key issues are identified in this context which has been advanced by various interests, primarily the Zambian National Farmers Union (ZNFU). Much of the present concern regards allocation of water rights, specifically concerning transfer of rights, enforcement in relation to use and fee collection, and groundwater allocations. In terms of water rights transfer, there is concern that the inability to transfer water rights with property will create problems and negatively affect liquidity in the land market and hinder investment in major irrigation infrastructure. Enforcement is also an important issue, with concern in relation to the ability of the proposed catchment authorities to effectively, transparently and evenly enforce water use fee structures. Given that the present, monitoring system and collection activities are ineffective and suffer from insufficient human capacity, there is hope with the proposed stakeholder participation at local level that the new institutions will have the capacity to successfully undertake these functions. Given the generally greater complexity of groundwater assessment, there is also the need for determination of groundwater abstraction permits as well as effective control and enforcement.

2.9. Water Sector Policy and Legal Reform

2.9.1. Water Sector Reforms

The water sector reform process in Zambia has been underway from as far back as the 1980’s when it was recognised that the then management framework was failing to service the sector in the provision of safe and adequate water supply and sanitation services as well as the protection, conservation, development and management of the water resources. The reforms primarily targeted the review of the policy, legal and institutional

framework of the sector. The reforms have benefited from developing consensus during comprehensive consultations on effective water resources management and optimal utilisation of water resources in the economy.

The 1994 National Water Policy was primarily adopted to address the issues, with emphasis on strengthening the framework for water resources management following an integrated approach. The objective of the National Water Policy is to promote sustainable water resources development with a view to facilitating adequate, equitable and good quality water for all users at acceptable costs and ensuring security of supply under varying conditions. This objective was to be achieved through the following key policy strategies:

- Recognising the important role of the water sector in the overall socio-economic development of the country;
- Vesting control of water resources in the country under state control;
- Promoting water resources development through an integrated management approach;
- Providing adequate, safe and cost effective water supply and sanitation services with due regard to environmental protection;
- Defining clear institutional responsibilities of all stakeholders in the Water Sector for effective management and co-ordination; and
- Recognising water as an economic good.

The reforms have and are being strategically implemented following two parallel approaches namely: the reorganisation of the water supply and sanitation sub-sector (WSS) which started in 1993; and the reorganisation of water resources management sub-sector which started in 2001. The key outputs of the reforms in the water sector are summarised in **Table 7**.

Table 7: Key Outputs and Progress in Water Sector Reform

SUB-SECTORS	OUTPUTS AND PROGRESS MADE
Water Resources Development and Management	• Nation Water Policy (1994) • Transfer of water supply and sanitation function from MEWD to MLGH in 1999 • Water Resources Action Programme (2002) • Water Resources Management Bill (2006) • Draft National Water Policy (2007) • Draft IWRM Implementation Plan (2007)
Urban Water Supply and Sanitation	• National Water Supply and Sanitation Act in 1997 • Transfer of 46 water services schemes as well as the responsibility for rural water supply and sanitation (RWSS) from MEWD to local authorities under the supervision of MLGH (1997) • Establishment of NWASCO in 2000 • Establishment of Department of Infrastructure Support Services (DISS) in the MLGH to improve infrastructure investment • Establishment of 10 Commercial Utilities (CUs) for urban/peri-urban water supply and sanitation • Operationalisation of the Devolution Trust Fund (DTF) for the facilitation of extending services to low income urban areas (2002)
Rural Water Supply and Sanitation	• Establishment of RWSS Unit in DISS in 2003 • Adoption of the RWSS Institutional and Financial Framework in 2004 • Development of National rural water supply and sanitation Programme, 2006

With the adoption of IWRM the water sector is now viewed in a broader context as evidenced by the composition of the Water SAG and the scope of the Draft National Water Policy, 2007. The challenge is to effectively coordinate and monitor policy development and implementation of the IWRM framework if the Water Sector Reforms are to succeed.

2.9.2. Reform of Urban Water Supply and Sanitation

The water sector reforms were first initiated to deal with domestic water supply and sanitation. This was a response to addressing poor service provision. The reforms are still ongoing and important objectives have already been achieved. The key ones being the enactment of the Water Supply and Sanitation Act. No. 28, 1997, that established the National Water Supply and Sanitation Council (NWASCO) in 2000 as an autonomous water supply and sanitation regulator and the decentralisation and commercialisation of domestic water and sanitation service delivery.

The enactment of the Water Supply and Sanitation Act No. 28 of 1997 and subsequent establishment of ten commercial water companies around the country fulfilled one of the basic principles of the water sector reforms, which was to separate the water supply and sanitation functions from the water resources function. The water companies deal with water supply and sanitation to urban centres around the country.

Significant reforms began in the water supply and sanitation sub-sector in 1994 and were aimed at addressing and clarifying the inadequacies in the institutional and legislative frameworks. Since the adoption of the National Water Policy in 1994, a number of sector reform initiatives and developments have taken place, including, in 1999, the transfer of water supply and sanitation functions from MEWD to MLGH, establishment of NWASCO in 2000, establishment of the Rural Water Supply and Sanitation (RWSS) Unit in MLGH in 2003, and adoption of the RWSS Institutional and Financial Framework in 2004.

The water supply and sanitation sector reforms are based on the seven sector principles contained in the National Water Policy (NWP). These key guiding sector principles have helped to maintain direction throughout the reform process.

2.9.3. Water Resources Management Reform

Following the reform of the UWSS sub-sector, government in 2001 initiated the Water Resources Action Programme (WRAP) to complement the reforms initiated in 1993 and to reform the water resources management sector. Various issues have negatively affected performance of the sector especially in the management and development of water resources to meet the demands of competing groups of users.

WRAP took a broader and more holistic perspective of the water sector – an approach that espouses the principles of Integrated Water Resources Management (IWRM). The WRAP aims at supporting the National Water Policy in the establishment of a comprehensive framework for the use, development and management of water resources in a sustainable manner with strong stakeholder participation. The key achievements of the WRAP include: the development of the proposed institutional framework and the Water Resources Management Bill, 2006 and the raising of awareness and capacity building amongst stakeholders.

To complement and build on WRAP, government in 2006 initiated the Water Sector Programme Support (WSPS). The integrated water resources component of this initiative is supporting IWRM activities in the MEWD, strengthening the water rights systems administered by the Water Board, groundwater monitoring in pilot areas, IWRM capacity building through the University of Zambia; piloting of decentralised water resources management structures and rehabilitation and construction of small dams and weirs. These programmes have been implemented alongside the formulation of this IWRM/WE Implementation Plan.

The Worldwide Fund for Nature (WWF) has also been involved in promoting IWRM as a concept through IWRM activities in the Kafue Flats. An Integrated Water Resources Management Plan for the Kafue Flats, was launched in January 2000, with the goal of managing the waters of the Kafue Flats for wise use of the wetland resources and to maintain a healthy wetland ecosystem.

2.9.4. Water Policy Framework

The National Water Policy developed in 1994 under the Water Sector Reforms provides the overall policy framework for the water sector. The policy is *"aimed at promoting sustainable water resources development with a view to facilitating an equitable provision of adequate quantity and quality of water for all competing users at acceptable costs and ensuring security of supply under varying conditions".*

It covers water resources management, urban water supply and sanitation, rural water supply and sanitation, water quality, and water tariffs. Some key policy measures adopted include: recognising water as an economic good; recognising the important role of the water sector in overall socio-economic development; promoting water resources development through an integrated management approach; defining clear institutional responsibilities of all stakeholders in the water sector; developing an appropriate institutional and legal framework for effective management of water resources; promoting a state of disaster preparedness; separation of executive and regulatory functions; and introducing groundwater resource regulations.

Although the Policy advocates for IWRM, other sectors impacting on IWRM such as agriculture, hydropower, environment etc were not elaborated upon. This may therefore have caused a gap in implementing IWRM. The 1994 National Water Policy has been under review and a Draft National Policy, 2007, has been developed. The reasons for revising the 1994 National Water Policy are (Ministry of Energy and Water Development, 2007):

- the need to provide for a clear vision and holistic policy direction for the water sector in Zambia;
- the need to assess the progress made in the implementation of that Policy and update it taking into consideration the key developments in the water sector in Zambia and international best practice for water resources management;
- the need to re-align the water policy with the current international developments including the Rio Declaration, Millennium Development Goals, New Partnership for Africa's Development and the Southern African Development Community's Revised Protocol On Shared Watercourses;
- the need to re-examine the role of the water sector in terms of the National Development Plan;
- the need to integrate gender and HIV/AIDS issues in the water policy; and
- the need to re-examine the institutional and legal framework and bring them in line with modern principles of water resources management and harmonise them with other legislation on the environment.

Other policies and programmes that directly complement the 1994 National Water Policy include:

- The National Environmental Action Plan which is the basis for sustainable and environmental sound management of the country's natural resources;
- The National Energy Policy *"aimed at promoting optimum supply and utilisation of energy, especially indigenous forms, to facilitate the socio-economic development of the country and maintenance of a safe and health environment";*
- The National Agricultural Policy with multiple objectives, chief among them being to ensure national and regional food security. Secondary objectives on irrigation and fish and fisheries have significant impacts on the development of the water sector; and

- The National Wildlife Policy and the National Forest Policy with their emphasis on conservation of biological diversity, and the sustainable management of the nation's abundant wildlife and forestry, have strong linkages with the development and management of water resources.

In addition, government has adopted policies in other sectors and is in the process of preparing further policies that have a bearing on IWRM in Zambia. These are:

- National Policy on Wetlands Conservation, 2000.
- National Decentralisation Policy, 2003.
- Draft National Environmental Health Policy, 2000.
- Information and Communications Technology (ICTs) Policy, 2007
- National Gender Policy, 2000.
- Fisheries Policy
- Draft Lands Policy
- Disaster Management Policy, 2005
- Irrigation Policy and Strategy
- Private Public Participation Policy
- National Policy on Environment. 2008.
- Industrial, Commercial and Trade Policy, 1994.
- Draft National Employment and Labour Market Policy.
- National HIV/AIDS/STI/TB Policy, 2002
- National Housing Policy, 1996.
- National Policy of Education, 1996.
- National Transport Policy, 2002.

During the review of the National Water Policy there were sentiments in the sector to have specific sector polices. It was agreed to develop one comprehensive National Water Policy rather than separate sub-sector policies, which has the risk of inconstancies and defeating the realisation of IWRM. The sub-sectors such as the WSS sub-sector will develop detailed specific strategies in the context of elaborating the overarching National Water Policy.

2.9.5. Policy Coordination

The Zambian government in 2003 introduced Sector Advisory Groups (SAGs) as a vehicle for contributing to the process of planning, implementing, monitoring and evaluating the Poverty Reduction Programme.

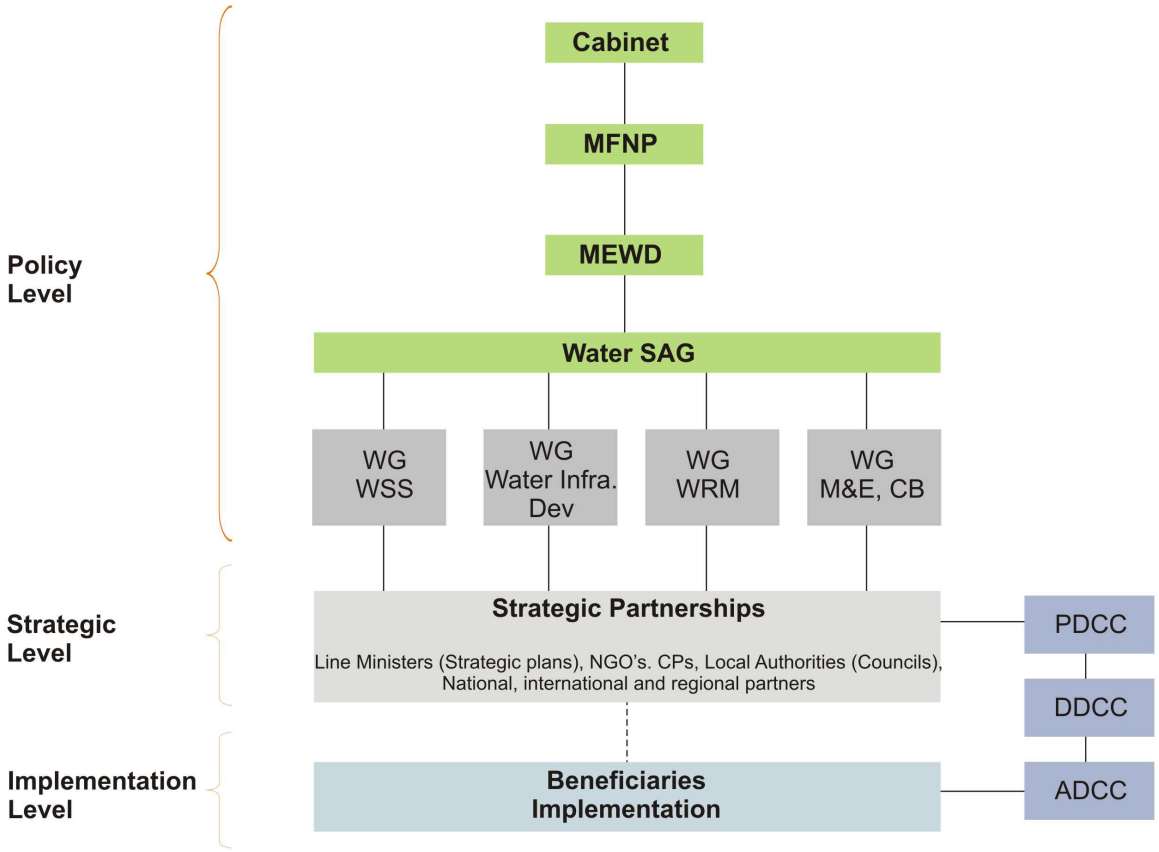
In the water sector, the Water SAG advises government on sector policy issues, on the performance of the sector and on efficient and effective use, transparent management and sub-sectoral coordination of assistance to the sector. It provides a forum for sector wide approaches to planning, budgeting, delivery and implementing of programmes. It comprises representatives from key institutions and stakeholders, which currently include the line ministries, statutory bodies, cooperating partners, academic and research institutions, NGOs and other associations actively involved in the water sector. However, membership is open to any other organisations with an interest in the water sector. It is chaired by the Permanent Secretary in the Ministry of Energy and Water Development who also provides the secretariat.

The organisations that are members of the Water SAG ensure that the Water Policy is enshrined and integrated in their sector plans. Thus, the Water SAG forms a forum which helps to harmonise the implementation of the

policy and has been able to improve coordination in the sector. The coordination arrangements are shown in Figure 13.

In order to effectively manage the sector, four sub-committees (working groups) have been constituted. These are aimed at facilitating regular meetings to enable communication and coordination among institutions responsible for specific functions. The four sub-committees are all chaired by different line ministries namely:

- The Water Supply and Sanitation sub- sector committee chaired by the Ministry of Local Government and Housing;
- The Water Resources Management sub- sector committee chaired by the Ministry of Tourism Environment and Natural Resources;
- The Water Resources Infrastructure Development sub-sector committee chaired by the Ministry of Agriculture and Cooperatives; and
- The Monitoring, Evaluation and Capacity Building sub committee chaired by the Ministry of Finance and National Planning.



PDCC - Provincial Development Coordinating Committee

DDCC - District Development Coordinating Committee

ADCC - Area Development Coordinating Committee, WG- Working Group

Figure 13: Coordination arrangements

The Water SAG has some challenges, which include the joint planning and implementation of water-related projects emanating from competing sectors and the capacity to effectively monitor and evaluate the impacts of programmes.

2.9.6. Gender

Issues of gender play a crucial role in water resources management. The National Gender Policy defines gender as an analytical concept, which focuses on women's roles and relation to those of men. Zambia recognises that full participation of women and men in the development process is cardinal to achieving sustainable development. Creation of an environment for equal opportunities for both women and men to play a more decisive role in water resource management and self-reliance employment, economic equality and justice are fundamental. These are some of the issues being addressed to empower women and reduce poverty at household levels. The Gender Strategy for the water sector is defined in Guidelines for Implementing Community Water Supply and Sanitation Projects in Rural Areas. The guidelines give direction on how to implement, monitor and evaluate gender mainstreaming at national, district and community level.

Mainstreaming gender in integrated water resources management has been recognised as evident from the provisions of the draft Water Resources Management Bill, 2006 that provides for consideration of Gender aspects in decision making as well as its inclusion in the revised draft National Water Policy of 2007. The major challenge is to build capacity, understanding and implementation of gender considerations so that programmes put in place reduce inequalities and enable integration of the knowledge of both genders thus increasing their sustainability.

2.9.7. Legal framework

The principal act presently governing the administration of water is the Water Act (cap.198) of the Laws of Zambia. This Act was passed in 1948 and has since under gone some minor amendments. The Water Act is the main statute dealing with ownership, allocation and regulation of the nation's water resources. The Act deals mainly with surface water and does not regulate groundwater, or those portions of rivers, such as the Zambezi, which constitute international boundaries. Other legal frameworks, for the water sector and relating to IWRM, are governed by the following acts (WRAP, 2004, Ministry of Energy and Water Development, 2005, 2007):

- The Constitution of Zambia;
- The Zambezi River Authority Act Cap 467;
- The Water Supply and Sanitation Act No. 28 of 1997;
- The Energy Regulation Act. Cap 436;
- The Fisheries Act Cap 200;
- The Tourism Act Cap 155;
- The Environmental Protection and Pollution Control Act Cap 204 of 1990;
- The Zambia Wildlife Act No. 12 of 1998;
- The National Heritage Conservation Act Chapter 173;
- The Forestry Act No. 7 of 1999;
- The Public Health Act Cap 295;
- The Local Government Act Cap 281;
- The Town and Country Planning Act Cap 283;
- The Mines and Minerals Act Cap 213;
- The Inland Water Shipping Act;

- The Land Act;
- The Citizens Economic Empowerment Act; and
- The Zambia Development Agency Act.

In addition, Zambia has signed and ratified several international instruments that directly relate to IWRM, such as:

- The revised Protocol on Shared Watercourses in the Southern African Development Community, 2000;
- The Convention on Wetlands of International Importance Especially as Water Fowl Habitat, 1971;
- The Convention on Biological Diversity, 1992;
- The United Nations Convention on the Law of Non-Navigational Uses of International Watercourses, 1997;
- The Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972;
- The Convention on Sustainable Management of Lake Tanganyika, 2003;
- The United Nations Framework Convention on Climate change, 1992;
- The United Nations Convention to Combat Desertification, 1994;
- The African Convention on the Conservation of Nature and Natural Resources, 1968; and
- The Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System, 1987.

An inadequate legislative framework and weakness in the 1948 Water Act has been identified as affecting the sector. In view of this, under the Water Sector Reforms the Government, through the Water Resources Action Programme (WRAP), has developed a proposal for a new legal and institutional framework for IWRM. The proposal is laid out in the Water Resources Management Bill, 2006. The new legislation has been developed through a comprehensive stakeholder consultation process and takes into account the principles of IWRM. It is currently in the process of being finalised.

2.10. Institutional Arrangements in the Water Sector

The Water Act (Cap 198) establishes the Water Board as the organisation responsible for administering water rights in the country. The Department of Water Affairs (DWA) in the Ministry of Energy and Water Development provides technical support to the Water Board. DWA is responsible for water resources planning, management and development. A repeal process, to address the gaps in the current Water Act, is being considered in the 2006 Water Resources Management Bill, which is awaiting enactment.

There are numerous institutions, government, private and NGO's involved in the Water Sector in Zambia. The Ministry of Energy and Water Development, through the Department of Water Affairs and the Water Board have the overall responsibility for water resources management and development. **Table 8** shows the major institutions involved in water resources management.

Table 8: Summary of Legal and Institutional Framework

MINISTRY /INSTITUTION	ROLE AND RESPONSIBILITY IN WATER MANAGEMENT	REGULATING ACT
Ministry of Energy and Water Development **Department of Water Affairs**	Responsibility of overall water resources management and development	
Water Board	Water Allocation through issuing of water rights for all purposes	Water Act Cap. 198
Zambezi River Authority	Gives effect to the inter-state Agreement relating to the utilisation of the Zambezi River between Zambia and Zimbabwe for economic, industrial and social developments. In addition, hydrological and environmental data is collected and used for dam operations	The Zambezi River Authority Act Cap 467
National Water Supply and Sanitation Council	Controls the provision of water supply and sanitation service delivery	The Water Supply and Sanitation Act No. 28 of 1997
Hydroelectricity companies (e. g ZESCO Limited, Lunsenfwa Hydro)	Responsible for planning, designing, constructing and operating hydropower facilities. In addition hydrological and environmental data is collected and used for dam operations	
Ministry of Agriculture and Cooperatives **Department of Technical Services**	Responsible for land use planning and irrigation development	
Department of Fisheries	Development of water resources for aquaculture	The Fisheries Act Cap 200
Ministry of Transport and Communications **Department of Meteorology**	Responsible for provision of meteorological data and information	
Department of Maritime Services	Provides for the survey, registration and safety of certain vessels used on inland waters of Zambia, and for the safety of passengers and cargo, as well as for the competency of masters and crews of shipping vessels	Inland Water shipping Cap. 466
Ministry of Tourism, Environment and Natural Resources **Tourism Council**	Broad mandate for tourism and environmental monitoring; and enforcement of legislation and improvement of watersheds through control of soil erosion and deforestation	The Tourism Act 155
Environmental Council of Zambia	Environmental management and enforcement of legislation	The Environmental Protection and Pollution Control Act. Cap 204 of 1990
Zambia Wildlife Authority	Responsible for all Game Management Areas (GMAs) and National Parks covering approximately 33% of the total land area of Zambia. It is largely responsible for the management of wildlife but is also responsible for the management of forests and water catchment areas found in national parks	The Zambia Wildlife Act No. 12 of 1998

MINISTRY /INSTITUTION	ROLE AND RESPONSIBILITY IN WATER MANAGEMENT	REGULATING ACT
National Heritage and Conservation Commission	Manages the sources of the Zambezi River and Kafue Rivers, which are protected as National Monuments. It in addition manages unique water bodies such as lagoons, geophysical sites such as hot springs; and all major waterfalls throughout the country, which are protected as National Monuments	National Heritage Conservation Act Chapter 173
The Department of Forestry	Controls, manages, conserves and administers national and local forestry Provides participation of local communities, traditional institutions and NGOs, preventions of pollution or fouling of public water	The Forests Act No. 7 of 1999
Ministry of Health	Responsible for monitoring sanitation; health education; monitoring of drinking water quality; setting standards and general sanitary supervision throughout the country	The Public Health Act Cap 295
Ministry of Local Government and Housing **Department of Local Government Administration**	Responsible for implementing the decentralisation policy of government (through Cabinet Office)	The Local Government Act Cap 281
Department of Physical Planning	Responsible for urban planning and demarcation of areas for development, the preparation, approval and revocation of development plans, the control of development and subdivision of land. These features are important in that the impact of development on natural resources is an important component of town and country planning, and this includes water The preparation, approval, and revocation of development plans subject to their impact on natural resources	The Town and Country Planning Act Cap 283
Department of Infrastructure and Support Service	Domestic urban water supply policy and investment projects. Is responsible for rural water supply and sanitation Support to planning and implementation of projects	
Ministry of Community Development and Social Welfare	Identification of social welfare, water and sanitation projects	
Ministry of Mines and Minerals Development **Department of Mines and Mineral Development**	Provides for environmental protection during prospecting, mining, decommissioning and abandonment of mines	Mines and Minerals Act Cap 213
Department of Mines Safety	Important partner in the development of groundwater resources and in mapping out the groundwater aquifers	
The Department of Geological Services	To advise the Minister on geological matters, to undertake the geological mapping of Zambia and undertake prospecting and exploration operations, and generally assist members of the public seeking information concerning geological matters	

MINISTRY /INSTITUTION	ROLE AND RESPONSIBILITY IN WATER MANAGEMENT	REGULATING ACT
Academic and research institutions	Provide human resources capacity building and knowledge through training, research an consultancy services	
Private Sector	Provide various services such as investment, consultancy services and constructing	
Farmers, Industries etc	Utilise water resources for different purposes and contribute to the management of water resources by the formation in some areas of water management committees	Currently the water management committees are not recognised under the Water Act. Function on administrative basis only
Non-governmental Organisations.	They usually support Resident Development Committees and District WASHE groups to manage water supply and sanitation in their areas	

Source: Water Resources Action Programme, 2004. Proposal for the Legal and Institutional Framework for the Use, Development and Management of Water Resources in Zambia

There are a number of institutions that have a role to play in water resources management. These institutions all have various interests. Ineffective coordination in the sector has contributed to the ineffective management of the water resources.

2.11. Capacity Building

Capacity building is a cross cutting and well acknowledged issue in the transition to IWRM in Zambian society. Although capacity building initiatives are required across all levels (sectoral, institutional and individual), a significant deficiency in existing plans, recommended as a focus area for IWRM, is catchment level capacity. Capacity needs at the catchment level include the development of specific methodologies and guidelines on crucial aspects of catchment level management, such as water resources allocation, determining environmental flow requirements and water resource assessment. Additionally, capacity building will be a key element in all of the IWRM supporting projects.

The institutional structure and distribution of responsibility envisaged in the new Water Resources Management Bill will require extensive and long-term capacity building to ensure effective implementation. In particular, decentralisation will entail the devolution of many significant responsibilities and powers to the catchment and sub-catchment level. However, having sufficient capacity to undertake and carry out all the specified functions will be critical to successful implementation. Catchment and sub-catchment councils as well as water user associations will have delegated responsibilities which imply the need for expertise, such as investigation of applications for water use, collection of hydrological, hydrogeological and environmental data, pollution control, implementation of guidelines on catchment protection, proposal of local water management plans and maintenance of equipment for data capturing.

Capacity building has significant financial implications. However, it will be crucial to first clearly identify the needs and define a plan to address these in the short and medium-term. The potential of private sector involvement to supplement existing capacity will also be an important approach.

To clearly identify the capacity needs and define a plan to address these, it will be necessary to examine the current status and future position of the water sector in Zambia. The water sector reforms have established very

clear institutional structures from the national/central level to the local government level. WRAP identified seven areas that hinder the effective, sustainable management of Zambia's water resources and proposed corresponding strategic interventions to address the issues (Table 9).

Table 9: WRAP Programme: Seven areas for Strategic Interventions

	AREA	OBJECTIVE OF INTERVENTION
i.	**Institutional and legal framework**	Establishment of an effective institutional and legal framework for water resources development and management
ii.	**International waters**	Strengthening of domestic capacity to manage and negotiate international water sharing issues
iii.	**Water resources information**	Establishment of an operational and sustainable data management system, which effectively supports water resources planning, management and development
iv.	**Institutional and human resources development**	Establishment of an organisational development and human resources competence, capacity and motivation to develop and sustain efficient work for management and public awareness-raising
v.	**Water resources, demand, supply and infrastructure**	Effective utilisation of improved technical aspects of water resource allocation practices, conservation and infrastructure development
vi.	**Economic and financing of water resources**	Integration of the economic value of water into decision making processes for water resource management and financing
vii.	**Water and environment**	Proper integration of environmental considerations into water resources management and development

Source: Water Resources Action Programme

So far, the milestones reached by WRAP are the development of the institutional framework and the Water Resources Management Bill that is expected to be passed into an Act of Parliament. When this happens, considerable changes in Zambia will take place in the areas such as groundwater rights (not included in the current 1949 Act) and creation of National Water Management Authority and Catchment Councils. For this to succeed, requires strengthening of institutions and human resources development and capacity. Therefore, the inclusion of a component on capacity building in this IWRM / WE Implementation Plan, comes at an opportune time as it outlines the status and a provides a projection of human resource needs in the sector.

2.12. Institutions

There are number of institutions involved in water activities in Zambia. The nature of their involvement ranges from policy/legal formulation and implementation, through service provision to consumption. Eight (8) broad categories can be identified:

- Government ministries and departments (e.g. MEWD, MLGH, MoH, DWA)
- Local authorities (e. g. city, municipal, district councils)
- Regulatory Authorities (e. g. Water Board, Environmental Council of Zambia (ECZ) and NWASCO)
- Commercial water utilities (e. g. Lusaka, Kafubu, Mulonga Water and Sewerage Companies)
- Private sector (e. g. Mining companies, Zambia Sugar Company, Chilanga Cement)
- Academic and research institutions (e. g. University of Zambia, Copperbelt University, NISIR)
- Bilateral and multi-lateral institutions (KfW, DFID, World Bank, UNICEF etc.)
- Non-governmental organisations (NGOs) and Community Based Organisations (CBOs) (Care International, Water Aid, Residents Development Committees)

The role of each group is described in the following paragraphs.

2.12.1. Government ministries and departments

Government ministries and departments have over the years played various roles in both the water supply and water resources sub-sectors.

- The Ministries of Energy and Water Development (MEWD) through the Department of Water Affairs (DWA) and the Department of Energy, is the main institution responsible for water policy formulation and water resources management activities.
- The Ministry of Local Government and Housing (MLGH) through the Department of Infrastructure Support Services (DISS) is responsible for the physical planning of water supply and sanitation services.
- The Ministry of Environment, Tourism and Natural Resources (METNR) through the Department of Forestry, Tourism and the Environmental Council of Zambia (ECZ) has a very broad mandate that includes water resource protection.
- The Ministry of Agriculture and Co-operatives (MACO) through the Departments of Fisheries and Agriculture is responsible for monitoring the use of water for agricultural purposes.
- The Ministry of Health is responsible for setting standards and monitoring for drinking water quality.
- The Ministry of Mines and Mineral Development (MMMD) through the Department of Geological Survey interprets geological formations that contain groundwater.
- The Ministry of Education (MOE) is responsible for human resource development through training by mobilising resources from the Ministry of Finance and National Planning and Cooperating Partners.

2.12.2. Local Authorities (cities, municipalities, districts)

According to the Water Supply and Sanitation Act (1997), local authorities are obliged to provide water supply and sanitation services to the areas under their jurisdiction. They do this through nine commercial water utilities established throughout the country.

2.12.3. Regulatory authorities

Regulatory authorities in the water sector are statutory bodies established by acts of parliament. The main regulatory institutions are:

- The Water Board is responsible for allocating raw water rights to the various sectors of the economy. The technical officers under the water board are in the Water Affairs Department except for the Secretary.
- The National Water Supply and Sanitation Council (NWASCO) established under the Water Supply and Sanitation Act, No 28 of 1997 is responsible for regulating the provision of water supply and sanitation services throughout the country.
- The Environmental Council of Zambia (ECZ) established under the Environmental Protection and Pollution Control Act, No 12 of 1990 is empowered to among others, establish water quality and pollution controls standards and determine conditions for the discharge of effluents into the aquatic environment.

2.12.4. Commercial Water Utilities

Commercial water supply and sanitation utilities (CUs) have been established pursuant to the water supply and sanitation reforms that began in 1994. As indicated above, they have been established by local authorities under the WSS Act (1997). The mandate of CUs is to provide efficient and sustainable supply of water and sanitation

services under the general regulation of NWASCO. There are currently nine CU's established in Zambia, being Chambeshi, Chipata, Kafubu, Lusaka, Mulonga, Nkana, North Western, Southern and Western.

2.12.5. Private Sector

The private sector constitutes an important end-user category in water supply. This includes the manufacturing, food and processing industries, mining, agricultural and hydropower generation. Although there are some private companies that provide water supply services as a fringe benefit to their employees (e.g. Chilanga Cement, Zambia Sugar, Maamba Collieries, ZESCO Ltd and Konkola Copper Mines (KCM), these are in a minority. However, the potential of private sector involvement to supplement existing capacity will also be an important approach.

2.12.6. Academic and Research Institutions

Academic and research institutions' participation in the water sector is mainly in the area of training personnel and in research. The University of Zambia is the premier training institution for water and related professions at both the under and post-graduate levels offering Bachelors, Masters and PhD degrees. Those offering direct water sector courses are the Civil and Environmental Department (Hydrology and Water Resources) and Geology (Hydrogeology). Other departments offer related disciplines that are applicable to water such as chemistry, irrigation in agriculture and biological sciences. Others institutions include the Copperbelt University and Natural Resources Development College. In addition, these institutions provide research in various fields such as water quality assessment and monitoring. The National Institute for Scientific and Industrial Research (NISIR) conducts research in water quality of drinking water and also quality of surface and ground water.

2.12.7. Bilateral and Multilateral Institutions

Bilateral and multilateral institutions have been the main financiers of water programmes in Zambia for over a decade now, providing over 90% of the total costs of all major programmes e.g. providing funds for the water supply and sanitation reforms and the WRAP initiative. Prominent amongst these are DANIDA, World Bank, GTZ, the African Development Bank, UNICEF, KfW, NORAD, SIDA, and JICA.

2.12.8. NGOs and CBOs

There are a number of NGOs involved in water activities in both water supply and sanitation, and water resources. These include the World Conservation Union (IUCN), the World Wide Fund for Nature (WWF), Zambia Water Partnership, Care International, Water Aid and World Vision International. CBOs such as Resident Development Committees (RDCs), co-operate in the promotion of community-based management of water supply and sanitation schemes. The role of NGO's has also extended to mainstreaming gender in community water programmes and projects.

Strengthening of these institutions will be required at all levels for them to deal more effectively and efficiently with all aspects of integrated water resources management, including the creation of a favourable policy environment, water resources assessment, planning, management, programme and project formulation, implementation, monitoring and evaluation.

2.13. Proposed IWRM Institutional Set Up

The proposed institutional set up is to manage water, including groundwater, through the creation of a National Water Authority and catchment councils. Up to six catchment councils have been proposed to be set-up and will

include sub-catchment councils and water user associations. The proposed institutional set-up calls for the introduction of integrated water resources management. This, in effect, calls for producing a totally different workforce that will be able to manage the water resources in a holistic manner. The new set-up therefore, has to immediately be planned for in terms of human resource development by carefully assessing and analysing the existing human resources in selected government institutions – ministries and departments, regulatory institutions, commercial water utilities and training and research institutions (UNZA & NISIR) and comparing this with the numbers of new graduates, mainly from UNZA, in the water sector at Bachelor, Masters and PhD levels.

2.13.1. Human Resource Analysis

It is difficult to make an accurate assessment of human resources in water management because several institutions have not kept their data current (Nyambe, 2005). A study carried out in 1995 indicates that;

(i) There are about 500 qualified people (though the figure for private companies - e.g. mines is an estimate) currently employed in the water sector and related areas (Table 10); and

(ii) The Zambian water sector will need approximately 1000 more qualified people (Table 10).

Table 10: Analysis of Human Resource Capacity in the Water Sector in Zambia

	Training and Research Institutions		Government						Private Sector	Planning Units		Proposed Catchment Councils
	UNZA	NISIR	Water Affairs	Geol Surv	DISS	Agric	REG. Insts	9 CommU tilities	Private Comp.	Prov-ince	Dist	Six in Zambia
Current	24	4	40	22	11	16	24	300	60	-	-	-
Vacancies	-	-	55	14	-	-	-	-	-	-	-	-
Future numbers in next 5 years	50	10	25 (author ity + DWA)	40	20	30	40	500	100	12	77	100

TOTALS	
Current	**Estimated Needed Manpower 5 years from now**
~ 500	~ 1000

Graduates at UNZA in last 5 years								
CORE AREAS				**IWRM**	**OTHER DISCIPLINES**			
Engineering		**Geology**		0	**Agriculture**		**Natural Sciences**	
Bach	Masters	Bach	Masters		Bach	Masters	Bach	Masters
95	3	42	3		119	36	139	14

Members of UNZA Staff on training present and left (emigrated)					
PRESENT			**EMIGRATED**		
On Training		**Employed**	**Emigrated while training**		**Left during employment**
Masters/PhD	Masters	PhD	Masters/PhD	Masters	PhD
50	7	17	35	7	5

No Tangible Research or Support Fund to Water Research at UNZA or NISIR

Key: Geol Surv = Geological Survey; REG Insts = Regulatory Institutions; Comm. = commercial; Dist = District; Bach = Bachelors; Mas = Masters.

From **Table 10**, the following observations are made:

- The vacancies at Water Affairs and Geological Survey Department (GSD) indicate that, the two departments are operating at half capacity, and actually at a much lower capacity for the Water Affairs Department. The establishment of about 100 staff, approved during re-structuring, has not been filled. GSD

on the other hand, has a lot of migration of geologists to private exploration and mining companies on the Copperbelt and other parts of Zambia, who offer better conditions of service such as salaries.

- There are few individuals graduating at Masters level (less than 5) and none at all at PhD level from the core areas of the Water Sector (Civil and Geology) at UNZA but higher numbers in the related fields of agriculture and natural sciences. Unfortunately output of Bachelors degrees is also low in the two core disciplines.
- At UNZA about 30% of those on training end up migrating while on training (35 out of 85), while of those employed 50% end up leaving (12 out of 24).
- There is no training either at diploma or degree level in IWRM at UNZA, a core focus of the proposed water resource management sector reforms, which from the estimates above, is expected to double in five years from now in order to feed the planning units in provinces, districts and the proposed catchment councils, plus the commercial utilities i.e. a training of 500 or more personnel at diploma, bachelors, masters and PhD levels in decreasing numbers. Unfortunately, using the core fields of engineering and geology at UNZA, at bachelors level, the two departments have produced only 137 graduates in the last 5 years, giving an average of 27 per year. To reach 1000 personnel, there is a need of producing 140 graduates per year including 40 candidates that may emigrate whilst still on training. The migration and switching of employment is due to low salaries in government and the new commercial water utilities. The utilities follow similar salary scales as those of local authorities (councils), who are the main shareholders. HIV/AIDS is also playing a major role and has contributed significantly to the low numbers of personnel through death in the sector.

Further, there is no funded water sector research or training at UNZA, Copperbelt University or NISIR. The reported research activities available in the country are mainly outside the core areas of IWRM except for the CIDA supported IWRM process facilitated by Zambia Water Partnership to come up with an IWRM/ WE Implementation plan. The core areas of generating basic water resources data (surface and groundwater) that would feed into the proposed National Water Authority are non-existent. In this case, groundwater is critical, in that for the first time in Zambia groundwater will be considered as a resource.

To address these challenges, training and general water sector research covering both surface and groundwater should be strengthened.

The delegation of water resources management to the lowest appropriate level necessitates educating and training water management staff at all levels and ensuring that women participate equally in the education and training programmes. Skills related to various water management functions have to be developed by local authorities, as well as in the private sector, local/national non-governmental organisations, cooperatives, corporations and other water-user groups. Education of the public regarding the importance of water and its proper management is also needed.

2.13.2. Addressing Human Resource Capacity Requirements for the Water Sector

Strategic intervention areas for IWRM identified by WRAP remain critical areas where capacity building is of utmost importance. Whereas, the enabling environment of policy and legislation will be in place when the revised National Water Policy and the Draft WRM Bill are enacted by Parliament, there is a need to develop capacity in the skills and knowledge required to integrate the water sector policies and strategies with other policies such as irrigation, environmental policy and legal instruments for water resources management. An increased human capacity is needed in the future institutional framework for decentralised water resources management as defined in the Draft WRM Bill. These will require human resources geared to implement IWRM interventions, making a deliberate policy to train Zambians in water resources management tools. Though Zambia has commendable

procedures and practices for public participation, other water resources management tools, however, are in need of strengthening through capacity building including:

(i) Water rights: These are a pre-requisite for the development of large scale commercial agriculture in Zambia that will ensure food security at national level and for securing access to water for emerging and traditional farmers. On the other hand, there are also demands for other uses such as hydropower and domestic use. At macro-economic level, equitable allocation of water rights and assurance of access is the principal contribution that the water resources sector can provide to national development.

(ii) Catchment water resources surveys and management planning: The issuance of water rights requires reliable water resources surveys that integrate surface water, groundwater resources and water quality.

Water resources planning may be carried out by two contrasting approaches:

- A scientific and technocratic approach establishing the available water resources and the future demands and on this basis preparing a master plan for development of different areas and different sectors; and
- A strategic and participatory approach identifying the key issues in water resources management through public consultation and on this basis developing an action plan that prioritises government actions and investment in water resources management and development.

(iii) Water resources and water quality monitoring: The issuance of firm water rights and catchment water resources planning depend on reliable water resources and water quality monitoring data. Water resources and water quality monitoring in Zambia needs to be restructured in accordance with international principles, which distinguish:

- A basic national monitoring network providing data for allocation of water resources between sub-catchments and for identifying major water resources issues;
- Specific monitoring networks in sub-catchments providing data for allocation of water between sectors and monitoring of compliance with water allocations; and
- Temporary monitoring networks for water resources surveys or research of specific water resources or water quality issues.

To address the shortage of human resource in the sector in the next five years and beyond, Zambia needs first to reduce the imbalance between the low levels of graduations from academic institutions and the high numbers of staff that will be needed to implement the water resources reforms. The following are recommended:

- Encourage the currently enrolled students in the School of Natural Sciences at UNZA to take hydrogeology (Geology) and hydrology (Civil and Environmental) studies and in other Schools (Law, Economics, Social work etc) to take up water-related research by offering them incentives such as scholarships to take up water-related studies. This would increase the average number of students from 27 to 40 per year for the two departments (30 Civil and 10 Geology).
- Promote and strengthen the DANIDA supported IWRM Centre established at the University of Zambia. The centre would offer, as a start, Diplomas in IWRM so as to meet the immediate needs for the upcoming water resources reforms. Starting candidate numbers are estimated at between 20 and 30 per year. The Centre may later offer bachelors degrees in IWRM. Both diplomas and bachelors in IWRM are not offered in Zambia or the region. Secondly, Zambia does not have colleges offering diplomas in this area.
- Promote water sector research through the IWRM Centre at the University of Zambia so as to foster collaboration with other research institutions abroad. An introduction of a water sector research fund is critical that will be targeted at funding post-graduate research at Masters and PhD level to a total of 5 per

year. This will assist in building capacity both at human and infrastructure levels such as assisting accreditation of Zambian laboratories to international standards. On research, existing regional research funds such as the Water Research Fund for Southern Africa (WARFSA) does not focus on post-graduate studies but is targeted to short-term studies carried by individuals or a group of individuals.

- Set-up of groundwater training programme, perhaps as post-graduate diploma targeting the bachelor candidates mainly from the Geology Department with candidate numbers ranging from 15 to 20 candidates, though meeting the maximum targeted number of 20 may be a problem due to low enrolments. However, this would improve in the near future as enrolment numbers in geology for example have improved from 6 to 22 in the 2007 intake at UNZA.
- Strengthen the current DANIDA supported IWRM activities at UNZA IWRM Centre that are to be carried out under a twinning arrangement with Danish Universities.

In addition, capacity building at local level will be promoted. This would be done through community based organisations (CBOs) and non-governmental organisations (NGOs).

In conclusion, this approach would build capacity in human resource in Zambia from local level to national level.

2.14. Financing of the Water Sector

The provision of water services is supported by seven sector principles, of which one states “increased sector financing” but financing levels have been very low and totally inadequate. The challenge the country faces is to increase and sustain investments.

The water sector is financed from three sources namely, government budgets, oversees development assistance and water charges. It should also be noted that there are some non-governmental organisations (NGOs) that implement programmes, finance activities and carry out capacity building for rural and peri-urban communities. However, information on NGOs funding trends is fragmented and not easily available.

The main financial interventions have been through the public financial mechanism. The government has provided funds through budgetary allocations to the institutions responsible for water and water-related programmes. However, most of these interventions have not been done in an integrated manner and usually actual expenditure has not reached the authorised expenditure, with 1997 and 2001, during drought, being the exceptions.

2.14.1. Public Financing

The Water Resources Master Plan estimated that public financing would amount to K164 billion in 2015 (at 1993 constant prices). The projected trend of public expenditure was based on the assumptions that GDP will increase by 27.5%. Furthermore, according to the plan, the public expenditure for water schemes was expected to amount to K13 billion in the year 2005 and K18 billion in 2015 (at 1993 constant prices). The total amount, accumulated from 1995, was to be K123 billion to 2005 and K283 billion to 2015 (equivalent to US$282 million and US$651million).

The current GDP stands at 5.7% and most of the actual expenditure by government has been in excess of billions to the sector over and above the levels of what was estimated for 2005. This could be attributed to the nominal increment of foreign exchange rates.

The primary information source on planned investments for the sector is the FNDP for 2006 -2010. The government for the next five years has outlined in the FNDP its expenditure in the sector as amounting to K2, 069

billion with a financing gap of K118.9billion amounting to about 3.7% of the total allocations. This is a slight increment from 3.1 per cent. However, there is a financing gap of K118.90 billion, while the budget of the sub sector, WRM stands at K 250.42 billion.

The plan has divided the programmes between those that are core for the sector and those that support the core business in order to prioritise the funding.

2.14.1.1. Central government;

On average, government funding to the sector over the years has been around 2.5% to 3.0% of the national budget. According to the National Water Resources Master Plan, the rate of total investment by government for capital expenditure was 5.3% on average for six years and ranged from 1.1% in 1992 to 15.4% in 1994.

Within the budgetary allocation to the institutions, the government has, in trying to formulate public innovative financing, created a number of funds:-

Water Supply and Sanitation

- Devolution Trust Fund: This fund is administered by National Water and Sanitation Council. This fund is a financing instrument to assist the service providers extend the provision of services to the urban poor. It receives its finances as grants from government and cooperating partners.
- Constituency Fund (CF): This fund was created for rural development programmes and is administered by Parliament. Community WSS has benefited from this fund, but it is difficult to aggregate what percentage of the fund was spent on water projects.
- Land Development Fund: This fund is supposed to cater for basic infrastructure in the rural areas, such as feeder roads and supply of water and electricity. The major source of finance is ground rent on state land and therefore anchored in the Ministry of Lands. However, since 1997 there has been no meaningful development on funds disbursed to this account. The Ministry of Lands disbursed funds to a number of local authorities throughout the country to enable them open up land for development through the provision of services.
- Social Investment Fund: This fund was administered by ZAMSIF. Many investments have been made to support the delivery of safe drinking water and access to sanitation points both in rural and peri-urban areas. It has been proposed that the fund be transferred to Ministry of Finance, under the Planning Division and modalities of such a setup are being examined.

Water Resources Management

- Rural Investment Fund (RIF): The purpose of this fund is to assist small-scale farmers with capital investments, on a matching grant basis; and privatisation of agricultural services and farms. It is administered by the Ministry of Agriculture and Cooperatives. It also has a sub-program – 'Rural Finance' to support strengthening of rural financial institutions and pre-lending activities to improve the access of smallholders and small entrepreneurs to formal financial services. A number of smallholders have been assisted in making water available for irrigation.
- Water Development Trust Fund (WDTF): The water sector reforms (and 2006 draft WRM Bill), have proposed the establishment for WDTF for the effective management of resources. It will be financed through grants from government and water use charges.

Energy

- Rural Electrification Fund: In 1994, in an effort to improve the financing of the rural electrification programme, REF was created. The money for the fund is drawn from a levy on all electricity bills and is

used for the installation of photovoltaic (PV) systems to supply power for water pumping, medical refrigeration and lighting. The main targets in this regard are community-based facilities such as rural health centres, schools and community centres. However, though some districts have benefited from this fund, progress is being hampered by the non-release of funds.

2.14.1.2. Local government:

The local authorities are supposed to raise money for regional development from own and central government sources. The Local Government Act Cap. 480 provides for councils to receive grants from the central government for operation and how to raise funds for development. However, because of economic difficulties, the central government has not been able to release adequate grants to local authorities. On the other hand, the local authorities' capacity to raise revenue has decreased. It should be noted that with current financing arrangements, local authorities have little say in decision-making on resource allocation which remains largely centralised

Local authorities use one type of front-end charge called the 'service charge'. This is a one-time charge to new customers for providing social services, such as connection to the water system and roads. Generally, these charges are paid by the developer at the time a land is delineated for settlement. It is worth noting that the funds requested are often not adequate to recover the investment in a new system, and quite often these funds are misused when not all settlements are provided with the sector's services.

Further, there are some local authorities that are still providing water supply and sanitation services in areas that are not covered by commercial utilities (CUs). There are usually information gaps in the data submitted to the regulator.

2.14.2. Overseas Development Assistance Financing

Over the years due to the inadequacy of government resources for financing new developments, Overseas Development Assistance (ODA) has helped to complement government expenditures. For instance, cooperating partners' funding of the sector capital expenditure amounted to 89% in 1995 compared to 31% in 1990. The financing has been sourced through grants and loans from bilateral and multilateral financing institutions.

Total external ODA inflows during the period 2002-2005 amounted to US $1,844 million. This was above the PRSP target of US $ 804 million set at 67 percent of the planned budget of US$1, 200 million. However, on an annual basis, external aid declined from US$746 million in 2002 to US$4023 million in 2003 and further to US$297 million in 2004. Project support has also shown a declining trend, dropping from US$348million in 2003 to US$302 million in 2005(Table 11).

Table 11: External Aid Inflows (in US millions), 2002-2005 in Zambia

CATEGORY	2002	2003	2004	2005
Programme Support	311	56. 8	64. 8	94. 8
Project Support	435	347	233	302
Total	746	403. 8	297. 8	396. 8

Source: Ministry of Finance and National Planning

As stated, donors provided about 70-80% of allocations to water supply and sanitation and could drive much of the process. With this leverage, there is a danger of some of the donors pushing for their own sector agendas and confusing the sector. The government has identified that there is weak management and coordination thereby

adversely affecting the effectiveness of aid. To address this government has developed a Joint Assistance Support Strategy, for aid coordination and harmonisation which has been agreed with the cooperating partners

2.14.3. Private Sector Financing

There has been some private financing in the water supply sub-sector. Currently, there are seven licensed private providers providing services as an auxiliary function (NWASCO, 2006). They provide the service to their employees. However, there has been no major private financing for infrastructure, apart from on-farm irrigation infrastructure in the agriculture sector. Private farmers, acting alone or in cooperatives, also frequently arrange and finance their own investment in water infrastructure for crops, livestock, etc. These works are financed through a combination of loans from banks and other specialised credit institutions, and supplemented by farmer's own savings and equity.

2.14.4. Community Financing

The government has been sensitising and encouraging rural communities to establish village water committees and subsequently create village water funds for the management of finances for operational and maintenance of rural water supply schemes by the communities. Up to June 2005, 9,283 village water committees and 8,099 village water funds have been formed. Communities are now contributing various percentages to capital investments ranging from 10% to 25% from a typical grouping of about 34 - 45 households with an average of six persons/household. This is done in kind, for example, when the community contributes some of the construction items like sand, gravel and labour.

2.14.5. Water Charges

2.14.5.1. Water Resources Management

The administration of water resources in Zambia is anchored in the Water Board, which charges for the use of the resource. The charges are applied to registration, renewal or application for a water right, advertisement fees, and water charges.

On average, the management and development activities in the sub-sector obtain about 20% of the required funds. It was estimated in 2003 by the Water Resources Action Programme that the collection efficiency rate is about 57% from about 347 officially active water right holders.

The revenue generated as with all government fees and charges is collected on behalf of the national treasury. However, for the Water Board it was decided that it could retain 50% of its revenue, while the interventions from the government in water resources management continued. Meanwhile, both the level of recovery of the water charges and the inadequacy of funds at the operational level has resulted in inadequate contributions to the recurrent cost of water resource management like investigations and monitoring of water use.

2.14.5.2. Water Supply and Sanitation

The government has adopted full cost recovery for water supply and sanitation services as a policy principle. It has therefore commercialised the water schemes. It was reported by NWASCO that services provided by local authorities are usually priced lower than that provided by CUs. Revenue collection efficiency differs from company to company. By 2004, 70% of the CUs showed improvements in their collection efficiency. According to NWASCO (2006), only North West Water and Sewerage Company (at 90%) and Western Water and Sewerage Company (at 85%) have had acceptable average collection efficiency over the past three years. By 2006, most CUs were not able to meet their operation and maintenance costs, let alone capital investments. However, it is important to

note that these water schemes also receive funding from government through the Ministry of Local Government and Housing to support operations and investments. According to NWASCO, there are no clear criteria for the release of such funds to the CUs and local authorities.

2.15. Monitoring and Evaluation Arrangements in the Water Sector

Over the years, the country has lost resources and programmes that were sidelined, partly due to lack of reviews. The monitoring and evaluation systems have been weak in the water sector making it difficult to track results. In implementing the FNDP, a monitoring and evaluation system has been developed by the Ministry of Finance and National Planning.

2.15.1. Resource and Use Monitoring

Monitoring of water resources, both in their natural state and in developed and impacted areas, is crucial to assessing and refining understanding of their extent, quantity, quality and development potential. Monitoring is an extremely complex concept with significant cost implications depending on the scale and format of implementation. Too often local and national monitoring programmes suffer from lack of focus and inefficient allocation of resources, resulting in insufficient data collection but at a high cost. Additionally, there are poorly integrated and often overlapping monitoring activities being undertaken by a variety of stakeholders, without a clear, encompassing strategy or delineation of responsibilities. As such, the translation of the broad directives of monitoring, for example specification of 'catchment protection and resource monitoring', listed in the new water bill will critically need comprehensive and practical plans, developed at an appropriate scale. Guidelines on data collection and data recording will also be crucial to ensure data quality and comparability across the various catchment units nationally.

Monitoring requirements to support effective decision making in terms of allocations and timely determination of 'water shortage areas' at the catchment level, will require technical support to catchment councils and associated capacity building. Development of detailed catchment and/or sub-catchment monitoring plans within their management plans will need to be a priority area. The emphasis on catchment level monitoring is important to increasing awareness, at the grass roots, of the significance of collecting data on water resources to livelihoods and health and not just scientific research. Community empowerment in water supply under the PUSH-2 Project implemented by CARE provides an important example of community involvement in monitoring and data collection with the use of simple equipment.

In addition to monitoring the resource, effective monitoring of use will be equally important as part of the permit allocation process. In this instance, metering usage and the maintenance of annual records will be important. It will be crucial for an optimal regulatory environment to emphasise the importance of water use monitoring and reporting for major users.

Awareness and technical support at the ground level will be an important focus. For example, water users utilising boreholes are, presently carrying out little or no monitoring of abstraction quantities or water level. However, there is generally an interest in collecting these data due to their relevance in ensuring reliable and sustainable operations. With guidance and support in initiating and improving monitoring, and guidelines on data capture, water use monitoring could rapidly be improved.

CHAPTER 3: ISSUES AND GAPS IDENTIFIED

3.1. Synthesis of Issues Identified in Situation Analysis

A vital foundation and basis for the development of the IWRM/WE Implementation Plan has been the identification and evaluation of the key issues related to water resources in Zambia. Crucial issues have been derived from stakeholder consultations undertaken since 2001. These consultative processes included the WRAP formulation process, the FNDP process as well as consultations for the implementation plan formulation process. The identification and clarification of water resources issues has been undertaken in an iterative process, with multiple stages of consultation as well as the presentation of identified primary issues at stakeholder workshops for further discussion, clarification and prioritisation.

During these consultative processes carried out throughout the country, stakeholders identified a wide range of substantive issues relating to improving water resources management. The identified issues related both to the need for an updated and improved legal framework for water resources management in Zambia, which under the WRAP has culminated in the draft Water Resources Management Bill, as well as additional issues related to improving water resources development and availability to all users, improving sanitation and environmental management. Although extremely varied, the identified issues have been distilled into a series of key areas of needing improvement.

The identified key issues and problems have been analysed and grouped into clusters namely; Policy, Institutional and Legal Framework, Water Resources Information, Institutional and Human Resources Development, Water Resources Demand, Supply and Infrastructure Economics and Financing, Water and Environment, International Waters as well as Advocacy, Public Involvement and Awareness. These analyses and assessments have underlined the fact that insufficient integrated water resources management has a significant negative impact on economic growth, poverty reduction and the environment in general (see table 12).

Table 12: Summary of Key Issues Identified

CLUSTER	ISSUE
Policy, Institutional and Legal Framework	• Weak or inadequate legal and institutional frameworks for water resources development and management • Weak or inadequate legal and institutional frameworks for rural water supply and sanitation • Inadequate implementation of integrated water resources management • Inadequate gender mainstreaming of water issues into national development • Inadequate collaborative arrangements among institutions involved in water resources management and with those in other sectors • Inadequate decentralisation of functions to manage water at local level
Water Resources Information	• Inadequate data and information systems for water resources management and rural water supply and sanitation • Inadequate systems to facilitate disaster preparedness and appropriate early warning systems • Data and information on quantity, quality, distribution and variability of both ground and surface water resources is poor
Institutional and Human Resources Development	• Inadequate human resource and institutional capacity(water resources management and WSS) • Inadequate research and development in water resources management • Inadequate gender mainstreaming of water issues • Limited research • Inadequate consideration of the needs of persons with disabilities with regards to technologies used • Prevalence of HIV/AIDS • Poor Monitoring and Evaluation of activities in the water sector

CLUSTER	ISSUE
Water Resources Demand, Supply and Infrastructure	• Mismatch between water demand and supply as a result of increasing water demand due to social and economic growth • Inadequate forward planning to secure water resources for future demands • Low access of water supply and sanitation services in urban areas and poor communities • Low access of water supply and sanitation services in rural areas • High dependence on rain-fed agriculture and limited utilisation of irrigation • Population dynamics and settlement patterns • Inadequate development of the country's water resources infrastructure to meet needs of various sectors • Inadequate policy, guidelines and regulations on the construction, operation, maintenance and monitoring of infrastructure (e.g. Dam operation rules) • Inadequate awareness or implementation of water demand management techniques • Inadequate water conservation and rainwater harvesting systems • Population dynamics and settlement patterns
Economics and Financing	• Inadequate and unpredictable sector funding, and relatively lower share in budgetary allocation • Lack of policies and strategies on collection and use of collected revenue for water resources management (ring-fencing/sharing/retention) • Inadequate mechanisms to mobilise funds for investments and operation and maintenance of water supply and sanitation systems
Water and Environment	• Ineffective land use planning • Alteration of natural flow regime of rivers • Poor environmental health • Inadequate of systems to monitor and control water pollution, river bank cultivation, deforestation and destruction of catchment areas/headwaters • Inadequate protection of wetlands • Inadequate integrated protection and management of catchment areas • Increasing threat of invasive species • Increasing threat to climate change and variability • Inadequate waste management systems (dump sites, waste water treatment)
International Waters	• Inadequate management of international waters
Advocacy, Public Involvement and Awareness	• Inadequate human resource and institutional capacity • Inadequate awareness of the role of water in economic and social development • Inadequate awareness or implementation of water demand management techniques • Inadequate gender mainstreaming of water issues into national development

3.2. Priority Issues and Strategic Areas of Focus for the IWRM/WE Implementation Plan

The prioritisation of issues in the plan was based on the recommendations from the various consultative meetings including the FNDP formulation process. The prioritisation was also guided by priorities of the FNDP (sustainable economic growth and wealth creation and IWRM (equity, efficiency and environmental sustainability). In addition the Strategic Focus Areas used adopted the Programme Areas already established by the government under the Water Sector Advisory Group.

Thus the priority issues were identified from the priorities set in the FNDP. These were cross checked by the issues identified by ongoing programmes such as the WRAP, National Rural Water Supply and Sanitation Programme (NRWSSP), National Environmental Action Plan (NEAP) and Water Sector Programme Support (WSPS), priorities indicated by stakeholders during the consultations, as well as those that will support achievement of the MDG's and the National Vision.

The identification of IWRM/WE plan priority issues utilised the following criteria:

- Issue a barrier to solving other problems;
- Issue a major equity issue;
- Issue will improve development and reduce poverty;
- Issue will significantly improve efficiency;
- Issue will positively impact on environment;

3.2.1. Programmes (Strategic focal areas) and Priority Issues

The priority issues identified in **Table 12** above were organised into four strategic programmes in line with the Water Sector Advisory Group inter-sectoral sub-committees. This approach will ease monitoring of implementation of the projects and coordination. The strategic focal areas include (i) Water Resources Management, (ii) Water Resources Infrastructure Development, (iii) Water Supply and Sanitation;; and (iv) Monitoring, Evaluation and Capacity Building. The Programmes (strategic focal areas) and priority issues are presented in **Table 13**.

Table 13: Programmes (Strategic focal areas) and Priority Issues

PROGRAMME (STRATEGIC FOCAL AREA)	PRIORITY ISSUES
1. Water Resources Management	• Mismatch between water demand and supply as a result of increasing water demand due to social and economic growth • Inadequate forward planning to secure water resources for future demands • Data and information on quantity, quality, distribution and variability of both ground and surface water resources is poor • Limited Research in Water Resources Management • Weak or inadequate legal and institutional frameworks for water resources development and management • Inadequate implementation of integrated water resources management • Inadequate management of international water • Inadequate collaborative arrangements among institutions involved in water resources management and with those in other sectors • Inadequate data and information systems for water resources management and rural water supply and sanitation • Inadequate systems to facilitate water-related disaster preparedness (floods and droughts). • Inadequate and unpredictable sector funding, and relatively lower share in budgetary allocation. • Inadequate mechanisms to mobilise funds for water resources management • Ineffective land use planning • Alteration of natural flow regime of rivers • Poor environmental health • Inadequate protection of wetlands • Inadequate integrated protection and management of catchment areas • Inadequate awareness or implementation of water demand management techniques • Increasing threat of invasive species • Increasing threat to climate change and variability
2. Water Resources Infrastructure Development	• High dependence on rain-fed agriculture and limited utilisation of irrigation. • Population dynamics and settlement patterns • Lack of ownership and protection of waylay for water infrastructure • Inadequate development of the country's water resources infrastructure to meet needs of various sectors • Inadequate policy, guidelines and regulations on the construction, operation, maintenance and monitoring of infrastructure (e.g. Dam operation rules) • Inadequate water conservation and rainwater harvesting systems

PROGRAMME (STRATEGIC FOCAL AREA)	PRIORITY ISSUES
3. Water Supply and Sanitation	• Weak or inadequate legal and institutional frameworks for rural water supply and sanitation. • Inadequate decentralisation of functions to manage water at local level • Inadequate data and information systems for water resources management and rural water supply and sanitation • Low access of water supply and sanitation services in rural areas • Low access of water supply and sanitation services in urban areas and urban poor communities. • Inadequate mechanisms to mobilise funds for investments and operation and maintenance of water supply and sanitation systems • Inadequate waste management systems (dump sites, waste water treatment)
4. Monitoring, Evaluation and Capacity building	• Inadequate gender mainstreaming of water issues into national development • Inadequate human resource and institutional capacity(water resources management and WSS) • Inadequate water research and development • Inadequate awareness or implementation of water demand management techniques • Inadequate awareness of the role of water in economic and social development • Prevalence of HIV/AIDS • Poor Monitoring and Evaluation of activities in the water sector

CHAPTER 4: IWRM/WE IMPLEMENTATION PLAN STRATEGIES

4.1. Introduction

Zambia has articulated its long-term development objectives in the National Vision 2030. The National Vision is *"To become a prosperous middle income country by the year 2030"*. The Vision 2030 identifies a number of development goals, which include: (a) reaching middle-income status; (b) significantly reducing hunger and poverty; and (c) fostering a competitive and outward-oriented economy. In the medium-term, the NDP articulates the national development objectives. Water, is cross cutting and impacts most sectors. It is critical in supporting the other sectors as well as meeting the MDG'S and is thus a high priority sector. The strategies and projects developed/ elaborated herein are therefore aimed at contributing to the attainment of the FNDP, while advancing the development objectives identified in the Vision 2030 and meeting the targets of the Millennium Development Goals (MDG's).

4.2. IWRM/WE Implementation Plan Vision

Within the context of the national development planning framework and in the context of implementing sustainable water resources management and development, the vision of this plan is:

"To achieve equitable and sustainable use, development and management of water resources for wealth creation, socio economic development and environmental sustainability by 2030"

4.3. Goal of the IWRM/WE Implementation Plan

In order to support the development goals of reaching middle-income status, significantly reducing hunger and poverty, and fostering a competitive and outward-oriented economy, outlined in the national Vision, the goal of the IWRM Implementation Plan is:

"Supporting economic growth and improving livelihoods through sustainable water resources development and management with equitable provision of water in adequate quantity and quality to all competing groups of users, at reasonable cost, with security of supply under varying conditions"

This goal is inline with that of the overall water sector stated in the National Water Policy as *"improving the quality of life and productivity of all people by ensuring an equitable provision of an adequate quantity and quality of water to all competing user groups, and, sanitation services to all, at acceptable cost, on a sustainable basis"*. The achievement of this goal will require undertaking the programmes and priority projects set out in this plan.

To realise the goal, there is a need for strong political support for the ongoing reform process ensuring current policies are sustained and that there is increased commitment to funding for the proposed programmes and sustained participation by stakeholders.

4.4. Strategic Objectives and Prioritised Projects

The strategic objectives of the IWRM/WE implementation plan have been developed based on priority water-related issues and concerns identified at district, provincial, catchment and national levels, by stakeholders through the IWRM/WE implementation plan consultation process , the water legislation and institutional reform

process under the WRAP programme and the FNDP consultation process. The strategic objectives are grouped into four programme areas (focal areas) of water resources management, water resources infrastructure development, water supply and sanitation and capacity building, monitoring and evaluation. The interventions in the FNDP that are water-related have been considered in the development of the objectives, strategies and prioritised projects. The strategic objectives for each of the programmes and their respective prioritised projects are outlined and presented in **Table 14**.

Table 14: Strategic Objectives and Prioritised Projects

PROGRAMMES (STRATEGIC FOCAL AREA)	STRATEGIC OBJECTIVES	PRIORITISED PROJECTS
1. Water Resources Management	• Integrated management of all the resources in the catchment areas • Improve water resources planning and management • Improve water use and allocation efficiency	1.1 Water resources planning 1.2 Information management system for water resources, water supply and sanitation 1.3 Surface water resources assessment 1.4 Groundwater resource assessment 1.5 Legal and institutional framework capacity enhancement 1.6 International waters 1.7 Drought management 1.8 Flood management 1.9 Sustainable environmental management 1.10 Protection of catchment areas and management wetlands 1.11 Environmental institutional capacity Building
2. Water Resources Infrastructure Development	• Develop water infrastructure to harness the country's water resources in a sustainable manner and make it available in the required quantity and quality to enhance its utilisation for economic growth.	2.1 Water resource development and infrastructure development 2.2 Monitoring development of water infrastructure
3. Water Supply and Sanitation	• Increase access to safe water supply and sanitation to the urban, peri-urban and rural population • Provide adequate, safe and cost effective water supply and sanitation services with due regard to environmental protection	3.1 Rural water supply and sanitation 3.2 Institutional capacity building and enhancement; 3.3 Urban water supply and sanitation 3.4 Peri-urban water supply and sanitation
4. Monitoring, Evaluation and Capacity building	• Improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects • Monitor and evaluate performance of the programmes and projects in order to determine their impacts	4.1 Mainstreaming cross cutting issues-gender and HIV/AIDS 4.2 Institutional and human resource capacity building and enhancement 4.3 Water research and development 4.4 Public awareness and advocacy 4.5 Monitoring and evaluation 4.6 Financing and economics

4.5. Implementation Plan Project Costs

Although the IWRM/WE Implementation Plan covers the medium-term period 2007- 2010 its aspirations are for the long-term up to 2030. Annex 1 shows the consolidated matrix of the programme focus areas, issues, strategies, objectives and programmes. The medium-term implementation plan will be based on the NDP cycle of five years.

4.5.1. Medium Term Projects (2007 – 2010)

The theme of the FNDP is: *"Broad based wealth and job creation through citizenry participation and technological advancement",* while the strategic focus is *"Economic infrastructure and human resources development"*. The intention is to advance the development objectives identified in the Vision 2030 as well as progress towards

meeting the Millennium Development Goals (MDG's). The Water-related interventions in the FNDP considered in the medium-term projects are shown in Annex 2. **Table 15** gives the cost of the projects. The detailed activities and costs for each of the projects are given in section 4.5.3. Project Concept Notes for selected projects and Project Fact Sheets for all the projects are presented in Annex 3.

Table 15: Project Costs

PROGRAMMES (STRATEGIC FOCAL AREA)	PROJECTS	COST IN K BILLION (2006-2010)
1. Water Resources Management	1.1 Water resources planning	31
	1.2 Information system for water resources, water supply and sanitation	
	1.3 Surface water resources assessment	24
	1.4 Groundwater resource assessment	
	1.5 Legal and institutional framework capacity enhancement	42
	1.6 International waters	9
	1.7 Drought management	
	1.8 Flood management	
	1.9 Sustainable environmental management	139
	1.10 Protection of catchment areas and management of wetlands	23
	1.11 Environmental institutional capacity building	24
2. Water Resources Infrastructure Development	2.1 Water resource development and infrastructure development	1,035
	2.2 Monitoring development of water infrastructure	
3. Water Supply and Sanitation	3.1 Rural water supply and sanitation	293
	3.2 Institutional capacity building and enhancement	
	3.3 Urban water supply and sanitation	291
	3.4 Peri-urban water supply and sanitation	644
4. Monitoring, Evaluation and Capacity building	4.1 Mainstreaming cross cutting issues- gender and HIV/AIDS	2
	4.2 Institutional and human resource capacity building and enhancement	42
	4.3 Water research and development	8
	4.4 Public awareness and advocacy	
	4.5 Monitoring and evaluation	6
	4.6 Financing and economics	

** cost 2007 prices. Exchange rate 1US$ = K 4000*

4.5.2. Long -Term Projects (2010 – 2030)

The specific key activities under the identified projects in the long-term are detailed in **Table 16**. Further details are contained in the Project Concept Notes in the Annexes. These long-term projects and activities are indicative and will be further improved during the preparation process of the subsequent NDPs.

Table 16: Long Term Projects

PROGRAMMES (STRATEGIC FOCAL AREA)	PROJECTS		KEY ACTIVITIES
1. Water Resources Management	1.1	Water Resources Planning	Access water demands to meet needs of various users and develop feasible investment options for implementation
	1.2	Information System for water resources, water supply and sanitation	Update national inventory of water points. Support decentralised information systems at catchment and sub-catchment levels
	1.3	Surface Water Resources Assessment	Update surface water inventory
	1.4	Groundwater Resources Assessment	Implement Ground water regulation
	1.5	Legal and Institutional Framework Capacity Enhancement	Strengthen established catchment councils
	1.6	International Waters	Capacity building for international waters Unit
	1.7	Drought Management	Implement Drought mitigation plans
	1.8	Flood Management	Strengthen early warning systems
	1.9	Sustainable Environmental Management	
	1.10	Protection of Catchment areas and Management of Wetlands	
	1.11	Environmental Institutional Capacity Building	
2. Water Resources Infrastructure Development	2.1	Water Resources Development and Infrastructure Development	Construct 2 large multi-purpose dams
	2.2	Monitoring Development of Water Infrastructure	Inspect and survey safety of major dams
3. Water Supply and Sanitation	3.1	Rural Water Supply and Sanitation (Construction and rehabilitation of facilities)	Construct and rehabilitate water points and sanitation facilities Employ appropriate technologies
	3.2	Institutional Capacity Building and Enhancement	Support Local Authorities in terms of management, planning systems, technical skills and equipment to under take RWSS Support CUs in terms of management, planning systems, technical skills and equipment to under take UWSS
	3.3	Urban Water Supply and Sanitation (rehabilitation of facilities)	Construct and rehabilitate water and waste water treatment plants in District Towns
	3.4	Peri-Urban Water Supply and Sanitation	
	3.5	National Solid Waste Management	Construct solid waste dumps in all the Provincial HQ towns
	3.6	Operation and Maintenance of Township Water Schemes	
4. Monitoring, Evaluation and Capacity building	4.1	Mainstreaming Cross Cutting Issues- HIV/AIDS and Gender	
	4.2	Institutional and Human Resource Capacity Building and Enhancement	
	4.3	Water Research and Development	
	4.5	Public Awareness and Advocacy	
	4.6	Monitoring and Evaluation	
	4.7	Economics and Financing	

4.5.3. Activities and Schedule (5 Year Rolling)

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																					Implementing entities	
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																					
	2006				2007				2008				2009				2010				Lead	others
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
1. 1 Water Resources Planning																						
Specific Objective: To improve water resources planning to allow for decision-making so that water resources supply and demand can effectively be met																						
Activities:																						
Assess current and future water demands considering population and economic growth																					MEWD	MOFNP, CSO, cross sectoral stakeholders
Assess sources of water supply and associated management options and/or investments to meet demands that take into account equity, efficiency and sustainability																					MEWD	Research institutions
Develop national water resources accounts																					CSO	MEWD, MOFNP, Research institutions
Map out potential sites that have adequate water resources to support various social economic activities (settlements and municipal supplies, agriculture, tourism, hydropower, industry and protected areas)																					MEWD	Line Ministries, Research institutions, cross sectoral stakeholders
Promote implementation of water demand management techniques																					MEWD	MLGH, MACO,
Implement integrated plans for water resources development, infrastructure maintenance and operation																					MEWD	Line Ministries, cross sectoral stakeholders
Develop a monitoring and evaluation system (dam operation rules with environmental consideration)																					MEWD	ECZ, Research institutions

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Develop IWRM Plans and integrate into national and local development plans																					MEWD	MOFNP, Line Ministries, cross sectoral stakeholders
Implement IWRM Plans																					MEWD	MOFNP, Line Ministries, cross sectoral stakeholders
Cooperate with other riparian countries and international organisation in the operation, utilisation and management of infrastructure on international waters																					MEWD	METNR, MOFA, RBOs
Build capacity in planning for sustainable infrastructure development																					MEWD	Training institutions, Consultants
Develop appropriate and defined methods for determining environmental flow requirements																					MEWD	ECZ, Research institutions
1.2 Information management system for water resources, water supply and sanitation																						
Specific Objective: i). To develop management information systems for planning, development,allocation and management of water resources at all levels and ii). To enhance planning and management of Water Supply and Sanitation systems																						
Activities																						
Set up an information network of water resources and related information with databases that link to national, provincial, district levels and catchments																					MEWD	Line Ministries, Multi- sectorial Stakeholders, LAs
Operate and maintain high quality information system that should ensure the efficient collection, processing, storage, retrieval and dissemination of information on water resources																					MEWD	Line Ministries, Multi- sectorial Stakeholders
Provide information on water potential and demand as a basis for water allocation in Kafue, Lunsemfwa and Chalimbana catchments																					MEWD	Line Ministries, NGOs, CBOs, LAs, Multi-sectorial Stakeholders

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Regularly update and implement information exchange protocols																					MEWD	Line Ministries, NGOs, CBOs, Multi-sectorial Stakeholders
Create and operate an information dissemination system (internet etc.)																					MEWD	Line Ministries, NGOs, CBOs, Multi-sectorial Stakeholders
Establish an early warning system for extreme hydrological events such as floods and droughts and suggest extenuation measures																					MEWD	OVP, MOCT
Produce weather and water 10-day bulletins;																						
Create and maintain both surface and ground water resource databases and publish yearbooks																					MEWD	MOCT
Develop information management system for rural water supply and sanitation																					MLGH	MEWD, LAs, NGOs
Update urban and peri-urban water supply and sanitation information management system																					MLGH	NWASCO, CUs, LAs, NGOs, Private providers
1.3 Surface Water Resources Assessment																						
Specific Objective: To provide adequate quality data and information on the status of water resources for planning, management and development																						
Activities																						
Rehabilitate and upgrade of 300 hydrometric stations, 6 marine meteorological stations and establishing 10 new stations per year																					MEWD	MOTC, LAs
Collect hydro-meteorological data																					MEWD	MOTC, LAs, multi sectoral stakeholders

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Undertake water assessment (including existing reservoirs)																					MEWD	Research institutions
Design & implement National Water Quality Monitoring Network (including data collection)																					MEWD	ECZ, LAs
Forecast flood and drought (including training) in conjunction with the Meteorological Department																					MEWD	MOTC, ECZ, OVP, Training institutions
Study water quality for threatened areas such as Lusaka, Copperbelt, Luapula, Eastern, Western and Northern provinces																					MEWD	ECZ, LAs
Identify and apply appropriate surface water resources assessment techniques																					MEWD	Research and training institutions
Build capacity in surface water resources assessment at district, provincial and national levels																					MEWD	Research and training institutions
Collect and analyse data on surface water resources potential, demand, use and forecast future demands																					MEWD	Research institutions, multi- sectoral stakeholders
Assess the quantity, quality, distribution and variation of the surface water resources																					MEWD	ECZ, Research institutions
Undertake assessment of the impacts on the water resources arising from climate change, water pollution, river bank cultivation, deforestation and destruction of catchment areas/headwaters and urban development																					MEWD	MTENR, Research institutions, NGos

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
1.4 Ground Water Resources Assessment																						
Specific Objective: To provide adequate quality data and information on the status of groundwater resources for planning, management and development																						
Activities																						
Construct 30 assessment and monitoring boreholes per year and rehabilitate existing boreholes in areas where the Government has directed its economic development for ground water mapping, water levels and quality monitoring																					MEWD	Research institutions, multi- sectoral stakeholders
Collect data from existing observation boreholes (Groundwater Monitoring Network)																						Research institutions, multi- sectoral stakeholders
Develop exploration boreholes to determine potential for use in water supply, agriculture and industry																					MEWD	Research institutions, Contractors multi-sectoral stakeholders
Rehabilitate existing observation boreholes																					MEWD	Research institutions, Contractors
Identify and apply appropriate groundwater resources assessment techniques																					MEWD	Research and training institutions
Build capacity in ground water resources assessment at district, provincial and national levels																					MEWD	Research and training institutions
Collect and analyse data on ground water resources potential, demand, use and forecast future demands																					MEWD	Research institutions, multi- sectoral stakeholders
Assess the quantity, quality, distribution and variation of the groundwater resources																					MEWD	ECZ, Research institutions

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Undertake assessment of the impacts on the ground water resources arising from climate change, water pollution, river bank cultivation, deforestation and destruction of catchment areas/headwaters and urban development																					MEWD	MTENR, Research institutions, NGOs
1.5 Legal and Institutional Capacity Enhancement																						
Specific Objective: To develop the legal and institutional framework for effective and efficient development and management of water resources																						
Activities:																						
Finalise revised National Water Policy																					MEWD	Cabinet
Finalise and enact Water Resources Management Bill																					MEWD	Cabinet, MOJ, Parliament
Set up National Water Authority, IWRM unit at national level																					MEWD	MOFNP, Multi sectoral stakeholders, Consultants
Pilot and set up catchment councils and water users associations (Kafue, Chalimbana and Lunsemfwa River basins)																					MEWD	Line Ministries, Traditional Authorities, NGOs, CBOs, LAs, Multi sectoral stakeholders, Consultants
Develop guidelines and regulations for catchment councils and water users associations																					MEWD	Multi sectoral stakeholders, Consultants
Support to development and implementation of catchment management plans in selected areas (Kafue, Chalimbana and Lunsemfwa River basins)																					MEWD	Line Ministries, Traditional Authorities, NGOs, CBOs, LAs, Multi-sectoral stakeholders, Consultants
Undertake stakeholder participation and awareness raising on the new Policy, Legal and Institutional frameworks																					MEWD	NGOs, CBOs, Print and electronic media

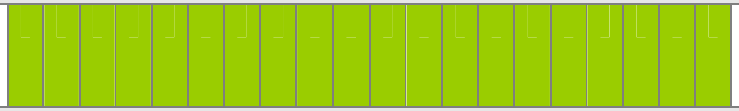
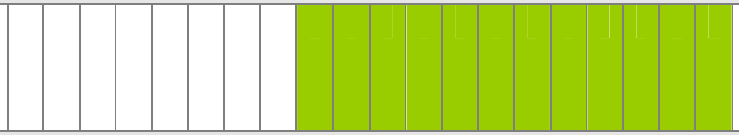
STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Develop and apply water allocation guidelines that include criteria and measures for water allocation and management in times of extreme hydrological conditions																					MEWD	Research institutions, Consultants, Multi-sectoral stakeholders
1.6 International Waters																						
Specific Objective: To manage and develop shared water resources																						
Activities																						
Establish an international waters unit with a system to promptly advise government on international water-related issues and conflict management and resolution.																					MEWD	Cabinet
Build capacity within the unit to manage international waters and in negotiating skills;																					MEWD	Training Institutions, NGOs, Consultants
Facilitate the participation and implementation of international programmes and plans (e. g. SADC, ZRA and ZAMCOM);																					MEWD	MOFA, Line Ministries, Multi sectoral stakeholders
Domesticate articles of international agreements and conventions into local laws.																					MEWD	MOJ, Cabinet, Parliament
Oversee policy, legal and institutional framework governing international waters;																					MEWD	Cabinet, MOJ
1.7 Drought Management																						
Specific Objective: To mitigate the effects of drought on the society																						
Activities																						
Develop and implement an appropriate early warning systems for drought forecasting																					MEWD	OVP, MOCT

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Identify and map all drought prone areas in each catchment																					MEWD	Line Ministries, Research institutions, Consultants
Prepare drought mitigation plans for all vulnerable areas																					MEWD	OVP, MLGH, LAs
Develop and implement protocols for monitoring, forecasting and coordination in the event of droughts																					MEWD	MLGH, LAs
Develop and implement appropriate adaptive mechanisms in drought prone areas such as using water saving/ water efficient devices and promoting drought resistant crops																					MEWD	OVP, MLGH, LAs, Line Ministries
1.8 Flood Management																						
Specific Objective: To mitigate the effects of floods on the society																						
Activities																						
Develop and implement an appropriate early warning systems for flood forecasting																					MEWD	OVP, MOCT
Identify and map all flood prone areas in each catchment																					MEWD	Line Ministries, Research institutions, Consultants
Prepare integrated flood management plans for all vulnerable areas																					MEWD	OVP, MLGH, LAs
Develop and implement a drainage plan for all vulnerable areas																					MEWD	MLGH, LAs

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																							
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																							
	Schedule of Activities																				**Implementing entities**		
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**	
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**			
Develop and implement protocols for monitoring, forecasting and coordination in the event of floods.																					MEWD	OVP, MLGH, LAs, Line Ministries	
1.9 Sustainable Environment Management																							
Specific Objective: (i)To facilitate the development of an effective land use planning system; (ii)To promote the protection and rehabilitation of the degraded environment																							
Activities:																							
Integrate land use plans into the existing guidelines and strategies on water resources management																					MOL	MLGH, MACO, MEWD, METNR, LAs, Traditional Authorities, Multi-sectoral stakeholders	
Strengthen the management plans for watersheds																					METNR	MLGH, MACO, MOL, METNR, LAs, Traditional Authorities, Multi-sectoral stakeholders	
Encourage tree planting and regeneration in degraded areas																					METNR	LAs, Traditional Authorities, Multi-sectoral stakeholders	
Promote sustainable land use systems on water catchment areas																					METNR	MLGH, MOL, MACO, Traditional Authorities	
Undertake on-farm demonstrations and training on mitigation measures for land degradation.																					MACO	Research and Training institutions, NGOs	
Monitor water quality for pollution control purposes																					MEWD	ECZ	
Implement appropriate environmental flow requirements MEWD ECZ																							

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Implement awareness campaigns on environmental management targeting different stakeholders at national, provincial and district level																					METNR	Line Ministries, NGOs, CBOs, Print and electronic media
1.10 Protection of Catchment areas and Management of Wetlands																						
Specific Objective: To promote integrated conservation and sustainable utilisation of wetlands resources; To strengthen the management systems of catchment areas																						
Activities																						
Promote community participation in wetlands management and application of indigenous knowledge in management of wetlands																					METNR	MEWD, NGOs, CBOs, line Ministries, Traditional Authorities
Undertake inventory and classification of wetlands																					METNR	Research institutions, NGOs, Traditional Authorities, MOL, MEWD
Participate in regional and international collaboration in the management of wetlands																					METNR	MEWD, MOFA, RBOs
Improve coordination of wetland management;																					METNR	MEWD, Cabinet, multi- sectoral stakeholders
Undertake public awareness on wetland values and functions.																					METNR	Line Ministries, NGOs, CBOs, Print and electronic media
Build Institutional and human capacity for effective protection of wetlands resources																					METNR	MEWD, NGOs, CBOs, line Ministries, Traditional Authorities
Establish sustainable wetlands resource use practices																					METNR	MEWD, NGOs, CBOs, line Ministries, Traditional Authorities

STRATEGIC FOCUS AREA: 1. WATER RESOURCES MANAGEMENT																						
Strategic Objective: i) Integrated management of all the resources in the catchment area and ii). Improve water resources planning and management																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Control river bank cultivation																					METNR	MEWD, MACO, LAs, NGOs, CBOs Traditional Authorities
Promote the control of deforestation and land degradation especially at headwaters																					METNR	MEWD, MACO, LAs, NGOs, CBOs Traditional Authorities
Incorporate environmental issues in water resources management plans and maintain a link between water and the environment																					MEWD	METNR, Line Ministries, Multi sectoral stakeholders
Undertake the removal of invasive alien species in affected areas of Kafue and Zambezi																					MEWD	METNR, Line Ministries, Multi sectoral stakeholders
Build capacity at entry points into Zambia to monitor the possible entry of invasive alien species																					METNR	MEWD, MOCT, Las, NGOs, CBOs
Harmonise of the existing legal frameworks on catchment areas protection and water resources management																					METNR	MEWD, MOJ, Line Ministries
1.11 Environmental Institutional Capacity																						
Specific Objective: To strengthen management systems of for sustainable utilisation of natural resources																						
Activities																						
Improve coordination and administration																					METNR	Line Ministries, Cabinet
Institutional development and capacity building																					METNR	Cabinet, Training institutions, Consultants

STRATEGIC FOCUS AREA: 2. WATER RESOURCES INFRASTRUCTURE DEVELOPMENT			
Strategic Objective: Develop the country's water resources in a sustainable manner and make it available in the required quantity and quality to enhance its utilisation for economic growth			
2.1 Water Resource Development and Infrastructure Development			
Specific objective: To conserve the country's water resources and make it available for economic and social activities			
Activities			
Construct small dams for economic production across the country (e. g. for agriculture in Nansanga, Kalumwange and Luena farming blocks and the Kafue basin)		MEWD	MACO, LAs, NGOs, CBOs, multi-sectoral stakeholders, Contractors, Consultants
Rehabilitate Dams across the country		MEWD	MACO, LAs, NGOs, CBOs, multi-sectoral stakeholders, Contractors, Consultants
Plan for the construction of 2 large multi-purpose dams (identification of sites, feasibility studies, financing arrangements and preparation of design and construction tender documents/ development agreements)		MEWD	Multi-sectoral stakeholders, Consultants
Develop water resource by means of boreholes for drought prone areas		MEWD	OVP, Line Ministries, NGOs
Undertake water use, irrigation and land use evaluation surveys in peri-urban, dambos and settlement schemes in rural areas		MEWD	MACO, MOL, MLGH, LAs, Traditional Authorities, NGOs, CBOs
Develop large and mini hydro power schemes		MEWD	Multi-sectoral stakeholders, NGOs, Contractors, Consultants
Develop canals for irrigation and transport		MEWD	MACO, MOCT, LAs, NGOs, CBOs, multi- sectoral stakeholders, Contractors, Consultants

STRATEGIC FOCUS AREA: 2. WATER RESOURCES INFRASTRUCTURE DEVELOPMENT			
Strategic Objective: Develop the country's water resources in a sustainable manner and make it available in the required quantity and quality to enhance its utilisation for economic growth			
Construct irrigation schemes		MACO	MEWD, LAs, NGOs, CBOs, multi-sectoral stakeholders, Contractors, Consultants
Provide water and sanitation facilities to industrial and manufacturing areas		MLGH	MEWD, LAs, multi sectoral stakeholders, Contractors, Consultants
Dredge inland water ways		MOCT	MEWD, LAs, multi-sectoral stakeholders, Contractors, Consultants
2.2 Monitoring Development of Water Infrastructure			
Purpose: To ensure development and management of water infrastructure in a sustainable manner			
Activities			
Develop policy, guidelines and regulations on water infrastructure development and management.		MEWD	NGOs, multi-sectoral stakeholders, Consultants
Undertake monitoring of water infrastructure development, operation and management		MEWD	LAs, multi-sectoral stakeholders, Consultants
Undertake public awareness on regulations for water infrastructure development and management		MEWD	Line Ministries, NGOs, CBOs, Print and electronic media

STRATEGIC FOCUS AREA: 3. WATER SUPPLY AND SANITATION

STRATEGIC OBJECTIVE: To provide adequate, safe and cost effective water supply and sanitation services with due regard to environmental protection

	Schedule of Activities																				Implementing entities	
	2006				2007				2008				2009				2010				Lead	others
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
3. 1 Institutional Capacity Building and Enhancement																						
Specific Objective: To promote legal and institutional framework capacity enhancement																						
Activities:																						
Elaborate on water supply and sanitation strategy																					MLGH	MEWD, NWASCO, CUs, LAs,
Undertake capacity building in UWSS planning, implementation, monitoring, information management, sanitation and hygiene education																					MLGH	Training institutions, NWASCO, MoH, MEWD, CUs, LAs,
Undertake capacity building in RWSS planning, implementation, monitoring, information management, sanitation and hygiene education																					MLGH	Training institutions, MoH, MEWD, LAs, NGOs, Consultants
Conduct Training in community management approaches, concepts water demand management, IWRM at District, Provincial and National levels																					MLGH	Training institutions, NGO's, CBOs, Consultants
3. 2 Urban Water supply and Sanitation																						
Specific Objective: Increase access to safe, adequate waters supply to 80% of the urban and peri-urban population by 2010, and proper sanitation systems to 70% for the urban and peri-urban population by 2010.																						
Activities																						
Provide Investments in Water Supply and Sanitation infrastructure in CUs and Local Authorities																					MLGH	CUs, LAs, Contractors, Consultants
Support commercialisation of water and sanitation services in Northern, Central, Eastern and Lusaka provinces																					MLGH	NWASCO, LAs
Construct land fill sites in Livingstone, Solwezi, Chipata and support to collection of solid waste																					MLGH	ECZ, LAs, Contractors, Consultants

STRATEGIC FOCUS AREA: 3. WATER SUPPLY AND SANITATION																						
STRATEGIC OBJECTIVE: To provide adequate, safe and cost effective water supply and sanitation services with due regard to environmental protection																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Construct and rehabilitate waste water treatment facilities in Lusaka, Livingstone, Solwezi and Kafue																					MLGH	ECZ, LAs, Contractors, Consultants
Undertake operation and maintenance of township water supply and sanitation systems																						
3.3. Rural Water Supply and Sanitation																						
Specific Objective: To increase access to safe water supply from present 37% to 66% of the rural population by 2010 and increase access to proper sanitation from 13% to 50% of the rural population by 2010																						
Activities:																						
Construct new RWSS facilities																					MLGH	LA's, MEWD, NGOs, CBOs , Contractors, Consultants
Rehabilitate RWSS facilities																					MLGH	LA's, NGOs, CBOs, Contractors, Consultants
Conduct Training in community management, planning, O&M of water supply and sanitation systems																					MLGH	Training institutions NGOs, CBOs, Consultants
Support to WASHE																					MLGH	LAs, Line Ministries, NGOs, CBOs
3. 4 Per-Urban Water & Sanitation																						
Specific Objective: Increase access to safe, adequate waters supply and sanitation to the peri-urban population																						
Activities																						
Construct new water and sanitation facilities																					MLGH	LA's, MEWD, NGOs, CBOs, Contractors, Consultants

STRATEGIC FOCUS AREA: 3. WATER SUPPLY AND SANITATION																					
STRATEGIC OBJECTIVE: To provide adequate, safe and cost effective water supply and sanitation services with due regard to environmental protection																					
	Schedule of Activities																			Implementing entities	
	2006				2007				2008				2009				2010				Lead	others
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Rehabilitate existing WSS facilities																					MLGH	LA's, NGOs, CBOs, Contractors, Consultants
Undertake environmental health education and sensitisation																					MLGH	MOH, MOE, CUs, LAs, NGOs, CBOs, Print and electronic media

STRATEGIC FOCUS AREA: 4. MONITORING, EVALUATION AND CAPACITY BUILDING																							
STRATEGIC OBJECTIVE: (i) To improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects, and (ii) To monitor and evaluate the performance of programmes and projects in order to determine their impacts																							
	Schedule of Activities																				**Implementing entities**		
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**	
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**			
4. 1 Mainstreaming Cross Cutting Issues- HIV/AIDS and Gender																							
Specific Objective: To implement measures in the sector which enhance mainstreaming of crosscutting issues																							
Activities																							
Monitor and evaluate gender mainstreaming in the development and implementation of water sector project activities																					Cabinet (GIDD)	MEWD, NGOs, Line Ministries	
Promote the use of appropriate and gender sensitive technology																					MEWD	Cabinet (GIDD), NGOs, Line Ministries, Research institutions	
Develop guidelines that consider gender and vulnerable in the use and management of water resources																					MEWD	Cabinet (GIDD), NGOs, Line Ministries, Research institutions	
Develop and disseminate of gender mainstreaming tools																					Cabinet (GIDD)	NGOs, Line Ministries, Research institutions	
4. 2 Institutional and Human Resource Capacity Building and Enhancement																							
Strategic Objective: To promote capacity in order to efficiently and effectively carry out the mandates of various stakeholders																							
Activities																							
Undertake recruitment, education and training of personnel to align them into IWRM sphere																					MEWD	Training Institutions, NGOs, Cabinet, Consultants	
Create a research and training centre for IWRM																					UNZA	MEWD, NGOs, Line Ministries, Training and Research institutions	
Conduct needs assessment and develop programme for capacity building																					MEWD	Line Ministries, NGOs, multi-sectoral stakeholders, Training institutions, Consultants	

STRATEGIC FOCUS AREA: 4. MONITORING, EVALUATION AND CAPACITY BUILDING																						
STRATEGIC OBJECTIVE: (i) To improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects, and (ii) To monitor and evaluate the performance of programmes and projects in order to determine their impacts																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Undertake informal training and exchange or secondment of staff between public, non-governmental and private sector water institutions																					MEWD	Line Ministries, NGOs, multi-sectoral stakeholders, Training Institutions, Consultants
Provide training in conflict management and arbitration for water resources related conflicts and arbitration																					MEWD	Line Ministries, NGOs, multi-sectoral stakeholders, Training Institutions, Consultants
4.3 Water Research and Development																						
Strategic Objective: To enhance the understanding of the country's water-related issues, and develop solutions and technologies that will improve planning, regulation, development, management, allocation and access of water																						
Activities																						
Research on application of appropriate technologies for efficient water use																					MEWD	UNZA- IWRM Centre, NGOs, line Ministries, Research institutions, Consultants
Study the cyclic variation of floods and droughts																					MEWD	UNZA- IWRM Centre, NGOs, line Ministries, Research institutions, Consultants
Study precipitation enhancement																					MOCT	UNZA- IWRM Centre, Research institutions, Consultants
Develop appropriate technology in water resources management (i.e. water re-use)																					MEWD	UNZA- IWRM Centre, NGOs, line Ministries, Research institutions, Consultants
Carryout research in inter basin water transfer																					MEWD	UNZA- IWRM Centre, NGOs, line Ministries, Research institutions, Consultants

STRATEGIC FOCUS AREA: 4. MONITORING, EVALUATION AND CAPACITY BUILDING																						
STRATEGIC OBJECTIVE: (i) To improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects, and (ii) To monitor and evaluate the performance of programmes and projects in order to determine their impacts																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Study operations of existing and new dams to improve the benefits																					MEWD	UNZA- IWRM Centre, NGOs, line Ministries, Research institutions, Consultants
Study the impact on water resources of erosion and land degradation																					MEWD	UNZA- IWRM Centre, NGOs, line Ministries, Research institutions, Consultants
Study indigenous practices and knowledge in management of water resources																						UNZA- IWRM Centre, NGOs, Traditional Authorities Research institutions, Consultants
Consider appropriate technologies for water supply and sanitation systems for persons with disabilities																					MLGH	NGOs, Research Institutions
Conduct research in international waters to address specific issues of equitable and reasonable utilisation, water allocation, benefit sharing and stakeholder participation																					MEWD	UNZA- IWRM Centre, Research institutions, Consultants
4.4 Public Awareness and Advocacy																						
Strategic Objective: To provide and disseminate information on Water resources for effective planning, development, management and utilisation																						
Activities																						
Develop awareness programmes on water demand techniques																					MEWD	Line Ministries, NGOs, CBOs, multi-sectoral stakeholders, Print and electronic media
Pilot the use on water demand techniques in some selected areas																					MEWD	MACO, MLGH, LAs, Research institutions, NGOs

STRATEGIC FOCUS AREA: 4. MONITORING, EVALUATION AND CAPACITY BUILDING																						
STRATEGIC OBJECTIVE: (i) To improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects, and (ii) To monitor and evaluate the performance of programmes and projects in order to determine their impacts																						
	Schedule of Activities																				**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Develop awareness programmes on role of water in the economy (role of water in energy, irrigation, industry, tourism, culture, fisheries sectors etc)																					MEWD	Line Ministries, NGOs, CBOs, multi-sectoral stakeholders, Print and electronic media
Strengthen multi stakeholder of Consultative Forum, the Water SAG (effective involvement of all stakeholders including the private sector, NGOs and civil society organisations)																					MEWD	MOFNP
Incorporate Education programmes on the water sector in the education curriculum																					MEWD	MOE, Training institutions
Disseminate National Water Policy and the new water management legislation																					MEWD	Line Ministries, NGOs, CBOs, multi-sectoral stakeholders
4.5 Monitoring and Evaluation																						
Strategic Objective: To monitor and evaluate the performance of the programmes and projects in order to determine their impacts																						
Activities																						
Design and setup a monitoring and evaluation system																					MEWD	WSAG, MOFNP
Collect data on input and outputs of various programmes and analyse																					MEWD	WSAG, MOFNP, multi-sectoral stakeholders
Undertake impact monitoring by collecting data on the planned outcomes																					MEWD	WSAG, MOFNP, multi-sectoral stakeholders
Undertake external evaluations and studies to assess long-term impacts																					MEWD	WSAG, MOFNP, Research Institutions, Consultants

STRATEGIC FOCUS AREA: 4. MONITORING, EVALUATION AND CAPACITY BUILDING																							
STRATEGIC OBJECTIVE: (i) To improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects, and (ii) To monitor and evaluate the performance of programmes and projects in order to determine their impacts																							
	Schedule of Activities																				**Implementing entities**		
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**	
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**			
4.6 Economics and Financing																							
Specific Objective: To provide sustainable financing for management of water resources																							
Activities																							
Develop appropriate tariff for urban water supply and sanitation																					CUs	NWASCO, LAs	
Develop raw water pricing policy, tariff system and financing mechanisms for water resources management and development																					MEWD	Multi-sectoral stakeholders, NGOs, Research institutions, MOFNP, Consultants	
Assess viability of issuing Municipal Bonds for urban water supply and sanitation infrastructure development																					MLGH	NWSCO, MOFNP, Consultants, CUs	
Assess viability of integrating micro- financing schemes with peri-urban and rural water supply and sanitation infrastructure development																					MLGH	NWASCO, MOFNP, Consultants, CUs	
Establish a irrigation development fund																					MACO	MOFNP	
Establish a water development fund																							
Develop national water resources accounts																					CSO	MEWD, MOFNP, Multi-sectoral stakeholders, Consultants	
Prepare integrated and consolidated budgets and investment plans for water-related projects																					MEWD	Multi-sectoral stakeholders, MOFNP, Consultants	

STRATEGIC FOCUS AREA: 4. MONITORING, EVALUATION AND CAPACITY BUILDING																					
STRATEGIC OBJECTIVE: (i) To improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects, and (ii) To monitor and evaluate the performance of programmes and projects in order to determine their impacts																					
	Schedule of Activities																			**Implementing entities**	
	2006				**2007**				**2008**				**2009**				**2010**				**Lead**	**others**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
Strengthen revenue collection management (by Water Board)																					MEWD	MEWD, MOFNP, Multi-sectoral stakeholders, Consultants
Review the effluent discharge charges and the charging mechanism																					ECZ	MEWD, MOFNP, Multi- sectoral stakeholders, Consultants
Prepare Business Plan for proposed IWRM institution																					MEWD	Consultants

CHAPTER 5: FINANCING OF THE IMPLEMENTATION PLAN

5.1. Financing the IWRM/WE Implementation Plan

The formulation process of the FNDP plan highlighted the need for stakeholder collaboration in the implementation of programmes in the FNDP. With regard to the financing of the IWRM/WE Implementation Plan, considerable resources will be needed to implement the IWRM programmes identified. An analysis of the programmes in the FNDP shows that the lists of programs are sectoral with each sector having outlined its own implementation mechanism. In order to improve coordination and avoid duplication, the water-related programmes outlined in the sectoral plans and included in the FNDP, have been rationalised and synthesised into the four priority clusters as outlined in section 3.2.1. Programmes (Strategic focal areas) and Priority Issues

In order to ensure that the programmes prioritised for implementation achieve maximum benefits, stakeholder collaboration is important and the various water-related sectors need to ensure that funds are budgeted for prioritised programmes during annual budgeting in line with the proposed implementation schedule of the IWRM/WE Implementation Plan.

5.2. Medium Term Expenditure Framework and IWRM/WE Financing

The government projects its financial resource allocation through a three-year financial framework, namely the Medium Term Expenditure Framework (MTEF). MTEF is a framework within which available resources (both government and cooperating partners) are divided between sectors on the basis of achieving government objectives. The MTEF approach involves a top-down and bottom-up process of estimating total resource availability for a three year period and dividing these resources between ministries, provinces and other spending agencies (MPSA's) based on government priorities. From the bottom up, MPSA's move away from an incremental approach to budget preparation and prepare a Strategic Plan as the basis of the budget. That Plan sets out the MPSA's objectives, outputs and activities, from which an activity-based budget is prepared, forming the basis for the main budget.

Table 17 below shows the indicative expenditure allocation to the sectors with water management and development related activities. However, it is important to note that the budgets are only for water specific programmes. The MTEF is an essential complement to the National Development Agenda and the FNDP. It is designed to help implement the latter by giving priority in resource allocation and implementation of activities in the FNDP. In addition, it is a tool or mechanism used to operationalise the plans and strategies stipulated in the FNDP.

Table 17: MTEF Indicative Expenditure Allocation

Institution	Sector	2007	2008	2009	2010
MEWD	Water	10,000,000,000	10,700,000,000	25,900,000,000	29,500,000,000
MLGH		24,907,244,966	20,800,000,000	21,100,000,000	23,500,000,000
MACO	Agriculture	48,700,000,000	34,400,000,000	53,450,000,000	87,950,000,000
MTENR	Environment	50,756,370,647	44,955,067,842	63,188,733,715	82,598,187,535

Source: Ministry of Finance and National Planning-modified from MTEF 2007-2010 (units Kwacha)

The factors that would guide the allocation of resources within an MPSA are the same as those at the national level, i.e. those programmes that achieve government objectives with the least cost and within the resources (both financial and human) available to the organisation. Based on the role of government for the particular programme, that is, if government is the main provider of a service then the expenditure requirements would be higher than if the government is mainly facilitating private sector growth.

With regard to allocation of public funds in the water sector in the national budget, the IWRM/WE Implementation Plan will be a basis for setting priority expenditure areas through the Water SAG. The Water SAG will allocate expenditure levels for institutions in the water sector for the budget year, according to FNDP priorities. These priorities have been the basis for prioritisation of the IWRM/WE programmes. The Water SAG will send proposed budget allocations to MOFNP for consideration in constructing the macro-economic framework and the fiscal framework for the MTEF Green Paper. Water sector institutions, through the Water SAG will allocate funds to water programmes from ceilings given in the MTEF Green Paper and in accordance with FNDP priority expenditure outlays identified by the SAG, including complying with PAF targets. Expenditure estimates for a budget year are then approved by Parliament. .

According to the FNDP, total projected financing requirements in water-related programmes will be K2,069.0 billion over the 5-year period. This is against the available resource of K1,950.1 billion. The financing gap of about 6.1% or K118.9 billion over and above the estimates is required. This gap is mainly from the water supply and sanitation related programmes.

The plan will be financed by a number of sources namely domestic resources, external grants, limited borrowing (both internally and externally), public private partnerships, regional and international financing initiatives, e.g. NEPAD, Africa Enterprise Challenge Fund and Infrastructure Consortium. An increase in the resource envelope based on an anticipated scaling-up of cooperating partners aid over baseline projections, such as the Gleneagles G8 Summit in 2005 and Millennium Challenge Account, is expected.

It is important to note that the Water Resources Action Programme has already sourced some finances to commence the water management interventions stipulated in the proposed Water Law from the European Union Water Facility.

The country has already established an enabling environment by establishing various funds that could finance the sector. There is need though to streamline the disbursement of these funds and evaluate their performance for effective capacity to be developed.

Capital investment finance for public infrastructure will remain the responsibility of the government in collaboration with development and private partners. It is also envisaged that with government's commitment to cost recovery, under domestic resources, the commercial utilities could be allowed to charge economic tariffs.

5.3. Financing Strategy

The sustainable development and management of water resources requires holistic planning and financing, stable financial mechanisms and availability of adequate funds for capital investments for both infrastructure expansion and rehabilitation. This also requires appropriate channelling of these resources to the prioritised needs. The plan will be financed from a number of sources namely:

5.3.1. Domestic Resources

5.3.1.1. Capital:

The strategy for capital investments will be to:

- Increase the government allocation for capital investment to the water sector;
- Implement a streamlined financial planning mechanism that facilitates equitable distribution of resources and has accepted expenditure principles for smooth execution of Water Sector programmed activities;
- Develop appropriate financing mechanisms (e. g. basket funds-SWAP, budget support, Local Government Capital Grant System,) that will provide for efficient and prioritised channelling of funds according to national plans;
- Establish a Water Development Trust Fund under the proposed water legislation as one of the sources for financing infrastructure; and
- Strengthen the financial mechanisms to ensure full recovery of operational and maintenance costs and an increasing contribution to covering replacement costs under water supply and sanitation

5.3.1.2. Recurrent:

Currently, the recurrent expenditure is supplemented by government. However these funds are not adequate to meet all recurrent requirements. The source of funds for recurrent costs in urban areas will have to be from consumers, based on cost recovery tariff principles. Therefore, in order to realise the recurrent funds necessary to support water resources management activities, the abstraction and use charges of water resources for economic purposes as well as for effluent discharge will be enhanced. The level of abstraction and discharge charges and the criteria to be used in setting such charges will be subject to regular review and approval by the water resources management regulator.

This could be achieved through:

- Setting appropriate water user charges to ensure that they reflect real value of water by using economic parameters such as inflation rate, market values and opportunity costs of water, while considering the social, political and environmental issues;
- Setting abstraction and discharge charges based on the costs of providing effective water resources management as determined by the approved annual operating budgets, taking into account any subsidies from government;
- Increasing the water user charges collection capacity at catchment levels; and
- Allocating revenue from water charges to the organisations responsible for water resources management at different levels in a transparent manner.

5.3.2. External Financing

5.3.2.1. Loans:

There is limited borrowing both internally and externally.

5.3.2.2. Grants:

Government has been reorganising its Aid Policy and the support mechanisms to streamline aid. The Cooperating Partners are being regrouped according to their sector interests areas and them identifying a lead-donor to represent their views to government to cut down on transaction costs.

Direct budget support through the Joint Assistance Strategy for Zambia is being developed- funds from Cooperating Partners are to be deposited into the national treasury for basket funding.

5.3.2.3. Private Finance:

Involvement of the private sector in the financing of water resources will be encouraged where this would result in a more efficient and cost-effective development and management of the resources. The government in creating an enabling environment and has developed a Private Public Partnership Policy that will be a national guide in engaging the private sector into developmental investments.

5.3.2.4. Regional and international financing initiatives

The government, within its FNDP acknowledges the need for more financial resources and it plans to scale-up the mobilisation of foreign resources e.g. NEPAD, African Development Bank, Africa Enterprise Challenge Fund and Infrastructure Consortium. An increase in the resource envelope based on an anticipated scaling-up of donor aid over baseline projections e.g. Gleneagles G8 Summit in 2005 and Millennium Challenge Account, is expected.

5.3.2.5. Community Financing

The government has been sensitising and encouraging rural communities to establish village water committees and subsequently create village water funds for the management of finances for operational and maintenance of rural water supply schemes by the communities.

In rural areas, communities will be required to pay full operation and maintenance costs and costs of higher service levels, and contribute to capital investment costs, as well as to manage their schemes. The communities, especially in peri-urban areas, set the price per unit measure of the quantity of water, normally equivalent to a 20-litre container. This is commonly done democratically with the main goal being to meet operation and maintenance costs. In addition, communities will be expected to contribute to capital costs in cash or kind amounting to about 20 percentage of the total cost. In river catchment areas, the tariffs will be set in accordance with the provision under the proposed Water Resources Management Bill.

5.3.2.6. Other financing mechanisms- Innovative financing

Environmental Charges:

To protect the environment as well as maintain the natural quality levels, the current environmental charges (e.g. effluent fees), will have to be enhanced taking into account economic and social considerations. The government intends to introduce a carbon tax as a charge for vehicles based on engine capacity.

Bonds:

The capital market has developed extensively in the country, and the water sector could utilise it to tap the required private as well as public resources for infrastructural construction. There is currently a proposal for lease bonds in water supply and sanitation. There are efforts to explore the possibilities of introducing these through municipal bonds, which are currently only in the form of housing bonds.

Virtual Water:

Zambia has a water resource advantage over other Southern African countries which she could use to lure more financial or infrastructural resources. There is a proposal to enter into a virtual project with Namibia. The project will be hosted in the Western Province of Zambia once the feasibility results are completed. There is a need for more efforts to tap “Virtual Water” gains in managing and developing the county’s water resources.

Transboundary water charges and benefits:

Zambia will explore the possibilities of charging for managing the international waters, as well as benefit and cost sharing of the trans-boundary catchments under the existing water management institutions. One such example is the benefit sharing between Zambia and Zimbabwe under the Zambezi River Authority.

These financing sources will be channelled in terms of the financial management reform processes, being:

- **Fiscal decentralisation**

  In line with its Decentralisation Policy, government has planned to disburse funds directly to the districts as the decentralisation of finances has been identified as one of the major strategies, for the successful implementation of the FNDP. It is hoped that ultimately this will bring about wealth creation and poverty reduction. Thus, in line with the Decentralisation Policy, the aspirations are that, power and resources will be devolved to the local governments to improve the implementation of programmes.

  However, any channelling of funds from the central government directly to districts will require capacity building if the districts are to absorb the resources, use them effectively and to ensure accountability, transparency and improved monitoring. In addition, the districts will need to have capacity for collecting revenues from revenue generating ventures and to account for it.

  In the medium-term therefore, resources will continue to be disbursed through the de-concentrated structures at the local level whilst capacitating local authorities in readiness for the devolution. One of the FNDP implementation strategies under fiscal decentralisation is to initiate an exercise of de-concentrating ministerial allocations by programme and location to ensure that resources get to the level of the projects in each district.

- **Sector Wide Approach**

  A holistic and sector-wide approach to planning (SWAP) has been advocated for as one of the methods to ensure efficient allocation of public financial resources, for the purpose of reducing sector, regional and district inequalities. The government is discussing these issues with its cooperating partners under the Joint Assistance Strategy.

CHAPTER 6: IMPLEMENTATION MECHANISMS

6.1. Introduction

The IWRM/WE Implementation Plan is proposed to coincide with the National Long Term Vision 2030. At a national level, the Vision will be realised through development and implementation of National Development Plans, starting with the current Fifth National Development Plan. The IWRM/WE Implementation Plan is intended to support the implementation of the water-related programmes in the National Development Plans, using an IWRM approach. While the IWRM/WE Implementation Plan is proposed up to 2030, it will be operationalised through 5 year rolling National Strategic IWRM/WE Implementation Plans. The long-term goal of the water sector is to have a robust and well functioning legal and institutional framework that promotes and supports the coordinated development, management and use of water resources.

The new legal and institutional framework, currently proposed in the draft Water Resources Management Bill, is designed to be the governance framework for integrated water resources management. Until a new legal and institutional framework has been established in Zambia, the focus will be on strengthening water resources management at all levels using the present legal and institutional framework. This will entail working with the present institutions engaged in water resources management. The implementation of the IWRM/WE Plan will thus be preceded by a transition phase under which several functions related to its implementation will be carried out by existing institutions under the existing legal and institutional framework.

It may take many years to fully establish a new institutional framework, depending on how the experience gained from the transitional phase is applied and on the financial and human resources available for implementation and follow-up. The importance of both institutional and human capacity building at all levels and in all programmes during implementation, is stressed.

6.2. Existing Institutional Roles and Responsibilities

Table 18 shows the existing institutions under the present legal framework and their responsibilities based on various pieces of legislation.

Table 18: Players in the Water Sector and their Roles

ACTOR	ROLES
MEWD, Water Board	• Sets National water policy • IWRM policy and international water • Management and development of water resources • Regulating water resources
MLGH, DISS	• WSS sub-sector policy and strategy elaboration and overseeing service provision to urban and rural areas by local authorities and the commercial water utilities • Resource mobilisation
MACO, MTENR, MoH	• Strategy elaboration (i. e. irrigation policy), sanitation, and hygiene promotion,
Statutory Bodies: NWASCO, Water Development Board, ECZ	• Advisory and regulatory roles • Pollution Control (ECZ)
CUs	• Service provision
Local Authorities	• Service provision in rural and urban areas; in urban areas service provision is delegated in most urban areas to CUs
Training and research Institutions	• Human resource training • Research

ACTOR	ROLES
Cooperating Partners and NGOs	• Provision of capital funds • Execution of WSS programmes and projects by NGOs
Private Sector	• Participation in financing and management of WSS • Consulting services • Construction of WSS facilities
Community and CBOs	• Beneficiary of WSS services • Maintenance of sources

Source: Government of the Republic of Zambia, 2006. Fifth National Development Plan

The above institutional framework is faced with challenges of effective coordination and overlapping responsibilities. The proposed institutional setup is expected to promote and adopt a dynamic, gender-sensitive, integrated, interactive, participatory and multi-sectoral approach to water resources management and development that includes human, land, environmental and socio-economic considerations (Water Resources Management Bill, 2006). The establishment of the new institutional framework is expected once the proposed Water Resources Bill has been enacted.

6.3. Transitional Arrangements

Implementation of the IWRM Implementation Plan, particularly the 1st 5-year rolling plan (2007-2010) will focus on implementation of actions to facilitate the establishment of the proposed institutional framework, capacity building and also implementation of the other projects identified as part of the IWRM/WE Implementation Plan. During the transition period to the new institutional framework, implementation of the IWRM programmes in the 5-year rolling plan will be guided by the institutional mandates of the above institutions. The approach proposed is to distinguish the activities of WRAP and the implementation of other programmes as detailed below.

6.3.1. Establishment of the new institutional framework

Lessons should be drawn from the then Reform Support Unit that facilitated the establishment of NWASCO and continued to operate for some time providing support. To facilitate ease of transition from the old to the new, the Water Resources Action Programme (WRAP), currently facilitating adoption of the proposed Water Resources Management Bill and development of key management tools and systems, will play a major role in facilitating the operationalisation of the proposed institutional framework.

During the transition phase, the WRAP should continue facilitating and coordinating activities towards the establishment of the proposed Water Resources Management Authority. These activities will be carried out within the framework of the IWRM/WE Implementation Plan and as a project under the Water Resources Management Programme under the Legal and Institutional Framework Capacity Enhancement Project. Some of these include development of the national pricing strategy and development of water allocation guidelines.

When the Water Resources Management Bill is passed, the WRAP will continue to facilitate commissioned activities (those already being implemented) within the framework of transitional activities. Un-commissioned activities will be passed on to the WRMA which will progressively take responsibility of facilitating the execution of activities.

6.3.2. Implementation of other projects in the five year rolling plans

Implementation arrangements for the other non-transitional activities that are not directly related to the establishment of the WRMA will be based on the arrangements for implementing projects under the 5- year rolling

plans. Implementation arrangements will be detailed in the implementation schedule and project concept notes that are developed along side each 5-year rolling plan will be included. The lead and participating agencies will be indicated for the programmes and projects. This will be based on the respective roles and responsibilities of the various stakeholders involved in the implementation of the plan.

6.4. Coordination Mechanisms

Coordination of the implementation will be a key determining factor for the success of the IWRM/WE Implementation Plan, particularly for the transition phase when the various water resources functions are split in different departments across the water sector.

6.4.1. Water Sector Advisory Group

Coordination between sectors should exist on all levels, central, provincial and local, for the planning of water resources, infrastructure, adoption of non-structural measures, institutional strengthening, decentralisation and operation of water resources systems.

To avoid duplication of efforts, and to ensure optimal utilisation of available resources, it is crucial to institute strong legal and institutional frameworks for coordination and collaboration among all institutions that are dealing with water resources management and development. The Water SAG framework described in section 2.9.5. Policy Coordination, will be the coordination mechanism during the implementation of the IWRM/WE Implementation Plan. With respect to monitoring and evaluation, regular and continuous checking and documentation of progress will be undertaken to ascertain whether objectives and planned programmes/activities have been implemented and have achieved the planned outputs and impacts. A decentralised approach to collecting data for monitoring will be used. The implementing structure and the beneficiaries will be invited to participate. Transparency of information and reporting will be emphasised in order to enhance effective utilisation of budgets and inputs and equity of distribution of resources, which will be communicated in the operational and strategic feedback loop. With the decentralisation policy and the Decentralisation Implementation Plan (DIP) in place, districts will be able to participate in monitoring results and making changes as and when required.

6.4.2. Technical Secretariat –IWRM Unit

The WSAG is currently coordinated through the Department of Planning and Information (DPI) in the Ministry of Energy and Water Development. The setting up of the proposed Water Sector Monitoring Unit should be finalised. It is proposed that this Unit be strengthened into a technical secretariat that will coordinate the implementation of the IWRM/WE Implementation Plan.

The Technical Secretariat (IWRM Unit) will be the main driver of the IWRM/WE Implementation Plan implementation and should be supported with adequate staff competences to enable it to execute its function. A full time IWRM/WE Implementation Coordinator is required to lead the Technical Secretariat. The roles of the Technical Secretariat will be:

- Coordinate the implementation of the IWRM programmes;
- Serve as WSAG Secretariat;
- Facilitate coordination of projects in the IWRM/WE Implementation Plan;
- Facilitate mobilisation of funds for the IWRM programs;
- Ensure that the WSAG is functional and fully serviced;
- Prepare progress reports for the IWRM programmes;
- Coordinate and lead the preparation of 5 year rolling plans for the IWRM/WE Implementation Plan; and

- Ensure linkages of the IWRM programmes with the National Development Plans.

The responsibilities for the activities under the prioritised projects are shown in section 4.5.3. Activities and Schedule (5 Year Rolling).

6.5. Risks and Assumptions

The implementation of the IWRM/WE Implementation Plan will encounter a number of risks but will also be based on a number of assumptions:. These include the following:

Assumptions are that:

- It is possible to mobilise adequate technical and human resources for large-scale implementation.
- The IWRM approach and framework, the National Water Policy as well as the legal and institutional framework can be sufficiently anchored at all levels to avoid a situation where stakeholders are operating in an institutional “vacuum” or where institutional sector responsibilities are not clarified and sufficiently met.
- Responsibilities of MFNP and other water related institutions and ministries regarding regulation, supervision and monitoring of district planning and budgeting procedures will be clarified.
- There will be improved coordination of government and donor interventions in IWRM
- Government policies, programmes and political interventions will not contradict or cause confusion among the implementers and the beneficiaries.
- Water users would appreciate the need to contribute towards water use.
- Government will fully implement the Fifth National Development Plan and subsequent national development plans.
- Key stakeholders will understand the decentralisation of responsibility and overcome the resistance for change.
- Government will be able to raise the funds necessary to implement the programmes, especially for infrastructure development.

Identified risks and mitigation are:

- Cooperating Partners may not identify with the IWRM Implementation Plan. This risk could be assessed as low to medium. It could be mitigated through formalising the cooperating partners coordination mechanism, the learning processes and the reviews included in the implementation plan.
- The implementing agencies will not adhere to the implementation plan. This risk is assessed to be low to medium and the capacity building activities and monitoring and evaluation mechanism included in the plan would be a mitigating factor.
- Government may not enact the Water Resources Management Bill. This would make it difficult for catchment councils to operate. This risk could be mitigated by the implementation of the decentralisation policy.
- Political interference in the implementation of programmes. This could occur through diverting of funds meant for water resource management projects. This risk would be mitigated through the ring-fencing of water related expenditures in the national budget.
- Corruption at all levels is a risk. This risk is assessed medium to high and it will be mitigated by rigid use of the government procedures for anti-corruption.

CHAPTER 7: MONITORING AND EVALUATION

Monitoring and evaluation (M&E) will be important input to achieving the targets of the IWRM/ WE Implementation Plan and eventually the FNDP. The monitoring and evaluation framework will thus be linked to the national planning monitoring and evaluation framework. Monitoring of the IWRM/WE Plan will involve the observation and verification of whether the IWRM/WE activities are happening as planned. Monitoring will supply both the planned projects and the plan implementation process with a continuous flow of information to make it possible to make the right decisions. Evaluation on the other hand will determine the relevance, impact, effectiveness, efficiency and sustainability of the plan interventions of the various institutions that will implement the IWRM/WE Plan. Information from the systematic monitoring will provide critical input to plan evaluation processes.

7.1. Monitoring Levels:

Monitoring will take place on three levels:

- **Project level –** mainly of IRWM/WE Plan implementation processes and activities, the delivery of outputs and progress towards outcomes
- **Portfolio level –** mainly of trends within the strategic focal areas or programmes and overall results as well as monitoring of institutional issues
- **National level –** mainly of national impact based on data and information gathered and analysis of national statistics from the Central Statistical Office and other national institutions

The purpose of monitoring will be to provide early information on progress or lack thereof toward achieving the intended objectives, outcomes, and impacts of the IWRM/WE Plan. By tracking progress, monitoring will help in the identification of implementation issues that warrant decisions at different levels of management.

It is expected that monitoring will be holistic, participatory and unified in approach

7.2. Evaluation Approaches:

Within the context of the IWRM/WE Plan, the main types of evaluations used will include:

- Project evaluations—of projects under implementation, at the end of the intervention (terminal evaluation), and after the project end (ex-post evaluation) or before project start (ex ante—quality at entry).
- Impact evaluations—of the long-term effects produced by an intervention, intended or unintended, direct or indirect.
- Cross-cutting or thematic evaluations under the focal areas/programmes
- Overall performance studies- of policy, strategies and priorities of the IWRM/WE plan.

The purposes of evaluation include understanding why and the extent to which intended and unintended results of the IWRM/WE Implementation Plan were achieved, and their impact on stakeholders.

Evaluation is an important source of evidence of the achievement of results and institutional performance, and contributes to knowledge and to organisational learning. Evaluation will serve as an agent of change and play a critical role in supporting accountability during the IWRM/WE Plan implementation. Evaluation will be used to improve the design and performance of the IWRM/WE Plan as the tool for implementing water targets in future NDPs as well as to make an overall judgment about the effectiveness of the IWRM/WE Plan after the first five years to better address issues of integrated water resources management.

Given the above, monitoring and evaluation will be done at all levels of the implementation of programmes and projects outlined in the Plan. At input level, it will be important to monitor the flow of resources being made available to implement planned activities under the various programmes. This will improve efficiency, accountability and confidence of government, cooperating partners and other stakeholders supporting the programmes. At output level, implementing agencies will be held accountable for deliverables outlined in the implementation plan and according to available resources from government, cooperating partners or any other stakeholder. With regards to outcome and impact levels, this will involve the assessment of the sector performance and the contribution of the sector to the performance of other sectors and the attainment of the socio-economic goals outlined in the national development framework. It would also involve measuring the progress of the processes involved in achieving the programme objectives, i.e., whether the planned programmes or activities have been implemented and have achieved the planned results.

7.3. Institutional Framework for Monitoring and Evaluation

The institutional mechanisms for monitoring and evaluation are described in the National Development Plan. The roles and responsibilities are detailed in **Table 19**.

Table 19: Institutional Roles and Responsibilities for the IWRM Monitoring and Evaluation

IMPLEMENTING INSTITUTIONS	ADVISORY INSTITUTIONS	ROLES/RESPONSIBILITIES
National Level		
• Cabinet • Ministry of Finance and National Planning • Sector Ministries and other spending Agencies • Committees • NGOs	• National Development Co-ordinating Committee (NDCC) – To be established • Umbrella Organisations and Research Institutions • SAGs • Special interest groups • Thematic Committees	• Cabinet will provide supervisory functions in policy development and implementation • MFNP will develop the overall implementation targets and indicators and monitor the implementation process • The sector ministries will formulate sectoral policies, programmes and projects • The National Development Coordinating Committee (NDCC) will be chaired by the Secretary to the Cabinet and will be responsible for making policy recommendations to Cabinet. The NDCC will also oversee overall monitoring and evaluation of programmes in the FNDP • SAGs will provide professional and technical advice • Special interest groups will participate in the relevant SAGs • The research institutions will add value to the process through the research findings, training and recommendations for policy development • The private sector will be a key partner in SAGs, PDCCs, and DDCCs • Thematic committees will be created to deal with specific issues
Provincial Level		
• Provincial Administration • Provincial Sector Departments (water Agriculture, Local Government, forestry) • Private sector(CUs)	• Special interest groups • PDCC • P-WASHE • catchment councils	• Special interest groups will provide advice to government and private sector. They will be represented on PDCCs • The provincial administration will co-ordinate implementation and monitoring and evaluating of programmes through the Provincial Development Co-ordinating Committee (PDCC) chaired by the Provincial Permanent Secretary • PDCC will scrutinise and harmonise development plans from districts and monitor their implementation through sub-committees such as the Provincial M&E sub-committee • PDCC and P-WASHE will advise on the consistency of plan implementation with national priorities • Note: These roles and responsibilities will be further refined as implementation of the decentralisation policy progresses

IMPLEMENTING INSTITUTIONS	ADVISORY INSTITUTIONS	ROLES/RESPONSIBILITIES
District Level		
• District Commissioner's office • District Councils	• Special interest groups • Catchment council • D-WASHE • DDCC	• Implementation, monitoring and evaluation of programmes will be co-coordinated by the District Development Co-ordinating Committee (DDCC) chaired by the District Commissioner • DDCC will scrutinise development plans from departmental submissions and monitor their implementation through sub-committees representing each sector • DDCC will advise on the consistency of plan implementation with Provincial and National priorities and present the plans to the relevant Local Authority (District Council) • The District Council will approve all the district plans and guide their implementation • Note: These roles and responsibilities will be further refined as implementation of the decentralisation policy progresses
Community Level		
• Ward Development Committees: • Resident development Committees	• V-WASHE • NGOs • Traditional Authorities or Establishments	• Local participation should be co-coordinated at ward level by the Ward Development Committee (WDC), Resident Development Committees (RDCs) and Area Development Committees (ADCs). These committees will participate in the implementation and monitoring of district plans by ensuring that the implementation is consistent with their local needs and priorities. Their participation will be through the District Development Co-ordinating Committees (DDCC) and District Councils

Source: Ministry of Finance and National Planning

Indicators:

A limited number of key performance indicators have been defined (see Annex 4) to enable regular and quality reporting on the programme implementation progress. These indicators will help to focus efforts and resources for evaluating sector performance. The report on the indicators will form a major input into the annual, mid-term, and end-of-plan progress reports and any other reports that may be required. The underlining factor in selecting the indicators was the logical linkages to the overall plan goal and objectives.

Data Requirements:

Determining performance assumes that there exists readily available quality data on the indicators and that the data source for the indicator can be clearly identified in the sector; the data is collected regularly, is reliable and can be accessed. However, the fact is that there are many data gaps that will need to be addressed before the indicators become reliable. Currently there are gaps in the national water data base related to urban and rural water supply coverage and data bases for surface and ground water quantity and quality at catchment level.

The key performance indicators for the programmes in the IWRM/WE Implementation Plan are shown in Annex 3.

CHAPTER 8: COMMUNICATION PLAN

8.1. Introduction

The Communication plan for the IWRM/WE Implementation Plan has been developed as a guide to the dissemination of the IWRM/WE Implementation Plan. As indicated earlier, the IWRM/WE Implementation Plan is an implementation plan for the water and sanitation and related sectors in the FNDP. There are many sectors and actors at all levels (from government to community to individuals) involved in water management and thus the need for a multi-sectoral IWRM approach to undertake the activities in an effective and efficient manner. The MEWD will take the lead in developing the Communication Plan. However, it is possible that this responsibility could be delegated to a specific stakeholder.

8.2. Communication Plan Objectives

The Objectives of the Communication Plan are:

- To provide information and raise awareness of the IWRM/WE Implementation Plan; and
- To build support for implementing the activities with coordination and cooperation.

8.3. Target Stakeholders

The communication target will be stakeholders who have a role to play in IWRM specifically in the implementation of the interventions identified in this IWRM/WE Implementation Plan as outlined in the four programme areas (focus area) including:

- Government ministries and departments
- Provincial Administration
- Local authorities
- Legislators
- Regulatory authorities
- NGOs
- Traditional authorities
- Multi-stakeholder user groups
- Print and electronic media
- Cooperating partners

8.4. Activities and Budget

Table 20 outlines the activities and budget for implementing the communication plan.

Table 20: Communication Plan activities and budget

ACTIVITY	TARGET STAKEHOLDERS	BUDGET K MILLION	RESPONSIBLE
Produce 2000 hard copies and 500 CDs of the IWRM/WE Implementation Plan	All	15	MEWD, MOFNP. ZWP
Hold 3 regional seminars to disseminate the plan	Provincial administration, Local authorities, Traditional authorities, Multi-stakeholder user groups	50	MEWD, MOFNP. ZWP
Upload the plan on the websites of MEWD, MOFNP, ZWP	All	-	MEWD, MOFNP. ZWP
Distribute by mail hardcopies and CDs of the plan to various stakeholders	All	4	MEWD, MOFNP. ZWP
E-mail the plan to stakeholders and provide regular updates	All	-	MEWD
Hold regular press briefings on IWRM/WE Implementation Plan and its implementation progress	Print and electronic media	2	MEWD, MOFNP
Issue Press releases on the IWRM/WE Implementation Plan and its implementation progress	All	-	MEWD, MOFNP
Hold official Launch of the IWRM/WE Implementation Plan	All	4	MEWD, MOFNP. ZWP
Provide regular updates on the status of implementation of IWRM/WE Implementation Plan	Water SAG	10	MEWD
Facilitate and assist in implementing the communication plan	MEWD, MOFNP		ZWP, Cooperating partners
Total		**87**	

ANNEXES

8.5. Annex 1: Consolidated Matrix of Programmes, Issues, Strategies, Objectives and Projects

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
1. Water Resources Management	Mismatch between water demand and supply due to increasing water demand due to social and economic growth Inadequate forward planning to secure water resources for future demands Water resources management	To improve water resources planning to allow for decision-making so that water resources supply and demand can effectively be met	Develop tools and mechanisms for water resources planning	**WATER RESOURCES PLANNING:** • Assess current and future water demands considering population and economic growth • Assess sources of water supply and associated management options and/or investments to meet demands that take into account equity, efficiency and sustainability • Develop national water resources accounts • Map out potential sites that have adequate water resources to support various social economic activities (settlements and municipal supplies, agriculture, tourism, hydropower, industry and protected areas) • Promote implementation of water demand management techniques
	Data and information on quantity, quality, distribution and variability of both ground and surface water resources is poor	To provide adequate quality data and information on the status of water resources for planning, management and development	Assess surface and groundwater resources country-wide	**a) Surface water resources assessment:** • Rehabilitate and upgrade of 300 hydrometric stations, 6 marine meteorological stations and establishing 10 new stations per year • Collect hydro-meteorological data • Undertake water assessment (including existing reservoirs) • Design & implement National water quality Monitoring Network (including data collection) • Forecast flood and drought (including training) in conjunction with the Meteorological Department • Study water quality for threatened areas such as Lusaka, Copperbelt, Luapula, Eastern and Northern provinces • Identify and apply appropriate surface water resources assessment techniques • Build capacity in surface water resources assessment at district, provincial and National levels

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
				• Collect and analyse data on surface water resources potential, demand, use and forecast future demands • Assess the quantity, quality, distribution, and variation of the surface water resources • Undertake assessment of the impacts on the water resources arising from climate change, water pollution, river bank cultivation, deforestation and destruction of catchment areas/headwaters and urban development **b) Groundwater resource assessment:** • Construct 30 assessment and monitoring boreholes per year and rehabilitate existing boreholes in areas where the Government has directed its economic development for ground water mapping, water levels and quality monitoring • Collect data from existing observation boreholes (Groundwater monitoring network) • Develop exploration boreholes to determine potential for use in water supply, agriculture and industry • Rehabilitate existing observation boreholes • Identify and apply appropriate groundwater resources assessment techniques • Build capacity in ground water resources assessment at district, provincial and National levels • Collect and analyse data on ground water resources potential, demand, use and forecast future demands • Assess the quantity, quality, distribution, and variation of the ground water resources • Undertake assessment of the impacts on the ground water resources arising from climate change, water pollution, river bank cultivation, deforestation and destruction of catchment areas/headwaters and urban development
	Limited Research in Water Resources Management	To enhance the understanding of the country's water resources, climate change and come up with technologies that will improve access	Establish a research unit and build capacity in research within the sector	**WATER RESEARCH AND DEVELOPMENT:** • Study the cyclic variation of floods and droughts • Study precipitation enhancement • Develop appropriate technology in water resources management (i.e. water re-use)

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
				• Carryout research in inter basin water transfer • Study operations of existing and new dams to improve the benefits • Study the impact on water resources of erosion and land degradation • Study and promote water use efficiency technologies • Study indigenous practices and knowledge in management of water resources • Consider appropriate technologies for water supply and sanitation systems for persons with disabilities • Conduct research in international waters to address specific issues of equitable and reasonable utilisation, water allocation, benefit sharing and stakeholder participation
	Weak or inadequate legal and institutional frameworks for water resources development and management	To develop the legal and institutional framework for effective and efficient development and management of water resources	Legal and institutional framework capacity enhancement	Legal and institutional framework capacity enhancement: • Finalise revised National Water Policy • Finalise and enact Water Resources Management Bill • Set up National Water Authority, IWRM unit at national level • Pilot and set up catchment councils and water users associations (Kafue, Chalimbana, Lunsemfwa River Basins) • Develop guidelines and regulations for catchment councils and water users associations • Support to development and implementation of catchment management plans in selected areas (Kafue, Chalimbana, Lunsemfwa River Basins) • Undertake Stakeholder participation and awareness raising on the new Policy, legal and Institutional framework • Develop and apply water allocation guidelines that include criteria and measures for water allocation and management in times for extreme hydrological conditions
	Inadequate implementation of integrated water resources management	To implement measures in the sector which enhance mainstreaming of crosscutting issues	Incorporate activities in other sectors in the planning and management of water resources	**Legal and institutional framework capacity enhancement:** • Develop IWRM Plans and integrate into national and local development plans • Implement IWRM Plans

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
	Inadequate management of international water	To manage and develop shared water resources	Build capacity in international water resources management	**International Waters:** • Establish an international waters unit with a system to promptly advise government on international water related issues and conflict management and resolution • Build capacity within the unit to manage international waters and in negotiating skills • Facilitate the participation and implementation of international programmes and plans (e.g. SADC, ZRA and ZAMCOM) • Domesticate articles of international agreements and conventions into local laws • Oversee policy, legal and institutional framework governing international waters
	Inadequate collaborative arrangements among institutions involved in water resources management and with those in other sectors	To improve planning and promote efficient use of resources in implementation of programmes	Promote dialogue and consultation with water related sectors	**Legal and institutional framework capacity enhancement:** • Finalise development of clear roles and responsibilities for the various institutions and stakeholders and disseminate them • Support and strengthen the Water Sector Advisory Group • Undertake harmonisation of sectoral policies (e.g. energy, irrigation, environment, etc) • Promote involvement of traditional authorities in water resources management (customary law and indigenous knowledge)
	Inadequate data and information systems for water resources management and rural water supply and sanitation	To develop management information systems for planning, development, allocation and management of water resources at all levels (To have an information system that will effectively support decision-making)	a) Establish water resource information systems for effective and efficient planning, development and management Establish an information system to effectively support decision-making	**Information Management System for water resources, water supply and sanitation:** • Set up an information network of water resources and related information with databases that link to national province, district levels and catchments • Operate and maintain high quality information system that should ensure the efficient collection, processing, storage, retrieval and dissemination of information on water resources. • Provide information on water potential and demand as a basis for water allocation in Kafue, Lunsemfwa and Chalimbana Catchments • Regularly update and implement information exchange protocols • Create and operate an information dissemination system

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
				(internet etc.) • Establish an early warning system for extreme hydrological events such as floods and droughts and suggest extenuation measures • Produce weather and water 10-day bulletins • Create and maintain both surface and ground water resource database and the publish yearbooks
	Inadequate systems to facilitate water related disaster preparedness (floods and droughts)	To mitigate the effects of floods and droughts on the society	Set up a flood and drought warning system	**FLOOD MANAGEMENT** • Develop and implement an appropriate early warning systems for flood forecasting • Identify and map all flood prone areas in each catchment • Prepare integrated flood management plans for all vulnerable areas • Develop and implement a drainage plan for all vulnerable areas • Develop and implement protocols for monitoring, forecasting and coordination in the event of floods **DROUGHT MANAGEMENT** • Develop and implement an appropriate early warning systems for drought forecasting • Identify and map all drought prone areas in each catchment • Prepare drought mitigation plans for all vulnerable areas • Develop and implement protocols for monitoring, forecasting and coordination in the event of droughts • Develop and implement appropriate adaptive mechanisms in drought prone areas such as using water saving/ water efficient devices and promoting drought resistant crops
	Inadequate and unpredictable sector funding, and relatively lower share in budgetary allocation	To raise the financial resources available for IWRM	Align to the JASZ system to enable tracking of commitments and disbursements	**ECONOMICS AND FINANCING** Develop national water resources accounts Prepare integrated and consolidated budgets and investment plans for water related projects
	Inadequate mechanisms to mobilise funds for water resources management	To raise the financial resources available for IWRM	Development of appropriate financing instruments	**ECONOMICS AND FINANCING** • Strengthen revenue collection management (by Water Board)

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
				• Develop raw water pricing policy , tariff system and financing mechanisms for water resources management and development • Review the effluent discharge charges and the charging mechanism • Prepare a Business Plan for proposed IWRM institution • Develop national water resource accounts
	Ineffective land use planning	To facilitate the development of an effective land use planning system	Development of an integrated land use planning system for watersheds	**SUSTAINABLE ENVIRONMENTAL MANAGEMENT** • Strengthen the management plans for watersheds • Integrate land use plans into the existing guidelines and strategies on water resources management
	Alteration of natural flow regime of rivers	To reduce the impact of flow regulation on the downstream.	Set guidelines and regulate the operation of hydraulic structures	**WATER RESOURCES PLANNING** • Implement integrated plans for water resources development, infrastructure maintenance and operation • Develop a monitoring and evaluation system (dam operation rules with environmental consideration) • Cooperate with other riparian countries and international organisation in the operation, utilisation and management of infrastructure on international waters • Build capacity in planning for sustainable infrastructure development • Develop appropriate and defined methods for determining environmental flow requirements
	Poor environmental health	To promote the protection and rehabilitation of the degraded environmental	Promote Environmental rehabilitation	**PROGRAMME: SUSTAINABLE ENVIRONMENTAL MANAGEMENT** • Encourage tree planting in degraded areas • Promote sustainable land use systems on water catchment areas • Undertake on-farm demonstrations and training on mitigation measures for land degradation. • Monitor water quality for pollution control purposes • Implement appropriate environmental flow requirements • Implement awareness campaigns targeting different stakeholders at national level

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
	Inadequate protection of wetlands	To promote integrated conservation and sustainable utilisation of wetlands resources	Promote coordination of wetlands management Mainstreaming of the issues of wetland protection into existing policies, plans and strategies on water resource	**PROTECTION OF CATCHMENT AREAS AND MANAGEMENT WETLANDS:** • Promote community participation in wetlands management and application of indigenous knowledge in management of wetlands • Undertake inventory and classification of wetlands • Participate in regional and international collaboration in the management of wetlands • Improve coordination of wetland management • Undertake public awareness on wetland values and functions. • Build Institutional and human capacity for effective protection of wetlands resources • Establish sustainable wetlands resource use practices
	Inadequate integrated protection and management of catchment areas	To maintain and protect all water sources and the surrounding environment through sustainable development	Promote the maintenance and improvement of the water resources by improving the state of the environment	**PROTECTION OF CATCHMENT AREAS AND MANAGEMENT WETLANDS:** • Control of river bank cultivation • Promote the control of deforestation and land degradation especially at /headwaters • Monitor the environment and water quality from all sources • Incorporate environmental issues in water resources management plans and maintain a link between water and the environment • Control all invasive alien aquatic and terrestrial plants • Encourage environmental conservation and protection
	Inadequate integrated protection and management of catchment areas	To strengthen the management systems of catchment areas.	Promotion of integrated institutional and human capacity building	• Undertake institutional and human capacity building for the water sector • Develop and implement catchment management plans • Harmonise the existing legal frameworks on catchment areas protection and water resources management
	Increasing threat of invasive species	To minimise the impact of invasive species on the environment and water resources.	Mitigate and manage the prevalence of Invasive Alien Species (IAS) in watersheds	**ENVIRONMENTAL INSTITUTIONAL CAPACITY BUILDING:** • Monitor the prevalence of Invasive Alien Species (IAS) in watersheds • Build capacity at entry points into Zambia to monitor the

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
				possible entry of Invasive Alien Species • Undertake the removal of Invasive Alien Species in affected areas of Kafue and Zambezi Rivers
	Increasing threat to climate change and variability	To minimise peoples vulnerability to the climate and the ability of the various sectors to provide goods and services	Adapt and mitigate the impacts of climate change and variability	**ENVIRONMENTAL INSTITUTIONAL CAPACITY BUILDING:** • Develop infrastructure for early warning and advanced planning purposes • Assess and monitor the potential impact of climate change on ecosystems, vegetation and net carbon sinks and key sectors of water supply, agriculture and hydropower. • Develop capacity to identify the human and natural drivers of climate change in the country • Establish an effective climate data management system for issuing weather forecasts • Enhance management of natural resources at local level • Participate in applicable and relevant international conventions and their protocols to combat global warming and climate change

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
2. Water Resources Infrastructure Development	High dependence on rain-fed agriculture and limited utilisation of irrigation	To improve on food security To promote a well regulated and profitable irrigation sub-sector that is attractive to both the public and private sectors	Public awareness on irrigation Develop socially desirable and economically viable irrigation schemes Facilitate irrigation infrastructure development for improved agricultural productivity	**WATER RESOURCE DEVELOPMENT AND INFRASTRUCTURE DEVELOPMENT:** • Improve hydro-meteorological early warning system • Develop irrigation schemes (Dams, weirs, canals • Research and application of appropriate technologies for efficient water use • sustainable utilisation of wetlands • Construct communal bulk water supply systems • Establish an irrigation development fund • Develop appropriate water allocation system
	Population dynamics and settlement patterns	To improve on the planning of the provision of water and sanitation services and the development of the water resource	Development of Catchment plans which incorporate land use plans	• Monitor demographics, water demands and use
	Lack of ownership and protection of waylay for water infrastructure	To protect the infrastructure and enable ease of access in maintenance	Development of land use plans	• Issue rights to manage the land upon which the water infrastructure is located on • Undertake Public awareness on the importance of waylays

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	ACTIVITIES
	Inadequate development of the country's water resources infrastructure to meet needs of various sectors	To assess , develop and allocate water resources in the four priority of economic development of agriculture, tourism, environment, mining, manufacturing and energy	To develop water resources to improve access for use for wealth creation and economic growth/ productive purposes Promote public private partnership in the development if water infrastructure Promote development of multi-purpose projects Increase funding for water infrastructure	**WATER RESOURCE DEVELOPMENT AND INFRASTRUCTURE DEVELOPMENT:** • Construct 4 small dams per year for economic production • Plan for construction of 2 large multi-purpose dams • Construct 2 large multi-purpose dams • Rehabilitate and expand dams • Undertake water use, irrigation and land use evaluation surveys in peri-urban areas, dambos and settlement schemes in rural areas • Develop Large and mini hydro power schemes • Develop irrigation schemes • Develop of canals for irrigation and transport • Provide of water and sanitation facilities to industrial and manufacturing areas • Dredge inland water ways
	Inadequate policy, guidelines and regulations on the construction, operation, maintenance and monitoring of infrastructure (e.g. Dam operation rules)	To ensure development and management of water infrastructure in a sustainable manner	Enhancing compliance of the legal framework (EIA regulations and Water Act)	**MONITORING DEVELOPMENT OF WATER INFRASTRUCTURE:** • Develop policy, guidelines and regulations on water infrastructure management and development • Undertake monitoring of water infrastructure development, operation and management • Undertake Public awareness on regulations for water infrastructure management and development
	Inadequate water conservation and rainwater harvesting systems	Enhance security of supply and conservation of water at local level	Encourage water conservation and rainwater harvesting systems particularly at local level	**WATER RESOURCE DEVELOPMENT AND INFRASTRUCTURE DEVELOPMENT:** • Construct rainwater harvesting facilities • Undertake impact assessment, social benefits and evaluation of the water conservation and rain water harvesting facilities • Undertake public awareness on rainwater harvesting

PROGRAMMES (STRATEGIC FOCAL AREAS)	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	PROJECTS: ACTIVITIES
3. Water Supply and Sanitation	Weak or inadequate legal and institutional frameworks for rural water supply and sanitation	To enhance the legal framework and the institutional framework and capacity	Develop Institutional support for effective planning implementation and monitoring of RWSS	**INSTITUTIONAL CAPACITY BUILDING AND ENHANCEMENT:** • Elaborate strategy on WSS
	Inadequate decentralisation of functions to manage water at local level	To enhance the legal framework and the institutional framework and capacity	Develop Institutional support for effective planning implementation and monitoring of RWSS and UWSS	**INSTITUTIONAL CAPACITY BUILDING AND ENHANCEMENT:** • Build institutional capacities for RWSS and UWSS in planning, implementation, monitoring, information management, Sanitation and Hygiene Education, Operation and maintenance and advocacy and publicity • Training at community, district, provincial and national levels in community management approaches and concepts of water demand management and mainstreaming cross cutting issues (Gender / HIV and AIDS / Environment/ IWRM)
	Inadequate data and information systems for water resources management and rural water supply and sanitation	To enhance planning and management of Water Supply and Sanitation systems	Development of information management system for planning and development at national, provincial and district	**INFORMATION MANAGEMENT SYSTEM FOR WATER RESOURCES, WATER SUPPLY AND SANITATION:** • Develop information management system for rural water supply and sanitation • Update Urban and peri-urban water supply and sanitation information management system
	Low access of water supply and sanitation services in rural areas	To increase access to safe water supply to from present 37% to 66% of the rural population by 2010 and increase access to proper sanitation from 13% to 50% of the rural	Provide adequate, safe and cost-effective water supply and sanitation services with due regard to environmental issues	**RURAL WATER SUPPLY AND SANITATION:** • Undertake capacity building at community and district levels in planning, operation and maintenance of water supply and sanitation systems

PROGRAMMES (STRATEGIC FOCAL AREAS)	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	PROJECTS: ACTIVITIES
		population by 2010	Institutional support activities to facilitate more effective planning, implementation and monitoring of RWSS	• Undertake integrated rural water supply and sanitation investment projects in all provinces, with construction of new facilities with priority given to extension of water and sanitation facilities, and related hygiene education awareness campaigns and rehabilitation of existing facilities
	Low access of water supply and sanitation services in urban areas and urban poor communities	To provide adequate, safe, and cost-effective water supply and sanitation Services To increase access to safe, adequate water supply to 80 percent of the urban and peri-urban population by 2010, and proper sanitation systems to 70 percent for the urban and peri-urban population by 2010	Development and provision of sustainable water and sanitation service to more people in urban and peri-urban areas	**URBAN AND PERI-URBAN WATER SUPPLY AND SANITATION:** • Support to the national UWSS development that focuses on enhancing institutional capacities • Promote Commercialisation, private sector participation and independent regulation • Undertake investment in construction and rehabilitation of WSS facilities • Undertake operation and maintenance of township water supply and sanitation systems
	Inadequate mechanisms to mobilise funds for investments and operation and maintenance of water supply and sanitation systems	To provide adequate, safe, and cost-effective water supply and sanitation services	To develop legal, financing and economic instruments	**ECONOMICS AND FINANCING:** • Develop appropriate tariff for urban water supply and sanitation • Assess viability of issuing Municipal Bonds for urban water supply and sanitation infrastructure development • Assess viability of integrating micro- financing schemes with peri-urban and rural water supply and sanitation infrastructure development
	Inadequate waste management systems (dump sites, waste water treatment)	To promote environmental health	Improve environmental protection	**URBAN AND PERI-URBAN WATER SUPPLY AND SANITATION:** • Construct land fill sites in local authorities • Construct and rehabilitate waste water treatment plants

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	PROGRAMMES: ACTIVITIES
4. Monitoring, Evaluation and Capacity building	Inadequate gender mainstreaming of water issues into national development plans	To implement measures in the sector which enhance mainstreaming of crosscutting issues	Develop community and district level multi-sectoral structures for the implementation of cross-cutting issues	**MAINSTREAMING CROSS CUTTING ISSUES- -GENDER AND HIV/AIDS** • Accelerate the representation of women at all levels and in all spheres of water management activities • Ensure gender balance by defining the key roles played by women, men and children • Monitor and evaluate gender mainstreaming in the development and implementation of water sector project activities; • Promote the use of appropriate and gender sensitive technology • Develop guidelines that consider gender and vulnerable in the use and management of water resources Development of gender mainstreaming tools
	Inadequate human resource and institutional capacity(water resources management and WSS)	To promote capacity in order to efficiently and effectively carry out the mandates of various stakeholders	Legal and institutional framework capacity enhancement Development of Human resources	**INSTITUTIONAL AND HUMAN RESOURCE CAPACITY BUILDING AND ENHANCEMENT** • Set up the NWA, IWRM unit at National level, catchment councils and Water users association • Undertake recruitment, education and training of personnel to align them into IWRM sphere • Create a research and training centre for IWRM • Conduct needs assessment and develop programme for capacity building • Undertake informal training and exchange or secondment opportunities between public, non-governmental and private sector water institutions • Provide training in conflict management and arbitration for water resources related conflicts and arbitration

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	PROGRAMMES: ACTIVITIES
	Inadequate water research and development	To carry out research and development in selected areas in the country for improved planning, regulation and allocation of Zambia's water resources	Conduct research in development of simple technologies Promote community participation in water and environmental management for economic growth	**WATER RESEARCH AND DEVELOPMENT** • Develop a research and training centre for IWRM • Research in technologies for rain water harvesting, reclamation, recycling etc. • Monitor and evaluate water resources programs and projects, • Promote effective and efficient demand-driven water sector research and technology development • Improve communication and collaboration between academic, research and scientific institutions
	Inadequate awareness or implementation of water demand management techniques	To promote efficient and sustainable utilisation of water resources	Undertake advocacy and publicity	**PUBLIC AWARENESS AND ADVOCACY** • Develop awareness programmes on water demand techniques • Pilot the use on water demand techniques in some selected areas • Strengthen Consultative Forum, the Water SAG for information sharing
	Inadequate awareness of the role of water in economic and social development	To provide and disseminate information on Water resources for effective planning, development, management and utilisation	Undertake advocacy and Publicity Promotion of IWRM in the education sector with special emphasis on youth	**PUBLIC AWARENESS AND ADVOCACY** • Develop awareness programmes on role of water in the economy (role of water in energy, irrigation, industry, tourism, culture, fisheries sectors etc) • Strengthening of Consultative Forum, the Water SAG (effective involvement of all stakeholders including the private sector, NGOs and civil society organisations) • Incorporate Education programmes on the water sector in the education curriculum • Disseminate National Water Policy and the new water management legislation

STRATEGIC FOCAL AREA	PRIORITY ISSUES	OBJECTIVES	STRATEGIES	PROGRAMMES: ACTIVITIES
	Prevalence of HIV/AIDS	To implement measures in the sector which enhance mainstreaming of crosscutting issue	Develop capacity in advocacy management, coordination and monitoring of HIV/AIDS and Environment Develop community and district level multi-sectoral structures for the implementation of cross-cutting issues	**MAINSTREAMING CROSS CUTTING ISSUES- HIV/AIDS AND GENDER** • Implement the national HIV/AIDS policy • Develop HIV/AIDS advocacy materials and disseminate the information with a focus on the role of water • Collaborate and cooperate with the health sector and other sectors in supporting measures to combat HIV/AIDS
	Poor Monitoring and Evaluation	To monitor and evaluate the proposed programmes in order to determine the impacts	Develop a coherent, transparent and independent monitoring and evaluation system	**MONITORING AND EVALUATION** • Design and setup a monitoring and evaluation system • Collect data on input and outputs of various programmes and analyse • Undertake impact monitoring by collecting data on the planned outcomes • Undertake external evaluations and studies to access long term impacts

8.6. Annex 2: Water Related Programmes in the FNDP Considered In the IWRM Implementation Plan

FOCAL AREA	FNDP INTERVENTION	OBJECTIVE	SECTOR
1. Water Resources Management	Policy, Legal and Institutional reforms	To develop and monitor the implementation of appropriate policies, legal and institutional frameworks to foster the development of sustainable meteorology and information and communications sub-sectors	Communication and Met
	Management of Protected Areas	To maintain a representation of eco-systems for the benefit of current and future generations	Natural Resources
	Legislation and Policy Review	To develop a conducive policy and legislative framework for enhanced contribution of the sector to the national economy	Natural Resources
	Sustainable Indigenous Forest Resource Management	To manage and conserve indigenous forests in a sustainable way	Natural Resources
	Management of Wetlands	To promote conservation and sustainable utilisation of wetland resources	Natural Resources
	Sustainable Management of Heritage Resources	To conserve and manage national heritage	Natural Resources
	Export promotion	Increase volume of Zambian exports, particularly in non-traditional sectors	Commerce and Trade
	Water Resource Management and Information Systems	To develop management information systems for planning, development, allocation and management of water resources at catchment, national and regional level and to provide safe water and improve coverage in Zambia	Water Resources Mgt
	Water Resource Assessment Programme	To assess surface and groundwater resources country-wide in order to determine the quantity and quality of available water	Water Resources Mgt
	International Waters	To manage and develop shared water resources	Water Resources Mgt
	Strengthening of Bilateral and Multilateral Relations	To facilitate and promote regional and international cooperation	Foreign Relations
	Promotion of Regional and International Peace and Security	To safeguard Zambia's sovereignty, territorial integrity, freedom, and national security	Foreign Relations
	Sustainable Environmental Management	a) To protect essential environmental processes and functions b) To promote sustainable development by minimising irreversible environmental damage, biodiversity loss, waste production and pollution	Environment
	Management of Environmental Information	To establish and support an effective institutional framework able to effectively manage environmental information	Environment

FOCAL AREA	FNDP INTERVENTION	OBJECTIVE	SECTOR
	Local Development Programme Planning and Budgeting	To contribute to sustainable service delivery for communities and districts Decentralisation To support local social and economic development at the district level To develop and implement a new integrated planning and budgeting system that is supportive of the National Decentralisation Policy	Local Government and Administration
	Implementation of the Decentralisation Policy	To empower councils through the implementation of the decentralisation policy and the enhancement of good governance, community participation in decision-making for effective and efficient generation, and delivery of services to local communities	Local Government and Administration
	Upgrading of unplanned settlements	To improve the living environment of unplanned urban settlements.	Housing
	Structure Plan Development	To prepare Integrated Development (Structure) Plans (IDPs) for 68 districts	
	Environmental Health	To reduce the incidence of water borne and vector borne diseases	Health
2. Water Resources Infrastructure Development	Irrigation Development and Support	To promote a well-regulated and profitable irrigation sub-sector that is attractive to both the public and private sectors	Agriculture
	Infrastructure Development	To promote public and private sector participation in the construction, installation and maintenance of infrastructure and provision of services in the meteorological, information and communications sub-sectors in order to stimulate economic growth in rural and urban areas	Communications and Meteorology
	Development and Implementation of Public Private Partnership Policy	To develop and implement an appropriate policy framework in order to facilitate effective private sector participation in the construction and maintenance of public infrastructure	Infrastructure/ Public Works Infrastructure/ Public Works
	Public Infrastructure Management	To effectively manage public infrastructure in order to ensure accountability, serviceability and prolonged life span	Infrastructure/ Public Works Energy
	Water Transport Infrastructure Development	To facilitate the construction of water infrastructure, set standards and contribute to national development	
	Electricity Generation and Transmission Line Development	To increase generation capacity, accessibility (through transmission lines) and trade of electricity	
	Rural Electrification	To increase electrification levels in order to increase access for social economic development in rural communities	Energy

FOCAL AREA	FNDP INTERVENTION	OBJECTIVE	SECTOR
	Infrastructure Development and Rehabilitation	To develop, rehabilitate and maintain science and technology infrastructure	Science and Technology
	Development of Large scale Mines	To ensure environmental sustainability by the sector	Mining
3. Water Supply and Sanitation	Urban Water Supply and Sanitation	To provide adequate, safe, and cost-effective water supply and sanitation services	Water and Sanitation
	Rural Water Supply and Sanitation	To provide adequate, safe and cost-effective water supply and sanitation services with due regard to environmental issues	Water and Sanitation
	Environmental Health	To reduce the incidence of water borne and vector borne diseases	Health
4. Capacity Building, Monitoring, & Evaluation	Mainstreaming Cross-Cutting Issues: HIV/AIDS, Gender and Environment	To implement measures in the sector which enhance mainstreaming of crosscutting issues	All
	Monitoring and Evaluation	To monitor and evaluate the proposed programmes in order to achieve the desired impacts	All

8.7. Annex 3: Project Concept Notes and Fact Sheets

Project Fact sheets for all prioritised projects have been developed. Concepts notes have also been developed for selected projects. This section outlines the project fact sheets for the water resources management component.

8.7.1. Water Resources Management

8.7.1.1. Water Resources Planning

8.7.1.2. Surface Water Resources Assessment

8.7.1.3. Groundwater Resource Assessment

8.7.1.4. Legal and Institutional Framework Capacity Enhancement

8.7.1.5. International Waters

8.7.1.6. Information Management System for water resources, water supply and sanitation

8.7.1.7. Drought Management

8.7.1.8. Flood Management

8.7.1.9. Sustainable Environmental Management

8.7.1.10. Protection of Catchment areas and management wetlands

8.7.1.11. Environmental Institutional Capacity Building

PROJECT FACT SHEET	
Project Title	**Water Resources Planning**
Project Number	1.1
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	There is a mismatch between water demand and water supply caused by increasing water demand due to social and economic growth. Within the sector there is inadequate forward planning to secure water resources for future demands. Data and information on socio-economics, population, water resources, and supply and demand is rather inadequate and not easily available. This makes long term planning in water resources difficult. This project will support the decision making processes for water resources and contribute to sustainable water resources management
Specific Objectives	To improve water resources planning to allow for decision-making so that water resources, supply and demand can effectively be met
Activities	• Assess current and future water demands considering population and economic growth • Assess sources of water supply and associated management options and/or investments to meet demands that take into account equity, efficiency and sustainability • Develop national water resources accounts • Map out potential sites that have adequate water resources to support various social economic activities (settlements and municipal supplies, agriculture, tourism, hydropower, industry and protected areas) • Promote implementation of water demand management techniques • Implement integrated plans for water resources development, infrastructure maintenance and operation • Develop a monitoring and evaluation system (dam operation rules with environmental consideration) • Develop IWRM Plans and integrate into national and local development plans • Implement IWRM Plans • Cooperate with other riparian countries and international organisation in the operation, utilisation and management of infrastructure on international waters. • Build capacity in planning for sustainable infrastructure development. • Develop appropriate and defined methods for determining environmental flow requirements
Key Outputs	• Current and projected water demands • Improved knowledge of water sources • Management options for water supply • Water resources accounts • Monitoring and evaluation systems
Implementing agents	MEWD, MOFNP, MLGH, MACO, ECZ, research institutions, CSO
Cost	

PROJECT FACT SHEET	
Project Title	**Information System for Water Resources, Water Supply and Sanitation**
Project Number	1.2
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	There are inadequate data and information systems for water resources management and for rural water supply. The information is key to effectively support decision-making for water resources and for long term planning
Specific Objectives	(i) To develop management information systems for planning, development, allocation and management of resources at all levels (ii) To enhance planning and management of water supply and sanitation systems
Activities	• Set up an information network of water resources and related information with databases that link to national province, district levels and catchments • Operate and maintain high quality information system that should ensure the efficient collection, processing, storage, retrieval and dissemination of information on water resources • Provide information on water potential and demand as a basis for water allocation in Kafue, Lunsemfwa and Chalimbana Catchments • Regularly update and implement information exchange protocols • Create and operate an information dissemination system (internet etc.) • Establish an early warning system for extreme hydrological events such as floods and droughts and suggest extenuation measures • Produce weather and water 10-day bulletins • Create and maintain both surface and ground water resource database and publish yearbooks
Key Outputs	• Information network and databases • Information system • Water potential and water demands • Information exchange protocols • Information dissemination system • Early warning system for floods and droughts • Weather and water 10-day bulletins • Surface and groundwater databases and yearbooks
Implementing agents	MEWD, MLGH, Line Ministries, Multi-sectoral stakeholders, LAs
Cost	

PROJECT FACT SHEET	
Project Title	**Surface Water Resources Assessment**
Project Number	1.3
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Data and information on quantity, quality, distribution and variability of both ground and surface water resources is poor
Specific Objectives	To support adequate quality data and information on the status of water resources for planning, management and development
Activities	• Rehabilitate and upgrade of 300 hydrometric stations, 6 marine meteorological stations and establishing 10 new stations per year • Collect hydro-meteorological data • Undertake water assessment (including existing reservoirs) • Design & implement National water quality Monitoring Network (including data collection) • Forecast flood and drought (including training) in conjunction with the Meteorological Department • Study water quality for threatened areas such as Lusaka, Copperbelt, Luapula, Eastern and Northern provinces • Identify and apply appropriate surface water resources assessment techniques • Build capacity in surface water resources assessment at district, provincial and National levels • Collect and analyse data on surface water resources potential, demand, use and forecast future demands • Assess the quantity, quality, distribution, and variation of the surface water resources • Undertake assessment of the impacts on the water resources arising from climate change, water pollution, river bank cultivation, deforestation and destruction of catchment areas/headwaters and urban development
Key Outputs	• 300 upgraded hydrometric stations • 6 marine meteorological stations • Hydrometeorological database • Water quality monitoring network • Flood and drought forecasts • Climate change impact reports • Surface water resources potential, demand, use information and reports • Climate change, water pollution impact, catchment management information
Implementing agents	MEWD, ECZ, MOTC, Line Ministries, NGOs, CBOs, and LAs, Multi-sectoral stakeholders, Research institutions
Cost	

PROJECT FACT SHEET	
Project Title	**Ground Water Resources Assessment**
Project Number	1.4
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Data and information on quantity, quality, distribution and variability of both ground and surface water resources is poor
Specific Objectives	To provide adequate quality data and information on the status of groundwater resources for planning, management and development
Activities	• Construct 30 assessment and monitoring boreholes per year and rehabilitate existing boreholes in areas where the Government has directed its economic development for ground water mapping, water levels and quality monitoring • Collect data from existing observation boreholes (Groundwater monitoring network) • Develop exploration boreholes to determine potential for use in water supply, agriculture and industry • Rehabilitate existing observation boreholes • Identify and apply appropriate groundwater resources assessment techniques • Build capacity in ground water resources assessment at district, provincial and national levels • Collect and analyse data on ground water resources potential, demand, use and forecast future demands • Assess the quantity, quality, distribution, and variation of the ground water resources • Undertake assessment of the impacts on the ground water resources arising from climate change, water pollution, river bank cultivation, deforestation and destruction of catchment areas/headwaters and urban development
Key Outputs	• Assessment and monitoring boreholes • Groundwater levels • Exploration boreholes • Rehabilitated observation boreholes • Groundwater resources assessment capacity (district, provincial and national levels) • Groundwater resources potential, demand, and use information and reports • Climate change, water pollution impact, catchment management information
Implementing agents	MEWD, ECZ, Multi-sectoral stakeholders, Research institutions
Cost	

PROJECT FACT SHEET	
Project Title	**Legal and Institutional Framework Capacity Enhancement**
Project Number	1.5
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	For rather too long the legal and institutional frameworks for water resources development and management have been rather weak or inadequate. This resulted in inadequate implementation of integrated water resources management programmes. The current legal and institutional framework therefore needs to be strengthened in order to allow for broad stakeholder participation and decentralised management of water resources
Objectives	To develop the legal and institutional framework for effective and efficient development and management of water resources
Activities	• Finalise revised national water policy • Set up National Water Authority, IWRM unit at national level • Pilot and set up catchment councils and water users associations (Kafue, Chalimbana and Lunsemfwa River basins) • Develop guidelines and regulations for catchment councils and water users associations • Support to development and implementation of catchment management plans in selected areas (Kafue, Chalimbana and Lunsemfwa River basins) • Undertake stakeholder participation and awareness raising on the new policy, legal and Institutional frameworks • Develop and apply water allocation guidelines that include criteria and measures for water allocation and management in times of extreme hydrological conditions
Key Outputs	• Revised national water policy and a new institutional framework • Pilot catchment councils and water user associations established • Water allocation criteria and guidelines developed • Guidelines and regulations for catchment councils • Catchment management plans • Increased stakeholder awareness on new water policy, legal and institutional frameworks
Implementing agents	MEWD, MOJ, Cabinet, Parliament, CBOs, Line ministries, multi-sectoral stakeholders
Cost	

PROJECT FACT SHEET	
Project Title	**International Waters**
Project Number	1.6
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Inadequate management of international waters issues. Yet most of the country's rivers are shared water courses
Objectives	To manage and develop shared water courses
Activities	• Establish an international waters unit with a system to promptly advise government on international water related issues and conflict management and resolution • Build capacity within the unit to manage international waters and in negotiating skills • Facilitate the participation and implementation of international programmes and plans (e.g. SADC, ZRA and ZAMCOM) • Domesticate articles of international agreements and conventions into local laws • Oversee policy, legal and institutional framework governing international waters
Key Outputs	• International water unit • Capacity within unit to manage international waters • Increased participation and implementation of international programmes and plans
Implementing agents	Cabinet, Training institutions, Consultants, MOFA, MOJ, Parliament, multi-sectoral stakeholders
Cost	

PROJECT FACT SHEET	
Project Title	**Drought Management**
Project Number	1.7
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	• Many parts of Zambia particularly the Southern, Western and Eastern parts of the country are affected by drought periodically. The rural communities and particularly women and children are usually the worst hit. Systems to facilitate drought preparedness are rather inadequate • Specific plans and measures need to be developed to reduce the vulnerability of communities from droughts
Objectives	To mitigate the effects of drought on the society
Activities	• Develop and implement an appropriate early warning systems for drought forecasting • Identify and map all drought prone areas in each catchment • Prepare drought mitigation plans for all vulnerable areas • Develop and implement protocols for monitoring, forecasting and coordination in the event of droughts • Develop and implement appropriate adaptive mechanisms in drought prone areas such as using water saving/ water efficient devices and promoting drought resistant crops
Key Outputs	• Early warning systems to forecast drought developed • Drought prone areas mapped in each catchment • Drought mitigations plans prepared • Adaptive measures developed
Implementing agents	MEWD, OVP, MLGH, LAs, Line Ministries
Cost	

PROJECT FACT SHEET	
Project Title	**Flood Management**
Project Number	1.8
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Zambia is vulnerable to climate change and climate variability. Many parts of the country have experienced floods and these have led to loss of lives and livelihoods and left thousands of people homeless. Systems and measures need to be developed to reduce the vulnerability of communities from floods
Objectives	To mitigate the effects of floods on the society
Activities	• Develop and implement an appropriate early warning systems for flood forecasting • Identify and map all flood prone areas in each catchment • Prepare integrated flood management plans for all vulnerable areas • Develop and implement a drainage plan for all vulnerable areas • Develop and implement protocols for monitoring, forecasting and coordination in the event of floods
Key Outputs	• Early warning systems for flood forecasting developed • Maps of flood prone areas in each catchment • Flood management plans prepared • Drainage plans prepared for vulnerable areas
Implementing agents	MEWD, OVP, MOCT, LAs, Line Ministries
Cost	

PROJECT FACT SHEET	
Project Title	**Sustainable Environmental Management**
Project Number	1.9
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Poor land-use practices have led to the destruction of protected forests and headwaters, and land degradation. This project will promote effective land-use practices and protection of degraded land
Objectives	(i) To facilitate the development of an effective land use planning system (ii) To promote the protection and rehabilitation of the degraded environment
Activities	• Integrate land use plans into the existing guidelines and strategies on water resources management • Strengthen the management plans for watersheds • Encourage tree planting and regeneration in degraded areas • Promote sustainable land use systems on water catchment areas • Undertake on-farm demonstrations and training on mitigation measures for land degradation • Monitor water quality for pollution control purposes • Implement appropriate environmental flow requirements • Implement awareness campaigns on environmental management targeting different stakeholders at national, provincial and district level
Key Outputs	• Water management guidelines with integrated land use plans • Strengthened watershed management plans • Sustainable land use systems • Water quality and pollution control data systems • environmental management materials developed
Implementing agents	METNR, MLGH, MACO, NGOs, Research institutions, MEWD, LAs
Cost	

PROJECT FACT SHEET	
Project Title	**Protection of Catchment areas and Management of Wetlands**
Project Number	1.10
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Many wetlands and catchment areas are being over utilised and exploited. Measures that point to the protection of wetlands and catchment areas are inadequate. This project will build on strengthening sustainable management and utilisation of wetlands and catchment areas
Objectives	• To promote integrated conservation and sustainable utilisation of wetlands resources • To strengthen the management systems of catchment areas
Activities	• Promote community participation in wetlands management and application of indigenous knowledge in management of wetlands • Undertake inventory and classification of wetlands • Participate in regional and international collaboration in the management of wetlands • Improve coordination of wetland management • Undertake public awareness on wetland values and functions. • Build Institutional and human capacity for effective protection of wetlands resources • Establish sustainable wetlands resource use practices • Control river bank cultivation • Promote the control of deforestation and land degradation especially at headwaters • Incorporate environmental issues in water resources management plans and maintain a link between water and the environment • Undertake the removal of invasive alien species in affected areas of Kafue and Zambezi • Build capacity at entry points into Zambia to monitor the possible entry of invasive alien species • Harmonise of the existing legal frameworks on catchment areas protection and water resources management
Key Outputs	• Improved indigenous knowledge • Wetlands inventory • Coordination mechanisms on wetlands management • Human and institutional capacity for wetlands protection • Protected headwaters • Alien species monitoring capacity • Harmonised legal frameworks for wetlands management
Implementing agents	METNR, MEWD, MACO, NGOs, RBOs, MOJ, Research institutions, line ministries, traditional authorities, MOL, LAs
Cost	

PROJECT FACT SHEET	
Project Title	**Environmental Institutional Capacity Building**
Project Number	1.11
Thematic / Focus Area	**Water Resources Management**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	There is an increasing threat to climate change and variability on one hand and the need to build institutional capacity for improved natural resources management. This project will endeavour to strengthen the management systems for sustainable utilisation of natural resources
Objectives	To strengthen management systems of for sustainable utilisation of natural resources; To minimise peoples vulnerability to the climate and the ability of the various sectors to provide goods and services
Activities	• Improve coordination and administration • Institutional development and capacity building • Develop infrastructure for early warning and advanced planning purposes • Assess and monitor the potential impact of climate change on ecosystems, vegetation and net carbon sinks and key sectors of water supply, agriculture and hydropower • Develop capacity to identify the human and natural drivers of climate change in the country • Establish an effective climate data management system for issuing weather forecasts • Enhance management of natural resources at local level • Participate in applicable and relevant international conventions and their protocols to combat global warming and climate change
Key Outputs	• Early warning systems • Monitoring reports • Climate data management system • Enhanced local level natural resources management
Implementing agents	METNR, Line ministries, Cabinet, training institutions
Cost	

WATER RESOURCES INFRASTRUCTURE DEVELOPMENT CONCEPT NOTES

Water Resource Development and Infrastructure Development

THE REPUBLIC OF ZAMBIA MINISTRY OF ENERGY AND WATER DEVELOPMENT			
Integrated Water Resources Management/WE Implementation Plan Project Concept Note			
PART A: PROJECT SUMMARY			**Last update of this PCN** 18 August 2007
State	**Province**	**City/Town**	**Reference Number**
Zambia	Whole country	Lusaka	PCN 2.1
Project Title			
Water Resource Development and Infrastructure Development			
Sector	**Sub-sector**	**Type of project**	
Water	Water Resources Management	Water Resources Infrastructure	
Implementing Agency	**Type of Institution (Government,**	**Contact Details**	
Department of Water Affairs	Government	P.O. Box 50288, Lusaka	
Partner Agencies	**Type of Institution and role in**	**Contact Details**	
Ministry of Agriculture and Cooperatives Ministry of Works and Supply, Local Authorities Private sector	Government-technical support, financing, implementation Private- financing, implementation	The Director Department of Water Affairs P.O. Box 50288 LUSAKA Tel. 260-1-248304 E-mail: AHussen@mewd.gov.zm	
Anticipated start date	**Estimated time to implement**	**Estimated Cost in K Billion**	
1st July 2008	Five Years	1,034.95	
PART B: PROJECT DESCRIPTION AND OBJECTIVES			
Project description: *(A list or short narration that describes the project and its rationale)*			
The project will involve the construction and rehabilitation of water infrastructure which include dams, canals, irrigation schemes and hydro power generation projects. THIS will facilitate the control of water and make it available in the required quantity and quality to enhance its utilisation for economic growth.			
Project fit with national and regional planning frameworks: *(Describe how the project fits into existing)*			
In the fifth National Development plan that Zambia is implementing, one of the emphasises is on improving availability, access to water for irrigation, industry and domestic use and for services such as water transport and electricity.. At SADC regional level Regional Indicative Strategic Development Plan (RISDP) emphasises co-operation in infrastructure in order to ensure the availability of a sufficient, integrated, efficient and cost-effective infrastructure that will support and sustain regional economic development, trade, investment, agriculture and contribute towards poverty eradication. The strategies for achieving this goal include establishing and strengthening shared watercourse systems; and promoting the development of water infrastructure. Development of water infrastructure is necessary to achieve these national and regional goals and has been identified as one of the priority areas of intervention			
Project objectives: *(A list of up to say 6 of the key objectives)*			
To construct and rehabilitate water infrastructure To conserve the country's water resources and make them available for economic and social activities			
Project outputs and / or deliverables: *(A list of the tangible items that will be produced by the project)*			
Construct and rehabilitate dams Construct and rehabilitate irrigation systems Develop ground water Construct and rehabilitate canals Construct hydraulic structures for hydro power stations			
Intended beneficiaries: *(A brief exposition of who will benefit from the project)*			
The people of Zambia among them the farmers, hydropower and water supply utility companies			
Project contribution to IWRM: *(Describe how the project contributes to IWRM)*			
Unless the water resources are developed it will be difficult to control the variability in resource availability and demand thus compromise on achieving equity and sustainable utilisation			

Project contribution to meeting the MDG's: *(Describe how the project contributes to the MDG's)*

Water contributes and is a key driver of almost all the MDGs, but more directly, it contributes to the eradication of extreme poverty and hunger through food production, improved water supply. Also it play's an important role in ensuring environmental sustainability

PART C: SUPPORTING INFORMATION *(In each of the sections below provide notes about the project's design relative to the issue and what has already been done or what will be done. include both costs and benefits)*

1. Social and Environmental Sustainability: *(Including impacts and mitigation strategies, EIA status)*

A good understanding of impacts of water infrastructure development will help in the decision making of mitigation measures. EIA procedures are in place to ensure environmental concerns are addressed

2. Participation: *(Who are the stakeholders and how are they participating?)*

Developers and financers of water infrastructure who comprise government (local and central), private sector, local communities and cooperating partners. Government will mainly finance public works while Public- Private Partnerships are being promoted for large projects such as the hydro power schemes and community management approach for local community based projects

3. Gender and Health Issues:

Consideration of gender issues will be undertaken to ensure substantive equality between women and men through mainstreaming gender into project activities to promote participation, decision making and management of the infrastructure. The involvement of all will ensure acceptable designs and sustainability in the operations of the infrastructure. Health considerations would mainly involve water borne diseases and their risk and mitigation measures would be identified in the EIA of the project

4. Legal framework: *(Status of the project partners, compliance with national law and international treaty etc)*

The current legal framework regulates the development of surface water resources. The Water Act and the Environmental Protection and Pollution Control Act are the main laws to abide by. It is also not restrictive on who should participate in water infrastructure development. The SADC Protocol on Shared Watercourses and other international treaties to which Zambia is a party provide the framework for the country to comply to international obligations

5. Risks and uncertainties: *(Are there any issues that may prevent or inhibit implementation?)*

Securing adequate funding and lengthy procedures to meet planning regulations such as EIAs may delay the implementation

6. Any other relevant issues: *(E.g. technology, skills, capacity building, institutional development etc)*

The IWRM reforms under implementation will provide both the legal and institutional framework in which IWRM will be implemented. These will contribute to improved framework for water resources infrastructure development

7. Monitoring and Evaluation Framework: *(Provide a preliminary indication of how M&E will be implemented)*

Government has provided a monitoring framework for the Fifth National Development Plan through the newly created division of planning in the Ministry of Finance and National Planning. The Division with the Water SAG will develop indicators for all the programmes including this one upon which monitoring activities will be based

PART D: FINANCIAL

1. Provisional Project budget:

DESCRIPTION OF ACTIVITY	ESTIMATE K Billion
Development of water for productive purposes (Dams, springs etc) Development of irrigation schemes Development of hydro-meteorological infrastructure Development of water ways for water transport Development of hydro-power generation facilities	
TOTAL	**1,034.95**

2. Provisional Financial programme: *(Expected cash flows for the next five years)*

Current YEAR	Year +1	Year + 2	Year + 3	year +4	TOTAL K Billion
					1,034.95

3. Contributions: *(Set out the anticipated sources of financing for the project and type e.g. grant, loan)*

EXPECTED SOURCE	NATURE	ESTIMATE K Billion
1. Cooperating partners 2. Government of the Republic of Zambia	Grant Counterpart funding	
TOTAL		**1,034.95**

4. Security: *(Provide details of how any financing can be secured)*

Government has a well established transparent system on programme/project expenditure which can reasonably secure all project funds

Monitoring Development of Water Infrastructure

THE REPUBLIC OF ZAMBIA
MINISTRY OF ENERGY AND WATER DEVELOPMENT

Integrated Water Resources Management/WE Implementation Plan
Project Concept Note

PART A: PROJECT SUMMARY			**Last update of this PCN**
			18 August 2007
State	**Province**	**City/Town**	**Reference Number**
Zambia	Whole country	Lusaka	PCN 2.2

Project Title		
Monitoring Development of Water Infrastructure		
Sector	**Sub-sector**	**Type of project**
Water	Water Resources Management	Water Resources Infrastructure
Implementing Agency	**Type of Institution (Government,**	**Contact Details**
Department of Water Affairs	Government	P.O. Box 50288, Lusaka
Partner Agencies	**Type of Institution and role in**	**Contact Details**
Ministry of Agriculture and Cooperatives, Water Board Local Authorities Private sector	Government-technical support, financing, regulating and monitoring developments Private- self monitoring	The Director Department of Water Affairs P.O. Box 50288 LUSAKA Tel. 260-1-248304 E-mail: AHussen@mewd.gov.zm
Anticipated start date	**Estimated time to implement**	**Estimated Cost in K Billion**
1st July 2008	Five Years	0.85

PART B: PROJECT DESCRIPTION AND OBJECTIVES

Project description: *(A list or short narration that describes the project and its rationale)*

The project will provide for the development of a monitoring system consisting of key indicators, the institutional design to enhance and the field collection of data and regular inspections and the establishment of an information and decision-making IT system. This will enable effective regulation and monitoring of water infrastructure development to ensure they are implemented in a holistic and sustainable manner

Project fit with national and regional planning frameworks: *(Describe how the project fits into existing programmes and how it aligns with policy)*

In the Fifth National Development Plan that Zambia is implementing as well as in the SADC Regional Indicative Strategic Development Plan as well as the SADC Water Regional Strategic Action Plan, one of the priority areas of intervention is development of water infrastructure which is necessary to achieve improving availability, access to water and services such as water transport and electricity. Monitoring water infrastructure is important to ensure compliance to regulations and sustainability of the developments

Project objectives: *(A list of up to say 6 of the key objectives)*

i). To ensure water infrastructure development is undertaken according to regulations
ii). To ensure management of water infrastructure is undertaken in a sustainable manner
iii) To improve decision making on the planning, development and management of water infrastructure

Project outputs and / or deliverables: *(A list of the tangible items that will be produced by the project)*

Policy, guidelines and regulations on water infrastructure development and management developed.
Monitoring of water infrastructure development, operation and management enhanced.
Data base of the management of water infrastructure
Public aware of regulations for water infrastructure development and management.

Intended beneficiaries: *(A brief exposition of who will benefit from the project)*

The people of Zambia among them the farmers, hydropower and water supply utility companies, including the environment as good practice in infrastructure development and operation will be enhanced

Project contribution to IWRM: *(Describe how the project contributes to IWRM)*

Equity, efficiency and environmental sustainability will be ensured through the monitoring of the infrastructure development and operation such that this is done within the set regulations

Project contribution to meeting the MDG's: *(Describe how the project contributes to the MDG's)*

Water contributes and is a key driver of almost all the MDGs, but more directly, it contributes to the eradication of extreme poverty and hunger through food production, improved water supply. Also it play's an important role in ensuring environmental sustainability

PART C: SUPPORTING INFORMATION *(In each of the sections below provide notes about the project's design relative to the issue and what has already been done or what will be done. Include both costs and benefits)*

1. Social and Environmental Sustainability: *(Including impacts and mitigation strategies, EIA status)*
An effective monitoring of water infrastructure development will help in the decision making of mitigation measures of impacts and ensure equity in access to water and compliance to set regulations
2. Participation: *(Who are the stakeholders and how are they participating?)*
Developers and financers of water infrastructure who comprise government, private sector and cooperating partners have the interest to ensure their projects are planned, executed and operated in compliance to set regulations. Government will monitor compliance and grant permits/ licences. The private sector and community stakeholders will undertake self- monitoring
3. Gender and Health Issues:
Gender has gained a prominent role in the water sector because women and children are the most affected if water is not properly managed to improve access. Mitigation measures against water borne diseases will be part of project design
4. Legal framework: *(Status of the project partners, compliance with national law and international treaty etc)*
The current legal framework regulates the development of surface water resources. The protocol on shared watercourses and other international treaties to which Zambia is a party provide the framework for the country to comply with international obligations
5. Risks and uncertainties: *(Are there any issues that may prevent or inhibit implementation?)*
Securing adequate funding and effective coordination and capacity at local level to undertake the monitoring
6. Any other relevant issues: *(E.g. technology, skills, capacity building, institutional development etc)*
The IWRM reforms under implementation will provide both the legal and institutional framework in which IWRM will be implemented. These will contribute to improved framework for monitoring water resources infrastructure development
7. Monitoring and Evaluation Framework: *(Provide a preliminary indication of how M&E will be implemented)*
Government has provided a monitoring framework for the Fifth National Development plan through the newly created division of planning in the Ministry of Finance and National Planning. The Division with the Water SAG will develop indicators for all the programmes including this one upon which monitoring activities will be based
PART D: FINANCIAL
1. Provisional Project Budget:

DESCRIPTION OF ACTIVITY	**ESTIMATE K Billion**
1. Develop policy, guidelines and regulations on water infrastructure development and management 2. Undertake monitoring of water infrastructure development, operation and management 3. Undertake public awareness on regulations for water infrastructure development and management	
TOTAL	**0.85**

2. Provisional Financial Programme: *(Expected cash flows for the next five years)*

Current YEAR	**Year +1**	**Year + 2**	**Year + 3**	**year +4**	**TOTAL K Billion**
	0.3	0.25	0.20	0.100	0.85

3. Contributions: *(Set out the anticipated sources of financing for the project and type e.g. grant, loan)*

EXPECTED SOURCE	**NATURE**	**ESTIMATE K Billion**
1. Cooperating partners 2. Government of the Republic of Zambia	Grant Counterpart funding	0.25 0.60
TOTAL		

4. Security: *(Provide details of how any financing can be secured)*
Government has a well established transparent system on programme/project expenditure which can reasonably secure all project funds

WATER SUPPLY AND SANITATION CONCEPT NOTES

Institutional Capacity Building and Enhancement

THE REPUBLIC OF ZAMBIA MINISTRY OF ENERGY AND WATER DEVELOPMENT			
Integrated Water Resources Management/WE Implementation Plan **Project Concept Note**			
PART A: PROJECT SUMMARY			**Last update of this PCN** 25 October 2007
State	**Province**	**City/Town**	**Reference Number**
Zambia	Whole country	Lusaka	PCN 3.1
Project Title			
Institutional Capacity Building and Enhancement			
Sector	**Sub-sector**	**Type of project**	
Water	Water Supply and Sanitation	Capacity Building	
Implementing Agency	**Type of Institution (Government,**	**Contact Details**	
Department of Infrastructure and Support Services	Government	P.O. Box , Lusaka	
Partner Agencies	**Type of Institution and role in project**	**Contact Details**	
Ministry of Energy and Water Development Local Authorities NGOs	Water resources assessment, technical advice Planning, resource and community mobilisation Planning, resource and community mobilisation	The Director Department of Infrastructure and Support Services, Ministry of Local Government and Housing. P.O. Box LUSAKA Tel. 260-1-253643 E-mail:	
Anticipated start date	**Estimated time to implement**	**Estimated Cost in K (Billion)**	
2007	Five Years (2007-2011)		
PART B: PROJECT DESCRIPTION AND OBJECTIVES			
Project description: *(A list or short narration that describes the project and its rationale)*			
The project will undertake elaboration of the domestic water supply and sanitation (WSS) strategies and enhance institutional capacity building in implementing WSS initiatives. This will ultimately increase access to safe water and sanitation and improve sustainability of the facilities in Zambia			
Project fit with national and regional planning frameworks: *(Describe how the project fits into existing programmes and how it aligns with policy)*			
Provision of water supply and sanitation in rural and urban Zambia is currently low. In rural there is 35% coverage for water supply and 13% for sanitation, while in urban areas there is 86% coverage for water supply and 41% for sanitation. This project will contribute to improved health and reduce poverty through the increase in coverage for rural and urban water supply and sanitation. This is in line with the following: • National Water Policy aim of increasing accessibility to safe drinking water and sanitation facilities to achieve the overall national goal of *"universal access to safe, adequate and reliable water supply and sanitation services"* • Fifth National Development Plan theme of broad based wealth and job creation through citizenry participation and technological advancement and has the improvement of water supply and sanitation as one of the priority areas of intervention • Meeting the MDGs target on WSS			
Project objectives: *(A list of up to say 6 of the key objectives)*			
To enhance planning of WSS programmes To build capacity the of WSS implementers in execution of WSS programmes To enhance sustainability of WSS programmes			
Project outputs and / or deliverables: *(A list of the tangible items that will be produced by the project)*			
The following will be the deliverables: • A strategy for water supply and sanitation • Capacity built in institutions in UWSS and RWSS planning, implementation, monitoring, information management, sanitation and hygiene education • Training of local communities in managing WSS systems			

Intended beneficiaries: *(A brief exposition of who will benefit from the project)*
The people in the rural and urban areas of Zambia
Project contribution to IWRM: *(Describe how the project contributes to IWRM)*
Water supply and sanitation is one of the sub-sectors that utilises 16% of the water resource. Its integration into the overall IWRM framework will lead sustainable and equitable access to safe water supply and proper sanitation to meet basic needs for improved health and alleviating poverty
Project contribution to meeting the MDG's: *(Describe how the project contributes to the MDG's)*
If Zambia has to meet the MDGs by 2015, the proposed project will build capacity that will enable the country better plan, manage, implement and sustain faculties thus increase on the WSS coverage to meet the MDGs by directly halving the number of people in Zambia without access to safe drinking water, sanitation, and thereby contributing to reducing poverty
PART C: SUPPORTING INFORMATION *(In each of the sections below provide notes about the project's design relative to the issue and what has already been done or what will be done. Include both costs and benefits)*
1. Social and Environmental Sustainability: *(Including impacts and mitigation strategies, EIA status)*
The wellbeing of the people as well as the environment will be enhanced by having adequate capacity to plan for and manage WSS facilities
2. Participation: *(Who are the stakeholders and how are they participating?)*
Provincial Administration, Local Authorities, NGOs, traditional leadership, local communities, and water utility companies will participate in consultations and training activities
3. Gender and Health Issues:
Gender equity with special focus of enhancing women's participation and promoting capacity in hygiene education will be considered
4. Legal framework: *(Status of the project partners, compliance with national law and international treaty etc)*
The Ministry of Local Government and Housing has the overall mandate over WSS and will coordinate all the partners
5. Risks and uncertainties: *(Are there any issues that may prevent or inhibit implementation?)*
Securing adequate funding and effective collaboration and coordination between the various stakeholders
6. Any other relevant issues: *(E.g. technology, skills, capacity building, institutional development etc)*
Clear institutional roles have been spelled out under the water sector reforms. Capacity building through the WASHE approach is being built at community level, while commercialisation is being pursued for UWSS
7. Monitoring and Evaluation Framework: *(Provide a preliminary indication of how M&E will be implemented)*
Government has provided a monitoring framework for the Fifth National Development plan through the creation of a division of planning in the Ministry of Finance and National Planning. The M and E will also be overseen by the Water SAG which has a working group on water supply and sanitation
PART D: FINANCIAL
1. Provisional Project Budget:

DESCRIPTION OF ACTIVITY	ESTIMATE K Billion
Elaborate on water supply and sanitation strategy Undertake capacity building in UWSS planning, implementation, monitoring, information management, sanitation and hygiene education Undertake capacity building in RWSS planning, implementation, monitoring, information management, sanitation and hygiene education Conduct Training in community management approaches, concepts water demand management, IWRM at District, Provincial and National levels	
TOTAL	

2. Provisional Financial Programme: *(Expected cash flows for the next five years)*

Current YEAR	Year +1	Year + 2	Year + 3	year +4	TOTAL *K (Billion)*

3. Contributions: *(Set out the anticipated sources of financing for the project and type e.g. grant, loan)*

EXPECTED SOURCE	NATURE	ESTIMATE K Billion
1. Cooperating partners 2. Government of the Republic of Zambia	Grant Counterpart funding	
TOTAL		

4. Security:*(Provide details of how any financing can be secured)*
Government has a well established transparent system on programme/project expenditure which can reasonably secure all project funds

Rural Water Supply and Sanitation

THE REPUBLIC OF ZAMBIA
MINISTRY OF ENERGY AND WATER DEVELOPMENT

Integrated Water Resources Management/We Implementation Plan
Project Concept Note

PART A: PROJECT SUMMARY			**Last update of this PCN**
			25 October 2007
State	**Province**	**City/Town**	**Reference Number**
Zambia	Whole country	Lusaka	PCN 3.2

Project Title

Rural Water Supply and Sanitation

Sector	**Sub-sector**	**Type of project**
Water	Water Supply and Sanitation	
Implementing Agency	**Type of Institution (Government,**	**Contact Details**
Department of Infrastructure and Support Services	Government	P.O. Box , Lusaka
Partner Agencies	**Type of Institution and role in project**	**Contact Details**
Ministry of Energy and Water Development Local Authorities NGOs	Water resources assessment, technical advice Planning, resource and community mobilisation Planning, resource and community mobilisation	The Director Department of Infrastructure and Support Services, Ministry of Local Government and Housing. P.O. Box LUSAKA Tel. 260-1-253643 E-mail:
Anticipated start date	**Estimated time to implement**	**Estimated Cost in K (Billion)**
2007	Five Years (2007-2011)	292.6

PART B: PROJECT DESCRIPTION AND OBJECTIVES

Project description: *(A list or short narration that describes the project and its rationale)*

The project will undertake new investments as well as rehabilitation of water supply and sanitation facilities in the Country. New hand dug wells, boreholes and pit latrines will be constructed during the project period. Facilities that are not functioning will be rehabilitated. In addition capacity in O&M will be built and hygiene education undertaken This will ultimately increase access to safe water and sanitation which is currently low in the rural areas of Zambia

Project fit with national and regional planning frameworks: *(Describe how the project fits into existing programmes and how it aligns with policy)*

Provision of water supply and sanitation in rural Zambia is currently low with 35% coverage for water supply and 13% for sanitation. This project will contribute to improved health and reduce poverty through the increase in coverage for rural water supply and sanitation. This is in line with the following:

- National Water Policy aim of *"increasing accessibility to safe drinking water and sanitation facilities for the rural population of Zambia"* so as to achieve the overall national goal of *"universal access to safe, adequate and reliable water supply and sanitation services"*
- Fifth National Development Plan theme of broad based wealth and job creation through citizenry participation and technological advancement and has the improvement of water supply and sanitation as one of the priority areas of intervention
- MDGs target on WSS

Project objectives: *(A list of up to say 6 of the key objectives)*

To increase access to functional rural water supply water points
To increase number of people in rural areas using safe sanitation facilities
To improve health
To contribute to poverty reduction

Project outputs and / or deliverables: *(A list of the tangible items that will be produced by the project)*

The following will be the deliverables:

- Hand dug wells, boreholes, protected springs and pit latrines as part of the new investments
- Hand dug wells and boreholes rehabilitated

Intended beneficiaries: *(A brief exposition of who will benefit from the project)*

The people in the rural areas of Zambia

Project contribution to IWRM: *(Describe how the project contributes to IWRM)*

Water supply and sanitation is one of the sub-sectors that utilises 16% of the water resource. Its integration into the overall IWRM framework will lead to the rural population have sustainable and equitable access to safe water supply and proper sanitation to meet basic needs for improved health and alleviating poverty

Project contribution to meeting the MDG's: *(Describe how the project contributes to the MDG's)*

If Zambia has to meet the MDGs by 2015, the proposed project will enable the country increase on the WSS facilities to meet the MDGs by directly halving the number of people in Zambia without access to safe drinking water, sanitation, and thereby contributing to reducing poverty

PART C: SUPPORTING INFORMATION *(In each of the sections below provide notes about the project's design relative to the issue and what has already been done or what will be done. Include both costs and benefits)*

1. Social and Environmental Sustainability: *(Including impacts and mitigation strategies, EIA status)*

The wellbeing of the people as well as the environment will be enhanced by having adequate WSS facilities. Rural WSS facilities are small scale and thus do not pose an environmental concern. EIA procedures will be followed if a project falls under the EIA regulations

2. Participation: *(Who are the stakeholders and how are they participating?)*

Provincial Administration, Local Authorities, NGOs, traditional leadership, local communities

3. Gender and Health Issues:

Site selection, technology choices, management and use of facilities will have gender and health considerations

4. Legal framework: *(Status of the project partners, compliance with national law and international treaty etc)*

The project partners are not limited by any legal issue. The Ministry of Local Government and Housing has the overall mandate over WSS and will coordinate all the partners

5. Risks and uncertainties: *(Are there any issues that may prevent or inhibit implementation?)*

Though not serious, counterpart funding and government bureaucracy may delay the implementation of some activities

6. Any other relevant issues: *(E.g. technology, skills, capacity building, institutional development etc)*

Clear institutional roles have been spelled out under the water sector reforms. Capacity building through the WASHE Concept is being built at community level

7. Monitoring and Evaluation Framework: *(Provide a preliminary indication of how M&E will be implemented)*

Government has provided a monitoring framework for the Fifth National Development plan through the creation of a division of planning in the Ministry of Finance and National Planning. The M and E will also be overseen by the Water SAG which has a working group on water supply and sanitation

PART D: FINANCIAL

1. Provisional Project Budget:

DESCRIPTION OF ACTIVITY	ESTIMATE K Billion
New investments 1. Hand dug wells 2. boreholes, and development of other sources (e.g. springs) 3. Pit latrines **Rehabilitations** 4. Hand dug wells 5. Boreholes and other sources **Capacity building** 6. Establishment and training of water committees 7. Undertaking hygiene and health education	
TOTAL	**292.6**

2. Provisional Financial Programme: *(Expected cash flows for the next five years)*

Current YEAR	Year +1	Year + 2	Year + 3	year +4	TOTAL *K (Billion)*

3. Contributions: *(Set out the anticipated sources of financing for the project and type e.g. grant, loan)*

EXPECTED SOURCE	NATURE	ESTIMATE K Billion
1. Cooperating partners 2. Government of the Republic of Zambia	Grant Counterpart funding	
TOTAL		

4. Security:*(Provide details of how any financing can be secured)*

Government has a well established transparent system on programme/project expenditure which can reasonably secure all project funds

Urban Water Supply and Sanitation

THE REPUBLIC OF ZAMBIA MINISTRY OF ENERGY AND WATER DEVELOPMENT			
Integrated Water Resources Management/WE Implementation Plan **Project Concept Note**			
PART A: PROJECT SUMMARY			**Last update of this PCN** 25 October 2007
State	**Province**	**City/Town**	**Reference Number**
Zambia	Whole country	Lusaka	PCN 3.3
Project Title			
Urban Water Supply and Sanitation			
Sector	**Sub-sector**		**Type of project**
Water	Water Supply and Sanitation		
Implementing Agency	**Type of Institution (Government,**		**Contact Details**
Department of Infrastructure and Support Services	Government		P.O. Box , Lusaka
Partner Agencies	**Type of Institution and role in project**		**Contact Details**
Commercial Utilities Local Authorities	Planning and Implementation Planning, resource and community mobilisation		The Director Department of Infrastructure and Support Services, Ministry of Local Government and Housing. P.O. Box LUSAKA Tel. 260-1-253643 E-mail:
Anticipated start date	**Estimated time to implement**		**Estimated Cost in K (Billion)**
2007	Five Years (2007-2011)		290.8

PART B: PROJECT DESCRIPTION AND OBJECTIVES

Project description: *(A list or short narration that describes the project and its rationale)*

The project will undertake new investments as well as rehabilitation of water supply and sanitation facilities in the urban areas of the country. In addition support to establishing commercial utilities and capacity in operating commercial utilities will be built. This will ultimately increase access to safe water and sanitation in the urban areas of Zambia

Project fit with national and regional planning frameworks: *(Describe how the project fits into existing programmes and how it aligns with policy)*

Coverage of water supply and sanitation in urban Zambia is currently 86% and 41% respectively. This project will contribute to improved health and reduce poverty through the increase in coverage for urban water supply and sanitation. This is in line with the following:

- National Water Policy aim of *"increasing accessibility to safe drinking water and sanitation facilities for the population of Zambia"* so as to achieve the overall national goal of *"universal access to safe, adequate and reliable water supply and sanitation services"*
- Fifth National Development Plan theme of broad based wealth and job creation through citizenry participation and technological advancement and has the improvement of water supply and sanitation as one of the priority areas of intervention
- MDGs target on WSS

Project objectives: *(A list of up to say 6 of the key objectives)*

To increase access to urban water supply
To increase number of people in urban areas using safe sanitation facilities
To improve on the delivery and sustainability of the WSS services
To contribute to poverty reduction

Project outputs and / or deliverables: *(A list of the tangible items that will be produced by the project)*

The following will be the deliverables:

- Water and waste water treatment plants improved
- Water distribution systems (pipe networks, reservoirs) improved
- Capability of commercial utilities to effectively and efficiently deliver WSS services enhanced
- Solid waste dump sites in place

Intended beneficiaries: *(A brief exposition of who will benefit from the project)*

The people in the urban areas of Zambia

Project contribution to IWRM: *(Describe how the project contributes to IWRM)*

Water supply and sanitation is one of the sub-sectors that utilises 16% of the water resource. Its integration into the overall IWRM framework will lead to the urban population having sustainable and equitable access to safe water supply and proper sanitation to meet basic needs for improved health and alleviating poverty

Project contribution to meeting the MDG's: *(Describe how the project contributes to the MDG's)*

If Zambia has to meet the MDGs by 2015, the proposed project will enable the country increase on the WSS facilities to meet the MDGs by increasing access of water supply to 95% and sanitation to 80% in urban areas of Zambia

PART C: SUPPORTING INFORMATION *(In each of the sections below provide notes about the project's design relative to the issue and what has already been done or what will be done. Include both costs and benefits)*

1. Social and Environmental Sustainability: *(Including impacts and mitigation strategies, EIA status)*

The wellbeing of the people as well as the environment will be enhanced by having adequate WSS facilities. EIA procedures under the EIA regulations will be followed for the projects

2. Participation: *(Who are the stakeholders and how are they participating?)*

Commercial utilities will be the implementers. Local Authorities will plan for the services as they have the overall responsibilities to ensure WSS services are provided

3. Gender and Health Issues:

Management and use of facilities will have gender and health considerations

4. Legal framework: *(Status of the project partners, compliance with national law and international treaty etc)*

The project partners are not limited by any legal issue. The Ministry of Local Government and Housing has the overall mandate over WSS and will coordinate all the partners

5. Risks and uncertainties: *(Are there any issues that may prevent or inhibit implementation?)*

Though not serious, counterpart funding and government bureaucracy may delay the implementation of some activities

6. Any other relevant issues: *(E.g. technology, skills, capacity building, institutional development etc)*

Clear institutional roles have been spelled out under the water sector reforms. Capacity building of the commercial utilities in terms of investments and skills will be key to success

7. Monitoring and Evaluation Framework: *(Provide a preliminary indication of how M&E will be implemented)*

Government has provided a monitoring framework for the Fifth National Development plan through the creation of a division of planning in the Ministry of Finance and National Planning. The M and E will also be overseen by the Water SAG which has a working group on water supply and sanitation

PART D: FINANCIAL

1. Provisional Project Budget:

DESCRIPTION OF ACTIVITY	ESTIMATE K Billion
New investments	123.9
1. Construction of water treatment plants	
2. Construction of waste water treatment plants	
3. Construction and operation of solid waste dump sites (solid waste management	(23.9)
Rehabilitations	97.4
4. Water treatment plants, water pipelines, pumps	
5. Waste water treatment	
Operation and maintenance of water schemes	19.4
Capacity building	
6. Commercialisation of utilities (metering systems, billing, management processes, customer care etc)	50.0
7. human resources	
TOTAL	**290.8**

2. Provisional Financial Programme: *(Expected cash flows for the next five years)*

Current YEAR	Year +1	Year + 2	Year + 3	year +4	TOTAL *K (Billion)*
	52.8	70.7	61.7	58.0	47.6

3. Contributions: *(Set out the anticipated sources of financing for the project and type e.g. grant, loan)*

EXPECTED SOURCE	NATURE	ESTIMATE K Billion
1. Cooperating partners	Grant	233.8
2. Government of the Republic of Zambia	Counterpart funding	57.0
TOTAL		**290.8**

4. Security: *(Provide details of how any financing can be secured)*

Government has a well established transparent system on programme/project expenditure which can reasonably secure all project funds

Peri-Urban Water Supply and Sanitation

THE REPUBLIC OF ZAMBIA
MINISTRY OF ENERGY AND WATER DEVELOPMENT

Integrated Water Resources Management/WE Implementation Plan
Project Concept Note

PART A: PROJECT SUMMARY			**Last update of this PCN**
			25 October 2007
State	**Province**	**City/Town**	**Reference Number**
Zambia	Whole country	Lusaka	PCN 3.4

Project Title		
Peri-Urban Water Supply and Sanitation		
Sector	**Sub-sector**	**Type of project**
Water	Water Supply and Sanitation	
Implementing Agency	**Type of Institution (Government,**	**Contact Details**
Department of Infrastructure and Support Services	Government	P.O. Box , Lusaka
Partner Agencies	**Type of Institution and role in project**	**Contact Details**
Commercial Utilities Local Authorities NGOs	Planning and Implementation Planning, resource and community mobilisation Planning, resource and community mobilisation	The Director Department of Infrastructure and Support Services, Ministry of Local Government and Housing. P.O. Box, LUSAKA Tel. 260-1-253643:
Anticipated start date	**Estimated time to implement**	**Estimated Cost in K (Billion)**
2007	Five Years (2007-2011)	644.3

PART B: PROJECT DESCRIPTION AND OBJECTIVES

Project description: *(A list or short narration that describes the project and its rationale)*

The project will undertake new investments as well as rehabilitation of water supply and sanitation facilities in the peri-urban areas of the country. Support will be provided to commercial utilities and Local Authorities. This will ultimately increase access to safe water and sanitation in the urban areas of Zambia

Project fit with national and regional planning frameworks: *(Describe how the project fits into existing programmes and how it aligns with policy)*

Between 40-80% of the people in Urban areas reside in peri-urban areas and informal settlements. Government plans to have 100% coverage of water supply and sanitation in peri-urban areas by 2015. This project will contribute to improved health and reduce poverty through the increase in coverage for peri-urban water supply and sanitation. This is in line with the following:

- National Water Policy aim of *"increasing accessibility to safe drinking water and sanitation facilities for the population of Zambia"* so as to achieve the overall national goal of *"universal access to safe, adequate and reliable water supply and sanitation services"*
- Fifth National Development Plan theme of broad based wealth and job creation through citizenry participation and technological advancement and has the improvement of water supply and sanitation as one of the priority areas of intervention
- MDGs target on WSS

Project objectives: *(A list of up to say 6 of the key objectives)*

To increase access to peri-urban water supply
To increase number of people in peri urban areas using safe sanitation facilities.
To improve on the delivery and sustainability of the WSS services in peri-urban areas
To contribute to poverty reduction

Project outputs and / or deliverables: *(A list of the tangible items that will be produced by the project)*

The following will be the deliverables:

- Water points (public standpipes, kiosks and individual yard or house connections)
- Toilets
- Solid waste collection system

Intended beneficiaries: *(A brief exposition of who will benefit from the project)*

The people in the peri-urban areas of Zambia

Project contribution to IWRM: *(Describe how the project contributes to IWRM)*

Water supply and sanitation is one of the sub-sectors that utilises 16% of the water resource. Its integration into the overall IWRM framework will lead to the peri-urban population having sustainable and equitable access to safe water supply and proper sanitation to meet basic needs for improved health and alleviating poverty

Project contribution to meeting the MDG's: *(Describe how the project contributes to the MDG's)*

If Zambia has to meet the MDGs by 2015, the proposed project will enable the country increase on the WSS facilities to meet the MDGs by increasing access of water supply to 95% and sanitation to 80% in urban areas of Zambia by 2015

PART C: SUPPORTING INFORMATION *(In each of the sections below provide notes about the project's design relative to the issue and what has already been done or what will be done. Include both costs and benefits)*

1. Social and Environmental Sustainability: *(Including impacts and mitigation strategies, EIA status)*

The wellbeing of the people as well as the environment will be enhanced by having adequate WSS facilities. EIA procedures under the EIA regulations will be followed for the projects

2. Participation: *(Who are the stakeholders and how are they participating?)*

Commercial utilities will be the implementers. Local Authorities will plan for the services as they have the overall responsibilities to ensure WSS services are provided. NGOs will facilitate community mobilisation, advocacy and mobilisation of financial resources

3. Gender and Health Issues:

Management and use of facilities will have gender and health considerations

4. Legal framework: *(Status of the project partners, compliance with national law and international treaty etc)*

The project partners are not limited by any legal issue. The Ministry of Local Government and Housing has the overall mandate over WSS and will coordinate all the partners

5. Risks and uncertainties: *(Are there any issues that may prevent or inhibit implementation?)*

Though not serious, counterpart funding and government bureaucracy may delay the implementation of some activities

6. Any other relevant issues: *(E.g. technology, skills, capacity building, institutional development etc)*

Clear institutional roles have been spelled out under the water sector reforms. Capacity building of the commercial utilities in terms of investments and skills will be the key to success

7. Monitoring and Evaluation Framework: *(Provide a preliminary indication of how M&E will be implemented)*

Government has provided a monitoring framework for the Fifth National Development plan through the creation of a division of planning in the Ministry of Finance and National Planning. The M and E will also be overseen by the Water SAG which has a working group on water supply and sanitation

Government has provided a monitoring framework for the Fifth National Development plan through the creation of a division of planning in the Ministry of Finance and National Planning. The M and E will also be overseen by the Water SAG which has a working group on water supply and sanitation

PART D: FINANCIAL

1. Provisional Project Budget:

DESCRIPTION OF ACTIVITY	ESTIMATE K Billion
New investments 1. Construction of water points 2. Construction of toilets 3. Solid waste management **Rehabilitations** 4. Water points 5. Waste water treatment **Operation and maintenance of water schemes** **Capacity building** 6. Community management and participation, metering systems, billing, management processes, customer care etc) 7. human resources	
TOTAL	**644.3**

2. Provisional Financial Programme: *(Expected cash flows for the next five years)*

Current YEAR	Year +1	Year + 2	Year + 3	year +4	TOTAL *K (Billion)*
	157.3	146.2	124.4	103.1	113.2

3. Contributions: *(Set out the anticipated sources of financing for the project and type e.g. grant, loan)*

EXPECTED SOURCE	NATURE	ESTIMATE K Billion
1. Cooperating partners	Grant	628.10
2. Government of the Republic of Zambia	Counterpart funding	16.20
TOTAL		**644.3**

4. Security:*(Provide details of how any financing can be secured)*

Government has a well established transparent system on programme/project expenditure which can reasonably secure all project funds

8.8. Annex 3: Project Fact Sheets

This section presents project fact sheets for projects identified under the infrastructure development, water supply and sanitation, and Monitoring, evaluation and capacity building components.

PROJECT FACT SHEET	
Project Title	**Water Resources Development and Infrastructure Development**
Project Number	2.1
Thematic / Focus Area	**Water Resources Infrastructure Development**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The project will involve the construction and rehabilitation of water infrastructure which include dams, canals, irrigation schemes and hydro power generation projects. This will facilitate the control of water and make it available in the required quantity and quality to enhance its utilisation for economic growth
Objectives	• To construct and rehabilitate water infrastructure • To conserve the country's water resources and make them available for economic and social activities
Activities	• Development of water for productive purposes (Dams, springs etc) • Development of irrigation schemes • Development of hydro-meteorological infrastructure • Development of water ways for water transport • Development of hydro-power generation facilities
Key Outputs	• Construct and rehabilitate dams • Construct and rehabilitate irrigation systems • Develop ground water • Construct and rehabilitate canals • Construct hydraulic structures for hydro power stations
Implementing agents	• Ministry of Agriculture and Cooperatives • Ministry of Energy and Water Development • Ministry of Works and Supply, Local Authorities • Private sector
Cost	

PROJECT FACT SHEET	
Project Title	**Monitoring Development of Water Infrastructure**
Project Number	2.2
Thematic / Focus Area	**Water Resources Infrastructure Development**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The project will provide for the development of a monitoring system consisting of key indicators, the institutional design to enhance and the field collection of data and regular inspections and the establishment of an information and decision-making IT system. This will enable effective regulation and monitoring of water infrastructure development to ensure they are implemented in a holistic and sustainable manner
Objectives	• To ensure water infrastructure development is undertaken according to regulations • To ensure management of water infrastructure is undertaken in a sustainable manner • To improve decision making on the planning, development and management of water infrastructure
Activities	• Develop policy, guidelines and regulations on water infrastructure development and management • Undertake monitoring of water infrastructure development, operation and management • Undertake public awareness on regulations for water infrastructure development and management
Key Outputs	• Policy, guidelines and regulations on water infrastructure development and management developed • Monitoring of water infrastructure development, operation and management enhanced • Data base of the management of water infrastructure • Public aware of regulations for water infrastructure development and management
Implementing agents	• Ministry of Energy and Water Development • Ministry of Agriculture and Cooperatives • Water Board • Local Authorities • Private sector
Cost	

PROJECT FACT SHEET	
Project Title	**Rural Water Supply and Sanitation (Construction and rehabilitation of facilities)**
Project Number	3.1
Thematic / Focus Area	**Water Supply and Sanitation**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The project will undertake new investments as well as rehabilitation of water supply and sanitation facilities in the Country. New hand dug wells, boreholes and pit latrines will be constructed during the project period. Facilities that are not functioning will be rehabilitated. In addition capacity in O&M will be built and hygiene education undertaken This will ultimately increase access to safe water and sanitation which is currently low in the rural areas of Zambia
Objectives	• To increase access to functional rural water supply water points • To increase number of people in rural areas using safe sanitation facilities • To improve health • To contribute to poverty reduction
Activities	• New investments • Hand dug wells • boreholes, and development of other sources (e.g. springs) • Pit latrines • Rehabilitations • Hand dug wells • Boreholes and other sources • Capacity building • Establishment and training of water committees • Undertaking hygiene and health education
Key Outputs	• Hand dug wells, boreholes, protected springs and pit latrines as part of the new investments • Hand dug wells and boreholes rehabilitated
Implementing agents	• Department of Infrastructure and Support Services • Ministry of Energy and Water Development • Local Authorities • NGOs
Cost	

PROJECT FACT SHEET	
Project Title	**Institutional Capacity Building and Enhancement**
Project Number	3.2
Thematic / Focus Area	**Water Supply and Sanitation**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The project will undertake elaboration of the domestic water supply and sanitation (WSS) strategies and enhance institutional capacity building in implementing WSS initiatives. This will ultimately increase access to safe water and sanitation and improve sustainability of the facilities in Zambia
Objectives	• To enhance planning of WSS programmes • To build capacity the of WSS implementers in execution of WSS programmes • To enhance sustainability of WSS programmes
Activities	• Elaborate on water supply and sanitation strategy • Undertake capacity building in UWSS planning, implementation, monitoring, information management, sanitation and hygiene education • Undertake capacity building in RWSS planning, implementation, monitoring, information management, sanitation and hygiene education • Conduct Training in community management approaches, concepts water demand management, IWRM at District, Provincial and National levels
Key Outputs	• A strategy for water supply and sanitation • Capacity built in institutions in UWSS and RWSS planning, implementation, monitoring, information management, sanitation and hygiene education • Training of local communities in managing WSS systems
Implementing agents	• Department of Infrastructure and Support Services • Ministry of Energy and Water Development • Local Authorities • NGOs
Cost	

PROJECT FACT SHEET	
Project Title	**Urban Water Supply and Sanitation (Rehabilitation of facilities)**
Project Number	3.3
Thematic / Focus Area	**Water Supply and Sanitation**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The project will undertake new investments as well as rehabilitation of water supply and sanitation facilities in the urban areas of the country. In addition support to establishing commercial utilities and capacity in operating commercial utilities will be built. This will ultimately increase access to safe water and sanitation in the urban areas of Zambia
Objectives	• To increase access to urban water supply • To increase number of people in urban areas using safe sanitation facilities • To improve on the delivery and sustainability of the WSS services • To contribute to poverty reduction
Activities	• New investments • Construction of water treatment plants • Construction of waste water treatment plants • Construction and operation of solid waste dump sites (solid waste management • Rehabilitations • Water treatment plants, water pipelines, pumps • Waste water treatment • Operation and maintenance of water schemes • Capacity building • Commercialisation of utilities (metering systems, billing, management processes, customer care etc) • human resources
Key Outputs	• Water and waste water treatment plants improved • Water distribution systems (pipe networks, reservoirs) improved • Capability of commercial utilities to effectively and efficiently deliver WSS services enhanced • Solid waste dump sites in place
Implementing agents	• Department of Infrastructure and Support Services • Commercial Utilities • Local Authorities
Cost	

PROJECT FACT SHEET	
Project Title	**Peri-Urban Water Supply and Sanitation**
Project Number	3.4
Thematic / Focus Area	**Water Supply and Sanitation**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The project will undertake new investments as well as rehabilitation of water supply and sanitation facilities in the peri-urban areas of the country. Support will be provided to commercial utilities and Local Authorities. This will ultimately increase access to safe water and sanitation in the urban areas of Zambia
Objectives	• To increase access to peri-urban water supply • To increase number of people in peri urban areas using safe sanitation facilities • To improve on the delivery and sustainability of the WSS services in peri-urban areas • To contribute to poverty reduction
Activities	• New investments • Construction of water points • Construction of toilets • Solid waste management • Rehabilitations • Water points • Waste water treatment • Operation and maintenance of water schemes • Capacity building • Community management and participation, metering systems, billing, management processes, customer care etc) • human resources
Key Outputs	• Water points (public standpipes, kiosks and individual yard or house connections) • Toilets • Solid waste collection system
Implementing agents	• Department of Infrastructure and Support Services • Commercial Utilities • Local Authorities
Cost	

PROJECT FACT SHEET	
Project Title	**Mainstreaming Cross-Cutting Issues – Gender and HIV/AIDS**
Project Number	
Thematic / Focus Area	**Monitoring, Evaluation and Capacity Building**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Inadequate gender mainstreaming of water issues into national development plans; and the prevalence of HIVAIDS pandemic
Objectives	To implement measures in the sector which enhance mainstreaming of crosscutting issues
Activities	• Monitor and evaluate gender mainstreaming in the development and implementation of water sector project activities • Promote the use of appropriate and gender sensitive technology • Develop guidelines that consider gender and vulnerable in the use and management of water resources • Develop and disseminate of gender mainstreaming tools • Implement the national HIV/AIDS policy • Develop HIV/AIDS advocacy materials and disseminate the information with a focus on the role of water • Collaborate and cooperate with the health sector and other sectors in supporting measures to combat HIV/AIDS
Key Outputs	• Monitoring and evaluation reports • Programmes, Information, pamphlets, posters promoting appropriate and gender sensitive technology • Gender sensitive/ vulnerable user guidelines on the use and management of water resources • Gender mainstreaming tools, and record of institutions, organisations, communities in possession of the tools • HIV/AIDS advocacy materials, record of communities and organisations in receipt of materials • Minutes of collaboration and coordination meetings
Implementing agents	
Cost	

PROJECT FACT SHEET	
Project Title	**Institutional and Human Resource Capacity Building and Enhancement**
Project Number	
Thematic / Focus Area	**Monitoring, Evaluation and Capacity Building**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Sector programmes and progress is hampered by inadequate human resource and institutional capacity. This project will support strengthening of institutional and human resources capacity
Objectives	To promote capacity in order to efficiently and effectively carry out the mandates of various stakeholders
Activities	• Undertake recruitment, education and training of personnel to align them into IWRM sphere • Create a research and training centre for IWRM • Conduct needs assessment and develop programme for capacity building • Undertake informal training and exchange or secondment of staff between public, non-governmental and private sector water institutions • Provide training in conflict management and arbitration for water resources related conflicts and arbitration.
Key Outputs	• Personnel trained in IWRM sphere • IWRM research centre • Needs assessment report and capacity building programme in place • Number of trained human resources in conflict resolution and arbitration
Implementing agents	MEWD, UNZA, Cabinet, Training and research institutions, NGOs, Consultants, Line ministries, multi-sectoral stakeholders
Cost	

PROJECT FACT SHEET	
Project Title	**Water Research and Development**
Project Number	
Thematic / Focus Area	**Monitoring, Evaluation and Capacity Building**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	Knowledge on key water related issues such as technology development, water allocation and quality and quantity of water resources needs better understanding than is currently known. There is therefore need to carry out water research and development
Objectives	To enhance the understanding of the country's water related issues, and develop solutions and technologies that will improve planning, regulation, development, management, allocation and access of water
Activities	• Research on application of appropriate technologies for efficient water use • Study the cyclic variation of floods and droughts • Study precipitation enhancement • Develop appropriate technology in water resources management (i.e. water re-use) • Carryout research in inter basin water transfer • Study operations of existing and new dams to improve the benefits • Study the impact on water resources of erosion and land degradation • Study indigenous practices and knowledge in management of water resources • Consider appropriate technologies for water supply and sanitation systems for persons with disabilities • Conduct research in international waters to address specific issues of equitable and reasonable utilisation, water allocation, benefit sharing and stakeholder participation
Key Outputs	• Research results on appropriate technologies and efficient use, inter-basin transfer • Study reports on variation of floods and droughts, precipitation enhancement • Dam operations and benefits reports
Implementing agents	MEWD, UNZA IWRM centre, research institutions, NGOs, Line ministries, Consultants, traditional authorities
Cost	

PROJECT FACT SHEET	
Project Title	**Public Awareness and Advocacy**
Project Number	
Thematic / Focus Area	**Monitoring, Evaluation and Capacity Building**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	While water plays a key role in national development, its role in national development is not well known. Awareness of the role of water in economic and social development is inadequate; awareness and implantation of water demand management techniques is equally inadequate
Objectives	To provide and disseminate information on water resources for effective planning, development, management and utilisation
Activities	• Develop awareness programmes on water demand techniques • Pilot the use on water demand techniques in some selected areas • Develop awareness programmes on role of water in the economy (role of water in energy, irrigation, industry, tourism, culture, fisheries sectors etc) • Strengthen multi-stakeholder Consultative Forum, the Water SAG (effective involvement of all stakeholders including the private sector, NGOs and civil society organisations.) • Incorporate education programmes on the water sector in the education curriculum • Disseminate national water policy and the new water management legislation
Key Outputs	• Water resources information on water demand techniques and role of water in the economy • Report on water demand pilots • Number of multi-stakeholder forums • Education curriculum inclusive of water sector programmes • Record of organisations, institutions and groups which have access to water policy and new water management legislation
Implementing agents	MEWD, MOE, MOFNP, MLGH, Print and electronic media, Line ministries, Training institutions, multi-sectoral stakeholders
Cost	

PROJECT FACT SHEET	
Project Title	**Monitoring and Evaluation**
Project Number	
Thematic / Focus Area	**Monitoring, Evaluation and Capacity Building**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The progress and performance of programmes and projects are very difficult track and assess as a result of poor and insufficient monitoring and evaluation systems. The project is aimed at improving programme and project performance
Objectives	To monitor and evaluate the performance of the programmes and projects in order to determine their impacts
Activities	• Design and setup a monitoring and evaluation system • Collect data on input and outputs of various programmes and analyse • Undertake impact monitoring by collecting data on the planned outcomes • Undertake external evaluations and studies to assess long term impacts
Key Outputs	• Monitoring and evaluation system set up • Impacts and outcomes assessed • Data • Reports
Implementing agents	MEWD, CSO, WSAG, MOFNP, Research institutions, consultants, NGOs
Cost	

PROJECT FACT SHEET	
Project Title	**Financing and Economics**
Project Number	
Thematic / Focus Area	**Monitoring, Evaluation and Capacity Building**
Duration	Five (5) Years
Planned Start Date	2007
Justification/Rationale	The mechanisms to mobilise funds for investments and operation and maintenance of water supply systems are inadequate. This project will support options for sustainable financing and management of water resources
Objectives	To provide sustainable financing for management of water resources
Activities	• Develop appropriate tariff for urban water supply and sanitation • Develop raw water pricing policy, tariff system and financing mechanisms for water resources management and development • Assess viability of issuing municipal bonds for urban water supply and sanitation infrastructure development • Establish a irrigation development fund • Develop national water resources accounts • Prepare integrated and consolidated budgets and investment plans for water related projects • Strengthen revenue collection management (by Water Board) • Review the effluent discharge charges and the charging mechanism • Prepare Business Plan for proposed IWRM institution
Key Outputs	• Urban water supply and sanitation tariff system • Raw water pricing policy and tariff system • Irrigation Development Fund • Water accounts • Consolidated budgets and Investment plans • Reports
Implementing agents	CUs, NWASCO, MLGH, MEWD, MOFNP, ECZ, CSO, Consultants, multi-sectoral stakeholders, MACO
Cost	

8.9. Annex 4: Key Performance Indicators

Water Resources Management Programme

STRATEGIC FOCAL AREA	PROGRAMMES	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATOR
1. Water Resources Management	**WATER RESOURCES PLANNING**	Finances	Institutions with IWRM mandate and capacity established or improved at regional, national or transboundary levels Water Resources Management and development plans at catchment level.	Maintenance of minimum flows in place Efficient allocation of the water resource	Effective and efficient management of the water resources	Prudent decision making in the management of the water resources thereby increase access for productive use
	SURFACE WATER RESOURCES ASSESSMENT **GROUNDWATER RESOURCE ASSESSMENT**		Surface and ground water monitoring network for water quantity in place Design water quality network Number of Rehabilitated and upgraded laboratory at national and provincial levels	Number of hydrological stations rehabilitated and established for surface water assessment Number of Exploratory boreholes constructed to asses ground water in selected areas Number of water quality stations established Quality of the water resources for both ground and surface water established	Improved decision making in the management of surface and ground water resource at national; catchment and sub catchment level	Water resources managed in an integrated manner

STRATEGIC FOCAL AREA	PROGRAMMES	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATOR
	WATER RESOURCES RESEARCH	Finances	A water resources research centre established Number of IWRM research projects undertaken	Improved understanding of the water resources New Water use efficient technologies developed availability of validated information Different Regimes of our water resources established	Enhanced understanding of the water resources and planning and decision making	Improved management of the water resources
	LEGAL AND INSTITUTIONAL FRAMEWORK CAPACITY ENHANCEMENT	Finances, legal instruments	Legislative framework for IWRM in place (laws, executive regulations, enforcement mechanisms) Development of regulatory instruments and guidelines Identification of roles and responsibilities for different actors in the sector established	Institutions with IWRM mandate and capacity established or improved at regional, national. River basin organisations established Key IWRM issues and concerns mainstreamed in other sector policies, strategies and laws	Enhanced capacity for the effective and efficient management of the water resource	Legal and institutional framework for management of the water resources in an integrated manner in place
	INTERNATIONAL WATERS	Finances and human resources	Water Resources Management Act (legislative frame work for international water management in place) Build capacity to deal with cross boundary water	Develop programmes and plans for the management of international waters Operationalisation of the international agreements and protocols Participation and implementation of international programs and project	Sound decision in the management of international water Adherence to all international agreements and treaties for transboundary waters	Adherence to all international agreements and treaties for transboundary waters

STRATEGIC FOCAL AREA	PROGRAMMES	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATOR
	WATER RESOURCES INFORMATION SYSTEM	Finances/ budget allocation	Network for data collection in place Information exchange protocol developed	An operational water resources management information system in place Standardised and regulated information exchange	Availability of water resources data and information for planning and decision making Information available for efficient allocation of water resources	Water Resources Information system in place and operational
	DROUGHT MANAGEMENT	Finances/ budget allocation	Early warning system for drought conditions developed and operational Mitigation measures for droughts established (supply of water, warn people to be prepared, types of crops to be grown) Develop protocols for monitoring and information exchange during emergences	Map areas which vulnerable to droughts Number of areas where mitigation measures have been undertaken Number of vulnerable persons given service	Rapid response to droughts Negative impact of drought reduced or mitigated	Number of areas where mitigation measures have been undertaken Number of people in need of assistance
	FLOOD MANAGEMENT	Finances/ budget allocation	Early warning system for flood conditions developed and operational Mitigation measures for floods established (supply of water, warn people to vacate areas to be flooded, coordination in operation of dams) Develop protocols for monitoring and information exchange during emergences	Map areas vulnerable to flooding Number of areas where mitigation measures have been undertaken Number of vulnerable persons given service	Rapid response to floods Negative impact of floods reduced or mitigated	Number of areas where mitigation measures have been undertaken Number of people in need of assistance

STRATEGIC FOCAL AREA	PROGRAMMES	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATOR
	FINANCING AND ECONOMICS	Finances/ budget allocation	Financial and management autonomy of Water Resources management Authority Formulation of business plans Efficient and effective system for collection of water fees.	Tariff system for water allocation in place Financing and incentive structures in place (incl. economic instruments	Increased efficiency and effective delivery of service to consumers	Mechanisms for increased private sector financing in place and working
	SUSTAINABLE ENVIRONMENTAL MANAGEMENT	Finances/ budget allocation, Remote sensing images	Number of awareness campaigns carried on sustainable utilisation of the resources Number of water resources management plans Incorporating land use plans Implementation of minimum flow requirements Up dated mapping of land use practices and deforestation	Number of Stakeholders sensitised on sustainable environmental mgt of the water resource Number of catchments /rivers where minimum flow are maintained Improve Land use practices and conservation of forests	Reduction in the pollution of surface and groundwater Sustainable utilisation of the water resource	Number of programs and projects carried out incorporating land use and suitable utilisation of the water resources
	MANAGEMENT OF WETLANDS	Finances/ budget allocation	Institutional and human capacity developed on the management and utilisation of wetlands Set up team to monitor and coordinate the sustainable use of wetlands Advocacy plans on value of wetlands developed	Number of institutional and human capacity built on sustainable utilisation of wetlands Reports on the sustainable utilisation of the wetlands Number of programs designed and materials disseminated on the utilisation of wetlands	Wetlands managed and maintained in a sustainable environmental manner	

STRATEGIC FOCAL AREA	PROGRAMMES	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATOR
	WATER CATCHMENT AREA PROTECTION	Finances/ budget allocation	Water Resources Act Water Resources catchment protection plan production of guidelines and regulation on catchment protection	Number of watershed and catchment areas established and maintained buffer zones for protection of catchment areas defined and mapped	Improved Protection of watershed Critical low flows increased	
	PROGRAMME: ENVIRONMENTAL INSTITUTIONAL CAPACITY BUILDING	Finances/ budget allocation	Develop tailor made environmental programs for the IWRM training centre Develop framework for the invasion of IAS Incorporation of Climate Change into Water resources programmes	Institutions set up. Incorporate, monitor and coordinate plans and strategies with aspects of IAS and Environmental issues Incorporation of Climate change on environment and water resources	Enhanced capacity for the effective and efficient management of the water resource	

Water Resources Infrastructure Development Programme

STRATEGIC FOCAL AREA	PROGRAMME	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATORS
2. Water Resources Infrastructure Development	**WATER RESOURCE DEVELOPMENT AND INFRASTRUCTURE DEVELOPMENT**	Finances/ budget allocation	Number of earth dams rehabilitated and constructed Number of irrigation schemes constructed Number of Hydropower plants constructed Number of water harvesting schemes constructed	Increased access to water for domestic, irrigation and industry usage	Water provision for agriculture improved (increased from water efficiency; new irrigation schemes etc) Water provision for economic development improved (ex. industry, hydropower, tourism, navigation etc)	Increased water use by various sectors Improved security of water supply Amount of water held in reservoirs
	MONITORING DEVELOPMENT OF WATER INFRASTRUCTURE	Finances/ budget allocation	Monitoring and evaluation reports	Improved programme implementation	Enhanced planning and decision making	Timely execution of water infrastructure projects

Water Supply and Sanitation Programme

STRATEGIC FOCAL AREA	PROGRAMME	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATORS
3. Water Supply and Sanitation	**INSTITUTIONAL CAPACITY BUILDING AND ENHANCEMENT**	Finances, Human resource, legal frame work in place	National Water Policy revised and adopted by Cabinet Water Resources Management Act Water Supply and Sanitation Act Subsidiary Legislation	Institutional capacity building and training programmes identified and a plan for human resources development Number of institutions receiving funds to carry out capacity building Separation of WRM and service delivery Decentralised management framework	Institutional and Human resource capacity available to manage and operate the sector	Roles and functions for WSS defined and adopted for all institutional levels (national, decentralised levels and river basin organisations for IWRM) - and between the public and private sector
	WATER RESOURCES MANAGEMENT INFORMATION SYSTEM	Finances/ budget allocation	Network for data collection in place Databases for WSS in place	An operational water resources management information system in place	Availability of water supply and sanitation data and information for planning and decision making	Information system on Water Supply and Sanitation in place and operational

STRATEGIC FOCAL AREA	PROGRAMME	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATORS
	RURAL WATER SUPPLY AND SANITATION	Finances Human resource	Number of boreholes rehabilitated and constructed in districts Number of water supply schemes, springs protected and rainwater harvester constructed Number of household with adequate sanitary and waste disposal facilities	Increased access to safe drinking water and other domestic uses and appropriate sanitation facilities	Percentage of rural population with access to safe and reliable water within 500 meter (*FNDP 2010 and MDG 2015 achievements)* Percentage of rural population with access to adequate latrines and disposal facilities(*FNDP 2010 and MDG 2015 achievements)* Water quality and hygiene improved Incidence of water and sanitation related diseases reduced	

STRATEGIC FOCAL AREA	PROGRAMME	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATORS
	URBAN WATER SUPPLY AND SANITATION	Finances/ budget allocation	Number of boreholes rehabilitated and constructed in districts Number of water supply schemes in place Number of household with adequate sanitary and waste disposal facilities	Increased access to safe drinking water and other domestic uses and appropriate sanitation facilities in place	Percentage of urban population served with drinking water (connections and public distributions) *FNDP 2010 and MDG 2015 achievements* Percentage of urban population with adequate sanitation facilities (connected to sewer and individual installations) *FNDP 2010 and MDG 2015 achievements* Water quality and hygiene improved Incidence of water and sanitation related diseases reduced Percentage of peri-urban population served with drinking water (connections and public distributions) Percentage of peri-urban population with adequate sanitation facilities (connected to sewer and individual installations)	

STRATEGIC FOCAL AREA	PROGRAMME	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATORS
	FINANCING AND ECONOMICS	Finances/ budget allocation. Legal instrument	Number of commercial water utilities in place Water sector financing mechanisms in place (DTF, water development fund)	Financial and management autonomy of urban W&S Mechanisms for increased cost contributions and cost recovery from users in place and working Mechanisms for increased private sector financing in place and working	Increased efficiency and effective delivery of service to consumers	Financing and incentive structures in place (incl. economic instruments)

4. Monitoring, Evaluation and Capacity Building Strategies and Programmes

STRATEGIC FOCAL AREA	PROGRAMMES	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATORS
4. Monitoring, Evaluation and Capacity building	**MAINSTREAMING CROSS CUTTING ISSUES- (A)- GENDER**	Finances/ budget allocation	Number or proportion of women in the management of water resources management	Capacity built in gender mainstreaming in IWRM	Incorporation of gender role in the programs and activities for IWRM	Percentage of Women in decision making competent personnel in place to hand and deal with gender issue in view of IWRM
	MAINSTREAMING CROSS CUTTING ISSUES-(B) HIV/AIDS	Finances/ budget allocation	Develop HIV/AIDS policy for the water sector	Implementation of HIV/AIDS policy in the water sector Number of officers trained in counselling of HIV/AIDS	incorporation of HIV/AIDS impact in all the programs for the sector Minimisation of the impact of HIV/AIDS on the human resource in the water sector	Workplace policies and programmes for HIV /AIDS in place

STRATEGIC FOCAL AREA	PROGRAMMES	INPUT INDICATOR	OUTPUT INDICATOR	OUTCOME INDICATOR	IMPACT INDICATOR	KEY PERFORMANCE INDICATORS
	INSTITUTIONAL AND HUMAN RESOURCE CAPACITY BUILDING AND ENHANCEMENT	Finances/ budget allocation	Legislative framework for IWRM in place (laws, executive regulations, enforcement mechanisms) Development of Regulatory instruments and guidelines Identification of roles and responsibilities for different actors in the sector established IWRM centre established	Legal and institutional framework for management of the water resources in an integrated manner in place	Enhanced capacity for the effective and efficient management of the water resource	Institutional capacity building and training programmes in place with regard to communities, national and decentralised government institutions Legal and institutional framework for management of the water resources in an integrated manner in place
	RESEARCH AND DEVELOPMENT	Finances/ budget allocation	A water resources research centre established	Improved understanding of the water resources New technologies developed which are used in the management of water resources Availability of validated information Different Regimes of our water resources established	Enhanced understanding of the water resources and planning and decision making	Improved management of the water resources
	PUBLIC AWARENESS AND ADVOCACY	Finances/ budget allocation	Incorporation of IWRM in educational programmes Production of information on IWRM in the print and electronic media	Popular awareness and political will for IWRM reforms present	Effective and efficient management of the resource	Popular awareness and political will for IWRM reforms present

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