Socio-Economic Assessment in the Context of Vision 2030 and Millennium Development Goals

Information assessment, Gap analysis and Action Plan

IMLT

Ocotber 2008

List of Abbreviations

BMC	Basin Management Committee
DWAF	Department of Water Affairs
GDP	Gross Domestic Product
HDI	Human Development Index
HPI	Human Poverty Index
IRBM	Integrated Results Based Management
IWRMP	Integrated Water Resource Management Plan
KBMC	Kuiseb Basin Management Committee
MDG	Millennium Development Goal
MAWF	Ministry of Agriculture, Water and Forestry
NDP	National Development Plan
WRMA	Water Resource Management Agency
WRP	Water Resource Plan

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1 Background

A new water law for Namibia, the Water Resources Management Act, Act No. 24 of 2004 (hereinafter referred to as the Water Act), is in the process of promulgation in Namibia. In terms of this Act, Namibia is being divided into new water basins that will be managed by Basin Management Committees (BMC), which will be established in due course. The Basin Management Committees will resort under a Minister whose ministry will be responsible for water resource management in Namibia.

A Water Resources Management Agency (WRMA) will be also be established by the Minister. The primary purpose of this agency will be to assist the Minister in the execution of his/her oversight responsibilities conferred upon him/her in terms of the Act. However, until such time that the WRMA is established and empowered, the Minister will be expected to perform these functions via the existing Ministry of Agriculture, Water and Forestry.

In due cognisance of this pending structure the assignment covered by this document will focus on basin-level developments, particularly the Kuiseb basin, as well as the relationship between and links to the overarching national structures.

Basin Management Committees must co-ordinate with the regional planning component in the regional councils concerned to ensure that water resources within the basin and the region are effectively managed in accordance with the Water Act. In terms of the Act a BMC will be required:

(a) to protect, develop, conserve, manage and control water resources within its water management area;
(b) to promote community participation in the protection, use, development, conservation, management and control of water resources in its water management area through education and other appropriate activities;
(c) to prepare a water resources plan for the basin which must be submitted to the Minister for consideration when developing the National Water Master Plan;
(d) to make recommendations regarding the issuance or cancellation of licences and permits under the Water Act;
(e) to promote community self-reliance, including the recovery of costs for the operation and maintenance of waterworks;
(f) to facilitate the establishment of an operational system and maintenance system of waterworks and the accessing of technical support for water management institutions within its water management area;
(g) to monitor and report on the effectiveness of policies and action in achieving sustainable management of water resources in its water management area;
(h) to collect, manage and share such data as is necessary to properly manage the basin in co-ordination with the Water Resources Management Agency when established, and/or with the Ministry of Agriculture Water and Forestry in the interim;
(i) to develop a water research agenda, together with the Water Resources Management Agency, appropriate to the needs of water management institutions and water users within its water management area;
(j) to help resolve conflicts relating to water resources in its water management area; and
(k) to perform additional functions as the Minister may direct in terms of the Water Act.

As basic principles for water resources management in Namibia the 2000 Namibian Water Policy white paper (MAWRD, 2000) emphasises equitable access, sustainable utilisation and contribution to best socio-economic development, with due consideration for the natural environment. Integrated management of water, land and natural resources within the geographical context of water management basins is fundamental and the input by all involved persons and organisations in this

regard is essential.

2 Overview of the Kuiseb Basin

More than 80 000 people live in the water-poor basin, of which about 70 000 live in Walvis Bay. Others live on commercial and traditional farms, and at mines, tourism enterprises and conservation areas. The present growth centre is Walvis Bay.

Entities that use water from the river are mainly:

(a) The natural environment from pools in the river and alluvial ground water;
(b) Commercial farmers, from small farm dams and boreholes;
(c) The Topnaar community, tourism enterprises and research units in the desert, from hand dug wells and boreholes in and along the river; and
(d) Namibia Water Corporation (NamWater) for supply of water to towns and mines in the Kuiseb basin and other nearby basins. Water for this NamWater scheme is partly sourced from a network of boreholes in and along the Kuiseb River, and otherwise from nearby basins. The towns of Walvis Bay, Swakopmund, Henties Bay, Arandis, the uranium mines Rössing and Langer Heinrich, and several smaller settlements are served from this water supply scheme.

The following are the focal areas for the first cycle WRP of the BMC that the project team must address:

(a) Database;
(b) Baseline information: Making of a consolidated description of existing information and knowledge on:

(b.1) Natural features of the basin with emphasis on geography, climate, water resources;
(b.2) Human settlement, demographics, present land use and socio-economic activities in the basin, and existing knowledge on impact thereof on natural resources (including water), hydrological cycle, ecosystem and other components of the environment;
(b.3) State of environment;
(b.4) Relevant stakeholders;

(c) Identification of gaps and shortcomings in the above information, knowledge and measures;
(d) Demographic changes and development: Summarising of the socio-economic development objectives forthcoming from Vision 2030, Millennium Development Goals 2015, NDPs: for the purpose of identifying the implications on land use, use of natural resources (including water), impact on hydrological cycle and ecosystem impact;

3 Scope of Work

The Terms of Reference required the team members responsible for completing the socio-economic assessment component to familiarise themselves with the relevant legislation, policies and guidelines in Namibia and take full account of all relevant previous studies undertaken under the auspices of the MAWF/DWAF, NamWater, Walvis Bay Municipality, the DRFN and others.

The ToR was very specific that the best available data is to be used to complete the tasks and no fieldwork was required, other than short duration site visits for the purpose of verifying and assessing the reliability of information and data and to carry out consultative processes.
As a final output, Action Plans should be developed by the consultant team, containing short, medium term, or long term actions to be considered for implementation.

It is expected that this report should provide an overview of economic activity and possible future developments and highlight potential economic stimulants and growth areas. It should also consider

requirements forthcoming from objectives set in Vision 2030, NDPs and MDGs. The implications on land use, use of natural resources (including water), impact on hydrological cycle and ecosystem impact expected from these developments should be estimated. Key issues pertaining to integrated development and management of these issues must be identified and prioritised.

4 The Context of Socio-Economic Assessment

> *"… water is not only the most basic of needs but is also at the centre of sustainable development and is essential for poverty eradication. Water is immediately linked to health, agriculture, energy and biodiversity. Without progress on water, reaching the other Millennium development Goals will be difficult, if not impossible."*[1]

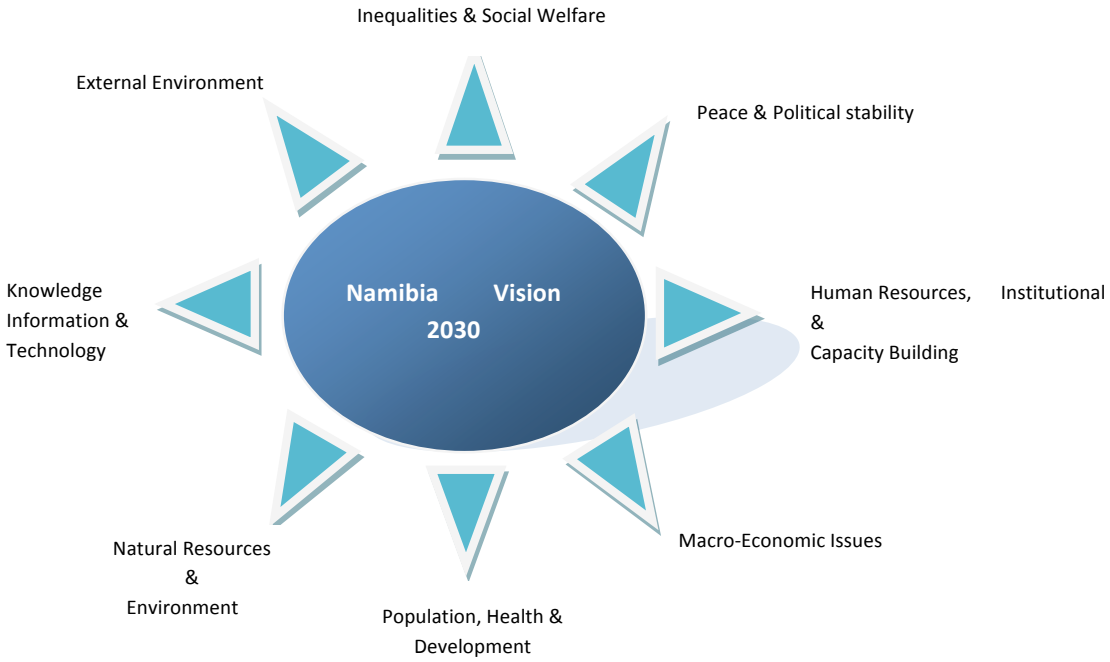
Namibia as an arid country is a good example of the various impacts that water has on society and the economy of a country. In a country where still more than an estimated 60% of the population lives in rural areas, water becomes a key factor in contributing towards rural poverty reduction, food production, promoting industrial development and sector growth and lately also the production of energy. In addition to these, the integrity and quality of our very fragile environment needs to be ensured.

1 Not only does water play a key role in unlocking the economic potential of the country in an attempt to improve the quality of life for all Namibians, but water poses its own development challenges or risks through floods, droughts and water related diseases that can, and do have, huge and serious impacts on communities and ultimately the national economy. A case in point is the floods experienced in 2006 in Mariental and the 2008 floods in the northern-central communal areas of Namibia.
2 How a country chooses to approach the challenge of finding the balance in optimising economic returns from water as a scare resource while conserving the resource and its associated environmental dependencies to ensure sustainable development for future generations while at the same time protecting its communities against the devastation that too much or too little water can cause it will need to consider:The numerous and complex interdependent links between activities that influence and that are influenced by how water is used, and
3. Improved efficiencies of water usage as a limited resource.

The importance of and role that socio-economic assessments will play in developing an appropriate IWRM approach will largely be guided by regional, national and international policies, protocols, agreements and targets that Namibia has ascended to. For the purpose of this analysis, two of the most important documents will be analyses, namely, Vision 2030 as the overall development guideline for national, regional, and local development planning in Namibia up to 2030, the National Development Plan 3 (NDP3), Agenda 21, and the Millennium Development Goals (MDGs) to be achieved by 2015.

While access to safe water is a specific target of Millennium Goal 7 (to which sanitation was added, during the 2002 World Summit on Sustainable Development) the starting point for this review is to consider how water and its management contributes to all the major objectives of Vision 2030, NDP3 and the MDGs for it is in this context that the contribution of the IWRM approach becomes clear.

IWRM provides a framework within which to consider tradeoffs between different development objectives and, where possible, to identify win-win water investments. By aligning and integrating interests and activities that are traditionally seen as unrelated or that, despite obvious interrelationships, are simply not coordinated, IWRM can foster more efficient and sustainable use of water resources to achieve the development goals. It must be emphasised however that an IWRM approach will support not just achievement of these development goals but also long-term economic development, poverty reduction and environmental sustainability that will be needed to sustain that achievement.



This process provides an opportunity to re-examine and modify the current development paradigm such that national development and poverty reduction strategies consider more explicitly (1) the multi-faceted role that water resources management plays in poverty alleviation, environmental protection, and economic development; and (2) the tradeoffs between, and potential synergies among, a multitude of objectives (e.g., equity, economic efficiency, and environmental protection). IWRM is not simply a process designed to carry us to a set of long-range targets, but a way of thinking that enhances our capacity to tackle multi-objective, multi-sectoral development planning—such as is embodied by the Vision 2030 and MDG goals and related implementation strategies.

4.1 IWRM and Vision 2030

The overall goal of Vision 2030 is to develop Namibia into a "… prosperous and industrialised Namibia, developed by her human resources, enjoying peace, harmony and political stability". This broader vision has been broken down into 8 dimensions, which once achieved, should lead to having achieved the vision. The following diagram provides a graphical illustration of the eight central themes addressed by Vision 2030:

In an attempt to redress the problems associated with these themes eight major objectives were set for Namibia's Vision 2030. Each of these objectives is thus examined in the context of the key attributes of sound water resource management.

4.1.1 Theme 1 – Inequalities & Social Welfare

The Project Group working on this theme has defined inequality as the "…absence of equality in any respect. It is the state of being unequal, uneven, variable or different. In contrast, equality is the state of being equal, uniform and balanced."

One aspect in which inequality persists in Namibia has been identified as access to land and natural resources by residents, specifically in communal areas. This is likely to be addressed through land

reform. The aim of land reform it to expand access to land in the southern and central areas of the country, but may not occur at the speed necessary to meet the pressing needs of many rural households. Land reform may lead to changes in land use patterns, which in turn may have an impact on water use and demand. The basin area, as will be seen in sections to follow, has seen relatively few cases of land reform related actions.

4.1.2 Theme 2 - Peace and Political Stability

Peace cannot exist outside political stability. To achieve this there is a need for an enabling environment to attain sustainable development. With regard to principles of development, the following requirements should be in place:

- a good constitution
- high level of legitimacy
- good infrastructure
- availability of resources, and
- an enabling environment

The last three requirements are directly related to water as the basic requirement for progress and development that would be the platform for promoting peace and stability.

4.1.3 Theme 3 - Human Resources, Institutional & Capacity Building

Eleven core issues were identified that would be crucial of the objectives of this theme are to be achieved by 2030. Seven of these will be directly related to the activities of the KBMC. They are:

- Labour force dynamics
- Labour productivity
- Capacity building for economic management
- Full employment
- Efficiency in public and private institutions
- Building and restructuring national institutions for posterity
- Private and public sector interrelations

The extent to which the KBMC will be successful in managing the availability of water in sufficient and sustainable quantities will have a huge impact on the industrial development in the basin area. This will have an impact on labour force dynamics, productivity, and achieving full employment. Capacity building, efficiency, restructuring and creating an environment in which private and public sector can interact all relates to the way in which the KBMC will plan and conduct its work.

4.1.4 Theme 4 – Macro Economic Issues

The key question to be addressed under this theme is the level of economic growth Namibia should aim for in order to ensure a better quality of life for all Namibians.

GDP growth rate, as a proxy for economic development, need to be in the order of 7% per year if the goals of Vision 2030 are to be achieved. Sectoral review shows that growth in the post independence decade emanated mainly from the primary sectors such as fisheries and agriculture. The contribution of the manufacturing sector to growth remained more or less unchanged when compared with the independence periods.

The Namibian economy will however remain reliant on exports of primary commodities, especially minerals, fish, and tourism as the main drivers for economic development. All three of these are the main sectors found in the Kuiseb basin area. It is therefore clear that whatever happens in the basin area will have direct consequences on national economic growth targets.

4.1.5 Theme 5 – Population, Health and Development

The demographic composition of Namibian society will be the determining factor in shaping a Vision for the year 2030. This is because it is the people of Namibia, with their diverse characteristics, talents and needs who will formulate and implement national policy, interact with the natural environment, determine economic growth and who will, ultimately, be responsible for their own destinies.

Demographic patterns have been strongly influenced by the resource endowments of the country, and as will be seen from this report, this is specifically true for the Kuiseb basin area.

Not only will demographic patterns and profiles be influenced by changes in indicators such as Life Expectancy, Infant Mortality Rates and Population Growth, it will also be affected by factors such as internal migration, urbanisation and the impact of HIV/AIDS. Internal migration will be an important issue when investigating the impact of development in the basin area.

One important aspect under this theme is the provision of water and sanitation. The basin area can boast with one of the highest coverage rates in Namibia in terms of this outcome. Maintaining this aspect will however come under pressure as increased numbers of Namibians will migrate to the Erongo region and specifically the basin area as a result of the overall attractiveness of the area in terms of economic opportunities.

4.1.6 Theme 6 – Natural Resources & Environment

Commercial fishing, mining, agriculture and nature centred tourism currently sustain Namibia's national economy and the majority of rural Namibians rely heavily on natural resources for their livelihoods. This couldn't be more true about the situation in the basin area. In addition, Namibia's natural environment provides essential services, natural capital and genetic resources that buffer the Nation against economic uncertainty, disease and environmental change. Namibia's renewable natural resource base is further characterised by low productivity and/or high variability.

The overriding message from analysing the consequences of the above on the management of natural resources is that:

> "… by capitalising on Namibia's comparative advantages and providing appropriate incentives to use our natural resources in the most efficient way possible, decision-makers today will be in a better position to create a safer, healthier and more prosperous future for all Namibians, to 2030 and beyond"[2]

This sets the stage for the future operations of the KBMC.

4.1.7 Theme 7 – Knowledge, Information and Technology

This theme will require the KBMC to ensure that all their strategies, planning, and activities will be driven by either utilising or promoting the use of the latest knowledge, information and technologies. This will among other include that the KBMC must ensure that the latest, most accurate and reliable planning information will be utilised for planning purposes. This also implies that as a managing authority, the KBMC will need to ensure that water users in the basin area utilises the latest knowledge, information and technology in their area of business.

4.1.8 Theme 8 – External Environment

The phrase "Think global, act local" is very fitting in terms of the theme. In terms of achieving the ideals set out in Vision 2030, Namibia and more specifically the KBMC, can not operate in isolation. Considerations under this theme will work both ways, the KBMC will need to be aware of changes globally and how these will impact on the local environment(s) and from a local perspective, how can the work of the KBMC be enhanced by forming global partnerships.

From the foregoing analysis, it becomes quite clear that the work of the KBMC will interface with all eight the strategic themes outlined in Vision 2030. It would therefore be very important for the KBMC for internal monitoring to develop an own set of performance indicators that would measure and track its contribution towards national goals and objectives as contained in Vision 2030.

4.1.9 Implications for KBMC

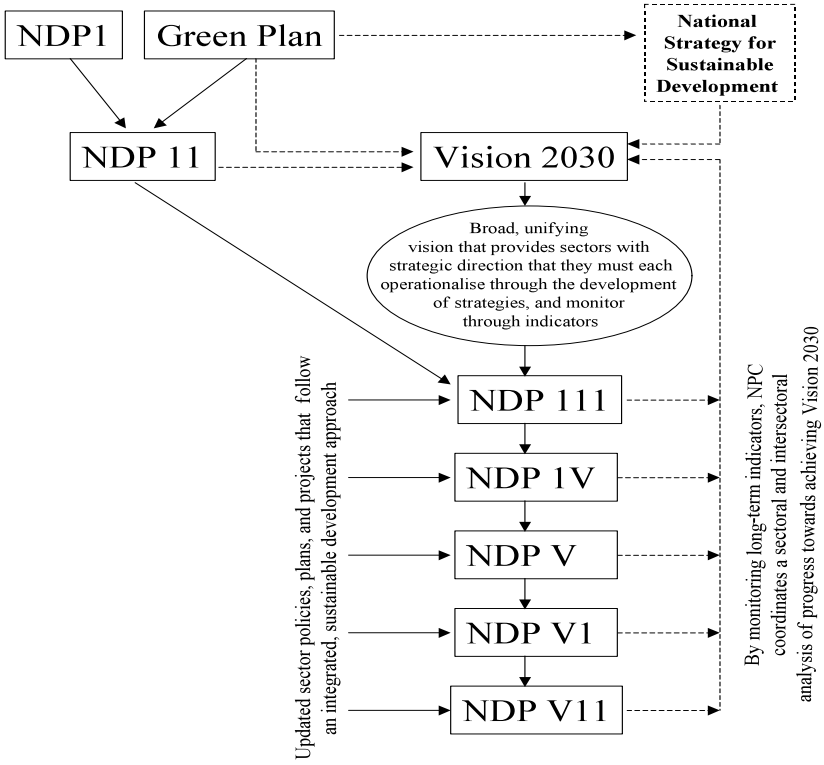
The implications of aims and objectives set out in Vision 2030 for the KBMC are that, although planning of resource utilisation and the management of it will happens within the local context, demand against the resource will most likely be defined from within a national context. Specific expectations are harboured in terms of industry or sectoral performance and these will need to be met within the limitations set by the level of sustainable use of water in the Kuiseb basin.

One weakness in the existing planning setup in Namibia, is that very little strategic analyses have gone into the various dimensions of Vision 2030 with the result that many of the expectations on the national or macro level are in most cases unrealistic. Another challenge for managers of strategic resources is that, like in the case of the Kuiseb basin, no clear expectations have been framed for what should be contributed by the geographical area of the Kuiseb basin. However, it can be expected that significant demands will be made against the development capacity of the basin area, especially in terms of industrial development, the expansion of the Walvis Bay port, mining development as well as the associated human settlement.

It will thus be absolutely necessary for the KBMC to develop a thorough understanding of the dynamics of these industries or sectors in the local as well as national context and to develop a management plan that will continuously monitor changes in these sectors in order tho ensure that the resource is managed in a strategic manner and that resource allocation happens in the most effective way possible.

4.2 IWRM and NDP3

The following schematic illustration provides an graphical overview of how medium and long-term planning processes in Namibia are interacting and should aim at achieving the goals and objectives set out in Vision 2030.



Vision 2030 was crafted during the NDP 2 period and NDP 3 is therefore the first post Vision 2030 medium term 5-year development plan. NDP 3 was formulated using the Integrated Results Based Management (IRBM) approach. The main theme of NDP3 is "Accelerated Economic Growth and Deepening Rural Development"[3].

Specific sectoral targets have been stated for the NDP 3 cycle of which the following are important for consideration in terms of integrated resources planning within the Kuiseb River basin:

	NDP 2 Growth %	NDP 3 Growth Targets	
	Actual	Baseline Growth Scenario	Higher Growth Scenario
Agriculture	2.2	3.7	4.7
Fishing and Fish Processing on Board	-0.5	2.5	3.6
Mining & Quarrying	9.3	0.8	3.0
Manufacturing	2.9	4.9	5.3
Electricity & Water	0.9	3.4	15.6
Hotels & Restaurants	3.6	8.2	10.7
Transport & Communications	11.6	11.4	14.3

The baseline growth expectations are based on existing sectoral/industry performances with known expansion or investment programmes while the higher growth scenarios are based on the following

assumptions:

Agriculture:

- Accelerated implementation of the Green Scheme
- Accelerated implementation of land reform policies
- Improved implementation of resettlement programmes
- Effective agricultural credit services
- Control of bush encroachment

Fisheries

- Additional investment in aquaculture

Mining

- Recent demand and high prices will continue
- Non-diamond mineral production including uranium will expand

Manufacturing

- Increase in value-adding addition to products from primary industries including diamonds as well as diversification into other manufacturing

Electricity & Water

- Investments in electricity generation plants

Hotels & Restaurants

- Increased demand from 2010 African Cup of Nations and World Cup as well as private spending

Transport & Communications

- Expansion of Walvis Bay harbour

In terms of focus areas identified in NDP 3, most of the expectations directly related to the activities of the Kuiseb Basin Management Committee are related to the fishing industry, mining, manufacturing, hotels and restaurants, and transport in terms of the expansion of the Walvis Bay harbour. However, it is known that the direct impact of changes in economic activities is frequently much smaller than the subsequent indirect impacts in terms of impact on land use and resource utilisation. In order to be prepared it would be necessary to monitor and evaluate on a continuous basis developments in these sectors.

Direct reference to the water sector as a critical factor of production within NDP 3 is made in connection with the sustainable utilisation of natural resources, also as part of improved quality of life, and lastly as a contributor towards regional and International Stability and Integration.

4.2.1 Sustainable Use of Natural Resources

Meeting the target growth scenarios for NDP 3 the expected contributions from the water sub-sector are:

- To find new sources of water to meet growing demand. This would include investigations as well as monitoring the utilisation of existing sources, especially ground water;
- Comprehensive data collection;
- Increased water use efficiency through Water Demand Management;
- Increased understanding of water use productivity;
- Increased water supply reliability in terms of quantity and quality to households, agriculture and industry, especially in rural areas; and
- Formulation of Regional Water Supply Development Plans

4.2.2 Quality of Life

Meeting the expectations under the Quality of Life aspect of Vision 2030, NDP 3 has a stated goal of "Affordable and Quality Health Care". The Water Sub-sector is required to ensure that sufficient and good quality water is supplied to users to reduce the health risks associated with drinking poor quality water. The provision and monitoring of sanitation services to those still without access to the minimum required levels of service delivery is another expected output from the water sub-sector.

Although many of the assumptions on which targets for NDP 3 are based have been turned on its head that will have a serious negative impact on achieving these targets, the expectations from the water sub-sector remains unchanged. The implications of this for the KBMC in terms of developing the IWRMP therefore are that the KBMC will need to spent considerable effort on developing knowledge management systems that would lay the foundation for improved WDM and increased value addition to water resources.

4.3 IWRM and Agenda 21

The worsening poverty, hunger, ill health and illiteracy, as well as the continuing deterioration of the ecosystems on which we depend for our well-being necessitated a different approach to the way development has been approached in the past. However, integration of environment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future.

Chapter	Topic	Relevance to KB IWRM
SOCIAL AND ECONOMIC DIMENSIONS		
Chapter 2	International Cooperation to Accelerate Sustainable Development in Developing Countries and Related Policies	
Chapter 3	Combating Poverty	
Chapter 4	Changing Consumption Patterns	
Chapter 5	Demographic Dynamics and Sustainability	
Chapter 6	Protecting and Promoting Human Health	
Chapter 7	Promoting Sustainable Human Settlement	
Chapter 8	Integrating Environment and Development in Decision-making	
CONSERVATION AND MANAGEMENT OF RESOURCES FOR DEVELOPMENT		
Chapter 9	Protection of the Atmosphere	
Chapter 10	Integrated Approach to the Planning and Management of Land Resources	
Chapter 11	Combating Deforestation	
Chapter 12	Managing Fragile Ecosystems: Combating Desertification and Drought	
Chapter 13	Managing Fragile Ecosystems: Sustainable Mountain Development	
Chapter 14	Sustainable Agriculture and Rural development	
Chapter 15	Conservation of Biological Diversity	
Chapter 16	Environmentally Sound management of Biotechnology	
Chapter 17	Protection of the Oceans, All Kinds of Seas, including Enclosed and Semi-Enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of Their Living Resources	
Chapter 18	Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and use of Water Resources	
Chapter 19	Environmentally Sound Management of Toxic Chemicals, Including Prevention of Illegal International Traffic in Toxic and Dangerous	

	Products	
Chapter 20	Environmentally Sound Management of Hazardous Wastes, Including Prevention of Illegal International Traffic in Hazardous Wastes	
Chapter 21	Environmentally Sound Management of Solid Wastes and Sewage Related Issues	
Chapter 22	Safe and Environmentally Sound Management of Radioactive Waste	
STRENGTHENING THE ROLE OF MAJOR GROUPS		
Chapter 24	Global Action for Women Towards sustainable and Equitable Development	
Chapter 25	Children and Youth in Sustainable Development	
Chapter 26	Recognising and Strengthening the Role of Indigenous People and Their Communities	
Chapter 27	Strengthening the Role of Non-Governmental Organisations: Partners for Sustainable Development	
Chapter 28	Local Authorities' Initiatives in Support of Agenda 21	
Chapter 29	Strengthening the Role of Workers and Their Trade Unions	
Chapter 30	Strengthening the Role of Business and Industry	
Chapter 31	Scientific and Technological Community	
Chapter 32	Strengthening the Role of Farmers	

Agenda 21 is a development agenda for the 21st century agreed upon and ascended to by 179 countries in Rio de Janeiro in 1992 at the Earth Summit. At the World Summit on Sustainable Development held in Johannesburg in 2002, this agenda was re-affirmed together with the framing of the Millennium Development Goals.[4]

Agenda 21 consist of a set of basic development principles with 30 specific development dimensions divided into 3 sections with a fourth section focussing on the means of implementation. The following Table lists the 30 development dimensions with an indication of the relevance of each of these dimensions to the work of the Kuiseb Basin Management Committee; red indicating highly relevant, green relevant, and yellow less relevant but still important.

The purpose of Agenda 21 is to provide a framework within which countries should attempt to approach development agendas and programmes. It makes specific mention of the difficulties that will be faced by developing economies and that it must be "… recognized that these countries are facing unprecedented challenges in transforming their economies, in some cases in the midst of considerable social and political tension."

In terms of the activities of the KBMC, all programmes should aim to comply with the aims and objectives as set out in each of the 30 development dimensions, but there are certain leeway in terms of absolute compliance especially where the developmental nature of the operating environment would impose sever constraints on the options available.

4.4 IWRM and the MDGs

Namibia has played a key role in the formulation of the Millennium Declaration, which has been adopted by all UN member states at the end of the World Summit on Sustainable Development (WSSD) that took place during 2002 in Johannesburg, South Africa. The Millennium Declaration sets out within a single framework the key challenges facing the developing world while at the same time outlines a response to these challenges, and establishes concrete measures for assessing performance through a set of interrelated goals on development, governance, peace, security and human rights. The eight Millennium Development Goals (MDGs) are to:

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development.

The Government of the Republic of Namibia is implementing the Millennium Declaration and systematically monitoring the MDGs within the context of national and sectoral development frameworks. Commitment towards achieving these MDG goals has to be integrated into the national process of strengthening policies and programmes to fulfil the grand Vision for the year 2030, through which Namibia will enjoy "Prosperity, Harmony, Peace and Political Stability".

IWRM provides an excellent framework within which to consider tradeoffs between different development objectives and, where possible, to identify win-win water investments. IWRM can foster more efficient and sustainable use of water resources to achieve the MDGs by aligning and integrating development demands that have traditionally been seen as unrelated or that have never been coordinated. With the Namibian context an IWRM approach will not just support the achievement of the MDGs but also lay the foundation for long-term integrated economic development, poverty reduction and environmental sustainability policies and programmes that will be needed to sustain that achievement. The multi-faceted role that water, as certainly one of the most important enabling factors of production on the one hand and a serious constraint on the other, plays poverty alleviation, environmental protection, and economic development and the various tradeoffs that will need to be made, or possible synergies that can be created, in order to achieve the various national and regional developmental goals can be properly investigated and understood if IWRM processes flowing from the MDG process is applied.

Although it might appear that water management might contribute to only two or three of the MDGs, it in actual fact plays an important role in achieving all of them. Following is a short overview of how improved water management can contributes to the achievement of the various MDGs as well as to highlight opportunities where water can complement other development investments where there are opportunities to contribute to multiple MDGs.

4.4.1 Goal 1 - Eradicate extreme poverty and hunger

It is the poor who must spend most of their resources (money and time) carrying water to their homes and at the same time it is also they who carry the greatest burden of productivity-sapping disease as a result of not having access to safe water and sanitation. Water is essential to economic development, which can create productive livelihoods for the poor. Water can also offer important direct opportunities for the poor to address their food and income needs. In many rural communities, the availability of food on which to subsist is dependent on the uncertainties of nature's cycles—on whether the rains come and the rivers flow. Creating conditions in which the poor can benefit from opportunities offered by access to water is one of the more important contributions that IWRM can make to poverty reduction.

As will be seen in sections to follow, the basin area is relatively well off in terms of national targets related to access to safe drinking water. This aspect however remains a critical issue that needs to form part of any socio-economic assessment of water resources management planning and monitoring and evaluation.

Poor communities, especially those in the Walvis Bay Rural constituency, are also particularly vulnerable to floods, droughts and similar water-related disasters which destroy their assets and incomes. It is possible to manage climatic uncertainty, to understand and predict the water cycle, to

store and distribute water when it is scarce and protect communities from it when it is over-abundant. These activities are only possible through an integrated approach to resource management. We have seen in the recent past the crippling effect floods and droughts can have in the basin area and it would appear that in the past, predicting, planning for, and responding to these events in a strategic manner continued to be a near impossible task when approached from a silo perspective.

4.4.2 Goal 2 - Achieve universal primary education

The challenge of primary education may seem removed from that of water until it is recognised that in many communities, children's time is a valuable commodity and school attendance competes with work such as carrying water. Water-related disease also affects school attendance. And the availability of adequate sanitation is a key determinant, for girls in particular, of attendance at school. Once again, the socio-economic profile of the various communities in the basin area is such that access to primary education is not that much of an issue, at least for now. The economic development and associated population dynamics in the area are however of such a nature that this current position can very easily change for the worse.

It is also a common phenomenon in Namibia that the development of new schools many acts as a catalyst for the formation of new settlements and population concentration. New schools developed in the rural parts of the basin area could have an impact on human settlement and migration patterns that could have a knock-on effect on water demand and visa versa.

4.4.3 Goal 3 - Promote gender equality and empower women

Within rural communities, the burden of sustaining households traditionally fell on women. The fetching and storing of water is a task which takes much of their time and that of their female children in many poor communities. Women are also often the primary users of water for productive activities such as agriculture. Properly applied, IWRM approaches can ensure that they have a voice in decisions about water that affect them and can gain access to water to help boost their incomes. Some of these aspects are already being addressed, especially through water point committees in the rural parts of the basin area, but still more could be done to increase the role women play in this process.

4.4.4 Goal 4 - Reduce child mortality

In most poor communities, the health of children is directly related to the quality of their immediate nurturing environment, in which access to safe and clean water plays a key role. Children are at risk when they are without safe water to drink, without adequate water to stay clean and when their care-givers are without the knowledge or power to make decisions about these issues. In developing countries, water-related diseases are almost always amongst the most important causes of death of children under the age of five, using deaths from diarrhoea as a proxy. The basin area is fortunate in this regard that it boasts with relatively excellent statistics. Monitoring this aspect will however remain an important activity to ensure that current performance levels are maintained.

4.4.5 Goal 5 - Improve maternal health

The burden of fetching water and dealing with water-related disease in the family falls disproportionately on women and puts pressure on their own health. Measures that help women to reduce this burden and to improve family health, will contribute to improved maternal health specifically, as well as to gender equality more generally. Once again this will be more related to service delivery to the rural population within the basin area.

4.4.6 Goal 6 - Combat HIV/AIDS, malaria and other diseases

Access to safe water and sanitation services can help to reduce poverty—which in turn is an important determinant of HIV/AIDS—and help to keep HIV-infected people healthy and productive. Water borne diseases are relatively unknown in the area as a result of excellent levels of service delivery. The

basin area is considered as one of a few economic growth hubs in Namibia and industrial development means increased human settlement and both could, if not well managed and controlled, become source of pollutants that may negatively affect the quality of water supply. It would therefore be one of the objectives of integrated water resources management to closely monitor the potential for subsurface water pollution and ensure that preventative measures are put into place well in advance. This would be a typical example of applying the precautionary principle.

4.4.7 Goal 7 - Ensure environmental sustainability

Water is key to the sustainable utilization of land, plant and animal resources. In many countries the main environmental problems, whether it is pollution, erosion or the loss of biodiversity in wetlands and estuaries, relate to water. If the water resources environment is not managed and protected, it will not be able to sustain human communities. A direct contribution offered by IWRM to Goal 7 is to facilitate, in a structured way, the achievement of a balance between economic, social objectives and activities, and environmental sustainability. Although abstraction from the Kuiseb aquifers is considered to be well within sustainable levels, there are claims of negative impacts on the livelihoods of those dependent on natural vegetation such as !Nara due to reduced yields as well as dying of trees in and along the Kuiseb River, which is a major source of fodder for the livestock farmers in the basin area.

Similarly, IWRM can help to ensure that the provision of water supply and sanitation services (the other dimension of Goal 7) is reliable and sustainable. Certainly, the disposal of waste water from sanitation is a major environmental challenge in many countries and there are numerous international examples how this is best addressed through IWRM. Similarly, the reliability of domestic water supplies in dry seasons often depends on influencing the behaviour of other water users. This would therefore not only call for ensuring water supply, but also to put a lot of emphasis on water demand management. The fishing industry in Walvis Bay is an excellent example of how innovative an industry can become in adopting alternative technologies, such as using sea water for cleaning purposes, which can reduce the pressure on supply sources.

4.4.8 Goal 8 - Develop a global partnership for development

Water is a resource that knows no political boundaries. Just as many communities depend on water shared with their neighbours, so too do many countries. What is also shared between countries is the common commitment to achieve the MDGs and, if water is key to meeting the MDGs, cooperation in its management is critical. There are many ways in which countries will need to cooperate if the MDGs are to be reached, by no means limited to financial and technical support for specific activities. Integrated water resource management is one mechanism through which such partnerships can be built, particularly where rivers are shared between more than one country.

The Kuiseb basin is not part of an international border that would involve other countries in terms of managing the basin. However, there is room for developing global partnerships from a different perspective. The area is, as will be discussed in the text to follow, very rich in uranium. With the world demand for uranium as a nuclear fuel ever on the increase, global development partnerships can be developed with foreign investors to invest in sustainable economic development projects as part of their social responsibility towards creating a sustainable future for the communities of the basin area who currently rely on the abstraction of a non-renewable resources to make a living as well as utilising water from the basin for this purpose.

4.5 Managing water within the Vision 2030, NDP3 and MDGs context

Traditionally the provision of piped water merely focussed on providing potable water for drinking and sanitation purposes. It is however recognized that without investment in water resource development and greater attention to the management of water resources, any gains in water services were unlikely to be sustained and that it would be difficult to achieve the goals and objectives in Vision 2030 and the broader Millennium Development Goals. Namibia is fortunate in this context in that having been faced

with severe water supply limitations, authorities have already made considerable progress in adopting an integrated management approach because the situation has required it. In many aspects Namibia has already set a benchmark example for other countries to follow. However, having said this, there are always opportunities to improve on current performance.

To understand how an IWRM approach may contribute to sustainable development and the achievement of the national development goals and MDGs, it is helpful to consider the challenges of the water cycle. The first challenge is the distribution of water. As a rule, communities normally deal with the uneven physical distribution of water by going to where it can be found. This is why great civilisations grew along the rivers of the world, which provided not just the water they needed but also a range of associated goods, including security and transport as well as food and building materials and the removal of human wastes. The Kuiseb basin scenario is however the reverse situation. Human settlement and economic development have taken place in an area faced by constant water scarcity. This therefore requires a management task of not only securing sufficient supplies to provide in existing demand levels on a sustained basis, but it must also ensure that future growth in demand can be supplied with in an environment where supply and resources are not a constant. Changing weather patterns are increasingly becoming a source of concern on a global scale and Namibia is not an exception. Recent extreme events are proof of this.

The second set of challenges relates to the quality of water resources. As population densities and economic activities increase, so too does their impact on water, particularly the impact of human wastes. While the first concern tends to be the impact on the health of people, water quality is also threatened. The Kuiseb aquifers are known for their vulnerability to sea water intrusion as water tables drop. Pollution as well as over-use can also destroy aquatic ecosystems on which communities depend for their livelihoods.

The human “demand side” of water is also complex. The growth of human settlements complicates water supply and management. Small settlements can meet their needs from local resources but, as they grow, water has to be brought from farther away. Similarly, human impacts on water quality in small settlements can be relatively easily managed. However, as settlements grow, their environmental impact spreads well beyond their boundaries. In both cases, the “environmental footprint”, the area affected by the human settlement, expands with both economic development and population numbers.

These impacts will limit our abilities to achieve and deliver on the national development objectives in two ways. First, where services require more infrastructure and supplies come from farther away, they tend to cost more; access increasingly becomes a function of income and wealth rather than a simple relationship with the local environment. This is already evident in that exploration for new aquifers higher up in the Kuiseb basin as well as to the south in less accessible areas is becoming an increased necessity. In the competition for more and higher quality water services, wealthier households and communities tend to fare better. The sources of water of poor households, especially in the rural areas, are claimed by other users, impacting their domestic supplies and their ability to generate at least survivalist levels of incomes. As will be shown in sections to follow, there is a conflict scenario busy developing between farmers upstream of the Topnaar communities that are restricting flows in the Kuiseb river by constructing dams in the upstream contributories and overexploitation of the aquifers in the past by mines and for domestic use led to serious sustainability issues for the Topnaar way of life.

Whereas an IWRM approach to water management cannot in itself deal with all these impacts, it can, if properly implemented, provide some opportunity for the needs of poor communities to be considered and for the communities themselves to engage in management processes and decisions. At the same time, it can enable decisions to be made about environmental protection and the tradeoffs that need to be made between environmental sustainability and economic and social priorities.

5 Socio-economic assessment of Kuiseb Basin

5.1 Social Aspects - Demographics

Analysing demographics in terms of the impact on water resources management and vice-a-versa will necessitate exploring various perspectives of development. As already stated, development initiatives that will impact on the human or bio-physical environment will have to be approached along the guidelines set in vision 2030 and the MDGs.

The population living within the Kuiseb basin can essentially be divided into three main categories, namely the residents of the greater Walvis Bay enclave, the population in the communal area which essential is populating the lower and middle basin areas and lastly the farming community found in the upper basin area.

According to the 2001 Population and Housing census, the Walvis Bay Urban enumerator area had 6,471 households and a total population of 25,026. The statistics for the Walvis Bay rural enumerated area is 4,426 households with a total population of 16,293. The population in the commercial farming area has been estimated according to the following assumptions:

- There are 102 farms falling within the Khomas Region that are also within the Kuiseb basin.
- It is assumed that there will be an average of 4 families living on each farm; the owner with three labourer families.
- The average family size for the Khomas Rural enumerated area was 3.8 in 2001, giving a total farming community size of 1,550 persons from 408 households.

The total population of the basin area is therefore estimated to be 42,869 with a total of 11,305 households. These figures are strictly according to the 2001 Census and it is known that many of these have been disputed as not accurate. The latest estimates provided by the Walvis Bay Municipality are a total permanent population size of approximately 70,000 for the town. This is nearly a three-fold increased based on the 2001 census figures. If this figure is accepted as a more up-to-date and accurate estimate together with the numbers for the rural and farming communities as relatively constant, the total population in the basin would be approximately 88,000 persons.

Table 5.1.1 overleaf summarises the age structure of the population of the Erongo Region. It is interesting to note that nearly 64% of the population of the region is in the age bracket 15 to 59. This phenomenon is mirrored by the population in the Kuiseb basin with the Walvis Bay rural constituency reflecting an even higher percentage of 70.6%. This should be an indication that population growth is not only as a result of natural increases, but includes a large proportion of migration into the region, especially into Walvis Bay as a result of socio-economic factors and considerations.

The rather huge difference between Census figures for total population in the area and the seemingly different population growth profile of the basin area would suggest that the KBMC should attempt to develop a more accurate database on population figures in order to have more reliable planning information at hand for planning and monitoring purposes. Either, the figures have been completely understated as a result of incorrect baseline data or the population growth profile was developed using an incorrect set of assumptions in terms of those issues that influences population growth in the basin area.

Table 5.1.1:Population distribution by area and age group for the Erongo Region – 2001 Census

	Percentage in age group				
Area	0-4	5-14	15-59	60+	Not Stated
Erongo	10.7	17.6	63.9	5.8	2.0
Urban	10.0	16.4	66.2	5.0	2.4
Rural	13.6	22.4	54.5	9.1	0.5
Arandis	11.3	21.8	59.0	6.8	1.1
Daures	14.8	23.9	49.9	10.9	0.5
Karibib	12.7	23.1	35.5	7.9	0.7
Omaruru	12.2	20.6	58.7	7.4	1.0
Swakopmund	9.9	16.7	66.8	6.1	0.6
Walvis Bay Rural	10.8	15.9	70.6	1.9	0.9
Walvis Bay Urban	8.5	12.8	68.7	4.5	5.5

It is expected that the basin area will experience accelerated population growth rates based on projected sectoral development plans such as expansion in uranium mining activities, industrial development in Walvis Bay, and developments in the port of Walvis Bay.

5.2 Human Development Index/Human Poverty Index

Development is about enlarging the array of choices for people to choose from in order for them to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community. Without these, many choices are simply not available and many of life's opportunities remain out of reach. Based on this assumption human poverty must be defined and measured to reflect the deprivation of capabilities. Measuring human development therefore requires a set of measures that goes beyond merely looking at GDP and average incomes.

In order to measure progress on achieving the MDGs, the UNDP developed a standard methodology for measuring human development and human poverty. This standard methodology is in the form of two main composite indices, the Human Development Index (HDI) and the Human Poverty Index (HPI).

There are at least three broad purposes for this type of analysis:

- To highlight to stakeholders involved in implementing Vision 2030 and the National Development Plans (NDPs) the progress made on local and regional level towards achieving national goals and objectives.
- To highlight differences in capabilities and deprivations within Namibia between regions and communities, across gender, ethnicity, and other socioeconomic groupings, in order to facilitate the targeting of policies and interventions to achieve the greatest possible impact.
- To facilitate comparisons and the exploration of why human development and poverty regions or targeted areas such as the Kuiseb basin is deteriorating while other regions are making progress.

The HDI seeks to provide a quantitative representation of three main dimensions of human development: a long and healthy life, knowledge and a decent standard of living. These three dimensions are represented by their three associated indices namely the Life Expectancy Index, the

Educational Attainment Index, and the Income Index. A range of values have been set for the achievement of these indices as per Vision 2030. These values are:

Index	Minimum Value	Maximum Value
Life Expectancy	35 years	69 years
Adult Literacy	0%	100%
Gross enrolment	0%	100%
Adjusted Income per Capita	N$1,400	N$90,000

Table 5.2.1 reflects how the Erongo Region fared against national achievement and a couple of other regions within Namibia.

Table 5.2.1: HDI Indicators for Erongo Region compared to national and regional indicators

	Life expectancy at birth (years)		Literacy rate, +15 yrs (%)		Gross Enrolment ration, 6-24 yrs (%)		Annual average adjusted per capita income (N$)	
	2001	1991	2001	1991	2001	1991	2003/2004	1993/1994
Erongo Region	59	65	94	85	58	63	16,819	8,189
Namibia	49	61	84	76	66	68	10,358	5,448
Urban	54	64	94	90	60	63	17,898	11,553
Rural	46	60	78	69	68	70	6,139	2,831
Khomas Region	58	68	96	91	59	57	25,427	17,152
Karas Region	57	60	92	88	58	59	12,706	10,049
Omusati Region	45	65	84	78	77	84	5,466	2,193
Ohangwena Region	41	63	80	71	72	74	4,304	1,616

According to Table 5.2.2, the Erongo region outperformed the national averages in all but one aspect, which is that of gross enrolment. The Erongo Region achieved the second highest HDI rating in Namibia only to be beaten by the Khomas Region. What is significant however is the fact that the Erongo Region is the only region to achieve an improvement in its HDI from 1991-1994 to 2001-2004. All the other regions experienced a decline as mirrored by the national index.

This will have certain implications on the region in terms of inter- and intra regional migration patterns as people, especially the unskilled unemployed part of the Namibian nation will flock to the region in order to share in its relative wealth and progress. This requires the KBMC to continuously monitor these aspects to ensure that water as one of the enabling as well as limiting factors of production is utilsed in a sustainable and economically optimized manner.

5.3 Economic Active Population

According to the 2001 Census, there were 74,902 persons in the Erongo Region 15 years and above, effectively constituting the potential labour force in the region. Of these, 17,938 could be considered as economically inactive being students, homemakers, income recipients, old aged, or retired. A total of 3,747 persons did not state whether they were economically active or inactive. The remainder, 53,217, could therefore be considered as economically active, which is 71% of the population. Of the 53,217 economically active persons, 18,113 or 34% were unemployed.

5.4 Access to Water

Vision 2030 has as its 7th Theme living increasingly a healthier life, which includes issues such as access to clean water as well as food security. Table 5.4.1 provides an overview of the type of access the communities falling within the boundaries of the Kuiseb River basin have in terms of their access to clean drinking water.

Table 5.4.1: 2001 Census – Households by main water source for Walvis Bay Urban and Rural enumerated areas.

Source of water supply	Walvis Bay Urban households	Walvis Bay Rural households
Piped water inside	4,801	2,554
Piped water outside	1,478	1,806
Public Pipe	129	21
Borehole	16	7
Borehole with open tank	9	3
Borehole with covered tank	26	5
River/Stream/Dam	6	10
Well	1	14
Not stated	5	6
Total	6,471	4,426

Table 5.4.2 below shows the distance that people need to walk to the nearest water point.

Table 5.4.2: 2001 Census – Households by walking distance from water source for Walvis Bay Urban and Rural enumerated areas.

Source of water supply	Walvis Bay Urban households	Walvis Bay Rural households
0m	6,392	4,372
1 -100m	74	33
101 – 200	-	16
1001+	-	2
Not stated	5	3
Total	6,471	4,426

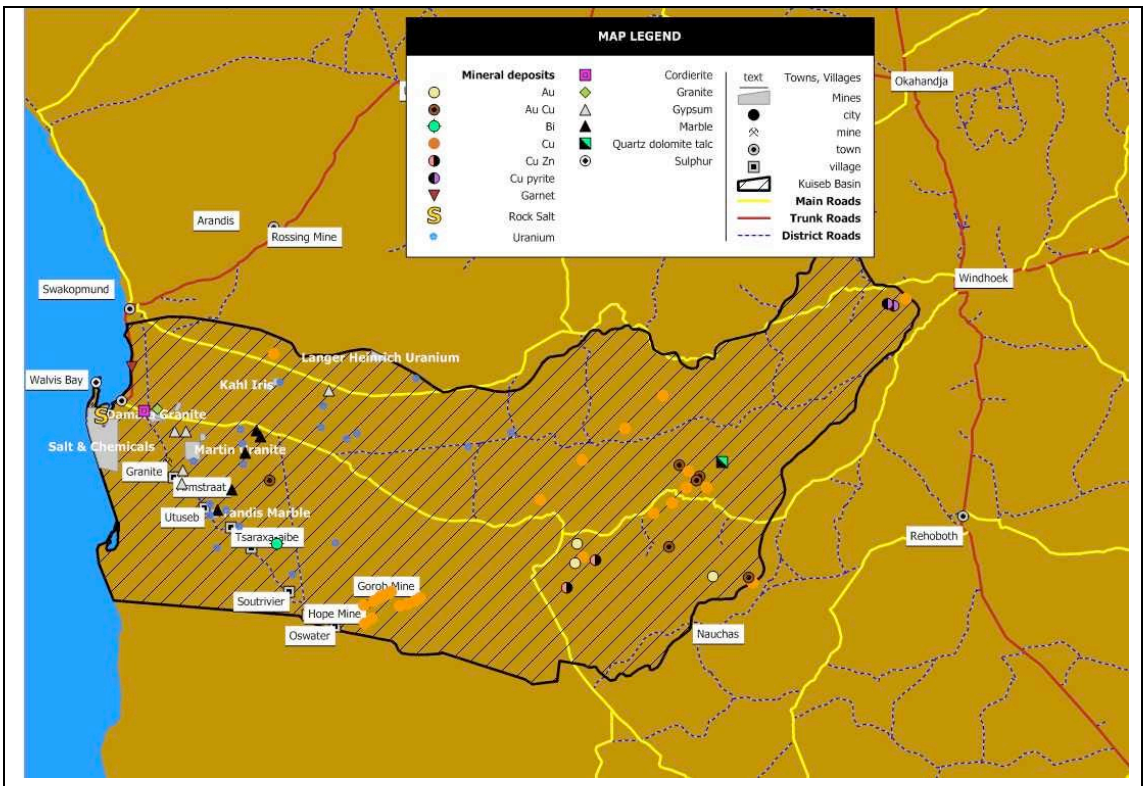
It is clear from Tables 5.4.1 and 5.4.2 that the water sector has come close to achieve the national goal of giving the Namibian population total access to clean drinking water. The target for NDP 2, ending 2006, was to achieve 90.7% access for rural communities and 98.4% for urban areas. The inhabitants of the Kuiseb basin enjoy more than a 99% access to clean drinking water. The main issue would therefore not be to have a major drive to provide increased access, but rather to ensure reliable and sustained supply and use of potable water.

5.5 Economic Aspects

5.5.1 Mining

The Erongo Region is probably one of the riches regions in Namibia in terms its mineral wealth. The Kuiseb basin historically played a key role in the development of the mining industry in the region through providing water to the Rössing Mine during its early years of operations. Map 5.5.1.1 below provides a clear picture of current mining activities in the basin area as well as the mineral deposits already identified. It is clear from the map that the area is especially rich in copper and uranium deposits. There are a number of active mining operations in the basin area, mostly granite/marble (3 mines), salt (1 mine), and the part of the Langer Heinrich Uranium Mine that partly falls in the basin

area. It was interesting to discover that, when consulting the Ministry of Mines and Energy, they did not carry any knowledge about Hope and Gorob mines and there are no references to any current mining licenses for the areas the two mines are situated at.



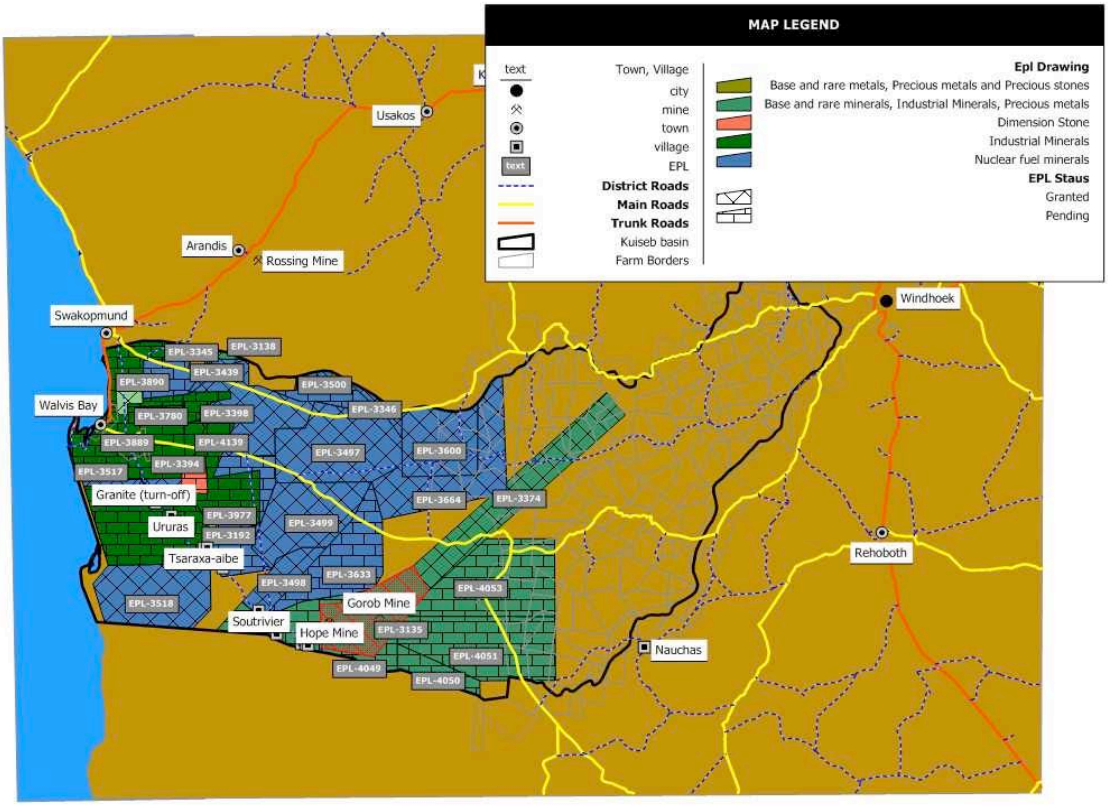
Map 5.5.1.1: Mines and Mineral Deposits

Apart from the known copper and uranium deposits there are also substantial gypsum and marble deposits that are not yet mined. Based on this brief desktop analysis it would appear that the basin area holds substantial potential for mining development. This is confirmed by Map 5.5.1.2 overleaf showing all exploration that is currently being conducted or for which EPL applications are pending in the basin area.

The exploration activities appear to be in line with the known resources as reflected in Map 5.5.1.2. Towards the eastern parts of the basin exploration focuses on base metals and minerals which are mainly copper, zinc and to a lesser extent gold. The central part of the basin is heavily explored for uranium and latest reports suggest that significant findings have been made especially towards the south-western part of the basin. Closer to the coast exploration activities focuses on marble, granite and other industrial minerals.

As part of the Vision 2030 theme of the sustainable utilization of natural resources certain performance outputs are being expected from the mining sector. During the period 2001 to 2006, the mining sector in general grew at a rate of 7.7% per year with an average contribution of 10.4% to the GDP. In formulating NDP 3 a specific strategy is stated that the Namibian mining sector will be promoted to further grow, although a smaller contribution to GDP is expected, but with an emphasis on mineral processing and value-adding. With the current growth phase in global demand for base metals and minerals as well as uranium, mainly spurred by China and India, it can be expected that commodity prices will continue to rise. This scenario makes mining development very attractive for investors and the recent interest shown in mining development in Namibia, especially in the target area, is evidence of this. However, such dramatic expansion has its downside in terms of its impact on human settlement and health as well as on the environment and services it demands from the

environment.



Map 5.5.1.2: Exclusive prospecting Licences Granted and Pending within the Kuiseb basin

Table 5.5.1.1 provides an overview of the impacts that the various mining developments in the recent past and up to 2014 will have in terms of resource input requirements. It is expected that a total of 6,100 new jobs will be created meaning approximately the same amount of households to migrate into the Swakopmund-Walvis Bay area. This would be as a result of the fact that the greater majority of jobs to be created by these new developments would be in the fields of technical and management expertise, skills not readily available in the basin area, region or even the country.

Table 5.5.1.1: Cumulative Impact of new mine developments in Erongo Region

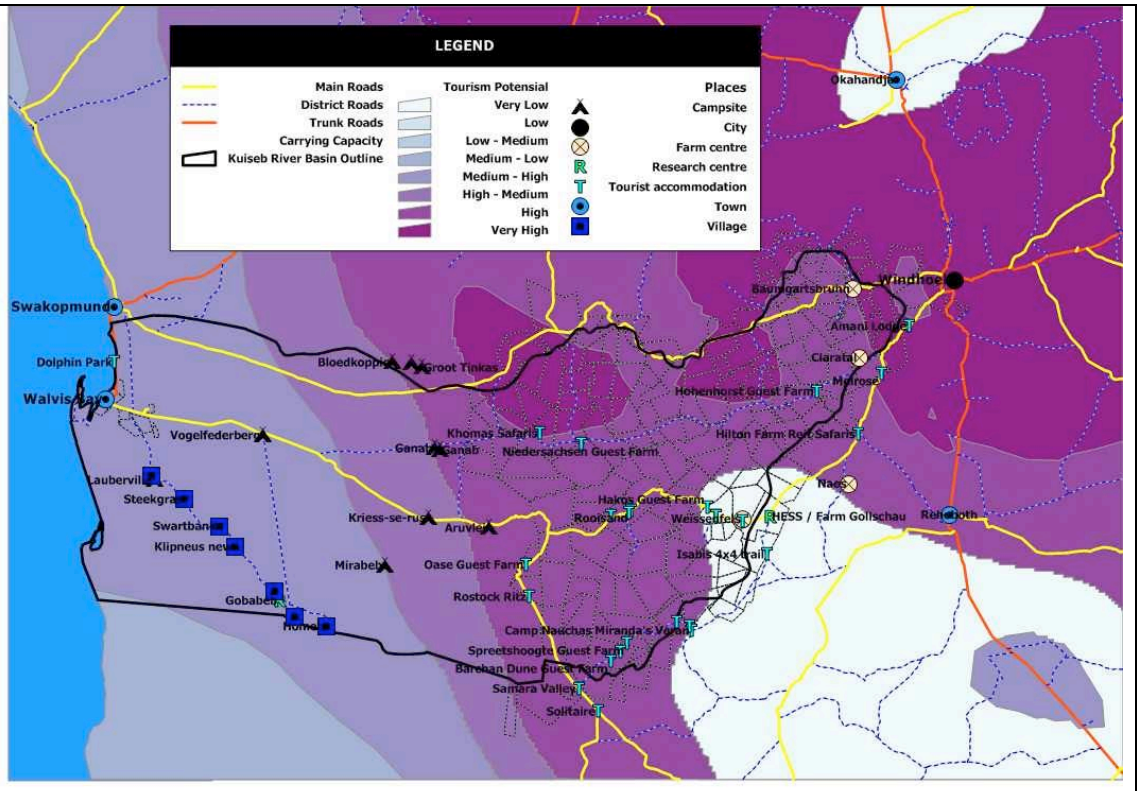
Mine	Estimated Year of Commissioning	Estimated Year reaching full production	Estimated No of employees at full production	Power use at full production	Water use at full production
Langer Heinrich	2007	2010	400	15 MW	3 Mm^3
Uramin Trekkopje	2008	2009	800	90 MW (+ Desal)	15 Mm^3
Valencia	2009	2010	600	20 MW	3 Mm^3
Rössing 2	2010	2011	300	10 MW	4 Mm^3
Swakop Uranium	2010	2011	500	15 MW	5 Mm^3
Bannerman Goanikontes	2010	2011	600	20 MW	5 Mm^3
Reptile Uranium	2012	2013	500	15 MW	5 Mm^3
Namura	2011	2013	1000	20 MW	5 Mm^3
Marenica	2013	2014	800	15 MW	5 Mm^3
Erongo Uranium	2013	2014	800	15 MW	5 Mm^3
			6100	**270 MW**	**55 Mm^3**

In addition to the human migration impact, these mines will require an estimated 270MW of electricity. It is known that Namibia is already at its limits in terms of electricity production capacity and imports from other SADC countries. These requirements will most probably have to be generated close to the demand, which will require an enormous amount of water. The total projected water demand as a direct mining development impact has been estimated to be 55 million cubic meters per annum. This is not considering the multiplier effect of these developments in terms of the forward and backward linkages when one considers the entire value chain in the context of increased local processing and value-adding. The quantity of water required as inputs to these developments will be well beyond the sustainable delivery capacity of the Kuiseb aquifer system. As already is the case, fresh water supplies will have to be augmented by alternative supplies such as desalination.

This development and expected future growth in the mining sector would therefore require close monitoring of the situation, in all its aspects, from the side of the Basin Management Committee.

5.5.2 Tourism

The Kuiseb River Basin is relatively well endowed in terms of tourism potential. Map 5.5.2.1 overleaf gives an indication as to the tourism potential based on a combined index calculated taking into consideration the landscape diversity, large herbivore diversity, carnivore diversity, bird population and human settlement. The largest part of the area has been classified as very high to medium high potential. A total of 15 tourist accommodation establishments have been developed in the upper and middle basin areas with 6 camping sites. Statistics provided by the Namibian Tourism Board indicate that there are 43 tourism establishments within the basin area of which 28 are situated in Walvis Bay. Together these 43 establishments can offer a total of 652 rooms or 1,432 bed nights to accommodate tourists. Compared to the Erongo Region, establishments in the basin area constitutes approximately 21% of the total bed nights on offer and 6% of the total number of beds offered nationally.



Map 5.5.2.1: Tourism potential in the Kuiseb River Basin with associated tourism infrastructure

In terms of national statistics, direct jobs created by the tourism industry were approximately 0.88 per bed offered. Based on this, the tourism industry contributed a total of 1,260 jobs to the total job market in the basin area. In terms of the economic value of each bed night sold, the value added to the total economy of the basin has been N$688 per bed night sold. At an average rate of 30% occupancy and based on these averages, the tourism industry within the basin contributed an estimated N$107 million to the total economy of the basin area in 2006.

However, based on the calculations contained in the tourism satellite accounts as published by the Namibian Tourism Board in collaboration with the World Travel & Tourism Council[5] the total direct and indirect impact on the economy in terms of jobs created was 71,777 from 2,300,740 bed nights sold in 2006 or 0.031 per bed night sold. The total impact on the national job market as contributed by tourism from the basin area was therefore 156,804 jobs created and/or maintained.

5.5.3 Fishing

It is generally accepted that Namibia has one of the most productive fishing grounds in the world rich in populations of demersal and large and small pelagic fish. The fishing industry has always been one of the mainstays of the Namibian economy and Walvis Bay and its economy have developed around this industry. Revenue from fisheries is the second most important foreign exchange earner in Namibia after mining and it contributed on average about 4.8% percent to GDP during the period 2001-2006. In addition, onshore fish processing contributed 1.7% to GDP.

Recent instabilities in the quantities of different fish species caught sent shock waves through the local economy of Walvis Bay and major corrections and structural adjustments took place for the industry to align processing capacity to a level that can be sustained by the resource. Not only had the instabilities in the resource had a negative effect on the industry in Walvis Bay, but other factors such as volatile exchange rates and cost of inputs such as energy also played a significant role in the sharp

decline in the viability in the industry. A number of lay-offs were necessitated which had a negative impact on the employment situation in the town with its associated impacts on the socio-economic conditions.

During the period 2001-2006, Namibia's annual fish catches averaged about 572,460 tonnes, valued at N$3.6 billion. The total industry employed about 13,400 persons, a number that remained fairly stable over the last 5 years. Although major lay-offs were experienced, the increase in onshore processing created additional job opportunities.

In addition to mainstream fishing, a small but lucrative mari-culture industry also developed in Walvis Bay. Nationally, oyster mari-culture production amounted to 670 metric tonnes, valued at N$64 million per year. Although this year proved to be a disastrous the industry as a result of major losses suffered due to sulphur outbreaks. It is however expected that the industry will recover and that substantial growth can be expected during the next few years.

It was unfortunately not possible to obtain from official sources an industry split between Walvis Bay and Lüderitz to estimate the direct contribution the industry makes to the Walvis Bay economy. However, if a 50-50 split is assumed, the industry would contribute approximately N$1.8 billion to the Walvis Bay economy and provide employment to 6,700 people. This is not taking into account the forward and backward linkages in the total value chain for the industry.

According to the Natural Resource Accounts published by the Department of Water Affairs and Forestry in the Ministry of Agriculture, Water and Forestry the fishing industry in total consumed 0.7 million cubic meters of water in 1997/98 and 1.6 million cubic meters in 2001/02 nationally. This represents less than 0.6% of total national water demand. Given the fact that the fishing industry is the second largest contributor to GDP, this shows that the industry is a very efficient user of water as an input resource.

The expected growth target to be achieved by the fishing industry in NDP3 is 3.6% against a past performance of -0.5% for the last 5-year planning cycle. This could be considered rather optimistic. However, the growth will not only come from increased tonnage landed but also from increased on-land processing and value addition as well as from aquaculture. This will have a definite impact on the demand for fresh water as processing input. The fishing industry has however showed that it is a very efficient user of fresh water for processing. This should however be continuously monitored.

5.5.4 Shipping and the Walvis Bay Harbour

Walvis Bay is a natural gateway for international trade and is strategically located half way down the coast of Namibia with direct access to principal shipping routes. It is Namibia's largest commercial port, receiving approximately 1,000 vessel calls each year and handling about 3.4 million tonnes of cargo. It is a sheltered deepwater harbour benefiting from a temperate climate and as a result of this it can offer a no-delays service because of bad weather.

The container terminal at the port of Walvis Bay can accommodate ground slots for 380 containers with provision for 210 reefer container plug points. In order to deal with even higher levels of throughput, Namport have steadily improved its cargo-handling facilities. The container terminal can host about 150,000 containers per annum.

Namport has completed the implementation of its Port Master Plan to develop the Port of Walvis Bay as a Hub Port for Southern Africa. The Port Authority is currently busy updating this Master Plan to cater for developments for the next five to ten years that would include an investment of some N$50 million in not only deepening the harbour but other infrastructure to position the Port of Walvis Bay as the gateway to countries in Southern Africa through the Walvis Bay Corridor.

Table 3.5.4.2: Key Statistics on Namport

Cargo Handled (Metric Tonnes)	Oct/Sep 99/00	Oct/Sep 00/01	Oct/Sep 01/02	Oct/Sep 02/03	Oct/Sep 03/04	Oct/Sep 04/05
Walvis Bay Cargo handled	2,223,698	2,229,362	2,419,158	2,350,120	2,763,446	3,031,357
National Cargo handled	2,387,316	2,509,233	2,722,096	2,664,506	3,131,822	3,411,754
%WB	93%	89%	89%	88%	88%	89%
Turnover (N$ '000)			166,274	181,219	211,270	220,858
Profit (N$ '000)			33,519	34,141	12,357	32,479
Employees			459	472	591	569

Based on the table above, the Walvis Bay Port constitutes approximately 90% of Namport's cargo volume. Assuming that Namport's turnover is related to its cargo volumes handled, the company adds about N$2.7 billion to the Walvis Bay economy.

What is significant about the harbour is the enormous amount of related business activities that is generated by shipping traffic and cargo handling such as Chandeliers, maintenance and the ever expanding dry docking facilities at the harbour. Expansion of docking facilities and cargo handling capacity will lead to increased ship traffic that will result in multiple economic effects.

5.5.5 Agriculture

Commercial Agriculture

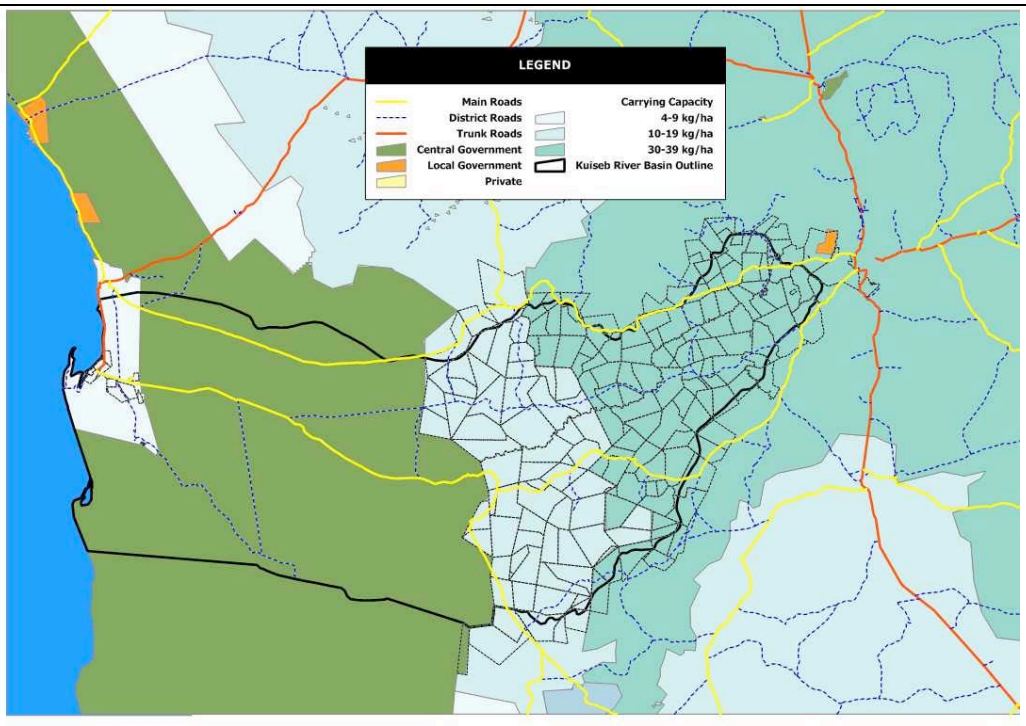
Most of the land in the upper catchment area of the Kuiseb River Basin has been subdivided into commercial farming units. According to official records there are 109 commercial farms of which one has been bought for resettlement purposes in the Khomas Hochland with another nine farms belonging to affirmative action loan scheme farmers. According to Wittneben & Klintenberg[6] approximately 500 farm workers are being employed on commercial farms supporting approximately 2000 people.

Large stock farming is the most common form of agriculture in the commercial farming area that intersects with the basin area but there are only a few permanent commercial farmers in the area below the escarpment as a result of the high variability of rainfall that makes income from farming financially a non-viable option. Farmers therefore have to rely on a second source of income, mostly permanent employment in Windhoek, Swakopmund or Walvis Bay.

The southern and south western parts of the Basin have also been used for small stock farming, especially Karakul sheep being well adapted to the extreme arid conditions on the edge of the Namib Desert.

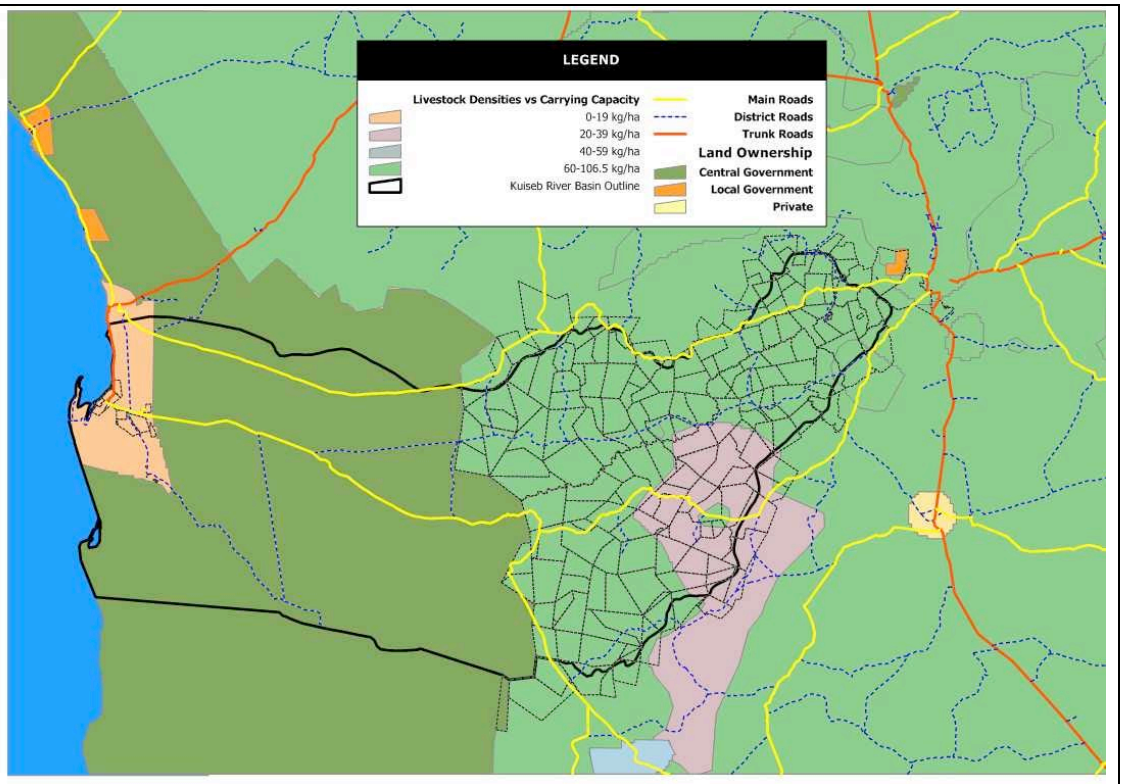
Map 3.5.4.1.1 overleaf gives an indication of the carrying capacity of the rangeland in the river basin. In the most eastern part of the basin the average carrying capacity is estimated to be between 30 and

39kg live weight per hectare. As one moves towards the west, the carrying capacity decreases to as little as 10kg/ha.



Map 3.5.4.1.1: Carrying Capacity Commercial Farms located in the Kuiseb River Basin

The Map overleaf reflects the actual live weight in kg/ha of livestock on the rangeland in the basin area.



Map 3.5.4.1.2: Livestock vs Carrying Capacity

When compared to the carrying capacity in Map 3.5.4.1.2, it becomes obvious that the area is overgrazed which poses long-term risks in terms of permanent damage to grazing. Bush encroachment has been identified as one of the challenges faced by livestock farmers in this area. Recent studies showed that bush encroachment has a negative effect on ground water recharge as well as moist availability to grasses during the growth season. The net effect would be a continuous reduction in carrying capacity.

The total commercial farming area that falls within the Kuiseb River Basin is approximately 1.18 million hectares. The national average net return per hectare is in the region of N$30/ha. The gross figure varies significantly, depending on land use and the agricultural potential of the area. For large stock farming, the national average is between N$250/ha to N$350/ha. At an average of N$300/ha, the annual gross economic value of agricultural production in this area would therefore be approximately N$354 million. This figure is however a rough estimate. It is very difficult to obtain data related to agricultural production on a regional basis as information in Namibia is mostly collected from a national planning perspective on a macro level and not for regional or micro planning.

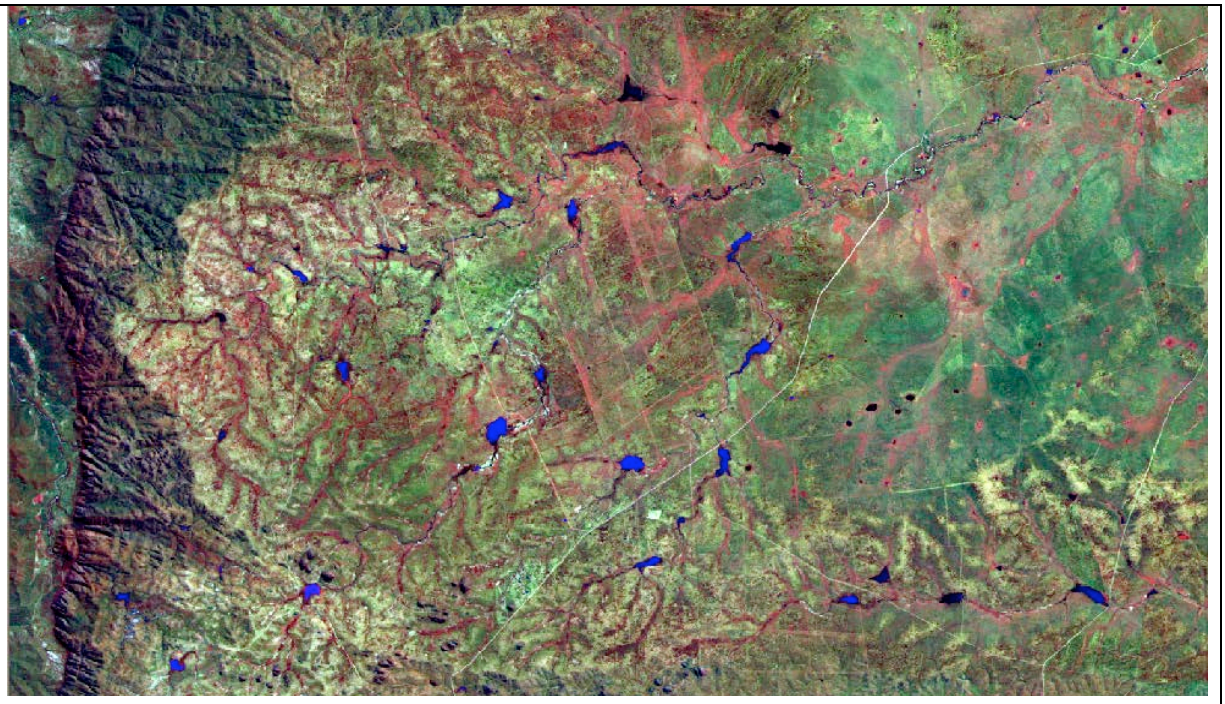


Photo : Satellite image showing some of the earth dams constructed in the basin area

Source: MAWF, 2006

Access to water is a critical issue for farmers in this area. Surface water in this area is very limited and farming is dependent on subsurface water. In addition to their reliance on subsurface supplies, these farmers also are faced with a high variability in the yields of these boreholes. These could be supplemented by dams that collect run-off and then allow recharge of subsurface aquifers to happen. There is therefore an increased need for farmers to optimize run-off collection for recharge purposes. This position however puts farmers in serious conflict with the needs and expectations of water users downstream in the lower basin areas. Research completed by the Department of Water Affairs identified more than 300 dams in the commercial farming area within the upper basin area covering a total area of 3.928 km2 which is about 10% of what DWAF records reflect. This is an indication of major illegal reservoir construction in the commercial farming area. The major disadvantage with these dams are the massive volume of water lost as a result of evaporation meaning that very little of the stored volume actually recharge aquifers. As much as 80 to 90% of the stored volume can evaporate.

Communal Agriculture

The Topnaar community is the most significant communal farming community that is found in the Kuiseb basin where farming takes place along the Kuiseb River with the most important source of fodder for the livestock coming from riverine vegetation. Livestock movement is mainly restricted to the riverbed and riverbanks.

Although there are very little accurate or reliable statistics regarding livestock numbers it is commonly known that livestock is kept and bred to maximise livestock numbers and is not necessarily to be marketed. Selling only happens when there is an immediate need for money, e.g. for school fees, weddings and funerals.

The Topnaars also harvest and process the !Nara as a supplementary agricultural activity. Traditionally, !Nara plants were demarcated and individual plants were owned by families. This system has changed during the recent past to an open access system in which everyone competes for the !Nara fruits. It would appear that the !Nara yield has declined over the last couple of years. One of

the factors that is believed to contribute towards the declining !Nara productivity is the dropping water tables of the various Kuiseb River aquifers. This trend has been observed since the early 70's when wells in the river bed started drying up as a result of over extraction to supply Walvis Bay and Rössing mine. It was observed that !Nara plants as well as trees and other riverine vegetation started dying.

6 Gap Analysis

In terms of viewing integrated water resource management from a Vision 2030 and MDG perspective certain gaps exists in terms of planning information. These gaps are:

1. Known planning targets: Although certain sectoral targets are specified in NDP 3 it would appear that there is very little connection between these and Vision 2030 targets. The KBMC should guard against managing the basin in a reactive manner. Instead, clarity should be sought in terms of the longer-term targets that would guide the KBMC in planning the management of the basin in a sustainable and responsible way.

2. Accurate population statistics: It would appear that information contained in published census statistics is not very accurate and reliable. The KBMC will have to ensure that they have access to reliable population statistics and demographics to ensure that strategic planning and management are executed on accurate and reliable statistics. Partnering with local managing authorities could overcome this problem by collecting relevant population data in their immediate environment as well as on a more frequent basis.

3. Industry water use profiles: Once again it would appear that water demand analysis is done on an aggregate basis. To understand the impacts on water demand in the future the demand profile of the various industries within the basin area should be analysed.

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