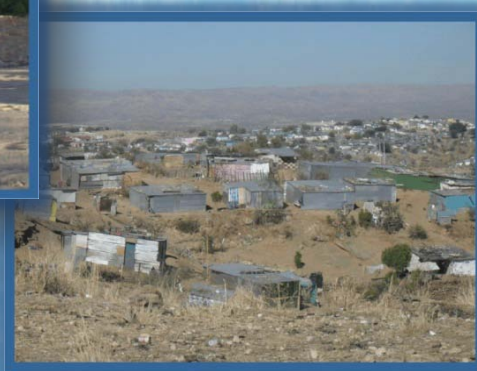




DEVELOPMENT OF AN INTEGRATED WATER RESOURCES MANAGEMENT PLAN FOR NAMIBIA

Theme Report 8

NATIONAL WATER DEVELOPMENT STRATEGY AND ACTION PLAN



AUGUST 2010

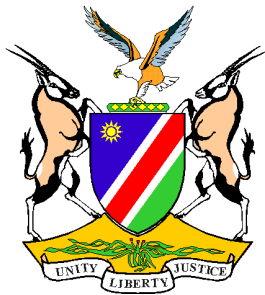
PREPARED FOR:

MINISTRY OF AGRICULTURE, WATER
AND FORESTRY

FUNDED BY:

AFRICAN WATER FACILITY





GOVERNMENT OF THE REPUBLIC OF NAMIBIA

INTEGRATED WATER RESOURCES MANAGEMENT PLAN FOR NAMIBIA

Funded by:

African Water Facility

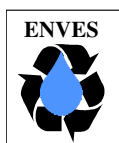


Prepared for:

Ministry of Agriculture, Water and Forestry

Prepared by:

IWRM Plan Joint Venture Namibia



AUGUST 2010

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INTEGRATED WATER RESOURCES MANAGEMENT STRATEGY AND ACTION PLAN

1 PROLOGUE

This Integrated Water Resources Management (IWRM) Strategy and Action Plan addresses IWRM defined as: *'A process that promotes the co-ordinated development, management and use of water, land and related natural resources in order to optimize the resultant economic, social and environmental welfare in an equitable manner without compromising the sustainability of vital ecosystems'* (adapted from Global Water Partnership).

The overall long-term goal of IWRM in Namibia is: **to achieve a sustainable water resources management regime contributing to social equity, economic efficiency and environmental sustainability.** This goal integrates a focus on poverty reduction through skills development, creation of jobs and creation of wealth all linked to efficiency improvements in water use.

This Draft Strategy is based on three thematic reports. The relevant reports discuss: (1) review and assessment of existing situation; (2) the assessment of resources potential and development needs; and (3) formulation of water demand management strategy. The Draft Strategy also incorporates the results of eleven regional stakeholder workshops covering thirteen regions and consultation with members of the IWRM Plan Steering Committee. The purpose of these workshops was to raise awareness about and encourage engagement in the development of the IWRM Plan, to gather inputs from stakeholders in the Regions and to obtain their endorsement of the draft. Consultations revealed that water suppliers and users in Namibia are comfortable with WHAT needs to be done to accomplish IWRM but have many questions about HOW it is to be done and WHO is responsible or accountable for doing it. Phased or step-wise implementation was agreed upon at most regional workshops and is recommended for the IWRM Plan.

The identified objectives of this fourth Draft Strategy were endorsed at a national workshop held on 11 August 2010.

2 INTRODUCTION AND BACKGROUND TO THE IWRM STRATEGY AND ACTION PLAN

IWRM is accepted globally as an essential component of sustainable development in which water is recognised as a key national asset. Nevertheless, the implementation of IWRM is a time consuming process, requires strong leadership and ongoing political endorsement and support to achieve its goals and activities as well as strong capacity in the diverse, involved sectors. IWRM is particularly important in Namibia as it is the most arid country in southern Africa with low and unpredictable rainfall ranging between a maximum of 700 millimetres/year in the northeast to less than 50 mm/year along the Atlantic coast. Only about 2% of rainfall ends up as surface run-off and a mere 1% becomes available to recharge groundwater. The internal annual renewable water resources available from ephemeral rivers and groundwater sources are estimated as 500 million cubic metres, close

to the amount abstracted each year, but Namibia also has access to internationally shared perennial and ephemeral water resources on its northern and southern borders.

The Namibian Vision 2030 is a perception of the future and its goal is to improve the quality of life of the people of Namibia to the level of their counterparts in the developed world, by 2030. The quality of life of all Namibians could be significantly improved through general access to potable water supply and appropriate sanitation based on more efficient water use tied to creation of wealth. Good progress regarding water supply coverage has been made since Independence, despite limited capacity in the sector. If implementation continues at the current rate, with a higher commitment of financial resources and enhanced capacity of human resources backing the programme, 100 per cent coverage for both urban and rural areas could be achieved by the year 2030. See **Table 2.1** for the projected rural water supply progress in terms of the Millennium Development Goals.

Table 2.1: MDG Targets

TEN YEAR DEVELOPMENT FRAMEWORK	1996 - 2005	2006 – 2015		2016 - 2025		2026 - 2035
National Development Plan	NDP 2	NDP 3	NDP 4	NDP 5	NDP 6	NDP 7
End date of NDP	2005/06	2010/11	2015/16	2020/21	2025/26	2030/31
Rural water coverage	80%	85%	90%	95%	-	100%
Full cost recovery	50%	60%	70%	80%	90%	100%
Decentralisation	Delegation 95%	Devolution 100%				
Gender policy implemented	100%					
Recurrent Budget (N\$ million)	423, 668	490, 000	560	650	740	850
Development Budget (N\$ million)	294, 533	338, 947	400	455	525	600

Progress regarding appropriate sanitation coverage has been less comprehensive since Independence and focus on this part of the sector is required. See **Table 2.2** and **Table 2.3**.

Table 2.2: Vision 2030 Sanitation Coverage*

AREA	YEARLY PERCENTAGE COVERAGE ACHIEVED OR PROJECTED							
	1991	1992	1996	2000	2006	2010	2020	2030
Urban	85	78	92	91	100	95	100	100
Rural	10	10	20	20	60	30	40	50
Total	22	22	50	41	70	60	70	80

*Adapted from Vision 2030, Figure 4.3.1

Table 2.3: MDG Sanitation Coverage*

AREA	YEARLY PERCENTAGE AND COVERAGE PROJECTED			
	1991	2001	2006	2015
Urban	89	82	80	98
Rural	15	21	50	65

*Adapted from MDG report

In 2008 the African Development Bank funded a Project for a Rapid Assessment of the Water Supply and Sanitation sector in Namibia. In the Report the investment gaps for the water supply and sanitation sectors were estimated in relation to the coverage required to attain the Vision 2030 targets for Namibia. The water supply and sanitation coverage requirements proposed, as well as the investments required to achieve those targets are shown in **Table 2.4** below. An estimated gap of US\$ 92 million should be required for water supply and US\$ 288 million for sanitation to meet the goals for 2030.

Table 2.4: Anticipated Coverage and Investment Requirements

COVERAGE TARGETS AND CAPITAL INVESTMENT REQUIREMENTS							
SUB-SECTOR	AREA	2006/7 Access (%)	2010 Target (%)	2015 Target (%)	INVESTMENTS (MILLION USD)		
					REQUIREMENTS	AVAILABLE 2008/09	GAP
Water	Rural	80	85	90	74	9,6	64,4
	Urban	98	99	100	29	1,0	28,0
	Total	86	91	96	103	10,6	92,4
Sanitation	Rural	25	30	65	30	0,1	29,9
	Urban	76	95	98	260	2,1	257,9
	Total	51	62	85	290	2,2	287,8

From the above it is clear that there are different assessments of the present coverage of sanitation, but with the newly established responsibility for the DWAF to manage sanitation development in Namibia through the Directorate of Water and Sanitation Sector Coordination (DWSSC), it is clear that more accurate assessments of the coverage and investments required will have to be made to address the situation properly. To achieve the targets for water and sanitation the strategy to be followed is the encouragement of the active participation of users and beneficiaries in regulating water access and management, as well as sanitation, in rural areas through the further establishment of the rural water point committees.

In 2008 the African Development Bank funded a Project for a Rapid Assessment of the Water Supply and Sanitation sector in Namibia. In the Report the investment gaps for the water supply and sanitation sectors were estimated in relation to the coverage required to attain the Vision 2030 targets for Namibia. The water supply and sanitation coverage

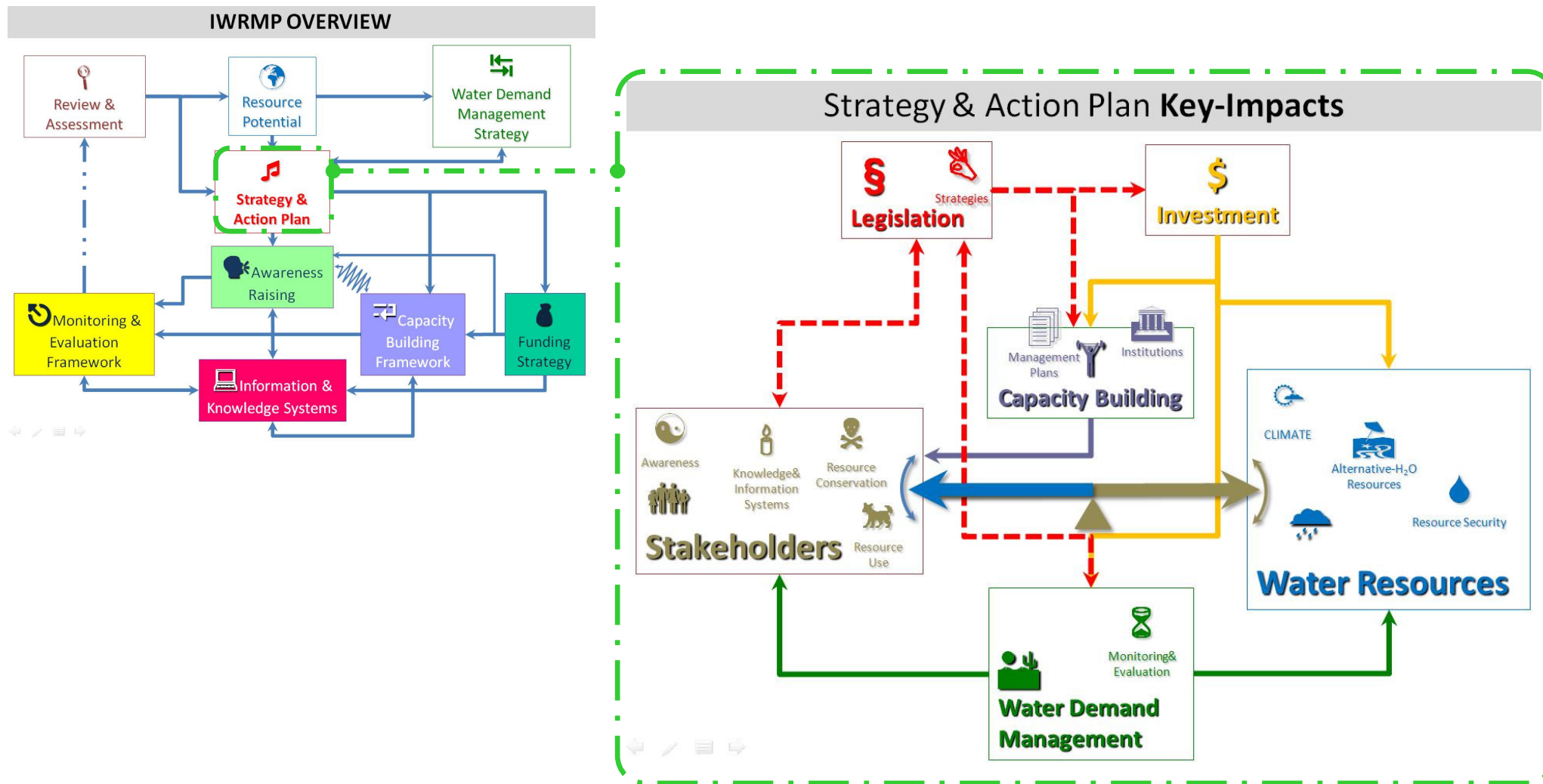
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Table 2.5: Anticipated Coverage and Investment Requirements

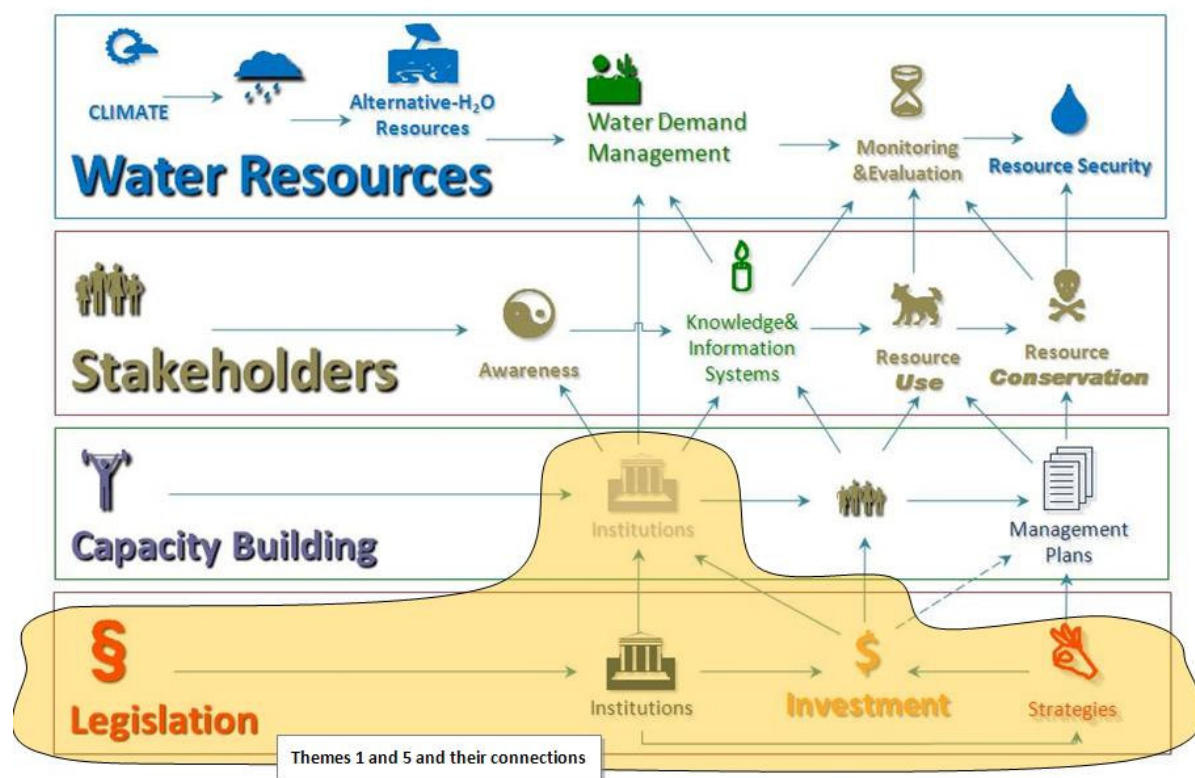
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Roadmap for accomplishing IWRM Strategy and Action Plan



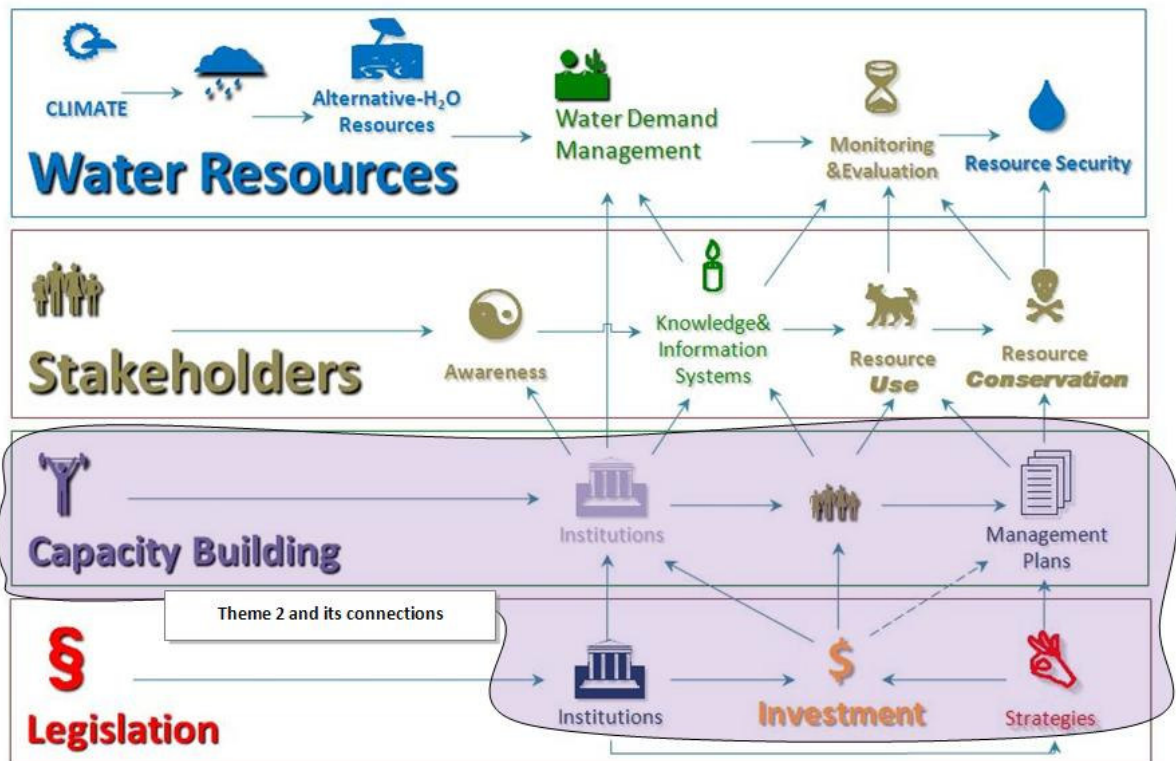
S&AP Strategy Map, IWRM Key-Issues



Following the Road Map as depicted in the above diagram, the Strategy and Action Plan was compiled in five main themes. The Strategy and Action Plan was discussed in all the regional consultations during which time the key importance of Policy and Legislation and of Investment was confirmed. These elements were then combined to represent the basis to support all aspects of IWRM. The direct connectivity of Legislation and Investment to Capacity Building, which is then extended to Stakeholder Involvement and lastly applied to Water Resources Management, is illustrated. All the identified elements are essential to ensure Resource Security for Namibia.

At the final National IWRM Workshop, the important elements of Policy and Legislation and of Investment, particularly as related to Institutions, were identified as key components of the IWRM Strategy and Action Plan.

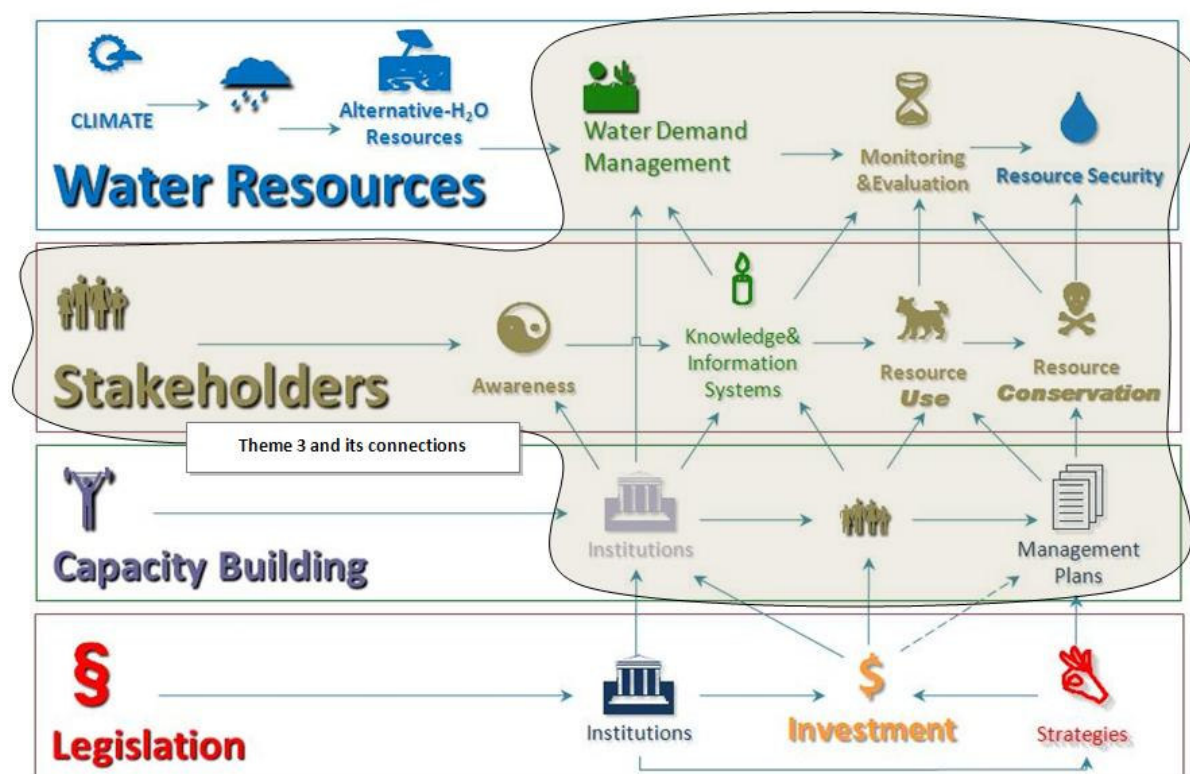
S&AP Strategy Map, IWRM Key-Issues



Capacity Building and Institutional Development on all levels was identified during the regional consultations as the key building block required to support IWRM. Capacity Building is dependent on appropriate Policy and Legislation and on Investment but can be implemented immediately based on existing Policy and Legislation and level of Investment. The connectivity to Stakeholders and the importance for Water Resource Management, and ultimately Resource Security, are highlighted.

At the final National IWRM Workshop, the important element of Capacity Building and Institutional Development, particularly as related to Policy, Legislation and Investment, were identified as key components of the IWRM Strategy and Action Plan.

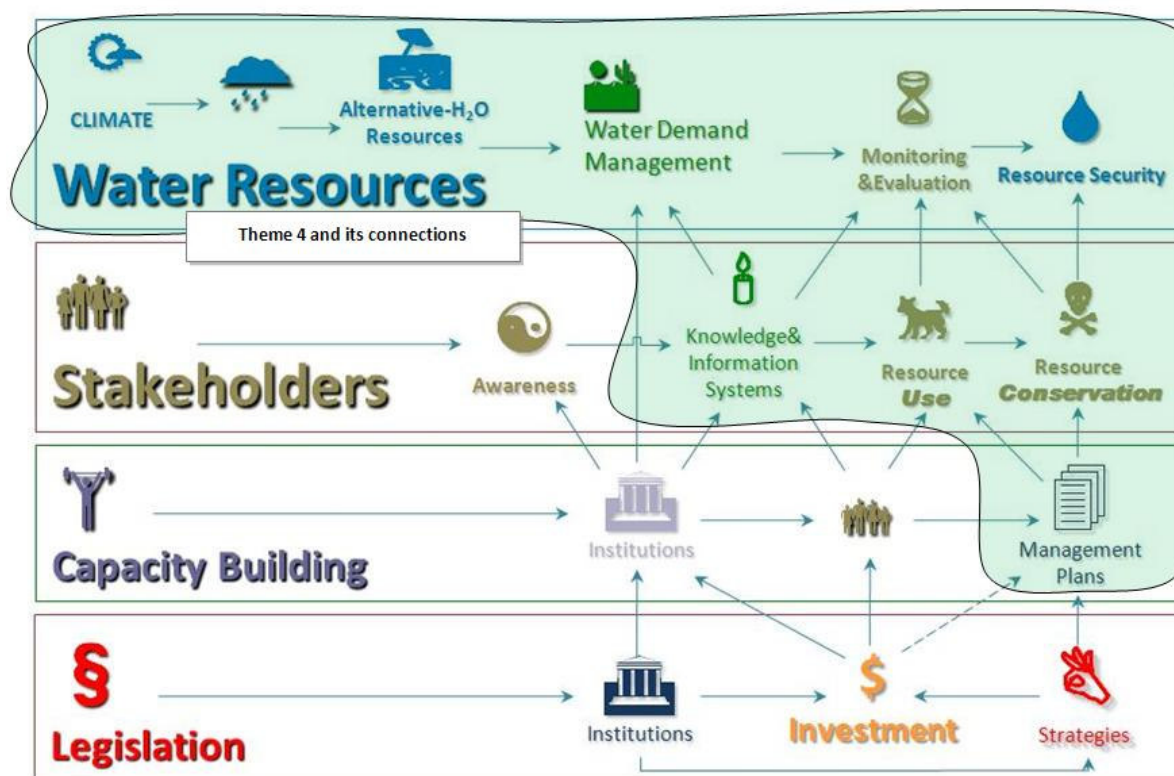
S&AP Strategy Map, IWRM Key-Issues



Stakeholder involvement represents an evolving approach to Water Resources Management and was identified during the regional consultations as a key factor required to support IWRM. Stakeholder involvement is connected to and influences almost all components of IWRM ranging from Capacity Building and Institutional Development to Water Resources Management. It too is a key element for ensuring Resources Security.

At the final National IWRM Workshop, the important element of Stakeholder involvement, relating particularly to Capacity Building, Institutional Development and Water Resources Management, was identified as a key component of the IWRM Strategy and Action Plan.

S&AP Strategy Map, IWRM Key-Issues



Although traditionally Water Resources and their management, supported by Investment, are considered the only elements of Resource Security, the regional consultations recognised the particularly strong connections coming from Stakeholder involvement and Capacity Building and Institutional Development as well as the connectivity to Policy, Legislation and Investment. The regional consultations allocated particular significance to Water Demand Management, in all its manifestations, as the key management element contributing to the ultimate aim of Resource Security.

At the final National IWRM Workshop, the important element of Water Resources and their management was noted along with its connectivity to Stakeholder involvement and Capacity Building and Institutional Development.

3 EXPLANATION OF THEME TABLES

3.1 EXPLANATIONS TO THE TABLES ADDRESSING ALL CHAPTERS

In the tables provided below, the main objectives (what needs to be done), strategies (how should it be done), actions (activities), who is responsible (main stakeholders) and indicators and time frame are linked. In these tables, the term 'Objectives' is used to refer to what will have been/will be attained to contribute to the overall goal; the term 'Strategy' provides the how it should be done. The 'Actions' refer to the defined activities that will contribute to attaining the objectives; this is followed by 'Who is Responsible'; the 'Indicators' provide a measurable outcome; and the time frame is tied to the objectives and strategies.

In the strategy summaries as well as the strategy sections of the respective tables the following terms are used to highlight the interconnection of key matters for IWRM and Water Demand Management: accelerator (*something that makes a situation change faster than usual or sooner than expected*); stabilizer (*something that helps to make something else steady*); lever (*something used to influence a situation to get the desired result*); indicator (*something that can be regarded as a sign which shows in what way a situation is changing*).

The term 'service providers' refers to NamWater, Local Authorities, Regional Councils or any other entity that provides water to consumers.

The term Basin Management Committee is used throughout this Strategy and Action Plan to cover concepts such as Water Management Areas, Catchment Management Areas and similar terms used in other parts of the world.

The term Water Demand Management (WDM) includes water supply and demand, leakage management, pollution control and similar topics.

The term 'stakeholder' refers to all Namibians who use, manage or in any way influence or take advantage of water resources.

4 THEME 1: POLICY AND LEGISLATIVE SUPPORT FOR IWRM

4.1 INTRODUCTION

4.1.1 Current situation

Namibia has a National Water Policy (2000) in place which, together with all other water related policies adopted by Government, are in full support of Integrated Water Resources Management. A good example is the Water Supply and Sanitation Sector Policy (2008) that clearly supports elements of IWRM. Despite this favourable policy situation, the policies are not fully implemented nor are they well known or understood by the general public. The participation of all Namibians in water management through knowledge, understanding and compliance with the water policies of the country is a key component of success to implement the IWRM Plan. This support is required by all implementing institutions such as the Department of Water Affairs and Forestry in the Ministry of Agriculture, Water and Forestry, the bulk water supplier NamWater, Regional Councils, Local Authorities and the general public.

The Water Resources Management Act (2004) has not yet commenced and is being revised. Critical regulations must still be formulated. It has been identified that, *inter alia*, a Water Regulator is central to IWRM and various strategies such as an end-user tariff strategy and subsidy/cross strategy are still awaited. In the current situation the enabling policy and legislative environment for IWRM is incomplete, the responsibilities for implementation not well understood and capacity for implementation is inadequate. The current initiatives regarding strategy, policy and legislation development including drafting of regulations represent a positive trend. It forms the basis for the implementation of the IWRM Plan once adopted.

4.1.2 Strategy and Action Plan summary

The formulation of outstanding policies is necessary to accelerate implementation of IWRM Plan while legislation and associated regulations must be promulgated as important levers for guiding, controlling and giving effect to the IWRM Plan.

Critical connections from:

Stakeholders theme.

Critical connections to:

Resource Management Strategies; Stakeholders; Water Demand Management; Institutional Capacity Building; Investment themes. This Theme is intrinsically linked to Theme 5.

Note: the tables below are to be read from top to bottom within each component. Only the Indicators and the Time Frame columns, addressing the objectives, are directly related.

THEME 1: POLICY AND LEGISLATIVE SUPPORT FOR IWRM

OBJECTIVES	Strategies	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
An enabling policy and legislative framework is established and enforced¹.	<p>Ensure that a self-regulating system is in place and functional where existing institutions manage strategy development with the aim to attain financial stability of all service providers</p> <p>Existing and newly established strategies and regulations to be implemented on a trial basis in cooperation with willing role players.</p> <p>Establishment of performance indicators for all water suppliers</p>	<p>Finalize the WRM Act and identify required strategies</p> <p>Compile and circulate draft required regulations to stakeholders, including LAs, RCs, as they are formulated</p> <p>Undertake strategy gap analysis and compile strategies required for the implementation of IWRM in consultations with all stakeholders</p> <p>Compile and finalize the following strategies:</p> <ul style="list-style-type: none"> - Strategy on bulk and end-user tariffs; - Strategy on subsidies and cross-subsidies; - Strategy for Water Demand Management (WDM) and water conservation; - Strategy on the reduction of bush encroachment to enhance groundwater recharge potential - Sanitation strategy <p>Develop operation plans that promote self-regulatory systems</p> <p>Compile guidelines for harmonisation of decentralisation process and IWRM</p> <p>Develop strategies to introduce incentives for IWRM/WDM initiatives in communities, industry and Government</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary institutions 	<p>The new WRM Act and regulations are promulgated, implemented and enforced by 2011 and</p> <p>outcome based key required strategies are compiled by 2012.</p> <p>The majority (80%) of water users and service providers are licensed and compliant by 2012</p> <p>Equitable tariffs are installed by 2012</p>

¹ This would include, inter alia, identified policies and the entering into force of the Water Resources Management Act

THEME 1: POLICY AND LEGISLATIVE SUPPORT FOR IWRM continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Water and Sanitation governance structures are established and functional, e.g. <i>inter alia</i>,</p> <ul style="list-style-type: none"> - the Water and Sanitation Advisory Council - the Water Regulator - Basin Management Committees 	<p>Investigate mechanisms for establishing key water governance structures by agreement until revised Act and regulations are in place</p> <p>When the new Act is in place, reconfirm establishment of key water governance structures</p> <p>Implementation of control mechanisms as described in the Act whereby the Minister may take over inappropriate LA water management and bring in an outside service provider</p> <p>Restructure existing water institutions and integrate with the new ones</p> <p>Use the strategies established under the first objective of Theme 1 and integrate the strategies of Theme 5</p>	<p>Establish the Water and Sanitation Advisory Council</p> <p>Establish the Water Regulator function to gather and manage relevant data, to evaluate and approve tariffs for water and sanitation services and to evaluate, using performance indicators, water and sanitation service delivery by service providers</p> <p>Establish Basin Management Committees, Irrigation Water Efficiency Groups and other water area management institutions to promote ongoing efficient and effective engagement with other community-based and non-governmental organisations</p> <p>Establish Performance Support Teams to assist Local Authorities and Regional Councils provide water supply service and meet performance indicators</p> <p>Establish a Water Research Council</p> <p>Provide funding for human resources and organisational capacity building</p> <p>Provide funding for iterative development of financial management plans</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - Line Ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary institutions 	<p>The majority of institutions are able to demonstrate successful implementation of annual work plans and budgets by 2012</p> <p>Proof of long-term strategic planning and management of their activities exists by 2014.</p>

5 THEME 2: INSTITUTIONAL SUPPORT AND CAPACITY BUILDING FOR IWRM

5.1 INTRODUCTION

5.1.1 Current situation:

In general, the assessments and contributions from stakeholders suggest that there is limited capacity and experience amongst water professionals, including DWAF, NamWater, Regional Councils and Local Authorities, for understanding, implementation and enforcement of water management, particularly IWRM. This applies to functions ranging from policy analysis, planning and management to pollution control, sanitation and related elements. Loss of expertise to the private sector and international opportunities are confounding factors. Inadequate capacity and experience exists at most levels including, *inter alia*, Basin Management Committees and Water Point Committees.

Institutional arrangements are currently inadequate which, *inter alia*, impinge on decentralisation that, in turn, does not support IWRM. Basin Management Committees do not have funding, capacity or authority to implement IWRM. Meanwhile, in some instances delineation of water management areas is inappropriate and some of the basins are not suitable for implementation of IWRM.

5.1.2 Strategy summary:

Institutions and water and land resource management plans have a major influence to mobilize and integrate stakeholder knowledge and experience through the installation of appropriate feedback channels, i.e. institutions will feed key-information to their interconnected monitoring and evaluation systems and knowledge and information systems through active stakeholder participation. In this regard capacity building in IWRM is seen as a complementary lever for self-starting the installation of the IWRMP for guiding and controlling the plan itself.

THEME 2: INSTITUTIONAL SUPPORT AND CAPACITY BUILDING FOR IWRM

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Institutional support programs established to strengthen management and governance structures</p>	<p>Improve the use of current policies to increase institutional effectiveness and resource use efficiency</p> <p>Current Water Act (1956) used to support and enforce the current policy landscape until the WRM Act is available</p> <p>Existing water resources management plans used for capacity building until IWRM Plan completed</p> <p>Experienced stakeholders/ senior experts should be taken advantage of to provide excellent leverage for capacity building and should be integrated into a resource pool for on-the-job training and performance monitoring</p> <p>An enforcement agency which is guided by the principles of WDM is established and functional</p> <p>Implementing agencies take advantage of the self-regulating potential of IWRM and feed information into the Knowledge and Information Systems</p> <p>Ensure sufficient hardware capacity at institution level</p> <p>Ensure appropriate research capacity to enable water users to undertake resource conservation and wise resource use</p>	<p>Establish institutional capacity needs for all organisations in the water sector</p> <p>Establish institutional capacity building programme according to Water Policy</p> <p>Provide management training to all levels as required based on established management plans of the various sectors</p> <p>Establish mentoring programme at institutional and individual levels</p> <p>Establish forums for mentored exchange of information and experience (e.g. Emerging Farmers programme, use Namibia Water Partnership as a forum for institutional support)</p> <p>Implement performance assessment programme</p> <p>Implement career development programs for institutions in the water sector</p> <p>Encourage and implement capacity building for IWRM implementation in all relevant instances and institutions</p>	<p>MAWF as lead agency should promote and oversee the actions</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions - Regional and international networks (NWP) 	<p>By 2015 institutional support programs are developed and implemented in all water sector institutions</p> <p>95% of institutions who require PST support receive it by 2015</p>

THEME 2: INSTITUTIONAL SUPPORT AND CAPACITY BUILDING FOR IWRM continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
IWRM integrated and implemented within the context of and in collaboration with decentralisation	<p>Develop an appropriate strategy to ensure that the IWRM plan, including basin management approaches, is implemented in line with decentralisation</p> <p>Institutional support programmes are actively used to foster stakeholder participation and engagement</p> <p>Focused training and support for decentralisation capacity established together with integrated governance structures to manage decentralisation and IWRM</p>	<p>Establish a task team to analyse and integrate goals, objectives, strategies and actions of decentralisation and IWRM for operationalisation</p> <p>Establish training programme for basin level stakeholders such as WPCs, Local Authorities and Regional Councils</p> <p>Use available capacity, within and outside government, to implement the Act and IWRMP</p> <p>Bring certain sections of the Act into force step-wise when and after capacity becomes available or has been developed</p>	<p>MAWF as lead agency should promote and oversee the actions</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>IWRM forms an integral part of the plans of Regional Councils by 2015</p> <p>All RCs are actively engaged in BMCs by 2015</p>

THEME 2: INSTITUTIONAL SUPPORT AND CAPACITY BUILDING FOR IWRM continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS
BMCs are formalised and functional.	<p>Transparent strategy followed to support evolving roles of individual BMCs</p> <p>BMCs will have a recognised statutory/advisory role (by <i>stakeholders and DWAF</i>)</p> <p>Community engagement in BMCs and WPCs will have been strengthened.</p> <p>Functional delineation of BMCs will have been undertaken on an as-needed basis.</p>	<p>Establish BMCs</p> <p>Develop and implement a sustainable source of funding for BMCs</p> <p>Encourage and facilitate community engagement in BMCs</p> <p>Recognise advisory/statutory role of BMCs</p> <p>Strengthen management capacity of BMCs</p> <p>Review delineation of BMCs as need arises, with stakeholders, with focus on functional and effective management</p> <p>Provide continuous support to BMCs and other relevant initiatives</p>	<p>MAWF as lead agency should promote and oversee the actions</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>BMCs are collecting and generating information for decision making by 2013</p> <p>All BMCs will have annual M&E reports by 2015</p> <p>Stakeholders (including community) express satisfaction on operations of BMCs by 2015</p>

THEME 2: INSTITUTIONAL SUPPORT AND CAPACITY BUILDING FOR IWRM continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Basic, vocational and higher education institutions have included IWRM into their curricula and extracurricular education programs</p>	<p>Water and land resource use, resource conservation and basic infrastructure maintenance capacity building should be included in basic education and teacher training</p> <p>IWRM should be the focus of higher education programmes which would also enhance contributions of basic education and offer IWRM related community services</p> <p>Higher education, research institutions, government and non-government institutions should invest in IWRM related research (e.g. research for resource conservation, alternative water supplies, water recycling technologies and institutional management support)</p>	<p>Provide IWRM curriculum support to the basic education and teacher training institutions</p> <p>Review applicability of training programme established under Namibia Water Resources Management Review</p> <p>Establish long-term education programs and delineate clear career paths in IWRM and encourage dual system training</p> <p>Establish regional and international partnerships for IWRM research and technology development</p> <p>Encourage implementing and educational institutions to undertake capacity building on all levels of IWRM implementation</p> <p>Offer continuous professional development in the fields of IWRM</p> <p>DWAF or a Water Research Council establish and manage a formal bursary scheme for young people to become professionals in water sciences, engineering, technology and policy analysis</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as:</i></p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT, MoE - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Basic, Tertiary and vocational institutions - International and regional networks (e.g. WaterNet - International Cooperation Partners 	<p>People are graduating in fields contributing to IWRM by 2015</p> <p>IWRM related topics are included in Basic Education, Vocational Training Centres and Higher Education curricula and continuous professional development by 2012</p>

5.2 SUB THEME 2.1: CAPACITY BUILDING FOR MANAGEMENT OF IWRM INCLUDING WDM

5.2.1 Assessment of current situation:

With respect to water management in general, encompassing IWRM including WDM, stakeholders feel that understanding of management and management capacity are limited and current water management does not address IWRM. Three aspects identified by stakeholders are: poor water environment management, the Local Authorities do not enforce water and sewage management and NamWater tariffs are arbitrary. Water use management in the mining sector is good but only accounts for 2.8% of all water used.

Currently there is no NamWater performance contract with the Government as contemplated in the NamWater Act (Act No. 12 of 1997). The Karst Water Management Body is recognised, by GRN, for good oversight while GRN maintains executive functions to manage groundwater. Overall, management is too sectoral and not appropriately integrated.

To date, there is an absence of assessment of skills gaps that, *inter alia*, means training and education are not appropriately targeted on any level.

5.2.2 Strategy summary:

Management and formulation of resource management plans are central accelerators for the implementation of IWRM while managerial capacity building is seen as a central lever for guiding, installing and controlling these plans. Appropriate strategies and legislation are further levers to guide the development and implementation of management plans which themselves are essential levers for resource conservation and appropriate resource use. This sub-theme is intrinsically linked to the sub-themes 4.1 (Knowledge Management) / 4.2 (Water Resources Monitoring) / 4.5 (Water Demand Management).

SUB THEME 2.1: CAPACITY BUILDING FOR MANAGEMENT OF IWRM

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Management capacity of stakeholders in the water sector is enhanced	<p>Take full advantage of existing policies and legislation to improve management</p> <p>Take advantage of lessons learnt from existing high performance initiatives such as the Karst Water Management Body</p> <p>Experts must be sourced, integrated into the system and used for on-the-job mentoring and guidance</p> <p>Use the results of the Performance Indicators to enhance decision making</p>	<p>Conduct an organisational assessment and development of stakeholders in the water sector</p> <p>Establish human resources capacity to design and implement resource management plans in all sectors</p> <p>Develop and implement demand based management and managerial effectiveness training</p> <p>Establish mentorship programs</p> <p>Formalize contract between NamWater and MAWF</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>The extent to which Performance Indicators are met improves continuously up to 95% by 2015</p>

SUB THEME 2.1: CAPACITY BUILDING FOR MANAGEMENT OF IWRM continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
DWAF management capacity for licensing and compliance control is in place and improved	<p>Key-information on monitoring and evaluation systems will be accessible to all stakeholders and DWAF in particular</p> <p>Integrated information for knowledge and information systems will be connected to all monitoring and evaluation systems</p> <p>Short feedback paths to water users and WDM initiatives will be established for all monitoring and evaluation systems</p> <p>Performance targets for the coverage of water and sanitation services as determined in the NDPs will be set by the water regulator</p>	<p>Develop guidelines for licensing and compliance routines.</p> <p>Build human resources capacity for licensing and compliance monitoring within DWAF and all licensed water users (sufficient competent and skilled staff).</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MWT - All Licensed Water Users 	<p>The majority (80%) of all water users and service providers are licensed and compliant by 2015.</p>

5.3 SUB THEME 2.2: TECHNICAL SKILLS AND MANAGEMENT FOR IWRM

5.3.1 Current situation:

With respect to technical management and IWRM including WDM, stakeholders feel that there are limited technical skills as well as limited skills for technical management and for systems management. Maintenance management is particularly weak. This limited capacity exists particularly in DWAF, NamWater and Local Authorities where holistic planning is also limited. Skills development for labour intensive maintenance, capital replacement and resource protection could provide opportunities for efficiency improvement, enhanced IWRM as well as wealth creation.

Overall, the state of infrastructure is poor as maintenance has been neglected for several decades throughout Namibia. An example of major wastage occurs in the Namibia Wildlife Resort facilities (tourism consumes 5.9% of all water in Namibia).

5.3.2 Strategy summary:

Technical skills and appropriate management plans are central accelerators and stabilizers for implementation and maintenance of IWRM while technical capacity building is also seen as an important lever for guiding, controlling and enforcing the IWRM plan including WDM. Technical capacity building is a strong lever that enables stakeholders on all levels to become employable and to create wealth.

SUB THEME 2.2: TECHNICAL SKILLS AND MANAGEMENT FOR IWRM

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Capacity for effective and efficient infrastructure operation and maintenance is in place	<p>Technical capacity building for water resource conservation, resource security and appropriate resource use, taking advantage of Performance Support Teams, will be integrated to support the water sector</p> <p>Development of alternative non-conventional water resources will be supported by technical capacity building</p> <p>Technical WDM is adopted as a central maintenance element for IWRM</p>	<p>Develop guidelines for the management, of infrastructures operation and maintenance.</p> <p>Implement permanent infrastructure maintenance programs for rural and urban domestic supply</p> <p>Build hands-on capacity to do preventative maintenance</p> <p>Develop Human Resources technical capacity for infrastructures O&M.</p> <p>Develop and apply capacities of performance support team and programme</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT, MHA - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Failure rate of infrastructure reduced by 10% per annum (baseline and target to be established).</p>

SUB THEME 2.2: TECHNICAL SKILLS AND MANAGEMENT FOR IWRM INCLUDING WDM continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Technical capacity for integrated land management (e.g. bush encroachment, prevention of erosion and livestock management,) sanitation and irrigation is developed</p>	<p>Land management capacity building will be integrated with water resource conservation, resource security and appropriate resource use across agencies and sectors</p> <p>Higher education institutions provide research support for optimized sanitation technologies</p> <p>HRDC, <i>inter alia</i>, provides training and capacity building for rural sanitation</p>	<p>Establish and strengthen existing training programmes for land use planning and management, and their linkages to IWRM.</p> <p>Establish and strengthen existing training programmes for sanitation and its linkages to IWRM.</p> <p>Support higher education institutions to provide research support for optimized crop production and water resources conservation</p> <p>Develop materials and train farmers in irrigation scheduling and improved crop production</p> <p>Develop training modules for water users to contribute to and draw information from the Knowledge and Information Systems</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT, MHA - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions - PSTs, NIWEG 	<p>Four hundred people trained per annum by 2013 on hands-on land use management and irrigation planning, and sanitation with emphasis on IWRM and retained in the systems.</p>

5.4 SUB THEME2.3: FINANCIAL SKILLS AND MANAGEMENT FOR IWRM INCLUDING WDM

5.4.1 Current situation:

With respect to financial skills and financial management related to IWRM including WDM, stakeholders feel that there are limited financial skills and generally poor financial management. Moreover, there is limited understanding and capacity for financial management. Financial systems are considered to be weak. The lack or absence of reliable and good financial management and planning severely limits the ability of the sector to attract the necessary funding resources. Another limiting factor is the absence of a well-structured policy framework that would guide tariff setting and cost recovery regimes in the future. Namibia is already locked into a situation where annual investment targets are not being met. The local financial market environment is well developed and sophisticated enough to accommodate the demands for investment capital requirements. The necessary funding instruments are available, but until such time that the necessary policies have been developed and adopted and the necessary financial management capacity has been installed, the Water and Sanitation Sector will continue to find it difficult to raise the necessary funding to meet the investment targets up to 2030. Another factor limiting the sector in meeting its targets is the absence of a revolving fund for service providers precludes, in many instances, opportunities for efficiency improvements. A revolving fund is an account established to finance a continuing cycle of operations and is replenished from the revenue of the projects that it finances.

5.4.2 Strategy summary:

Developing a funding strategy for Namibia would go beyond merely deciding on what funding option or instrument to use to fund the different aspects of WSS investments. The following steps need to be followed in developing an appropriate funding strategy:

- Create a conducive governance structure and set financing principles;
- Accurately estimate the financial needs, potential cost recovery, and the affordability of services;
- Decide on the structure of central government funding;
- Explore external aid being aware of the fact that any external funding is merely deferred costs that ultimately needs to be covered by tariffs or user charges; and
- Decide on how much commercial funding needs to be taken up and what type of funding would be most appropriate.

Namibia is fortunate to have a modern and flexible legislative environment that will allow various decentralised government institutions and SOEs involved in water and sanitation service delivery to independently explore alternative funding option to augment their development budgets.

The critical aspect remains the development of the necessary financial management capacity and systems. The ability to manage already available funding resources will determine Namibia's ability to attract new or alternative resources in future.

SUB THEME 2.3: FINANCIAL SKILLS AND MANAGEMENT FOR IWRM INCLUDING WDM

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Adequate capacity for efficient financial management in place	<p>The roles of monitoring and evaluation and knowledge and information systems are understood and acknowledged to control investment and financial management</p> <p>Water resource security is adopted as a global indicator (encompassing many regional indicators regarding abstraction and sustainable yield) for sound financial management</p> <p>Information for appropriate guidance for financial management and financial control is readily available for all</p>	<p>Develop Operational manuals for financial management</p> <p>Develop Tariff Setting Policy and Regulations to be approved by Water Regulator</p> <p>Develop and implement training and capacity building programs on financial management (including tariffs setting, pricing, cost recovery, etc)</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MWT, MoE, MHA - LAs, RCs, NamWater - NGOs, CBOs, CSOs - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Financial management plans established to improve cost recovery and to maintain financial liquidity (95% by 2015)</p> <p>Tariff setting policy and regulations developed and approved by 2012</p>

6 THEME 3: STAKEHOLDER INVOLVEMENT

6.1 INTRODUCTION

6.1.1 Current situation:

Amongst most stakeholders who are using or managing water, IWRM is seen as an issue for DWAF only. There is little awareness, participation or engagement in IWRM. Promotion of women's participation is a recent development.

Basin Management Committees including the Karst Water Management Body as well as Water Associations create platforms for stakeholder awareness, participation and engagement. At the same time they provide platforms that could be used for capacity building, efficiency improvements and wealth creation.

6.1.2 Strategy summary:

Stakeholder participation is a key accelerator for implementation of IWRM. Furthermore, in combination with WDM and appropriate monitoring and evaluation systems, a combination of both stakeholder participation and capacity building acts as a stabilizer on IWRM. Stakeholder engagement is critical to establishing a national knowledge and information system and has, through knowledge sharing, a strong impact on water demand management and monitoring and evaluation.

THEME 3: STAKEHOLDER INVOLVEMENT AND AWARENESS

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
All stakeholders are committed and actively engaged in IWRM	<p>Consult widely on evolving IWRM plan</p> <p>Use facilitated gathering methods to obtain contributions from stakeholders in all sectors and at all levels</p> <p>Raise broad awareness about potential for BMC or other potential stakeholder engagement platforms</p> <p>Focus on obtaining engagement of stakeholders as well as raising awareness and obtaining participation</p> <p>Enable stakeholders to take decisions and responsibility for IWRM</p> <p>Enable stakeholders to implement jointly taken decisions</p> <p>Enable stakeholders to comply with decisions taken and standards set</p> <p>Enable stakeholders to recognize results, interpret and provide feedback</p> <p>Key players are included; e.g. Regional Councils, Local Authorities, DWAF, NamWater and private industry</p>	<p>Carry out a comprehensive Stakeholders analysis/mapping</p> <p>Raise awareness on IWRM</p> <p>Design scenarios showing benefits of IWRM to stakeholders. Showcase best practices and success stories of benefits gained through IWRM (national and international).</p> <p>Facilitate formation of appropriate stakeholder engagement platforms as identified</p> <p>Develop stakeholder forums for efficient and effective engagement among implementing agencies such as DWAF, NamWater, Regional and Local Authorities, line Ministries such as MET, MLR, NPC, MoF and MRLGHRD.</p> <p>Strengthen the Namibia Water Partnership (NWP) to facilitate awareness, participation and engagement in particular</p> <p>Provide BMCs with appropriate material for awareness raising and to encourage engagement.(regarding sanitation, water use efficiency and conservation, waste minimization)</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Stakeholders, e.g. Local Authorities, Regional Councils, BMCs and all relevant stakeholders engage on policy testing and provide feedback to the IWRMP implementing agency by 2012</p> <p>Basins/regions are effectively applying IWRM plans by 2014</p>

THEME 3: STAKEHOLDER INVOLVEMENT AND AWARENESS continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
All stakeholders are committed and actively engaged in IWRM (continued)	<p>Major sectors are actively contributing to the IWRM/WDM plans, <i>inter alia</i>: rural, urban, mining, irrigation, tourism and environmental sectors</p> <p>Stakeholder engagement is recognised as a central lever for IWRM design and installation</p> <p>Stakeholder input is essential for policy development and testing with specific focus on resource conservation and resource use</p> <p>Stakeholders will share their reasoning in a transparent way through communicating their respective models and sensitivity analyses</p> <p>Stakeholders test proposals and models for IWRM and particularly WDM to understand their consequences</p> <p>Stakeholder responsibility for IWRM increased through efficient and effective joint monitoring and evaluation of results and mutual feedback</p>	<p>Train people to do process and infrastructure maintenance within their communities.</p> <p>Integrate BMCs in outreach programs to urban and rural schools</p> <p>Provide funding mechanisms for the NWP and the BMCs to take lead role in promoting awareness, participation and engagement in IWRM particularly on regional and local level</p>		

THEME 3: STAKEHOLDER INVOLVEMENT AND AWARENESS continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Women and youth are equitably involved at all levels in IWRM</p>	<p>Information on IWRM is tailored for all audiences: women, men and youth</p> <p>Ongoing poverty and gender analyses should be promoted</p> <p>Women are involved in IWRM at all levels (aware, participating and engaged)</p> <p>IWRM plans and implementation take gender issues into account at all times</p> <p>Gender sensitive capacity building must be ensured and women promoted to engage in all IWRM</p>	<p>Develop tailored information on IWRM for women and youth.</p> <p>Integrate women in committees on all levels</p> <p>Provide for IWRM skills training for women and youth</p> <p>Provide for general education options for women</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoE, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Women have at least 33% representation in committees on all levels ensuring that women are significantly involved in decision taking with respect to IWRM on all levels by 2013</p>

7 THEME 4: RESOURCES FOR IWRM

7.1 INTRODUCTION

7.1.1 Current situation:

Land use planning rarely includes water as a key resource and almost never includes IWRM as a basis for integration. Similarly, IWRM tends to focus on the water and sanitation sector and ignore relevant cross impacts from land and other natural resource use planning. The current focus on resource planning, management and use does not include all aspects of land, water and other natural resources as well as human development plans and trajectories

Human resources are insufficient, *inter alia*, for sectoral planning much less for integrated planning. Capacity building is limited and the opportunities for creating jobs and wealth are mainly overlooked.

7.1.2 Strategy summary:

Available water resources in general and water resource use in particular are best indicators for IWRM implementation and success while resource security is an accelerator of IWRM implementation. Alternative water resources, water resource conservation and water demand management are understood as the basis for self-regulation of IWRM and to achieve resource security.

THEME 4: RESOURCES FOR IWRM

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
IWRM provides the framework for land use/management plans and orientation for sustainable resource development	<p>Interlink land use planning and IWRM to ensure its viability and sustainability</p> <p>Adaptation to possible impacts of climate variations and changes in land use planning, regarding declining water resources</p>	<p>Provide professional assistance to the responsible land planning institutions to produce land use/management plans</p> <p>Integrate land use and respective management plans in IWRM</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>A set of integrated land management plans for the land/water interface in all basins/regions is established and applied by 2015</p>

SUB THEME 4.1: KNOWLEDGE MANAGEMENT

7.1.3 Current situation:

With respect to knowledge and understanding of resources for IWRM, information is inadequate, poorly housed and poorly managed. Information and knowledge is rarely shared, in a proactive or even in a reactive manner. The axiom that 'knowledge is power' and thus something to be kept to ones self seems to prevail in the water sector precluding efficient and effective integrated water management

Human resources are insufficient, *inter alia*, particularly for research, management, synthesis and dissemination of information, knowledge and understanding. Vision 2030 targets have been established and information and knowledge are at least partially available to support these targets but political and financial considerations override logic and science.

7.1.4 Strategy summary:

Available water resources in general and water resource use in particular are best indicators for IWRM implementation and success while resource security is an accelerator of IWRM implementation. Alternative water resources, water resource conservation and water demand management are understood as the basis for self-regulation of IWRM. Important elements for knowledge acquisition and sharing are the integration of stakeholder/ water user knowledge and experience (learning from water users) and institutional knowledge and experience as well as national and international research results.

SUB THEME 4.1: KNOWLEDGE MANAGEMENT

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>All necessary data for IWRM are available, accessible, translated to information and knowledge and appropriately managed</p>	<p>Water sector institutions and stakeholders use knowledge management system to interact, cooperate, facilitate and accelerate decision taking.</p> <p>Utilize available standards for digitalization and archiving (e.g. the “Guidelines for the preservation of digital heritage (UNESCO 2003)”.</p> <p>Involve Community Libraries and Multipurpose Access Centres as access points for water information.</p>	<p>Conduct gap analysis of current and future data needs for mandated services by each institution in the water sector</p> <p>Establish a centralized knowledge management system, identify existing relevant databases, improve (operationalise) and harmonise them for inclusion.</p> <p>Identify existing hardcopy archives, re-organize and digitize them where appropriate.</p> <p>Identify viable options for data access by stakeholders on regional and local level.</p> <p>Make data, information and knowledge accessible to all water users.</p> <p>Produce informative reports and newsletters with key data processed and translated into a generally understandable format.</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoE, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Stakeholders have free access to the national IWRM Knowledge Management System by 2013</p>

SUB THEME 4.1: KNOWLEDGE MANAGEMENT continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Knowledge acquisition programs are established and results are accessible to all stakeholders.</p>	<p>Access by stakeholders to national and regional IWRM knowledge data banks and information systems is facilitated</p> <p>Knowledge acquisition and free knowledge sharing are recognised as essential to IWRM</p> <p>Knowledge acquisition from stakeholders is a key consideration</p>	<p>Establish a Water Research Council to actively promote research, to provide appropriate access to research information, Namibian case studies and IWRM information in general for all stakeholders</p> <p>Develop data collection strategies and action plans and carry out necessary research and investigation programs.</p> <p>Provide appropriate funding mechanisms for establishing research, knowledge and information systems</p> <p>Develop and conduct stakeholder/ water user forums for knowledge and experience acquisition and integration</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoE, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>The Water Research Council is fully operational by 2013.</p>

SUB THEME 4.2: WATER RESOURCES MONITORING

7.1.5 Current situation:

With respect to monitoring, evaluation and modification of resource management for IWRM, data and information are inadequate, particularly to generate an understanding of groundwater sources. Overall quantification of resources and prescribing the long term sustainable safe yield are inadequate.

Human resources are insufficient, *inter alia*, particularly for the hydrology/ geohydrology sectors of DWAF and NamWater. Vision 2030 targets have been established but political and financial considerations override logic and science.

Unsustainable use of sensitive resources, e.g. wetlands and aquifers continues unrecorded in most areas as does inequitable allocation of water and inadequate allocation of financial resources.

7.1.6 Strategy summary:

Available water resources in general and water resource use in particular are best indicators for IWRM implementation and success while resource security is an accelerator of IWRM implementation. Alternative water resources, water resource conservation and water demand management are understood as the basis for self-regulation of IWRM. Water demand management and the national knowledge and information systems have a key-influence on monitoring and evaluation.

SUB THEME 4.2: WATER RESOURCES MONITORING

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Effective groundwater monitoring and control is fully established.</p>	<p>Groundwater monitoring and control is strengthened on all levels of service provision</p> <p>Facilitate establishment of appropriately delineated groundwater basin committees and involve users and managers</p> <p>Annual assessments of ground water quality are conducted in areas with pollution potential</p> <p>Capacity built and maintained amongst water users to participate in national groundwater monitoring and management programmes</p> <p>Irrigation water metering installed and data reported regularly to DWAF</p>	<p>Identify weaknesses and deficiencies of existing groundwater resources monitoring and control.</p> <p>Develop and implement a nationwide groundwater level and quality monitoring strategy.</p> <p>Improve the existing monitoring network.</p> <p>Apply guidelines for groundwater abstraction registration, licensing(where appropriate) and compliance.</p> <p>Establish a mandatory reporting scheme for service providers and users who abstract their own water (rest water levels and abstracted volumes) including water quality aspects.</p> <p>Install groundwater abstraction metering where appropriate and establish reporting mechanisms.</p> <p>Develop real-time monitoring and modelling systems with results accessible to all parties (users, managers, service providers)</p> <p>Train BMCs to conduct groundwater monitoring spot checks</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoE, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Groundwater abstraction balances with sustainable yield by 2018</p>

SUB THEME 4.2: WATER RESOURCES MONITORING continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Groundwater resources sustainability² and security is improved	<p>Artificial groundwater recharge and water banking must be enhanced to prevent excessive surface water evaporation losses and to form part of any water augmentation planning.</p> <p>Pursue full engagement in trans-boundary commissions and identify additional opportunities for near-by and distant international cooperation</p> <p>Water resources security will be attained through resource conservation, improved data coverage and processing, research capacity, monitoring and evaluation, funding and wise investment and integrated international cooperation</p> <p>Bush encroachment will be fully recognised as causing a reduction of livestock and ultimate loss of resource security and acted upon.</p> <p>Work with rangeland, agricultural and energy sectors to reduce bush encroachment and enhance groundwater recharge.</p>	<p>Plan and implement artificial groundwater recharge schemes</p> <p>Develop and implement programs for the reduction of bush encroachment</p> <p>Investigate, quantify and manage groundwater resources of trans-boundary aquifers</p> <p>Establish water quality guidelines and standards for agriculture and effluent discharge to safeguard groundwater quality</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Groundwater abstraction balances with sustainable yield by 2018</p>

² **sustainability** refers to resource distribution and resource flows and system adaptation to maintain resource flows

SUB THEME 4.2: WATER RESOURCES MONITORING continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Effective (perennial and ephemeral) surface water monitoring and control is fully established.</p>	<p>Data gathering, updating, integrating and processing by relevant agencies should be enhanced.</p> <p>Regular feedback to DWAF on water quality monitoring of perennial and ephemeral rivers is provided</p> <p>Water abstraction from perennial and ephemeral rivers metered and reported to DWAF</p> <p>Mandatory reporting of appropriate data in the correct format should be enhanced by and within DWAF and other relevant agencies</p> <p>The Water Research Council will be used to attract funding for research and researchers</p> <p>Maps of sensitive resources in Namibia are available</p> <p>International cooperation in all relevant trans-boundary instances is vigorously pursued</p>	<p>Identify weaknesses and deficiencies of existing monitoring and control strategy and infrastructures.</p> <p>Improve management of catchments to enhance both surface and groundwater sources</p> <p>Design and implement appropriate flood management plans</p> <p>Integrate stakeholders in monitoring and reporting of changes to surface water resource availability</p> <p>Implement existing Drought Policy and Strategy using national and community-based forums</p> <p>Review and strengthen fully informed representation and engagement in relevant international basin commissions.</p> <p>Use submitted returns to determine how much water is abstracted</p> <p>Establish water quality guidelines and standards for agriculture and effluent discharge to safeguard surface water quality.</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, such as:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Effective surface water resource monitoring and scheduled evaluation programmes are applied by service providers and users for water resources security by 2015</p>

7.2 SUB THEME 4.3: CLIMATE AND CLIMATE CHANGE

7.2.1 Current situation

With respect to knowledge and understanding of climate and climate change as it influences IWRM, data and information are inadequate and largely inaccessible. In general, the potential impact of climate change on water resources in Namibia is not well understood. As yet, monitoring of resources is inadequate to allow assessment of the impacts of climate variability, much less of the effects of climate change.

Namibia experiences high climate variability which means that current, ongoing preparations and adaptations for climate variability are applicable to climate change as well. Nevertheless, drought management is minimal, despite the Namibian Drought Policy and Strategy (1996) and flood early warning and flood management is insufficient.

7.2.2 Strategy summary

Climate, especially climate change, is an increasingly important lever for guiding, controlling and enforcing the IWRM plan including WDM.

SUB THEME 4.3: CLIMATE AND CLIMATE CHANGE

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Water resources are managed with full consideration of climate variability and climate change</p>	<p>Integration of improved flood management, extended hydrology gauging networks, improved hydrology modelling, improved groundwater modelling, improved data processing, appropriate drought management and enhanced disaster risk management</p> <p>Direct impacts of climate variability and climate change on the water sector in Namibia are integrated and managed, by relevant agencies.</p>	<p>Develop climate variability and climate change adaptation and mitigation strategies</p> <p>Integrate key potential impacts from climate variability and climate change into IWRM Plans</p> <p>Include climate variability and change parameters into the design and implementation of droughts and flood management plans</p> <p>Establish linkages between water resources and climate monitoring.</p> <p>Establish multi-directional communication platform to process data and information and interpret results</p> <p>Strengthen and maintain the capacity of the Directorate of Emergency Management</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT, meteorological services - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Predicted and known impacts of climate change on the water sector are integrated into IWRMP and other relevant management plans and reviewed and revised every two years by 2013</p>

7.3 SUB THEME4.4: WATER SUPPLY

7.3.1 Current situation:

With respect to water, water resources are mainly sourced from ephemeral and perennial rivers and groundwater. Unconventional sources are being used and inter-basin transfers take place. For water distribution, good infrastructure capacity is established creating no major concerns although maintenance is weak. The total amount of available water is sufficient but it is inequitably located and unevenly distributed throughout the country. It remains a question as to whether decentralisation is supporting or hindering water supply. Rural water supply is well developed and ahead of the Millennium Development Goal (MDG) targets. None-the-less, financial administration of water supply is generally poor. In contrast, the state of sanitation is very poor and is nationally far behind the Millennium Development Goal (MDG) targets. Sanitation in rural areas is almost non-existent. Both sanitation and water supply in informal settlements in urban areas are still a challenge. At the same time, provision of both necessities provides opportunities for capacity building, skills development, efficiency improvements and wealth creation.

7.3.2 Strategy summary:

Water resources are a good indicator for IWRM implementation and success while overall water potential and development contribute opportunities for self-regulation of the IWRM plan. All objectives and strategies in this sub-section are also connected to the objective “maintenance management” under 2.2 above.

SUB THEME 4.4: WATER SUPPLY

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Access to quality water supply for all users is ensured	<p>National and regional land use management plans are considered in the planning of water supply management and integral part of IWRM.</p> <p>Investigate alternative water supply sources</p> <p>Development of reliable and accessible safe water sources with sufficient capacity on a sustainable basis at an affordable cost.</p>	<p>Assess weaknesses and shortages of water supply coverage</p> <p>Develop and implement water supply management master plans. (Identify water supply management related gaps by assessing existing water resources related policies and regional and national development and land use plans. Adjust water supply planning to regional land use and development plans).</p> <p>Define water supply targets and performance indicators (including quality standards and guidelines, and coverage).</p> <p>Develop and implement country-wide quality monitoring strategy and network.</p> <p>Develop desalination plants for coastal water supply.</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT, meteorological services - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Percentage of households supplied with drinking water quality and quantity (95% by 2015).</p>

SUB THEME 4.4: WATER SUPPLY continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Water supply is affordable and economically viable	<p>Access to safe drinking water is a human right and economic good.</p> <p>Development and implementation of water service plans.</p> <p>Setting of operational targets for service providers</p>	<p>Define tariffs according to the existing Water Tariff Policy 2009</p> <p>Establish subsidies and cross-subsidies structures for low income groups.</p> <p>Develop and implement fair and effective credit control policies for service providers</p> <p>Determine financial performance indicators for economically viable service provision.</p> <p>Develop an effective system to collect payment for water services from Rural communities.</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, such as:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT, MoHSS - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Monthly recovery of at least 90% of accounts rendered by 2015</p> <p>Actual -revenue collected from water services in comparison to total amount billed does not differ more than 10% by 2015</p> <p>65 % of the population (low-income) benefiting from subsidy or cross subsidy policy by 2014</p>

SUB THEME 4.4: WATER SUPPLY continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Water resources from perennial rivers are equitably and sustainably allocated</p>	<p>Considerations of water quality and quantity (local needs) will be part of international basin commission deliberations</p> <p>Active participation in international basin commissions should be enhanced</p> <p>Downstream users and the environment must receive adequate water to maintain their existence</p>	<p>Establish priorities for water allocation during periods of shortage or extended periods of drought.</p> <p>Develop master plans for water allocation from international rivers.</p> <p>Establish parameters for water allocation from the perennial rivers.</p> <p>Make water abstraction metering from perennial rivers and reporting mandatory for big water users</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Water users along perennial rivers have full access to such water by 2015</p>

SUB THEME 4.4: WATER SUPPLY continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Water supply infrastructure is adequately maintained, replaced, upgraded and extended	<p>Maintenance and replacement of existing functioning infrastructure should always take precedence over development of new infrastructure</p> <p>Existing water infrastructure should be replaced in a way that will enable water users to maintain such infrastructure</p> <p>Preventative maintenance is a core element of maintenance plans</p>	<p>Identify weaknesses and deficiencies of existing schemes and infrastructures.</p> <p>Develop and implement infrastructure maintenance, replacement and extension plans</p> <p>Allocate adequate funding for the implementation of the plans</p>	<p>MAWF and Service Providers as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Maintenance capacity and maintenance plans are established and applied by all service providers and identified users by 2013</p> <p>Non-revenue water is reduced to below 10% in all Local Authorities, settlements and bulk water schemes by 2015</p>

7.4 SUB THEME4.5: WATER DEMAND MANAGEMENT AND WATER USE EFFICIENCY

7.4.1 Current situation

With respect to water demand, there is a continuous increase in demand mainly fuelled by population increase (e.g. Oshikango growing at 6% per year) augmented by requirements for technology and trade. At the same time, annual population growth is not appropriately integrated into water demand projections, planning and management.

The population of Namibia is not sensitive to the value or the vulnerability of water and incentives to manage demand and efficiency are lacking. This situation is exacerbated by inadequate integrated land and water use planning.

7.4.2 Strategy summary

Water demand as properly managed contributes significantly to self-regulation of the IWRM plan. Water demand management is the central lever for water resources conservation and for maintaining water supply security.

SUB THEME4.5: WATER DEMAND MANAGEMENT AND WATER USE EFFICIENCY

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Water use efficiency is increased through WDM</p>	<p>Considerations of fundamental sustainability and viability principles, such as social, economical, environmental and technological principles, are integrated into strategies for ensuring good water management</p> <p>Principles of affordability, value creation, cost recovery, financial liquidity for service providers, manageability of processes and infrastructure are integrated into considerations of economical responsibility and viability</p> <p>Principles of water use efficiency, energy use efficiency, land use efficiency, waste minimization are integrated into consideration of environmental responsibility and sustainability</p> <p>Principles of enabling people to do things themselves include maintainability, extendibility, adaptability, durability of processes and infrastructure</p>	<p>Assess the existing practices in water demand management and identify gaps and best practices</p> <p>Assess current water use efficiency of key water users in industry, agriculture, tourism, mining, Investigate, develop and implement unconventional resources, and reuse of treated wastewater</p> <p>Provide research funding to develop water saving technologies</p> <p>Facilitate forums for participation, engagement and knowledge sharing in WDM</p> <p>Facilitate and implement water metering and recording of results</p> <p>Educate the public in water saving strategies and promote water saving devices.</p> <p>Implement water infrastructure maintenance programs through WDM urban and rural areas</p>	<p>MAWF as lead agency should promote and oversee the actions</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i></p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs, - Tertiary and vocational institutions 	<p>Water use efficiency of key water users is increased by 10% per annum</p> <p>Nationwide improved water resource use efficiency through cost stabilisation and cost recovery while maintaining service provision by 2020.</p> <p>All sectors comply with WDM master plans and WDM key performance indicators by 2015</p>

SUB THEME4.5: WATER DEMAND MANAGEMENT AND WATER USE EFFICIENCY continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>WDM Master Plans³ for urban and rural areas, the irrigation sector, industry, mining and tourism are developed and implemented.</p>	<p>National and regional land use management plans are considered a basic planning tool for WDM and integral part of IWRM.</p> <p>All water resource use will be fully metered, recorded and retained in appropriate data banks</p> <p>Rural, urban and industrial wastewater must be recycled and reused for important urban amenities such as sport fields or in agriculture and agro-forestry</p> <p>WDM should be connected to sanitation and wastewater recycling.</p> <p>Policy and legislation are regularly enhanced by feedback from stakeholders</p> <p>WDM will be considered as a central stabilizer and self-regulator of IWRM</p> <p>Regulatory and monitoring function of WDM we be exploited fully</p>	<p>Identify WDM related gaps by assessing existing sectoral policies (urban and rural areas, the irrigation sector, industry, mining and tourism)</p> <p>Carry out a situation assessment for each service provider at all levels which covers:</p> <ul style="list-style-type: none"> -Water use and conservation, historic water requirements, water use efficiency, infrastructure characteristics, non-revenue water, customers profile management practices and pollution potential of the activity/entity; -Prepare a demand forecast without water savings to estimate the extent of supply augmentation required to satisfy the water demand including the estimated capital and operational costs; -Identify WDM initiatives, expected water savings and price them based on Unit Reference Values (URV); -Determine required capital & human resources for implementation; - Evaluate effect of savings on both the service provider & consumer; and -The effect of sanitation provision in area of jurisdiction if applicable. <p>Develop WDM master plans including goals and indicators.</p> <p>Develop an implementation and monitoring programme.</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MoHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>WDM masters plans for all water user sectors are developed by 2013</p> <p>Overall reduction of country-wide water losses 10% per annum by 2014</p> <p>Use of recycled water increased by 20% by 2015</p> <p>Percentage of effluent treated to acceptable standards for re-use increased by 20% per annum</p>

³ WDM (WDM) strategy and guidelines are developed under the Water Demand Management report of the IWRMP

SUB THEME4.5: WATER DEMAND MANAGEMENT AND WATER USE EFFICIENCY continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Irrigation management plans for improved efficiency are established and implemented	<p>Irrigation management for water resource conservation, resource security and efficient resource use is recognized as an important component of WDM and will be ensured by appropriate agencies.</p> <p>Consideration should be given to the concept of virtual water</p>	<p>Fully implement metering for irrigation.</p> <p>Promote and introduce water saving technologies.</p> <p>Introduce and implement water recycling and reuse of treated wastewater for irrigation near urban areas</p> <p>Promote and conduct research on optimized crop selection and production.</p> <p>Develop irrigation management plans including setting of appropriate tariffs and fees, and M & E parameters.</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Irrigation water use plans are Nationwide established and monitored by 2015</p> <p>WaSAC, NIWEG and PSTs support regular capacity enhancement by 2013</p> <p>Irrigation water use efficiency is increased by target by 10% per annum</p>

SUB THEME4.5: WATER DEMAND MANAGEMENT AND WATER USE EFFICIENCY continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Innovative conjunctive water use and use of unconventional water sources is enhanced.</p>	<p>Innovative conjunctive water use and the use of unconventional sources strongly promoted including artificial groundwater recharge, increased reclamation, recycling and reuse of treated grey water</p> <p>Investigation and facilitation of conjunctive water use widely encouraged</p> <p>Rural, urban and industrial wastewater recycled and reused for sport fields, industry and/or in agriculture and agro-forestry</p> <p>Water reclamation and reuse should be promoted in all possible instances</p> <p>The use of recycled grey water should be integrated where practical in all water management plans</p> <p>Grey water reuse should be reflected in water related research and capacity building programmes</p> <p>Appropriate technologies should be promoted for grey water recycling and other water treatment options</p> <p>Water users should be educated in pollution prevention</p>	<p>Investigate and elaborate potential for conjunctive water use in all basins and regions</p> <p>Allocate adequate funding to implement conjunctive water use</p> <p>Investigate the application of diverse technologies for the treatment of wastewater (e.g. artificial wetland treatment systems for wastewater treatment, rapid oxygenation) and share best practices.</p> <p>Train water users in grey water recycling technology</p> <p>Build capacity for installation, operation and maintenance of grey water recycling technologies</p> <p>Further develop artificial aquifer recharge initiatives</p> <p>Test and implement appropriate water treatment technologies, such as desalination and defluoridation of groundwater</p> <p>Further implement desalination as solution for coastal water supply</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as:</i></p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - -NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<ol style="list-style-type: none"> 1) Wastewater recycling and reuse is applied by all sectors by 2015 2) Economic growth sectors (urban, industrial, tourism, agriculture and mining) recycle at least 90% of their wastewater by 2018 3) The use of grey water is integrated in water demand management master plans by 2013 4) Windhoek aquifer is artificially recharged to a sustainable level by 2018

7.5 SUB THEME4.6:SANITATION, POLLUTION CONTROL AND PROTECTION

7.5.1 Current situation

With respect to sanitation, pollution control and protection, the protection of the resources is insufficient and limited water conservation practices are in place. Knowledge, understanding and capacity about pollution control and conservation are limited, inadequate environmental instruments exist and there is insufficient enforcement capacity. Of particular concern is the insufficient water quality monitoring.

Overall there is a major backlog in adequate sanitation and ownership of sanitation responsibilities and accountabilities are unclear. Flying toilets and bush toilets are still predominant in many peri-urban and rural areas.

7.5.2 Strategy summary

Pollution control and resource conservation are key stabilizers and provide opportunities for self-regulation of the IWRM plan. With declining water resource availability water resource conservation becomes a central lever for resource security.

SUB THEME 4.6: SANITATION, POLLUTION CONTROL AND PROTECTION

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Water resources are adequately protected	<p>The precautionary principle should be invoked in all instances of potential pollution</p> <p>Service providers are trained in water quality monitoring, mandatory reporting and enforcement of quality standards</p> <p>International basin commissions and national basin management committees are involved in water quality issues</p> <p>The 'polluter pays' principle is enforced while ensuring that this approach is not a licence to pollute for those who can pay</p> <p>All users are educated in pollution prevention</p> <p>The 'polluter pays' principle should be integrated into relevant policy and regulations while ensuring that the principle is not seen as easy solution for large polluting industries</p> <p>The polluter is fully liable for the remediation of the contaminated water source</p> <p>Water resource conservation and protection should be included in all policies, strategies and programmes for use and management</p>	<p>Assess water resources vulnerability and identify needs and measures for their protection.</p> <p>Develop special water resources protection and conservation rules.</p> <p>Implement and enforce water and effluent quality regulations.</p> <p>Promote understanding of interpretation and application of 'polluter pays' principle and precautionary principle</p> <p>Facilitate training in monitoring and enforcement of water resources protection and pollution prevention</p> <p>Design and implement water resources conservation programmes</p> <p>Maintain water resources protection on the agenda of international basin commissions</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>National, regional and local land use planning complies with water resources protection rules by 2015.</p> <p>Water quality monitoring indicates full compliance with water protection regulations by 2015</p>

SUB THEME 4.6: SANITATION, POLLUTION CONTROL AND PROTECTION continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Sanitation systems improved and management plans established and implemented</p>	<p>Sanitation awareness</p> <p>Information and opportunities regarding diverse sanitation options should be integrated into all water related documentation</p> <p>Policy and decision makers, regional and traditional authorities, managers and users should be informed about sanitation options to broaden understanding of benefits and options</p> <p>Sanitation should be connected to water demand management and water resources management in all instances</p> <p>Water use required and accompanied costs for different sanitation technologies should be made known to the user communities</p> <p>Sanitation options should save water and prevent pollution in all possible instances</p> <p>Sanitation options should be diverse in technology and easily adaptable to regional and local conditions</p> <p>Sanitation options must be affordable, easily manageable and fully maintainable</p>	<p>Define sanitation targets based on NDPs</p> <p>Assess rural and peri-urban conditions, and identify appropriate sanitation technologies.</p> <p>Develop and implement sanitation management plan and its M&E parameters.</p> <p>Provide information on benefits of sanitation and options for facilities, to inform users and managers at all levels</p> <p>Educate decision makers in different sanitation options to understand the benefits of sanitation and water resources conservation</p> <p>Establish training programmes for rural and peri-urban sanitation installation and maintenance</p> <p>Develop manuals for construction and maintenance of sanitation facilities, including description of regulations on design and location of sanitation facilities.</p> <p>Train rural people in installation, operation and maintenance of sanitation facilities</p> <p>Provide research funding for sanitation technology</p> <p>Provide funding for sanitation option installations and maintenance of sanitation facilities for Government owned infrastructure</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs, - Tertiary and vocational institutions 	<p>Regionally appropriate sanitation facilities are accepted, installed at a rate of 10% p.a. by 2013</p> <p>Sanitation management plans nationwide established and implemented by 2015</p>

SUB THEME 4.6: SANITATION POLLUTION CONTROL AND CONSERVATION continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Adequate solid and liquid waste management practices⁴ are established and enforced</p>	<p>Good solid waste management practices, such as waste minimisation and recycling, should be integrated into all resource management plans</p> <p>All sectors at national, regional and local level should be fully informed about good solid waste management practices; such practices are available worldwide</p> <p>'The polluter pays' principle should be integrated in all relevant policies and regulations and should be enforced</p> <p>Users in all sectors should be educated in good solid waste management practices such as waste minimisation and recycling</p> <p>Users must be educated in pollution prevention in general</p>	<p>Assess existing solid/liquid waste management policies.</p> <p>Assess existing solid/liquid waste management practices of key water users</p> <p>Provide support to regional and local authorities to develop solid/liquid management plans.</p> <p>Develop and implement national guideline for the disposal of solid waste by land filling.</p> <p>Develop and implement national guidelines for the treatment and disposal of hazardous waste.</p> <p>Make available good solid waste management practices to the public</p> <p>Integrate good solid waste management practices in all resource plans</p> <p>Promote and enforce the 'polluter pays' principle.</p> <p>Educate users in all sectors in good solid waste management practices such as waste minimisation and recycling</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs, - Tertiary and vocational institutions 	<p>Appropriate solid/liquid waste management plans are established nationwide and fully operational in all Local Authorities by 2015</p> <p>National guideline for the disposal of solid waste by land filling approved by 2012</p>

⁴ regarding the land / water interface

SUB THEME 4.6: SANITATION, POLLUTION CONTROL AND PROTECTION continued

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
<p>Wastewater and solid waste infrastructure is adequately maintained, replaced, upgraded and extended</p>	<p>Maintenance and replacement of existing functioning infrastructure should always take precedence over development of new infrastructure</p> <p>Existing infrastructure should be replaced in a way that will enable practical maintenance of such infrastructure</p> <p>Preventative maintenance is a core element of maintenance plans</p>	<p>Identify weaknesses and deficiencies of existing infrastructures.</p> <p>Develop and implement infrastructure maintenance, replacement and extension plans</p> <p>Train water users in infrastructure maintenance</p> <p>Allocate adequate funding for the implementation of the maintenance plans</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - TAs and elected leaders - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>Maintenance capacity and maintenance plans are established and applied by all service providers by 2013</p> <p>Water quality discharge standards are met by 2015</p>

8 THEME 5: INVESTMENT FOR IWRM

8.1 INTRODUCTION

8.1.1 Current situation

With respect to investment for IWRM, a number of deficiencies were noted. These include: poor prioritisation of investment needs, lack of understanding of investment requirements, inappropriate investments, little inter-sectoral coordination of investment, lack of transparency for investments and ultimately lack of political investment causing a serious backlog in investment overall.

In terms of investments made, stakeholders indicated that there have been low investments in infrastructure and services and what investments are made are for infrastructure but not maintenance. Investment is generally understood to equal infrastructure.

Overall there is a lack of asset management. All investment is thought to come from GRN. Overall, constraints preventing appropriate investment are unknown. Meanwhile, large amounts of scarce resources are being wasted through poor financial management.

Little planning has taken place for investment in the sanitation section.

Bailouts rather than appropriately addressing all aspects of management capacity, particularly of Local Authorities and Water Point Committees, represent inappropriate investment and use of scarce resources. It is recognised by stakeholders that appropriate, well-managed investments provide opportunities for capacity building, efficiency improvements and wealth creation.

8.1.2 Strategy summary

Investment for IWRM provides opportunities for self-regulation of the IWRM plan. Furthermore, investment is a pre-requisite lever for capacity building and capacity maintenance in particular and for water resources security in general. Investment itself has a strong dependency on policies/ strategies and institutions with regards to investment management approaches and with regards to functional and user friendly monitoring and evaluation systems. This Theme is intrinsically connected to Theme 1 above.

THEME 5: INVESTMENT FOR IWRM

OBJECTIVES	STRATEGY	ACTIONS/ ACTIVITIES/ INITIATIVES	WHO IS RESPONSIBLE?	INDICATORS AND TIMELINES
Sustainable investment for IWRM is secured.	<p>Harmonization of the IWRM Plan with the national water security strategy</p> <p>Investment needs should be related to the revenue to make projects bankable.</p> <p>Optimum use of investment resources should be targeted and a clear understanding of investment scale and constraints should be developed</p> <p>A long-term water and sanitation investment plan should be established to encompass all aspects of investment for IWRM</p> <p>Awareness of and capacity for development of investment strategies should be built to ensure optimum investment</p> <p>Investment approaches and strategies should be integrated into education and capacity building and capacity maintenance programmes</p> <p>Investment approaches and strategies should take climate variability and climate change into account</p> <p>Establish revolving funds to finance a continuing cycle of operations for service providers</p>	<p>Retain revenue from water services in the water services cost centre</p> <p>Develop a long-term investment plan with alternative investment inputs</p> <p>Harmonize investment plan with water and sanitation related policies and strategies</p> <p>Communicate the investment plan to all stakeholders.</p> <p>Integrate investment plan into all relevant sector plans</p> <p>Establish a mentorship programme to support investment decisions and activities (WaSAC, PSTs, NIWEG)</p> <p>Connect the investment plan to the monitoring and evaluation systems to support timely feedback</p> <p>Integrate capacity building and capacity maintenance programmes into the investment plan</p> <p>Integrate resources for IWRM into all MTEF and NDPs</p>	<p>MAWF as lead agency should promote and oversee the actions.</p> <p>MAWF will solicit contributions from, provide information to, encourage engagement and establish dialogue with involved institutions, <i>such as</i>:</p> <ul style="list-style-type: none"> - line ministries, e.g. MLR, MRLGHRD, MET, MHSS, MoF, MWT - LAs, RCs, NamWater - NGOs, CBOs, CSOs - WPCs, LWCs, BMCs - Tertiary and vocational institutions 	<p>A clearly defined scope of investment is coordinated and harmonised with long-term water and sanitation investment plans by 2015</p> <p>Relevant stakeholders at national, regional and local level develop annual investment plans within the framework of the national long-term water and sanitation investment scope by 2015</p> <p>Investments for water supply and sanitation are adequate and available on time on all levels by 2015.</p> <p>Viable cash flow budgets introduced by all service providers by 2015</p>