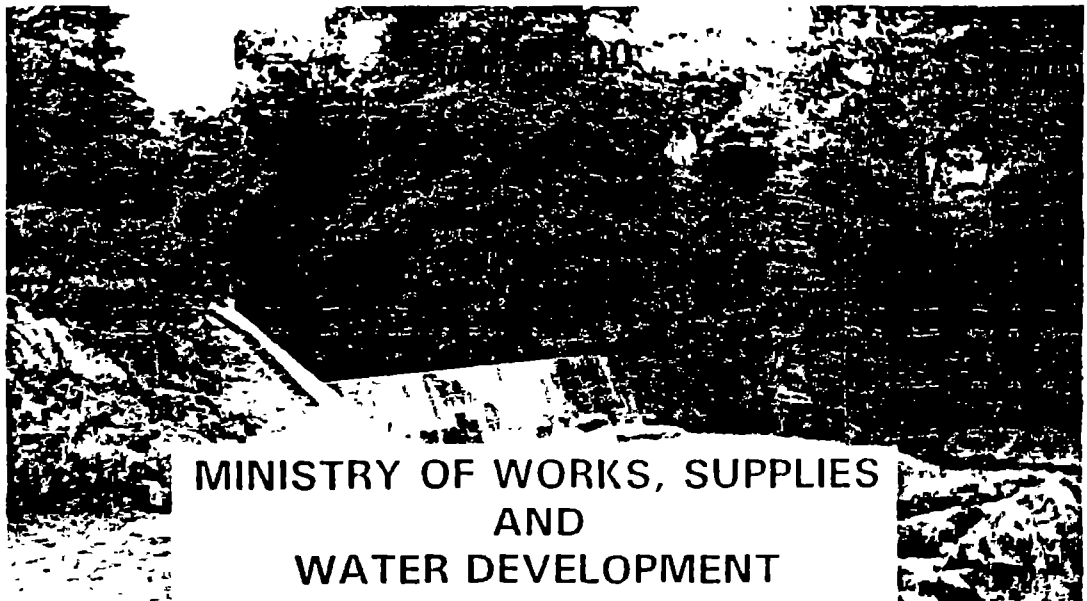


WATER RESOURCES MANAGEMENT POLICY AND STRATEGIES



MINISTRY OF WORKS, SUPPLIES
AND
WATER DEVELOPMENT

MAY 1994.

824-MW-16154

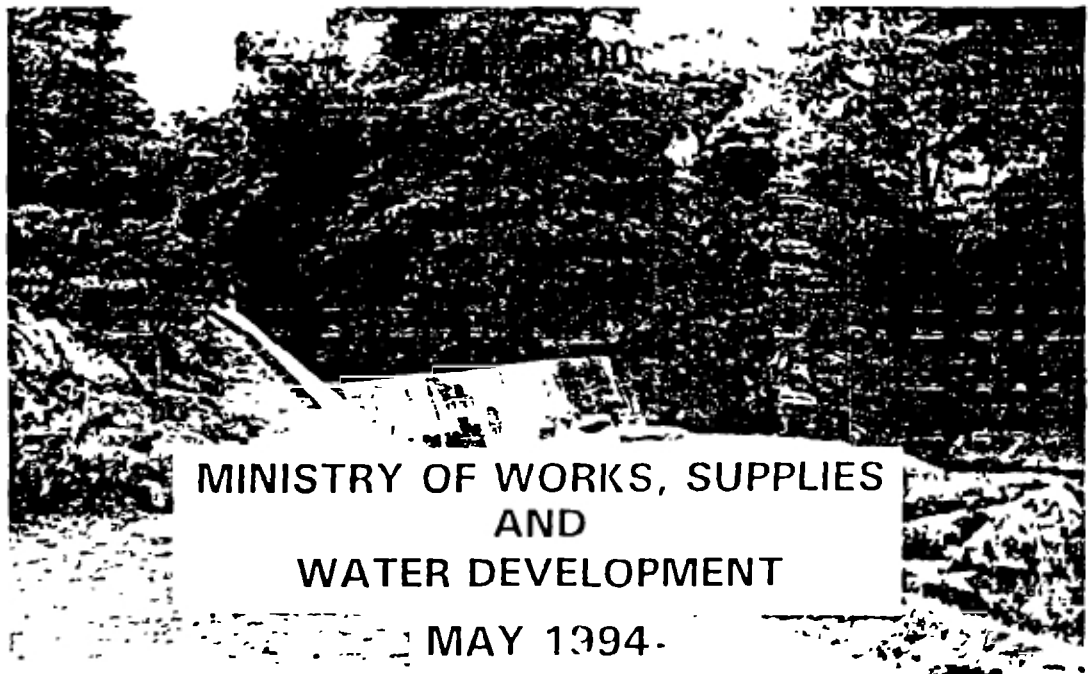


MALAWI GOVERNMENT



LIBRARY IRC
PO Box 93190, 2509 AD THE HAGUE
Tel.: +31 70 30 689 80
Fax: +31 70 35 899 64
BARCODE: 60154
LO: 5224 00001

WATER RESOURCES MANAGEMENT POLICY AND STRATEGIES



MINISTRY OF WORKS, SUPPLIES
AND
WATER DEVELOPMENT

MAY 1994.

MALAWI GOVERNMENT

**WATER RESOURCES
MANAGEMENT POLICY
AND
STRATEGIES**

**MINISTRY OF WORKS, SUPPLIES
AND
WATER DEVELOPMENT**

MAY 1994

FOREWORD FROM THE MINISTER

The Government of Malawi considers provision of water to the people of Malawi as a priority item on its National Development Programme. The growing population has to be matched with a corresponding increase in water supply in order to achieve a balance. However, there are many hindrances which almost negate this balancing to happen and in many instances water allocation and investment options are taken without considering any opportunity costs on the water project to be undertaken.

In order to address the problems of untreated water, usually consumed by a large percentage of our rural community, it has become necessary that a comprehensive programme of water resources development be put in place. The national goals are laid out in the development policies. The goals are to achieve a travelling distance of not more than 500 metres one way to a water point and provide a minimum water per capita of 36 litres per day in urban areas and 27 litres per day in the rural areas. However, those goals must be consistent with acceptable water quality standards. Government considers that provision of clean water is an efficient way of reducing hospitalization and costs on drugs required for treating diseases which are water borne.

The choice and allocation of investment, if it has to be effective must promote maximum involvement by all concerned. In order to reduce recurrent costs on maintenance of water schemes, decentralization of operations and transfer of ownership to the beneficiary community need to be taken into account.

For proactive planning and in order to avoid ad-hoc investment, long term vision is necessary. While following least cost option in the short term the long term view must be to achieve a comprehensive network of water supply. Clear policies and strategies are needed to govern the water sector if it has to perform with definite deliverable goals. Those goals must include the welfare of the people, use of natural resources, type of investment and resource allocation. Pricing for the service and involvement of the beneficiary community in the rural areas must be adequately considered.

The Water Resources Management Policy and Strategies have been prepared in order to adopt this approach and to avoid undertaking water service projects and programmes by reaction. This policy document will guide all water service development programmes in this country and I have all the trust that it will promote rational investment programmes.

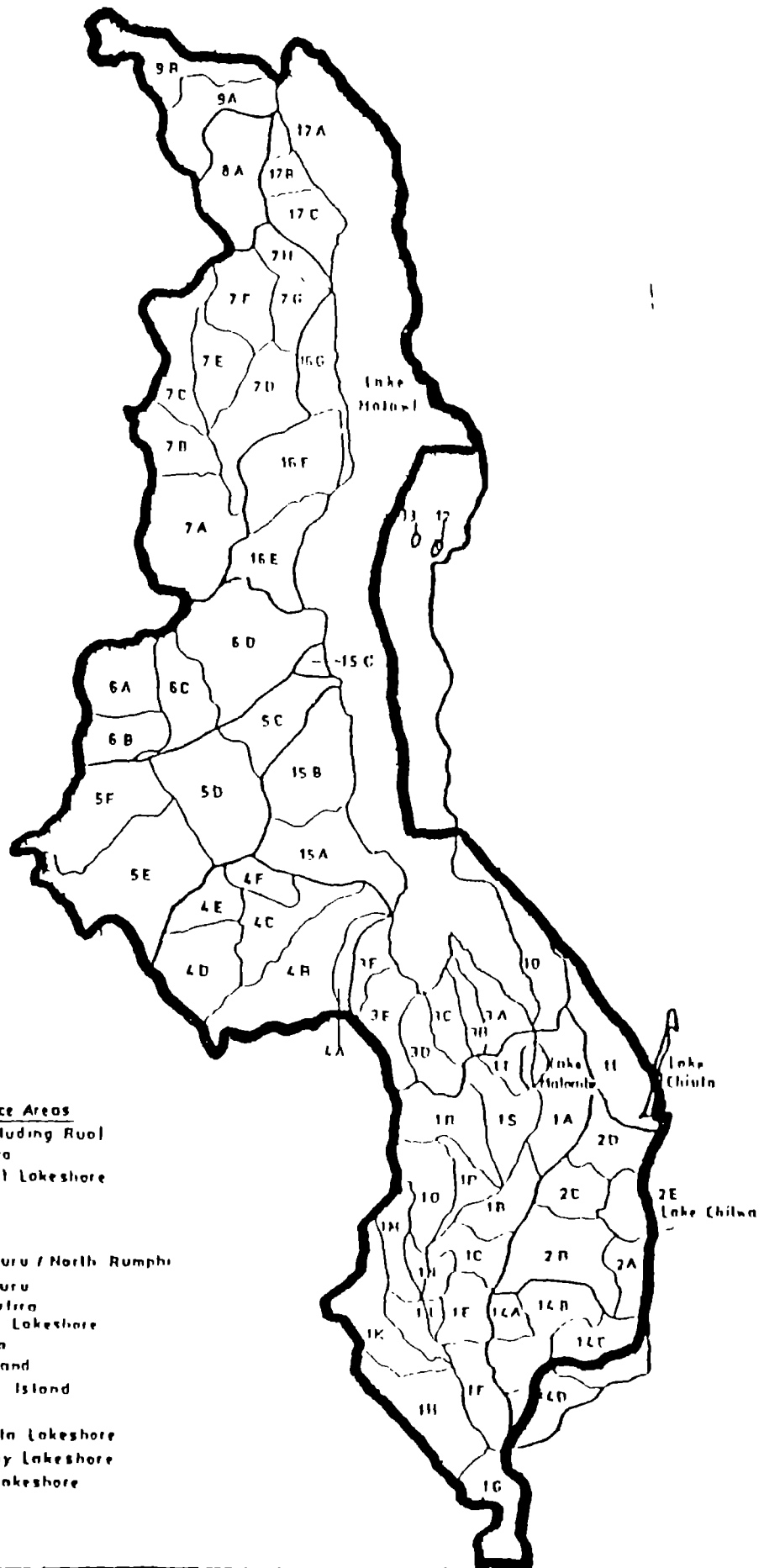
Perfection is always achieved when all exceptions are removed and this document has no exceptions if we have to develop our water resources logically with the speed that is required.

I would like to thank members of my Ministry who were actively involved in the compilation of this document. I also would like to thank members of the Water Sector Study Steering Committee, the World Bank and all those Ministries, Donor Agencies and Institutions involved in the Water Sector service delivery programmes for their constructive comments and zealous participation during the preparation of this Policy Document. Other guiding principles in the development of this policy have been gained from the comments of our major donors on water projects and all non-governmental organizations who work in the Water Sector in Malawi. All these contributions are treasured and this policy document is a result of all those mutual consultations.



Patrick B. Mbewe, M.P.
**MINISTER OF WORKS, SUPPLIES
AND WATER DEVELOPMENT**

WATER RESOURCE UNIT BOUNDARIES



Water Resource Areas

- 1 Shire (excluding Ruol)
- 2 Lake Chirwa
- 3 South West Lakeshore
- 4 Linthipe
- 5 Bua
- 6 Dwangwa
- 7 South Rukuru / North Rumphu
- 8 North Rukuru
- 9 Songwe / Lulira
- 10 South East Lakeshore
- 11 Lake Chiuta
- 12 Likoma Island
- 13 Chisumula Island
- 14 Ruu
- 15 Nkhala-kola Lakeshore
- 16 Nkhala-Bay Lakeshore
- 17 Karonga Lakeshore

ABSTRACT

1. The need for a Water Resources Management Policy and Strategies

The water resources of Malawi are relatively abundant. They are, however, coming under increasing pressure. Land use is intensifying, causing increased demand and a range of actual and potential threats to the quality and availability of water. At the same time, water supply and water-borne sanitation services are proving difficult not only to extend to meet the needs of communities in a number of areas, but also to sustain in good operating condition.

The water sector is at a turning point. Unless new and pro-active approaches to water resources management and the provision of water services are developed and adopted, the water sector will increasingly be characterised by water services which fail to provide effectively and efficiently for an increasing proportion of the population, and by water resources that in a number of areas will be degraded in quality.

A coherent set of policies guiding the management of water resources and the efficient and responsive provision of water services, supported by strategies and proposals for change to ensure their implementation, can provide a route to a new and positive future for the water sector in Malawi, and for all those who benefit from it.

2. Policy Framework

A set of statements of policy are proposed, to guide the sustainable management of water resources and the provision of services. They cover:

the management, and use of water for conservation and environmental protection and for the benefit of the community,

stakeholder involvement,

the allocation of water;

the investment of public funds, and

pricing.

They prescribe how decisions should be made on the management of water resources and the planning and provision of services, to secure maximum benefit for all those who may be affected, and to ensure that water resources are well managed and protected.

3. Overview of the Water and Sanitation Sector

It is only from an understanding of the status and condition of the water resources of Malawi, and of water and water-borne sanitation services to its communities, that a true assessment can be made of the problems that resources and services face and of the opportunities for their solution.

The geographical distribution of surface and groundwater resources, the current status of their development and use, and adverse effects on water quality resulting from inappropriate land use, indicate that Malawi's water resources although relatively abundant, are coming under pressure in some areas.

Malawi infrastructure providing water supply and water-borne sanitation services is characterised by rapidly growing demand and difficulty in ensuring the financial and physical sustainability of existing schemes.

The legal and regulatory structure for water resources management, the institutional and organisational arrangements under which the water sector operate, the pricing and tariff arrangements, the practice for most water supply systems of providing funding from central government sources rather than from those benefiting directly from the service, and all arrangements and practices which, though no doubt appropriate in days gone by, act today often to discourage effectiveness, efficiency and responsiveness to the needs of the community.

Degradation of water quality is resulting from increased suspended solids and turbidity, caused by deforestation and inappropriate land use. Inadequate sanitation and waste disposal arrangements in many settlements are resulting in increasing contamination of water resources, with potential risks to human health. Improper application of agricultural and hazardous chemicals in industrial wastes, also present risks of contamination of receiving waters. The legal and institutional arrangements for national environmental management have been recognised as needing to be upgraded to enable more effective management of multi-sectoral environmental issues.

4. Strategies

4.1 Objectives

The status and condition of water resources and water services clearly indicate the need for a set of strategies that provide new directions to the water sector, guiding all investment and management initiatives. The challenges which the water sector face are a result of many factors which make it difficult to exercise good husbandry of water resources and to provide efficient, responsive water services. The challenges can be overcome by developing and following a complementary set of strategies which ensure that all investment and management decisions act in concert towards the development of a stronger, more efficient and self-reliant sector.

It will be helpful in formulating the strategies and consequent actions to have in mind a set of objectives for the water sector which reflect values widely shared by the community and accepted by the government. These can be briefly stated as follows:

Community Services

To ensure that all citizens of Malawi have and will continue to have convenient access to water in sufficient quantity and of adequate quality for basic domestic needs, and to have available adequate sanitation;

Economic Development

To provide water infrastructure and services that will underpin the economic development of all sectors of the economy and to do so in the most economically efficient manner; and

Environment

To preserve and enhance aquatic and riparian environments.

4.2 Institutional Development and Capacity Building

The opportunity now exists to implement a number of institutional adjustments and a determined programme of capacity building over the next few years. The institutions of the sector should be structured to create a consistent environment of incentives which encourages all the organisations to achieve good performance, and ensures accountability to the government and to the recipients of services. A strategy for capacity development is also required, leading the organisations to carry out their tasks in accordance with their charters, to develop and maintain the skills of their people and to deploy them to undertake those tasks efficiently and effectively.

The strategy for institutional development and capacity building accordingly consists of a set of initiatives which establishes an appropriate set of organisations, each growing in capacity and contributing to an evolving self-sufficiency and confidence to achieve quality, sustainable services. The initiatives proposed are the following.

The Water Resources Board to be strengthened as a high level body responsible for the management of the water resources of the nation and constituting the prime source of policy advice to the Government on water resource management issues. The results are a desirable separation of policy resources management from operations:

Decentralising the water service activities of the Water Department, and moving towards establishing them as commercially oriented government-owned water boards, responsive to the needs of the communities served.

Developing a sustainable capacity by adopting and working towards targets of self-sufficiency in the planning and execution of a significant proportion of water projects.

Strengthening the central services such as hydrology, hydrogeology, scientific and laboratory services and planning and design. An important strength to be established is the evaluation of investment proposals and the assessment of sector performance.

4.3 Strategy for Environmental Management

The institutional arrangements for environmental management for the nation generally, but particularly to coordinate and provide strategies direction for all sectors that affect the water environment, need to be strengthened. It is proposed that a national environmental regulatory authority be established, to take charge of research in environmental affairs and be provided with adequate legislative support. This will provide the capacity to assess the status of the environment, propose and coordinate environmental management, environment impact assessment process independent of the operational organisations within the various sectors of the economy, which at times may be seen to have wasted interests in proposals or operations which may adversely affect the environment.

4.4 The Value of Water

The development of strategies for the efficient allocation of water, for investment to create new assets to provide water services, and for pricing, all require a common approach to the value of water.

It should be recognised that water has not only a social value, but also an economic value, both at the point of use, and at its source.

4.5 Sanitation

Water-borne sanitation services require substantial upgrading and extension. The responsibility for water-borne sanitation should be integrated into the water sector. This will provide consistent policy direction and enable the development of a strategy for upgrading and further extending these services. Existing water-borne sanitation services which are provided by local government should be taken over by the Water Boards for greater efficiency and effectiveness.

4.6 Allocation of Investment

A strategy for the allocation of investment is provided. This provides an approach to ensuring that scarce financial resources available for investment, are deployed so as to achieve maximum sustainable benefit for the community.

4.7 Stakeholder Involvement

A strategy for stakeholder involvement in the development of all proposals for water services and facilities will be aimed at better matching services with community needs and willingness to pay.

4.8 Water Allocation

A strategy for water allocation is one which seeks to maximize benefits through a "market" approach to ensuring that water allocation assigned to uses that have economic benefit as the primary objective, can be made available through market mechanisms for the most beneficial uses. The strategy also ensures that allocations are determined and reserved for purposes such as for environmental protection that is difficult to ensure through market forces.

Pricing

4.9 A pricing strategy will be to provide an incentive framework for ensuring financial sustainability of sector institutions and of the capital base of the industry and a mechanism to ensure efficiency in operations and the matching of service with willingness to pay.

5. Required Changes

In conclusion a set of change required to implement the policies and strategies are proposed as described below:

5.1 Institutional Arrangements

Change are required in four areas regarding institutional arrangements of the water and sanitation sectors

1. The prime role of policy advice on water resources management should be undertaken by a central policy making body, established by reconstructing and upgrading the functions of the Water Resources Board. Membership of the Water Resources Board will include stakeholder representation as well as the highest level representation from other ministries in order to facilitate in the spot decision making.
2. In order to increase efficiency and promote user satisfaction, decentralisation of implementation and operational functions of the Water Department will be put in place as soon as is practical by forming three government owned regional water boards.
3. The responsibility for water-borne sanitation will be integrated into the water sector. Sanitation activities will be undertaken by the local water boards in order to address current operational deficiencies.
4. It is proposed that a national environmental regulatory authority be established to look into research on environmental affairs and be provided with adequate legislative support, that all policies and activities affecting water supplies, sanitation and aquatic life are coordinated and integrated.

5.2 Capacity Building

Capacity building is an area requiring major emphasis in order to achieve the following targets and objectives.

To ensure sustainable development of water services undertakings in the area of the planning and implementation of schemes and in operation and maintenance, targets have been set such that by the year 1999-2000 greater than 50% of all projects to implement new water and sanitation schemes or rehabilitate existing systems should be, carried out by Malawian human resources, without the need for foreign-sourced technical assistance.

In the area of human resources development every effort should be made to ensure a continued upgrading of the skills and expertise of all staff in water and sanitation agencies

There is need to strengthen the existing capabilities in the Water Department in order to provide a full set of key central services to the water industry.

5.3 Stakeholder Involvement

The involvement of stakeholders will become the normal procedure in the development of the sector. This will ensure maximum participation and a sense of ownership which will in turn contribute to the efficiency, sustainability and success of projects, as local stakeholders often have more detailed knowledge of the local areas which may not be available to the agencies implementing or financing the projects.

5.4 Water Management

In the area of water management there is need to develop an integrated approach that will guide the allocation of water the allocation of investment and the pricing of water services. These strategies aim at achieving maximum net benefit to Malawi from its water resources while recognising both the social and economic value of water. The overall result will be that, except in unusual cases of need, users will be expected to pay the full cost of the services in cash or in kind.

6. **Conclusion**

It is important therefore that all those concerned with the financing and implementation of water and sanitation projects be made aware of the policy framework and strategies promulgated in this document and play a part in putting them into effect.

Adherence to these strategies will result in very substantial improvements in the coverage, efficiency, effectiveness and sustainability of water services throughout the nation and in the conservation and management of its water resources for the benefit of the present and future generations.

TABLE OF CONTENTS

	Page
ABSTRACT	i
BACKGROUND	1
CHAPTER 1	2
POLICY FOR WATER RESOURCES MANAGEMENT	2
CHAPTER 2	3
REVIEW OF THE WATER SECTOR	3
2.1 GEOGRAPHICAL DISTRIBUTION OF THE RESOURCE	3
2.2 ALLOCATION TO SPECIFIC USES	4
2.3 EXISTING LEGAL AND REGULATORY STRUCTURE	5
2.3.1 National Water Policy Formulation	5
2.3.2 Water Resources Act	6
2.3.3 The Water Resources Board	6
2.4 ORGANISATIONAL STRUCTURE AND FUNCTIONS	7
2.4.1 Water Resources Management	7
2.4.2 Sanitation	7

2.5	PRICING STRUCTURE AND PRACTICES	8
2.5.1	Water Tariffs	8
2.5.2	Government Financial Support	8
2.6	ENVIRONMENTAL ISSUES	9
2.6.1	Physical Aspects	9
2.6.2	Legal and Regulatory Aspects	11
2.6.3	Organisational Aspects.	11
CHAPTER 3		12
	STRATEGIES FOR WATER RESOURCES MANAGEMENT	12
3.1	OBJECTIVES	12
3.2	WATER RESOURCES MANAGEMENT : INSTITUTIONAL ASPECTS AND CAPACITY BUILDING	14
3.2.1	The Need for Institutional Development and Capacity Building.	14
3.2.2	Objectives	15
3.2.3	Institutional Initiatives	16
3.2.4	Sustainable Capacity Development	17
3.2.5	Central Services to the Water Industry	19
3.3	STRATEGY FOR ENVIRONMENTAL PROTECTION	22
3.3.1	Why an Environmental Protection Strategy?	22
3.3.2	The Environmental Regulatory Authority	23
3.3.3	Water Systems and Projects	24

3.4	THE VALUE OF WATER	24
3.5	SANITATION	27
3.5.1	Why a Sanitation Strategy?	27
3.5.2	Recommendations	27
3.6	ALLOCATION OF INVESTMENT	28
3.6.1	Why an investment strategy?	28
3.6.2	Objectives	29
3.6.3	Preparing Investment Options	29
3.6.4	Investment Allocation Priorities for Malawi	30
3.6.5	Evaluating Sustainability	31
3.6.6	Strategic Emphasis of Investment Programme	31
3.7	STAKEHOLDER INVOLVEMENT	31
3.7.1	Why a Strategy for Stakeholder Involvement?	31
3.7.2	Objectives	32
3.7.3	Mechanisms and Processes of Involvement	32
3.7.4	Resources for Planning and Stakeholder Involvement	34
3.8	WATER ALLOCATION	35
3.8.1	Why a Water Allocation Strategy?	36
3.8.2	Objectives	36
3.8.3	Prerequisite	36
3.8.4	Water Allocation Principles	37
3.9	PRICING OF WATER	39
3.9.1	Why a Pricing Strategy?	39
3.9.2	Objectives of a Pricing Strategy	40
3.9.3	Prerequisites for a Pricing Strategy	41
3.9.4	Pricing Strategy and Processes	41

CHAPTER 4	45
CHANGES REQUIRED TO IMPLEMENT THE POLICY AND STRATEGIES	45
4.1 INSTITUTIONAL ARRANGEMENTS	45
4.1.1 Policy in Water Resources Management	45
4.1.2 Decentralization	45
4.1.3 Sanitation	45
4.1.4 Environmental Management	45
4.2 CAPACITY BUILDING	46
4.2.1 Sustainable Development of Water Services Undertakings	46
4.2.2 Human Resources Development	46
4.2.3 Central Services to the Water Industry	46
4.3 STAKEHOLDER INVOLVEMENT	46
4.4 WATER MANAGEMENT	47

WATER RESOURCES MANAGEMENT POLICY AND STRATEGIES

BACKGROUND

Malawi is immensely endowed with a variety of natural resources which include, amongst others, rich agricultural soils and vast expanses of water systems. The latter includes Lake Malawi (28750 km²) Africa's third largest fresh water lake, Lake Malombe (303 km²) an inflation of the Shire River, Lake Chilwa (683 km²) and a dense network of perennial rivers. The intensity and methods of use of these resources can, if not properly managed and regulated, result in their serious deterioration and/or depletion.

The growth in population over the years has resulted in an increase in demand for water for domestic consumption, irrigation, power, transport and other uses. Furthermore, the country's economy has until now been based on agriculture as the main source of foreign exchange earnings, especially estate farming, which itself consumes large quantities of water.

Another area of focus that needs serious attention is the national energy requirement. While the country has *marginal reserves of coal* as an energy resource, its exploitation and marketing has only benefited the urban industrial sector and has not yet become an alternative to or substitute for woodfuel which is the single largest energy source in the country, meeting more than 95% of the energy demand in the rural areas. As a result, deforestation has increased over time from subsistence level to the current commercial scale in order to satisfy demand for wood energy, and for survival.

The tourist industry in Malawi which derives its base from the natural beauty of the country, while being in its infancy, plays a major role in the economy of the country. Unfortunately, cross-border migration of tourist facilities such as boats and dinghies can result in the introduction of exotic aqua-culture into the country's water systems, resulting in the infestation of the systems. In most cases, the resultant damage is irreversible.

In other sectors of the economy, the government has implemented projects aimed at import substitution. However, the extraction of natural resources for the manufacture of these substitutions has had an adverse impact on the environment which in turn has affected water as a resource.

Finally, the excessive use of chemicals in agriculture either as fertilizer or as pesticide, the unregulated discharge of industrial effluent into water systems, and the careless disposal of domestic waste all have a detrimental effect on the quality of water and its management.

Water is a finite resource. Its conservation, allocation, and utilization, must therefore be guided by a strong policy framework and strategies to achieve the policy objectives. To this end, the Government of Malawi has developed this report outlining its Water Resources Management Policy and Strategies to guide the country in the sustainable use of water and on sanitation.

CHAPTER 1

POLICY FOR WATER RESOURCES MANAGEMENT

The following statements constitute the broad policy framework for the sustainable management of water resources

1. Water should be managed and used efficiently and effectively so as to promote its conservation and future availability in sufficient quantity and acceptable quality
2. All programmes related to water should be implemented in a manner that mitigates environmental degradation and at the same time promotes the enjoyment of the asset by all
3. The approach to allocation of water should be designed in a way that recognizes water not only as a social but also as an economic good, and in a manner that achieves maximum benefit to the country
4. In planning and providing water supply services consideration should be given to safe disposal of the resultant waste water
5. Investment of public funds in water and water related programmes should be guided by the expected net economic, social and environmental benefits of the programme to the country as a whole
6. The government shall facilitate the participation of stakeholders (including users and special target groups) both in the public and private sectors to ensure that the needs of relevant interests are taken into account in the development of water systems
7. The pricing of water should reflect demand and the costs of water services. Pricing policy should aim at the reduction of government financial support to the sector over time

CHAPTER 2

REVIEW OF THE WATER SECTOR

2.1 GEOGRAPHICAL DISTRIBUTION OF THE RESOURCE

Surface water is extensively available in Malawi, comprising a network of river systems and lakes that covers 20 percent of the country's territorial area. Much of this resource is in Lake Malawi with a water surface area of 28750 Km² and an estimated volume of 7725 Km³, Lake Chilwa with a water surface area of 683 Km² for Lake Malombe and the lakes' sole outlet, the Shire River.

Replenishment of surface water resources is dependent on the seasonal rainfall. Consequently, most of the rivers and lakes display seasonal flow and level patterns and sometimes a number of these rivers dry up during the months of July to October. The distribution of the surface water resources is therefore variably limited to 50% of Malawi's surface area. The drainage system has been divided into 17 major water resource catchment areas and subdivided into 78 water resources units (See Map). There are no major storage dams in Malawi although many small reservoirs have been constructed for water supply and conservation purposes. These dams total about 700 in number presently.

Groundwater sources are widespread throughout the country. Its presence is associated with two major aquifers: the extensive but relatively low yielding precambrian weathered basement complex aquifer which makes up approximately 85% of Malawi's geology, and the higher yielding quaternary alluvial deposits covering almost exclusively most of the lakeshore plains and the Lower Shire Valley. Yields of up to 5 litres per second are obtainable in the weathered basement aquifer, while in the alluvium zones, yields of up to 15 litres per second can be achieved. The quality of ground water in the weathered basement complex aquifer is generally acceptable although localized groundwater quality problems do occur due to high concentrations of some elements present in the basement complex rocks. In the alluvial aquifer however, groundwater is more mineralized. The main agents causing problems in groundwater are iron, fluoride, sulphate, nitrate, chloride and total dissolved solids.

The availability of water as a resource for various uses varies throughout the country due to the uneven natural distribution of both surface and groundwater. Shortages of water are more pronounced in the dry months especially during years of drought. The sustainability of these resources is dependent on the conservation and better management of all other natural resources with particular attention to natural forests which have a bearing on streamflow regimes.

2.2 ALLOCATION TO SPECIFIC USES

Malawi depends on its water resources for various uses such as domestic use, industrial activity, hydro-power, transport and agriculture. Allocation of water to specific uses is currently done by the Water Resources Board. Assessment of water resources both in quantity and quality is done by the Board's Technical Sub-committees on Abstraction, and Water Quality and Pollution Control respectively before allocation to specific uses.

Presently, domestic water supplies are accorded the highest priority. Water for drinking purposes is provided to rural and urban population from both surface and ground sources.

The two major urban centres of Blantyre and Lilongwe are supplied by parastatal entities; namely, Blantyre and Lilongwe Water Board, respectively, serving a total of more than 600,000 people. The Water Department of the Ministry of Works, on the other hand, is responsible for the remaining urban and semi-urban centres, and institutions - serving 350,000 people through 53 schemes.

Supply of water to rural areas from surface and groundwater sources is also the responsibility of the Ministry of Works. There are at the present time 56 rural piped gravity water supply schemes abstracting water from protected catchments and serving approximately 1.45 million people. This water is supplied through communal water points only. Construction of these schemes is done by a combination of self-help and direct labour efforts with materials and supervision provided by the Ministry of Works. Most schemes are simple, but a few involve simple treatment techniques. In rare cases the supply is from a dam or reservoir. Complementing these efforts Non-Governmental Organizations (NGOs) have also played and continue to play a vital role in the delivery of water services particularly to the rural communities. Emphasis has been placed on provision of new facilities and rehabilitation of existing structures.

Rural groundwater supplies involve supplying water to the rural communities through boreholes and shallow wells. There are at the moment 9,700 boreholes and 5,600 shallow wells equipped with handpumps serving a total rural population of 3.125 million. On going programmes include construction of new boreholes and shallow wells, rehabilitation of existing boreholes, standardization of handpumps and establishment of Village Level Operation and Maintenance (VLOM) involving community participation.

The coverage of potable water in Malawi is 58% with the rest of the population, 90% of which is rural, being dependent on traditional sources such as dug wells, springs, streams, rivers and lakes.

Water allocation for industrial use is limited. Where this is done, the quantity allocated is commensurate with demand. Since most industrial development is located in cities and large towns, the allocations of water to these areas for domestic use as well as for industrial processes and effluent disposal are made by the two Water Boards. Demand for water for hydro-power generation continues to be high. Although not consumptive in nature, large amounts of water are allocated for the generation of hydro-power on the Shire River and other minor rivers in the northern part of the country. The regulation of flows for power generation is not always consistent with requirements for reliable irrigation and domestic use. It is estimated that a potential of about 600 Mw of power is required and available in Malawi although only 164 Mw plant capacity has been installed to date. A number of additional hydropower plants are planned for installation on the Shire River and several other plants have been planned for installation on smaller rivers especially in the Northern Region to generate a total capacity of 300 - 400 Mw.

Since the country depends on its water resources for both rain fed and irrigated agriculture, the Water Resources Board (WRB) allocates water for the latter in many parts of the country. There are a total of 44,600 hectares being irrigated at the moment mostly for sugar and on a small scale, for smallholder rice schemes and tobacco estates. There are also small scale self-help irrigation schemes for which the potential is estimated at over 100,000 hectares. Greater quantities of water will be required for fish farming as demand increases.

Lake Malawi and Shire River also serve as alternative highways for transportation. Passenger and cargo vessels ply Lake Malawi waters, while smaller passenger boats cruise on the Shire River. A required minimum water level on the Lake and part of the River Shire must always be maintained and guaranteed to cater for this service.

2.3 EXISTING LEGAL AND REGULATORY STRUCTURE

2.3.1 National Water Policy Formulation

The legal instrument currently available for the regulation of Water Resources is the Water Resources Act, 1969. This Act replaced the Water Works Act, 1926. Whereas the earlier Act gave power to the Water Undertaker to manage the resource and guided the *modus operandi* of the management of water systems, the 1969 Act sets guidelines for the allocation of water for various uses and the monitoring of its quality. The Water Resources Act, 1969 was amended in 1990 to give the Water Resources (Amendment) Act, 1990.

Complementary legislations are the Blantyre Water Works Act, 1971 and the Lilongwe Water Works Act, 1987 which give legal status to the Blantyre and Lilongwe Water Boards respectively to operate water works in the Cities of Blantyre and Lilongwe.

2.3.2 Water Resources Act, 1969

Whereas the water resources Act, 1969 gives the President authority over all water resources in the country, the duty to oversee the application of the legislation rests with the Minister responsible for water through a Water Resources Board appointed by him.

It is generally accepted that current legislation on the use of water resources has evolved in a piecemeal manner to respond to ambient demands. Several areas where it is weak have thus been identified¹, necessitating a review aimed at strengthening areas where it lacks flexibility, notably in the devolution of certain functions to subsidiary regulations.

Complementary regulations have not been developed to cover comprehensively, specific issues of sanitation insofar as these relate to water resources, and the control of aquatic weeds and hazardous wastes that have adverse effects on the environment.

2.3.3 The Water Resources Board

As has already been mentioned above, the legal authority for the management of water resources is vested in the Minister responsible for water who in turn delegates this function to the Water Resources Board.

Membership of the Board is for a term of three years after which period the Minister has to appoint new members. Although this is required by legislation, no changes have been made to the membership for a long time and it has therefore meant that ministries have most often delegated functions to officers of such low rank as to be unable to take decisions.

The functions of the Water Resources Board include the granting of water rights for abstraction, the provision of consents to discharge effluent into public waters, the determination of acceptability of civil water works, the provision of right of easement where this involves two or more owners. The functions include collaboration with other

¹ Water Services Sector Study Cowiconsult Malawi, 1994

institutions responsible for environmental monitoring and control, for instance, the Department of Research and Environment Affairs, Forestry and the Ministry of Works. The Board is also responsible through its technical subcommittee for the regulation of the flow of the Shire River which is vital for energy supply to the nation

2.4 ORGANISATIONAL STRUCTURE AND FUNCTIONS

The water sector in Malawi comprises several levels of responsibility that range from national policy setting to the construction, operation and maintenance of water supply and sanitation services at the end user level. These levels of responsibility are assigned to different government institutions and parastatal bodies. Private sector involvement is confined almost exclusively to the provision of water for private needs.

2.4.1 Water Resources Management

The Ministry responsible for water (presently the Ministry of Works) coordinates policy for water resources management in the country with relevant Central Planning Ministries and stakeholders. It also initiates legislation that affects the management of water as a resource.

Water resources master planning, based on such parameters as population coverage and service level, and the setting of quality standards for the purpose of monitoring and evaluation of water supply and sanitation systems, is carried out by the Water Resources Board under the general direction of the Minister responsible for water. The Board also grants licences for the discharge of effluent and waste water, and regulates the two activities.

The level of investment of public funds in the water sector is dictated by the Public Sector Investment Programme (PSIP) each year. The extent to which the sector is developed therefore depends on the priority government accords it on the PSIP, the adequacy of financial allocations on the revenue budget for the operation and maintenance of facilities, and the efficiency of financial management systems in place.

2.4.2 Sanitation

Presently, the organizational framework for sanitation is not clearly apparent. Urban, Municipal, Town and District Councils are responsible for the provision of sanitation, namely water-borne sewerage, emptying of septic tanks and sludge disposal. In addition, they disseminate models of improved pit latrine.

2.5.2.1 Diversity Among Water Users

Present practices, which put into effect the Government's policy of supporting those who cannot afford the cost of water, can have the unintended effect of providing free or low cost water to those who can well afford to pay a higher price

This can have two consequences. First, the organization providing the service forgoes revenue. It is thus less able to maintain the system in good working condition, or to extend services to those in need. Second, better-off users of water find that it pays them to put water to uses that may be uneconomic for Malawi overall. For example, a farmer may use water to produce a commercial product, and sell it to receive a net income that is less than the cost to the community of the water he uses. The community would be better off if the only commercial purposes the water is used for, are those which still pay if the user is paying the full cost of water. This is only guaranteed if pricing practices are modified to ensure, as far as possible, that those who can afford to pay, and those who use water for commercial purposes, pay a fair share.

2.5.2.2 Diversity Among Water Schemes

Similar uneconomic and inequitable effects can also occur where a single average tariff is used across several schemes for which the true cost of water differs substantially. In such cases, for example in some of the schemes of the District Water Supply Fund, the use of average tariffs fails to discourage uneconomic water use by users in those schemes where the true cost of water is relatively high

2.6 ENVIRONMENTAL ISSUES

2.6.1 Physical Aspects

It is essential that adequate supplies of uncontaminated water continue to be available for domestic use, irrigation and industrial activities. Furthermore, it is crucial that aquatic life, including fish, is not endangered in the process of supplying water for these purposes. In most areas Malawi has not yet reached the limits of availability of surface and ground water. Several factors

construction to the public. The Ministry of Local Government implements rural sanitation programmes and offers technical and logistical support to the local authorities. The role of the Ministry of Health in promoting public health and sanitation through hygiene education programmes that are coordinated with water programmes, are worthy of note.

2.5 PRICING STRUCTURES AND PRACTICES

Existing legislation regulating the pricing of water and sanitation services and pricing practices in Malawi treat water at the source as if it has little economic value. In other words, the implication is that there is sufficient abundant water in the lakes and rivers to harness and store in dams and supply it to consumers on demand without taking account of the cost of water at the source.

2.5.1 Water Tariffs

In Malawi, water is now considered as a social good only and not also as an economic good to be managed prudently at the lowest appropriate level. For instance, raw water abstracted from natural water courses and stored in dams by various public and private institutions and individuals is not subject to charges.

Government is now aware of the economic value of water, the rapidly increasing unit cost of building new raw water storage structures, and the effect of such schemes on the environment. All these must inevitably be taken into consideration when developing tariffs for water services. Current pricing practice that aims to recover operation and maintenance costs of water and sanitation schemes, especially in the public sector, is being reviewed to include the recovery of capital expenditure.

2.5.2 Government Financial Support

Government financial support is intended to improve living standards by making available sufficient water at acceptable tariffs (low or zero) in cases where communities cannot afford the full cost of water. In practice, government financial assistance has not been restricted to such cases. This aspect of current practices should be reviewed to encourage efficient management of water resources.

The water tariffs currently in force are not systematically related to the cost of supply of water.

the peri-urban areas is becoming a common problem due to improper disposal of waste. Industrial effluent, which may contain hazardous chemicals can be a major source of contamination of water in receiving bodies.

2.6.2 Legal and Regulatory Aspects

The Water Resources Act of 1969, Chapter 72:03, and other related Acts pertaining to use of water, cover the water resources of the country. However, water resources legislation is not well covered especially in the area of applying punitive measures against serious offenders. Planning, environmental protection and water resources management must be well coordinated. The National Committee for the Environment (NCE), the Inter-ministerial Committee and several inter-departmental groups that have been formed to coordinate and develop a National Environmental Action Plan must integrate their plans and clear them with the ministry responsible for water.

2.6.3 Organizational Aspects

In Malawi there is no apparent conflict between physical planning, environmental protection and water management authorities. This may be more by default than by design because there exists no Act on the environment. Nevertheless, there is a National Committee for the Environment (NCE), an Inter-ministerial Committee and several smaller committees that have been formed to oversee environmental planning.

Matters concerning water as a resource from these committees are channelled to government through the Water Resources Board. There is therefore need to coordinate the work of all these committees for an effective policy on the environment.

CHAPTER 3

STRATEGIES FOR WATER RESOURCES MANAGEMENT

3.1 OBJECTIVES

The water sector in Malawi is characterised by rapidly growing demand and difficulty in ensuring the financial and physical sustainability of existing schemes. The existing water supply and sanitation services as described earlier are fragmented among several ministries and institutions with inadequate coordination between them. Water and water borne sanitation programmes are largely centralized and technologies being utilized are in many cases inappropriate to the users. Community participation is lacking in most cases resulting in relatively centralized systems of operation and maintenance which are expensive to run. At the moment supply of water to the rural community is free, a practice which tends to create a pattern of services and facilities not well matched to the needs of the community, and difficult to sustain.

As a result there is a need for considerable investment to rehabilitate existing systems and extend services to new areas. Revenue is insufficient to provide any funds for capital requirements and in some areas insufficient to fully fund operations and maintenance with no provision to cover depreciation. The reasons for this include an established and justified government policy to provide financial support to those unable to pay for basic domestic services. The appropriate response to these problems requires an integrated set of strategies, leading to actions which will lower operating costs, reduce water losses, better match technology and service level with the level desired by the communities served and with their willingness to pay, and reform pricing policies and practices. The performance of the sanitation sector also requires strengthening. The coverage is low and rapid urbanization has resulted in the production of waste in quantities far beyond the capacity of the sector agencies, causing pollution of the environment and public waste.

While it is recognized that Malawi is endowed with abundant water resources, the distribution of these resources sometimes restricts its optimum development and use. The Government therefore seeks to undertake a number of initiatives in the water sector, including further reforming and developing the institutional arrangements for the sector, providing new and upgraded infrastructure and services and managing the nation's water resources. Its aims are to ensure that the water sector makes a strong and lasting contribution to the achievement of objectives in the areas of community health and welfare, economic development, and environment protection.

The objectives of the government for the water sector are:-

Community Services

To ensure that all citizens of Malawi have and will continue to have convenient access to water in sufficient quantity and of acceptable quality for the basic needs of drinking, cooking, washing and personal hygiene, and to have available adequate sanitation, and such higher levels of service as communities agree as appropriate to their requirements and for which they confirm their willingness to pay in cash or kind;

Economic Development

To provide water infrastructure and services that will underpin the development of all sectors of the economy and to do so in the most economically efficient manner; and

Environment

To manage water resources and implement, operate and maintain water facilities for the benefit of the community and the preservation and enhancement of aquatic and riparian environments.

Chapter 1 above, provides a set of policies to give broad guidance to the formulation strategies and actions to help achieve the objectives

To give effect to the policies and ensure that maximum benefit is gained from the deployment and use of the limited human, financial and water resources that are likely to be available, a set of coordinated strategies is required. Strategies are required in the areas of.

the institutional capacities and human resources of the sector.

environment protection

sanitation

investment allocation

stakeholder involvement

water allocation, and

the pricing of water

Strategies in the areas of investment allocation, stakeholder involvement, water allocation and water pricing, should all be based on a common understanding of the value which a community attaches or

should attach to water, and accordingly the concept of the value of water needs to be developed as a precursor to each of these four strategies.

In seeking to implement the policy and achieve the Government's objectives in each of the above areas, the strategies contain, among other things, the following proposals:

An integrated approach is proposed to the provision of expanded water supply and water borne sanitation programmes to both rural and urban areas

Improved approaches to water resources development and allocation, and the efficient use of water, will be important factors in upgrading the institutional arrangements for the water supply and sanitation sector. When water resources are scarce, priority will be given to the provision of drinking water. All users of water will be encouraged in water conservation.

Decentralization of the sector should include appropriate mechanisms for channelling of funds to the sector institutions from government, whether the funds are sources from government, or via the government from donors.

Human resources development is invariably the most difficult problem faced by the sector, but this needs to be implemented continuously both in the short and long-term.

Availability of resources should be one of the factors which will determine whether the implementation programme should proceed or not.

3.2 WATER RESOURCES MANAGEMENT : INSTITUTIONAL ASPECTS AND CAPACITY BUILDING

3.2.1 The Need for Institutional Development and Capacity Building

It is now well established that in spite of some significant achievements and the undoubted ability and dedication of many of the people involved in the water sector, the performance of the sector could be substantially improved. This is manifested by several areas of deficiency in capacity. First, among the private and public sector organisations involved in the provision of services and infrastructure, not one has sufficient financial, professional, technical or support services to enable it to extend significant services to new customers, without the injection of financial resources and substantial foreign-sourced expertise.

Second, recent work identifying rehabilitation needs, suggests that with the possible exception of the Lilongwe and Blantyre Water Boards, preventive and failure-response maintenance is generally inadequate. Third, the water resources management function in Malawi appears to cope inadequately with the tasks of water resources assessment, and with managing water resources and planning their development to meet established public health criteria, to provide more extensively for irrigated agriculture, and to manage aquatic and riparian environments.

On the other hand, in the area of reticulated water services there are in the Lilongwe and Blantyre Water Board, two organisations that are relatively successful and provide a useful model for the future.

There are also small but increasingly capable sets of Malawi based (and in some cases, Malawi owned) engineering consultants and construction contractors. In addition the public sector components of the water sector are oriented towards constructive change and are developing capabilities of policy leadership.

The opportunity therefore now exists to implement a small number of institutional adjustments, and a determined programme of capacity building over the next few years, which build on the examples that the Lilongwe and Blantyre Water Boards provide of successful institutional models. With the appropriate institutional adjustments and capacity building, in conjunction with the strategies developed in subsequent sections of this document, there is every likelihood that the overall performance of the sector will improve substantially over the next few years and measures will be put in place for cohesiveness of the sector in order to retain and promote efficiency and output from the manpower resources.

3.2.2 Objectives

The effectiveness and efficiency of the water sector, that is, the degree to which it achieves the objectives set for it by the government, depend centrally on the institutional arrangements, particularly on the extent to which they create a structure of incentives which encourage good performance, cooperation between organisations to achieve shared objectives, and accountability to the government and the recipients of services.

It depends also on the extent to which organisations of the sector develop their capacities, that is, undertake the set of tasks required to fulfill their charters, develop and maintain the skills of

their people, and deploy them appropriately to undertake those tasks effectively and efficiently

It is necessary therefore to develop and propose a set of institutional arrangements and a strategy for capacity development that will best contribute to a high level of performance and achievement in the water sector

3.2.3 Institutional Initiatives

3.2.3.1 Upgrading Policy Advice and Water Resources Management

The functions of water resources management and policy advice seek to formulate and recommend to the government, policies on the following, as examples:

water allocation, including allocations to parastatals and other organisations responsible for water infrastructure operations.

management of the quality of water resources, including resources to which organisations responsible for water borne sanitation contribute wastes.

policies governing standards and guidelines (such as water quality) with which water supply agencies must comply

To avoid conflicts of interest which are in effect disincentives to good performance, it is important that organisations responsible for operations and aspects of operations support, be institutionally separated from the organisation responsible for water resources management and associated aspects of policy formulation and advice to the government.

To achieve this separation, the Water Resources Board should be accorded full responsibility for water resources management and associated policy advice and provided with adequate independent resources to support it in this role. This is further discussed in section 3.7.4.2

3.2.3.2

Decentralisation

The long central government traditions of a permanent public sector organised on Departmental lines under a Treasury-led system of financial allocation have strengths of continuity, independence of advice, and probity. However, it is the universal international experience, confirmed also in Malawi, that these strengths act against the establishment of a framework of incentives to good performance, and result in counter-productive inflexibility, wherever a Departmental structure is retained as the basis for utility operations. A water service undertaking established as a water board with a commercial financial charter, with flexibility in procurement and human resources management, with an accountability link to the community served, with a substantial degree of independence to set prices, and utilising the private sector selectively to provide internal services, has wide acceptance as a better performing model.

Accordingly, it is proposed that the current operational responsibilities of the Water Department for the provision and operation of water services be decentralised, strengthened locally, and converted to become separate water boards. Each of the accountability and performance - enhancing strengths listed above should be incorporated

3.2.4 Sustainable Capacity Development

Problems of systematic failure through most of the water sector to adequately and consistently perform preventive and failure-response maintenance, or to carry through new schemes from start to finish without the aid of foreign-sourced expertise, will need to be addressed on several fronts. Later in this document, the potential roles of investment allocation strategies, stakeholder involvement, appropriate technology, and pricing strategies are each discussed. However it is clear that without a strategy to develop and sustain the necessary capacity within the water sector, the operating organisations and private sector consultants and contractors are likely to remain unable to substantially improve maintenance and demonstrate the full range of project implementation capacity.

The water sector appears fixed into a cycle in which training sponsored by the government and donor organisations, is extended to a range of professionals and technical officers. However, on conclusion of their training, these officers return to their home organisations and the inflexibility of the institutional arrangements, and the policies of donors, result in no change being possible in the work the home organisation actually does. In this circumstance much of the training in such capabilities has proved futile. The skills acquired are for the most part not used and are lost.

The establishment of additional decentralised water service undertakings, as recommended above will be a major step forward towards remedying these deficiencies. However, a further step is necessary. This is to set the targets and policies, associated with programs of rehabilitation and the provision of new water supply and sewage systems in rural and periurban areas, so as to ensure that what is expected of the water service undertakings and what they do from day to day, actually does change and that the change is sustained.

Government intends to proceed as follows:

3.2.4.1 Procurement

The government will agree with donor organisations that the government be free to nominate any component or number of components within any water sector rehabilitation or new system project to be reserved for procurement from providers based in and/or owned in Malawi.

3.2.4.2 Parastatal Organizations

By December 1997 all parastatal organisations that are planned should be in operation and be provided with the full set of capacities necessary to plan and implement extensions, new systems or rehabilitation projects.

3.2.4.3 Expertise

Within the 1997-8 fiscal year, all of the parastatals commence at least one such project without foreign sourced expert assistance

3.2 4.4 Local Human Resources

By 1999-2000 more than half of all rehabilitation and new system implementation projects should be undertaken using Malawian human resources with minimal foreign technical assistance

3.2 5 Central Services to the Water Industry

To provide essential support for the continued process of upgrading the coverage, quality and efficiency of service provided by the Water Service Undertakings, it is proposed that the central service capabilities of the Water Department be strengthened in four areas

First, the National Office of Hydrology and Hydrogeology should be strengthened to enable it to assess effectively the water resources of Malawi and provide full and accurate water information for planning by all sectors; second the National Water Laboratory should be strengthened to provide a full set of professional and analytical services in the water, third, the Department capabilities to evaluate investment proposals and monitor sector performance should be strengthened, fourth, the Department's Central Planning and Design services should be strengthened to enable it to support effectively the increased pace of planning and implementation of projects for rehabilitation and for new services.

3.2.5 1 Hydrology and Hydrogeology

Much of the planning to be undertaken by the Water Resources Board and by the water services undertakings to manage water resources and provide water services will depend crucially on the availability of information on the quantity and quality of water resources throughout Malawi. This will include information on hydrometeorology and on the hydrology of surface waters, including level and flow records of rivers and streams, lake levels basic measurements quality and records of water abstractions. It will also include hydrogeology, especially the occurrence and quality of groundwater, associated planning information including yield, transmissivity and recharge rates and information on groundwater abstraction.

Hydrological information is also of national value for use by organisations concerned with flooding and drainage, for example road and bridge design, urban drainage and

private businesses which seek to use water for irrigation of crops or for manufacturing

It is therefore proposed to strengthen the existing services within the Water Department, provided by the National Office of Hydrology and Hydrogeology. Funded initially by Government, this office would continue to undertake data collection and hydrological and hydrogeological analyses, in accordance with the coverage and frequency of data collection and analysis approved by the Water Resources Board, and meeting as a minimum, the data collection requirements of the Water Services undertaking. By 1999 - 2000, more than half of the services of this office would be undertaken on a fee for service basis for the Water Services undertakings. The Office would therefore develop a commercial orientation, and accordingly would require appropriate commercial and financial management arrangements from the outset.

Some technical staff whose duties would include hydrographic calibration and measurement in the field and working with local communities to establish local self-sufficiency, would be trained by the office and then seconded on a rotation basis to the regional Water Services Undertakings for activities in the regions.

3.2.5.2 Scientific Services

The water services undertakings the Water Resources Board and some private businesses have a growing need for analytic services for the measurement of water quality and professional scientific services related to water. It is therefore proposed to reorganise and strengthen current laboratory and scientific services of the National Water Laboratory within the Water Department. The main scientific disciplines required would include

- microbiology
- water chemistry
- aquatic biology and zoology
- waste water chemistry and
- geochemistry

Utilising these disciplines a major function of the Department in conjunction with other Ministries will be to provide advice to the government on a framework of national water quality standards and guidelines.

Important internal services will include

quality control

methods appropriate for use by rural and village communities

instrumentation

data management

The laboratory would undertake investigations and applied research on water quality issues of high national priority and would also have a partly commercial function. It would charge for analytical services including those sought for national purposes by the Water Resources Board. Minimum water quality sampling programs for the water services undertakings would be developed based on international experience, approved by the Water Resources Board, and paid for by the undertakings. Appropriate commercial financial management arrangements would therefore be required from the outset.

3.2.5.3 Investment Evaluation and Sector Performance

The Government and the communities served by the Water services undertakings have a vital interest in ensuring that decisions on investment in the water industry achieve maximum net benefit for Malaya. They also have a close interest in the efficiency and quality of service provided by the undertakings and in the performance of the National Office of Hydrology and Hydrogeology and the National Water Laboratory. For these organisations operating and financial targets will need to be established and performance objectives set annually. They should be required to report annually on their performance against these targets within four months of the end of each fiscal year. The bodies should be held to account publicly for their performance.

It is proposed that existing services within the Water Department be strengthened to enable it to lead and support the evaluation of proposals for investment in the water sector, and the monitoring of the sector's performance.

3.2.5.4 Planning and Design

The Water Services Undertakings should be supported by a strong central planning and design service. There are insufficient professional engineering and technical officer resources available and an insufficient level of new project activity in the region or urban area of each undertaking, to justify each having more than minimal local planning and design resources. An advantage of a significant central planning resource is an enhanced ability to participate in multi-sectoral planning activities aimed at coordinated approaches to providing services for new development. For new urban residential development, coordinated approaches to planning the location and layout of its development and to planning water and other utility services can lead to an improved result, especially if all stakeholders can be involved.

All planning and design personnel, although centrally based, must undertake their work in a highly mobile manner, with on-site planning and design in conjunction with future recipients of the service being the rule rather than the exception.

3.3 STRATEGY FOR ENVIRONMENTAL PROTECTION

3.3.1 Why an Environmental Protection Strategy?

The observations made in Section 2.6 of this document throw light on the current status of the environment and put emphasis, therefore, on the need to identify an improved approach to achieve acceptable levels of environmental management as they relate to water.

The Malawi Government is conscious of the importance of the environment and accordingly is undertaking a number of initiatives aimed at addressing national environmental problems. The environmental challenges which Malawi faces arise mainly from the pressure on the country's natural resources, resulting from rapid population growth. As they affect water they include some land use practices which lead to low productivity and resource degradation, the use of marginal or unsuitable land for

agriculture and wood extraction for woodfuel and other purposes. The resulting soil erosion, together with some inappropriate waste disposal practices, adversely affect water quality and the aquatic environment. The effects include increased turbidity and nutrient levels, and reduced aquatic biodiversity.

The management of environmental issues is complex partly because of the number of organisations involved. They include the Department of Lands and Valuation, the Department of Housing and Physical Planning, the Department of Forestry and Natural Resources, the Department of National Parks and Wildlife, the Ministry of Works, the Ministry of Labour, the Ministry of Agriculture, and the Malawi Bureau of Standards.

The 1994 report on the National Environmental Action Plan² notes the importance of taking account of environmental impacts in development policies of each sector and the economy as a whole. With regard to water using sectors this would be facilitated if the implementation of major water using systems and projects including sanitation, were preceded by environmental impact assessments. The scope of the assessment should be determined by the potential environmental effects of the project.

The same report also emphasises that while there is a comprehensive package of specific sector laws, there is now no overall legal framework for the environment that encompasses national conservation principles and provides for effective interventions when needed. Such a legal framework should be developed and should reflect the government's fundamental obligation to ensuring that natural resources are adequately and properly conserved and that such conservation is sufficiently monitored and regulated.

3.3.2 The Environmental Regulatory Authority

In order to address the issues concerned with the management of the environment, decisions need to be made on the strength and location of the environmental regulatory authority.

From the perspective of the water and sanitation sector the environmental regulatory authority should be authorised to take into account water and sanitation needs and coordinate with those Ministries and Departments which directly or indirectly have some roles affecting water and sanitation.

² Malawi - National Environmental Action Plan (NEAP) 1994

The major advantage of having a centralized environmental regulatory body is that cross referencing between sectoral regulations and accounting for multiple sector interests are easier than in situations where sectors only address issues directly relevant to themselves. This is recommended

The Department of Research and Environmental Affairs (DREA) is suitably placed to take on this function, although the Department would need to be strengthened and be provided with adequate structure and expertise which would satisfy the demands and expectations of the various sectors in the country

3.3.3 Water Systems and Projects

The basic theme of the environmental management policy is environmental sustainability. Consideration of this should be built into all water systems and the development of new water projects be supported by adequate environmental impact investigations as described earlier. The cost for such assessment should be taken into account in project preparation.

Very little consideration seems to have been given to the requirements for planning, design and implementation of sanitation projects. Like water projects, sanitation projects should be preceded by adequate environmental impact assessments in order to avoid damaging the quality of water resources and air.

THE VALUE OF WATER

Water resources in Malawi are a valuable social and economic asset. The value of these resources comes from the actual and potential uses of the water to:

contribute to the health and well being of the people through domestic use,

contribute to the production of other valuable goods -- such as agricultural and industrial products; and

maintain the aquatic environment.

3.4

It is easy to agree to the statement that water is valuable. Having a good idea of how valuable it is now and is likely to become in the future is more complicated, but, as a practical matter, more important than simply knowing that water is valuable. Its practical importance is that it provides a basis for improving on current approaches to

Water Allocation

allocation of water resources among potential uses and users by providing information on the value of water in alternative uses in order to estimate the opportunity costs of any particular allocation;

Allocation of Investment

allocation of investment resources for water development by providing the basic input for estimating the benefits of investment in particular schemes; and

Pricing

identification of appropriate prices for access to and use of water since it provides an understanding of the primary motivation for user willingness to pay the costs of alternative schemes.

Essentially, improved knowledge of the magnitude of the value of water among users and uses is of practical use in making the choices described above. The value of water is the benefit from the user perspective associated with these choices and can be compared to their costs.

The value of water has two aspects. the value of water in particular uses and the value of water at its source. The value of water in use is easier to understand than the value of water at its source and is illustrated as follows:

A farmer or factory owner using water as an input knows how much water it takes to produce given product. If water is available to him at a price equal to or less than he gains in output, the farmer or factory owner will use the water he requires. If the price he has to pay is greater than the value of the extra output that can be produced, he will either switch to more valuable crops or cease using the water. Consequently, the value of water to the farmer or factory owner is equal to the price that he would be willing to pay for a certain quantity of water in order to produce the highest value crop or product that can be produced with the amount of water he uses.

A similar scenario applies to household users of water. A basic minimum quantity of water is essential for survival and preservation of health. The value of water at or slightly above this amount consequently is very high. The high value of at least a minimum level of consumption is demonstrated by the time and effort and, sometimes, cash income expended by those who lack relatively easy access to water. Often the value of these expenditures exceeds (by multiples of four to five and sometimes more) the amounts expended by those with easy access. Additional amounts of water generally decrease in value to the user as the additional consumption is used to satisfy progressively less important needs. The total value of the water to a user thus depends on the quantities used as well as the price he is willing to pay.

These patterns of changing value for water for household use (from very high value for small quantities and progressively declining, but still positive, value for additional amounts) are a world-wide phenomenon. The magnitudes of these values in different countries have been measured by systematically observing what people both do and pay in response to the costs of gaining access to various quantities of water in different circumstances. They can be measured, also, by determining how much people are willing to do or pay (and, in some cases, contract to do or pay a certain amount) for an improvement in access to or quality of various quantities of water over their existing water supply situation, if presented with options. A systematic effort to determine these values prior to designing and implementing water supply improvements in particular places is essential. Through these mechanisms the costs of supply schemes can be more accurately related to the demand of the population served. (See Section 3.9)

As demand for water grows for the kinds of uses described above, it will become the case that providing water for any one application use, for example irrigation, will impede the use of that water in another use, for instance domestic. In such cases, the water at source allocated to the chosen use should be assigned the value of the impeded use. This cost (called the opportunity cost) should be included in the cost calculations used in deciding whether or not to allocate the water in this way. What this means in practice is that the value of water to farmers, in this example, should be at least equal to the direct cost of the irrigation scheme plus the opportunity cost of preventing household use. Conversely, if an allocation is made for urban use which restricts application to irrigation, the urban use should have a value at least equal to the urban direct costs of the scheme plus the opportunity cost of the prevented agricultural use, (see Sections 3.6 and 3.8 for additional discussion).

The development of systematic information on the magnitude of the value of water for different uses and users in different locations in Malawi as well as processes to update and check it in areas served by particular water schemes is urgent. Such information is a critical input

3.6.2 Objectives

As stated at the beginning of this chapter, the objectives of the government for the water sector are to ensure that all citizens have access to water at least for basic domestic needs, to provide water infrastructure to underpin economic development and to do so efficiently, and to protect the environment

The objective of an investment allocation strategy is therefore to maximise net benefit to the nation by ensuring that investment programmes are prepared which take into account all feasible investment options, can be undertaken within the resources available, and which optimises the achievement of the three objectives.

3.6.3 Preparing Investment Options

Each project proposal which is a candidate for funding needs to be prepared in such a way as to optimise or maximise the net benefit it individually achieves for the community, allowing, however, for possible interactions between projects (For example groundwater and surface water resources used jointly can sometimes provide a greater and more secure yield of water than either source alone).

The project documentation that is used for the assessment of each project, should contain all the information necessary to compare all costs and benefits and other information relevant to decision making.

Each project will show evidence of having been prepared in accordance with the policies, strategies and processes outlined herein. In particular, the following steps will be undertaken in an integrated programme as part of the pre feasibility and feasibility studies

3.6.3.1 Stakeholder Involvement

This process is designed to ensure that the solution selected meets the needs of the community and will do so sustainably, that the technological approach used is appropriate to the skills and resources of the operating authority and the participating community, and that the community values the programme sufficiently to use it and pay for it

3.6.3.2 Water Allocation

This is to ensure that the water to be withdrawn by the project from the resource is sustainable by the resource, and that the project has sufficient net benefit to compete successfully for an allocation against other proposals that could use the same resource

3.6.3.3 Pricing

This is to ensure that the project is sustainable financially and provides the appropriate signals for efficient water use.

3.6.4 Investment Allocation Priorities for Malawi

The government's objectives include economic development and efficiency. For these objectives, the measures used to determine the relative merits of projects are the costs and benefits for each project, which can be quantified in monetary terms.

The objectives include two other categories of cost and benefit which can often be quantified but not usually in monetary terms. These are the objectives of services to meet basic domestic needs and of protecting the environment

In comparing the total net benefit of any two proposals, in order to determine priorities for funding allocation, ranking will be clear in those cases where all the categories of net benefit of one project exceed those of another.

It will be less clear where the projects are of different ranking for different objectives. Project ranking is then determined by the government having regard to all benefits and all costs considered together, whether in monetary terms or not, and whether quantified or not.

A project will not be allocated investment funds unless it can reasonably be expected that its net benefit assessed in this way will be positive. Ordinarily, many projects with positive net benefit will not gain a funding allocation as it is expected there will only be sufficient resources for those with the highest net benefit to proceed in the short to medium term

3.6.5 Evaluating Sustainability

An especially important area of evaluation required is sustainability, a characteristic embedded in all three objectives. Sustainability depends on a number of factors, including the continued willingness and abilities of customers to pay water charges and the abilities of operating organisations and participating communities to operate and maintain the water systems using the technologies proposed. Project documentation should therefore clearly evaluate sustainability.

3.6.6 Strategic Emphasis of Investment Programmes

Both insufficient coverage and the poor condition of existing systems suggest that some projects of both kinds would rank high in competition for scarce investment funds and yield substantial positive net benefits. Consequently, selection of projects for investment on the basis of the principles described above is likely to lead to a mix of projects to address these problems over the near term. It is likely that projects emphasizing rehabilitation, because of the serious consequences of failure of existing systems will be more heavily represented in the ranking in the early years, with increasing attention to projects that increase coverage in later years.

3.7 STAKEHOLDER INVOLVEMENT

3.7.1 Why a Strategy for Stakeholder Involvement?

A characteristic of water infrastructure projects and water resources management, is that there are usually many stakeholders, that is people and organisations with an interest of any kind in the project or programme.

In spite of efforts of planners and operators of water infrastructure to communicate effectively with those who can help them in their tasks, traditional approaches to planning and operations often result in systems that do not meet the needs and expectations of the communities they serve. This is not for any reason of technical deficiency, but simply that the communication processes used often do not result either in the planners and operators understanding the needs of the community, or in the community understanding what the planners and operators intend. As a result, the world-wide experience that infrastructure, when completed is often less useful to the

community than it could have been, and the community is therefore often unwilling to use it, maintain it or pay for it

Similarly, decisions on the management of water resources made without the involvement of stakeholders, run risks of being based on inadequate information or of being misunderstood. On the other hand, involvement of stakeholders in the management of water resources increases their sense of "ownership", improves decision-making, increases efficiency, and reduces the need for enforcement.

Involvement and participation of stakeholders in the planning operations and maintenance of water infrastructure, and in water resources management is therefore regarded as vital.

3.7.2 Objectives

The objectives of stakeholder involvement are:

3.7.2.1 Meeting the Needs of the Community

To ensure that water infrastructure projects and water resource management programmes meet not only national standards and guidelines (eg water quality), but also the specific needs of the communities affected, at a price they are willing to pay.

3.7.2.2 Efficiency and Sustainability

To ensure, through effective two-way communication at all stages, and through the development of community self-reliance, that infrastructure and resource management initiatives are planned and implemented so as to meet community needs efficiently and sustainably.

3.7.3 Mechanisms and Processes of Involvement

The mechanisms and processes of stakeholder involvement will be designed to ensure an open communication process between the stakeholders and those responsible for the proposal. Steps to be included in the involvement process include:

3.7.3.1 Identifying participants

Identification of stakeholders in the project, and of those proposing it.

3.7.3.2 Begin Communication Early

Establishment of communication between the two at the earliest stages of the project or proposal

3.7.3.3 Arranging Representation

Establishment of representation arrangements, using not only existing consultation mechanisms including Regional and District Development committees but also groups directly representative of affected communities.

3.7.3.4 Planning Communications

Planning communications including selection of materials of communication, and ensuring that the information conveyed is accurate, understandable and useful, and that the stakeholders on their part have adequate opportunity to communicate and their views are taken into account.

3.7.3.5 Communicating the Decision Making Process

Communicating the decision making process, so that stakeholders understand the process, ensuring that all stakeholder views can be communicated and taken into account in the decision making process

3.7.3.6 Giving Stakeholders a Part in Choices between Options

Involve stakeholders in choices between options to ensure that the solution recommended utilises technology appropriate to the skills of the community served and matches its willingness and ability to pay.

3.7.3.7 Exploring opportunities for community self-reliance

Develop in consultation with the community to be served, opportunities for efficiency and sustainability in which the community itself manages and undertakes aspects of rehabilitation of operations and maintenance including the supply of parts, with these contributions counted equitably as part of the payment to meet the cost of the scheme

3.7.3.8 Participation in Water Resources Management

Monitoring of the condition and use of water resources will be a continuous process. Involvement of the user community in the monitoring exercise is essential if the schemes are to be sustainable

There is a special challenge in monitoring groundwater resources. The management of groundwater resources and ensuring the sustainability of groundwater development can be improved greatly if communities are involved from the beginning in groundwater schemes. Monitoring of groundwater resources and of their use and development can best be initiated where a full fledged village level operation and maintenance (VLOM) arrangement is in operation.

3.7.4 Resources for Planning and Stakeholder Involvement

3.7.4.1 Resources for Planning and Developing Schemes

Stakeholder involvement pays. It improves the value and relevance of projects for users, engenders a sense of ownership, contributes greatly to the efficiency, sustainability and financial viability of projects and water resources management initiatives, and makes agency and government decision-making far more secure.

However, it is time consuming and very demanding of the resources of the proponent agencies. Most water infrastructure agencies have not in the past provided adequate resources to plan projects in a properly consultative and involving manner. It is proposed that the capacity to do so be provided

3.7.4.2 The Role of the Water Resources Board in Stakeholder Involvement

Stakeholder involvement in water resources management and water infrastructure services will consist not only of programmes involving urban and rural domestic users of water, but also close involvement of representatives of other sectors of government and the economy.

Accordingly, it is intended that the role and composition of the Water Resources Board be upgraded to perform a major policy advice role and to exercise the highest level role in stakeholder involvement.

Assumption of a leadership role in stakeholder involvement by the Water Resources Board is one of the most important capacity building measures advocated in the overall strategy. This will include upgrading its membership to the highest level of representation of the above interests, assignment to the Water Resources Board of the responsibility to ensure continuing stakeholder involvement at all levels, and the provision of the necessary financial and support services.

3.8 WATER ALLOCATION

3.8.1 Why a Water Allocation Strategy?

Relative to other parts of Southern Africa, Malawi is well endowed overall with water. However, within Malawi, spatial and seasonal variations in its occurrence and growing competition for its use, are leading in a number of areas towards full or over commitment of water resources at their present level of development. It is thus becoming increasingly important to put in place strategies and processes to ensure that water is allocated in a manner that creates the maximum achievable benefit for Malawi.

If such strategies and processes are not implemented, the result is likely to be that in some areas, water resources will become fully committed with little practical opportunity for reallocation. When opportunities later arise for more beneficial uses of water from the resource, the "first come first served" system currently in use foregoes opportunities to reap these economic benefits. Application of a number of the principles outlined in this document provides strategies and procedures which can help ensure

that higher levels of social, economic and environmental benefits are obtained

3.8.2 Objectives

In managing water resources and in evolving strategies for water resources development, the government seeks to meet three objectives

Briefly restated, these are to enable the requirements of the community at least for basic water services to be met, to provide an infrastructure² to underpin economic development and to do so efficiently,³ and to protect the environment

A characteristic of the water sector is that these objectives interact. Furthermore, strategies and processes recommended herein will help to ensure that simultaneous progress is made towards the achievement of all three objectives. Provided such strategies and processes are followed, achievement of each objective can aid the achievement of the others.

On the other hand if, for example, a do-nothing approach is followed (that is continuing with allocation on a first come first served basis) then individual decisions are likely to be made that achieve none of the objectives well, or achieve one at the expense of the others. The accumulated effect can be progress in the reverse direction in regard to one or more of the objectives. For example commitment of most of the yield of a catchment for irrigation purposes could result in insufficient stream flow for maintenance of the aquatic environment and in inadequate quantity and quality of water for basic domestic needs.

3.8.3 Prerequisites

To establish strategies and processes for water allocation that best meet the above objectives, some prerequisite steps and information gathering is desirable, although a start can be made even if these steps and information are incomplete.

3.8.3.1 Water Resources Assessment

There needs to be a good understanding of the response of the natural water systems of the country to the regulation of stream flow and to increased abstraction of water. This information including data on water quality, is particularly important in areas where there is increasing competition for available resources.

3.8.3.2 Water Resources Management

There needs to be an ongoing national program of water resources management including assessment of abstractions and the measurement of water quality to ensure continued availability of water in terms of both its quantity and quality.

3.8.3.3 Stakeholder Involvement

Stakeholders should be involved in resource management and in carrying out the strategies and processes of water allocation (see 3.7)

3.8.3.4 Optimum Allocation of Investments

Project optimisation and selection should be based on the strategies and processes outlined in section 3.6, above.

3.8.3.5 Pricing Policy

Pricing policy can contribute through providing incentives to use water efficiently and encouraging a "market based" approach (Section 3.9)

3.8.4 Water Allocation Principles

The foregoing suggests that the strategy and process for the allocation of water should be in accordance with the following principles.

3.8.4.1 Provisions for basic domestic needs

The government's objectives include providing basic domestic water needs to those who cannot pay in kind or cash. An allocation for the basic domestic needs of this portion of the community should therefore be reserved within the total available from

each water resource that will provide water for this purpose.

3.8.4.2 Provisions for resource management and environment

Allocations will be reserved to ensure the continued viability of each resource and for the conservation of the environment. For water courses this might include provision of a minimum flow to maintain water quality and aquatic ecosystems, and to keep pump intakes covered

3.8.4.3 Market Based Allocation Process

There will be developed over a period of time a market based approach to water allocations, which results in those users of water to whom the water is of greatest value gaining access to an allocation. This approach puts to practical use the principles outlined in section 3.4 above regarding the value of water. The water available to be allocated in this manner is determined based on an understanding of the available yield less any allocation reserved for basic domestic needs and for resource management and the environment.

The principle will be that allocations can be bought by those to whom the water is of greatest value, thus yielding the greatest benefits to the national economy. A "market-based approach" will ideally be the establishment of actual markets for water. It will also be an administrative system of selling to and from a government operated "water bank" of allocations using estimated opportunity costs as defined in section 3.4 above. Other variations of a market-based approach are also possible.

During the transition period leading to the establishment of a market-based allocation process, action will be taken to determine the yield of each resource at its present level of development, and the allocations necessary to provide for basic domestic needs and for resource management and the environment. From this information, the amount available for allocation using a market-based approach should then be determined. These steps will be taken with full stakeholder involvement, emphasising the continued security of

existing allocations, and the potential economic value to stakeholders of a transition to a market based approach

3.8.4.4 Response to Drought

Assessment will be made of the response of the water resource in time of drought and of the water uses which draw upon the resource. This will indicate whether a detailed strategy in response to drought should be developed. Such a strategy may involve limiting total allocations in perpetuity, or reducing the allocations of selected classes of users during these periods. Generally, total allocations and thus benefits from use of the resource, can be larger if the allocation consists of at least some uses which can tolerate some reduction during drought.

3.9 PRICING OF WATER

3.9.1 Why a Pricing Strategy?

As indicated in section 2.2 above, the Ministry of Works is responsible for all public water supply schemes, except for Blantyre and Lilongwe. These include 53 urban and peri-urban schemes, 56 rural piped gravity schemes and 9,700 boreholes and 5,600 shallow wells equipped with handpumps. These schemes plus Blantyre and Lilongwe provide coverage of 56% of the population. The schemes cover populations with considerable variation in characteristics (monetary income and employment for example) and with considerable variation in the costs of providing service.

The intent of the government is to broaden coverage of those people dependent on traditional sources while progressively converting as many of these schemes as possible into autonomous, commercially viable systems. The government intends also to reduce the share of government financial support in the sector, while targeting the support which is available to those people who cannot pay the costs of the service in kind or in cash.

This will only be possible if cost-sharing arrangements in the sector include mechanisms to increase the share of costs paid for (in kind or cash) by the beneficiaries of the water schemes, while holding costs to the minimum

necessary through careful, least-cost designs of supply schemes and providing incentives for efficient operation of the schemes once built

A pricing strategy is to ensure that this transition proceeds as rapidly as possible, while being perceived to be both justified and fair. The success of this approach will ensure that there is an increase in its acceptance and in levels where the principles guiding pricing are applied in an open consistent way. The probability is likely to increase, also, to the degree that the potential beneficiaries perceive the proposed schemes as real improvements for which they are willing to pay.

3.9.2 Objectives of a Pricing Strategy

A pricing strategy has multiple objectives and these include the following:

3.9.2.1 Investment

Providing incentives to encourage selection of cost-effective investments in schemes which are responsive to the demand of the users

3.9.2.2 Efficient Management

Providing incentive to the managers of schemes to operate and maintain efficiently.

3.9.2.3 Efficient Water Use

Providing incentives to the users to use the water efficiently.

3.9.2.4 Financial Sustainability

Generating sufficient income from the scheme to cover costs and help ensure financial sustainability of the scheme.

As is true of other strategy objectives, it is possible to design approaches to water pricing which work in a mutually reinforcing way to achieve high levels of accomplishment of all the objectives at the same time. World wide experience has shown that such approaches emphasize a high degree of local autonomy in commercially oriented water schemes, responsibility at the

local level for payment of most costs from user charges, a corresponding reduction in subventions by government and a redirection of government financial support to carefully targeted groups, for instance those who really cannot pay in kind or cash and have no viable alternative source of water, and to targeted aspects of service like advanced treatment of sewage, which is very costly and provides benefits to much larger groups than the users of the schemes

3.9.3 Prerequisites for a Pricing Strategy

The primary prerequisite for development of a pricing strategy that will achieve the foregoing objectives in addition to applying the principles just described above, is to establish mechanisms to begin to base pricing choices on more local differentiation among users with regard to the values they place on improved service delivery schemes, that is, their locally expressed demand for the service, and among types of service which can be offered.

Example of types of services include boreholes with handpump only, boreholes with piped water delivery to standposts only, piped water with standposts and house or yard connections, or fully piped systems with house and yard connections. Broad classification of users into groups, such as urban and rural, masks the difference which exist, in the degree of variation in the real demand within these broad categories. Similarly, identification of only a limited number of technologies does not offer enough options to match the supply choices to locally expressed demand.

For specific use in price setting, the most important differences among users are in their willingness to pay (in kind or in cash) for types of improved services. Among types of service schemes, the most important differences are in their service characteristics relative to existing or traditional source, and their cost.

3.9.4 Pricing Strategy and Processes

The pricing strategy recommended is one based on locally expressed demand (as indicated by willingness to pay) and the matching of supply options to such demand, with the aim of increased coverage of the costs of supply through user charges. This requires the establishment of processes determine local willingness to pay and active local stakeholder involvement in these processes. It also

requires more active exploration of supply options and their associated cost

Many factors influence a household's willingness to pay for an improved water supply. Of these, the most important are

3.9.4.1 Household Characteristics

The socio-economic and demographic characteristics of the household, such as occupation and education and measures of income, expenditures, and assets.

3.9.4.2 Supply Characteristics

The characteristics of the existing or traditional source of water versus those of the improved water supply, including the costs, the quality and reliability of the supply.

Somewhat surprisingly, in recent studies of willingness to pay for improved water systems carried out in Tanzania and Zimbabwe, Asia, and Latin America, income levels, while important are not always the most significant factor in willingness to pay. Often it is influenced more strongly by a comparison of the proposed improved scheme with the existing or traditional source of water. A low willingness to pay for an option offered by the government may, for example, indicate a local preference for an existing or traditional source of water, which the government should honour unless it is established that such a preference poses unacceptable health risks. In the latter case, an attempt should be made to explain such risks to the local people in order to change their preferences rather than initiating a proposed scheme without their endorsement.

The adoption of a pricing strategy based on local willingness to pay, and selection of the most appropriate water supply schemes to better match this local demand, provides an important set of incentives to local managers, whether they are managers of formal urban schemes or more community related management in rural areas. These include:

3.9.4.3 Self-sufficiency and Sustainability

An incentive to become more financially self-sufficient and ensure sustainability of the schemes.

3.9.4.4 Efficiency

An incentive to utilize revenues of the schemes to pursue well planned operation and maintenance of existing schemes; and

3.9.4.5 Good Planning

An incentive to plan for appropriate and timely expansion of schemes when demonstrated demand in the local service area justifies such an expansion

The adoption of such a pricing strategy also provides incentives to actual and potential users to express their demands regarding service level and quality of service and expect a response from the providers of the service for which they are committed to pay (once again, in cash or in kind). Moreover, they will have an increased incentive to hold local service providers accountable for delivering, at reasonable cost, the services which they want

Such a pricing policy, also provides an important set of opportunities and incentives for the government, including, amongst others, the following

3.9.4.6 Better Value for Money

An opportunity to achieve greater coverage and improved service delivery more rapidly, from any given level of investment, because of the reduced requirement to provide government financial support to provide services to those who are willing to pay for the service and those who prefer their existing services to government sponsored schemes;

3.9.4.7 More effective Direction and Management

Both an opportunity and incentive to concentrate attention on major policy issues affecting the delivery of water services and management of

water resources as more detailed day-to-day operation of services and increasingly delegated to autonomous, financially self-sufficient water schemes, and

3.9.4.8 Better Trouble-Shooting

Increased flexibility to initiate special programmes and to respond to trouble spots in the sector as they emerge, both because of less stress on government financial resources and because the government can concentrate on further development of sector-wide expertise in the water-using sectors for the planning and design of improved service delivery systems, development of investment programs and quality enhancement of local schemes.

In the near term, the most important actions by the government will be to develop greater expertise in obtaining reliable information to assess local willingness to pay and apply this information in the selection and operation of local schemes.

At the same time, the government will need to disseminate and explain the pricing policy and strategy to stakeholders in existing schemes and potential stakeholders in new schemes. The key to the success of this policy and strategy is to actively and accurately disseminate information about the policy and its application in all places and to demonstrate that the policy and strategy are being applied evenly and fairly.

CHAPTER 4

CHANGES REQUIRED TO IMPLEMENT THE POLICY AND STRATEGIES

4.1 Institutional Arrangements

4.1.1 Policy Advice in Water Resources Management

In order to achieve the aims of this policy there is need to strengthen the existing central policy advisory body, through the reconstruction of existing institutions and a more appropriate allocation of responsibilities. It is recommended that this be done as a matter of urgency. The current functions of the Water Resources Board should be reviewed and strengthened as described in this document. Its membership should include representatives of stakeholders as well as the other ministries, and these should be at the highest level possible to facilitate on the spot decision making. In addition to policy, the Water Resources Board would have the primary responsibility for managing the nations water resources and act as Central Policy regulatory body.

4.1.2 Decentralization

Decentralization of the implementation and operational functions of the sector is an immediate need. This should include appropriate mechanisms for channelling of funds to the sector institutions. Decentralization will result in rapid improvements in efficiency and greater user satisfaction. Three regional water boards should be formed and made operational.

4.1.3 Sanitation

The institutional arrangement for the management of sanitation should incorporate the capacity for integrated policy-making, to ensure that the minister responsible for water affairs has a combined responsibility for both water and sanitation. All sanitation activities should be undertaken by the local Water Board, enabling current operational deficiencies to be redressed.

4.1.4 Environmental Management

A legal framework should be enacted, encompassing national conservation principles, to empower and support the Government in achieving its objective of conservation of the environment. A central environmental regulatory body, possibly based on a

strengthened Department of Research and Environmental Affairs, should be created and charged with the carriage of this role for the Government. Its role and obligations should include coordination of those Ministries and Departments whose activities may affect water supplies, sanitation and aquatic environments. In support of environmental objectives, all new water and sanitation projects should be supported by adequate environmental investigations.

4.2 CAPACITY BUILDING

4.2.1 Sustainable Development of Water Services Undertakings

To achieve a level of skills and expertise sufficient to assure sustainability of the developmental, operational and maintenance activities of the water services undertakings, a target will be adopted that by the year 1999-2000 greater than 50% of all rehabilitation and new system implementation will be undertaken with Malawian human resources, with minimal foreign technical assistance.

4.2.2 Human Resource Development

A program of training and staff development will be initiated to ensure a continual upgrading of the skills and expertise of the staff of all of the agencies of the water sector, encompassing all disciplines and all levels of staff, sufficient to enable the above target to be achieved.

4.2.3 Central Services to the Water Industry

Within the Water Department existing capabilities should be reorganised and strengthened to enable it to provide a full set of key central services for the water sector.

4.3 STAKEHOLDER INVOLVEMENT

Decisions on water resources management and infrastructure services often require subjective judgements and detailed local knowledge. Neither governments nor aid agencies are suitably equipped to make judgements on how local people value these services and their environment.