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## **IWRM IN CEB ANNUAL COORDINATION WORKSHOP**

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PROTEA HOTEL, ONDANGWA

6 AND 7 JULY 2011

## CONTENTS

<b>1. OFFICIAL OPENING</b>	<b>3</b>
1.1 Opening Remarks: MAWF, Mr Nehemia	3
1.2 Opening Remarks: Country Director GIZ, Mr F von Kenne	3
1.3 Workshop Objectives: MAWF, Ms M Amakali	4
1.4 Programme Overview: Moderator, Ms M Davel	4
1.5 Participant Introductions	4
<b>2. FOLLOW-UP TO APRIL 2010 COORDINATION WORKSHOP: Ms B Xulu</b>	<b>5</b>
<b>3. WATER RESOURCE MANAGEMENT IN NAMIBIA: Mr A Nehemia</b>	<b>5</b>
<b>4. PROGRESS SINCE 2010</b>	<b>11</b>
4.1 Ohangwena Regional Council: Ms Ndaitwa	11
4.2 NRC-CONTILL: Mr R Davis	14
4.3 The Bio-physical and Socio-economic Characteristics of the Cuvelai-Etosha Basin: Mr J Mendelsohn	16
4.4 Flood Management Planning by MRLGHRD: Mr P Roque	18
4.5 Water Supply Infrastructure Development and Capital Replacement Master Water Plan for the Central North Water Supply Area (CNSWA): Mr F Ihuhua	21
4.6 Groundwater Management in the Cuvelai-Etosha Basin: Mr M Quinger	25
4.7 Water Storage and Supply in the Cuvelai-Etosha Basin: Dr F Kluge	28
<b>5. THE WAY FORWARD</b>	<b>32</b>
<b>6. CLOSURE</b>	<b>36</b>
<b>7. WORKSHOP EVALUATION</b>	<b>36</b>

## **1. OFFICIAL OPENING**

### **1.1 OPENING REMARKS: US: DWF, Mr A Nehemia**

Mr Nehemia officially opened the workshop by inviting the distinguished guests and guests. He said that the Cuvelai-Etoshia Basin is a strategic basin and that relevant issues would be touched on during the ensuing two days within the culture developed of having annual workshops to obtain a microscopic view of the basin system. The purpose would be to review e.g. policies and strategies and the building of synergies. He cautioned that the world trend that calls for decentralisation at grass roots level should not be interpreted literally as there are many different governing systems across the world. IWRM was therefore implemented in Namibia emphasising three main aspects, i.e. recognition of the socio-economic dimension, focusing on people using resources to live; environmental and biodiversity requirements, i.e. the need for infrastructure within the context of nature and resources for generations to come; and hydrological and meteorological issues. All three aspects must receive recognition and must be managed. There were many players in the CEB – all doing something related to the three components, and their involvement could lead to progress or wastage. MAWF does not want to preach integration, but not apply it in practice. The workshop was therefore intended to share amongst stakeholders what each was doing and to harmonise efforts towards concerted effort by all. The workshop was aimed at coordination, but in earlier years it was called an annual planning meeting. Integrated planning is a cumbersome process but participatory planning is needed. Such integrated plans should form the basis for the coordination exercise – to see whether all role players are doing what they agreed to do and to ensure that efforts are coordinated. With a focus on coordination only, one is losing out on planning which is the basis. He further said that communities during the 90's were only concerned about water supply points. Today interest has expanded to include, e.g. where water is coming from. This has demonstrated achievement, but that the BMC should move beyond and create a platform where it would no longer be planning on behalf of others, but planning by those involved. The workshop presents an opportunity to learn and share with others and the call was therefore to interact – also during breaks. The US referred to an Oshikwanyama proverb, namely “Edina IOmbwa oku mu kweni ho li u dile – You will learn your dog’s name from someone. Delegates were thanked for their time and effort to work on the noble task of the CEB.

### **1.2 OPENING REMARKS: Country Director GIZ: Mr F von Kenne**

Mr von Kenne explained that Namibia was introduced to him as the most arid country, but upon his arrival he encountered never-ending rain. This has made him wonder about the accuracy of the statement. He went further to introduce the objective of the workshop as sharing and learning on IWRM in CEB and as a follow-up to the workshop held in 2010. The purpose of sharing amongst different stakeholders was to attain the common goal of sharing resources. This initiative was started 6 years previously with GTZ supporting these successful annual interventions. Since then, implementing partners, e.g. EU, has joined in. It was, however, his first time to attend such a workshop personally and would give him the opportunity to learn also about successes achieved to date.

Mr von Kenne explained that GIZ was a new name for which no official translation existed yet and that it was the new company for development in which GTZ, InWent, and DED merged. The merger did, however, not have any major implications for the project. The cooperation amongst the partners would be celebrated the next day in the ceremony to be held. He explained that GIZ had to follow the rules set by the donors and that these sometimes led to cumbersome processes and delays, but that every attempt was made to try and minimise the administrative burden to projects and to improve communication.

He concluded his opening statements by referring to the Namibia-German negotiations that took place in Bonn earlier that year, with the positive results that GIZ could embark on a new green-scheme and bush encroachment programmes in Namibia and that the two programmes, i.e. Communal Land Support and Integrated Water Resource Management, could be extended to 2013, in partnership with the EU, in the CEB.

He wished delegates a fruitful workshop and inspiring future cooperation.

### **1.3 WORKSHOP OBJECTIVES: MAWF: Ms M Amakali**

Ms Amakali said that it was the sixth annual workshop of that nature and that the initiative came out of the late 90's as a review project for the water sector in Namibia as a joint initiative between MAWF and GTZ. During implementation of the programme, the focus was taken to the CEB and working with the BMC. In planning with stakeholders, in the CEB, it was discovered that there were other initiatives relating to IWRM in the basin and it was then decided that it would be a good idea for stakeholders to learn from each other and to share resources during an annual planning workshop. The first such meeting was held in 2005. At the end of 2007 the nature of the workshop turned into a coordination workshop. She referred to Mr Nehemia's comment that the forum should not hide from planning together and reflected that the status of participating organisations were that some projects were in the middle of implementation of plans, some ending their activities, whilst others had new issues coming on board and that new institutions were coming into play e.g. the Regional Councils. It was thus a good platform, at basin level, to see, also for the Ministry as custodian of policies, how to coordinate and plan together. The objectives of the 2011 workshop therefore were to share, learn and coordinate. Delegates were also invited to also express their challenges and concerns.

### **1.4 PROGRAMME OVERVIEW: Moderator: Ms M Davel**

The moderator provided an overview of the programme and highlighted the following alterations:

- A new point should be added, i.e. the Introductory Remarks by the GIZ Country Director, Mr Von Kuehne;
- The presentations by the Omusati RC and on the Rural Water Supply Master Plan would no longer take place;
- The presentation by Mr John Mendelsohn would be postponed on day one until after 14:00 to allow for discussions during the morning programme;
- At the closure of day 1, the Gender Mainstreaming and Wellness Programme, also supported by GIZ, would conduct a short intervention with participants;
- Day 2 will start with presentations by Mr Martin Quinger from BGR and Dr Kluge from CuveWaters; and
- A video screening by MAWF/GIZ Project on the Exchange/Exposure Visit to Calueque and Ondjiva would take place at 14:00 on day 2. Subsequently, learners from Heroes School, Ondangwa would perform a drama on IWRM.

A copy of the programme is attached as Annexure A.

### **1.5 PARTICIPANT INTRODUCTIONS**

An opportunity was given to all participants to introduce themselves. Introductions were done per organisation, i.e.:

- Ministries: MAWF, MET, MRLGHRD;
- RCs: Ohangwena;
- Sub-basins: Olushandja, Niipele, Tsumeb; Iishana

- Projects: IWRM CEB, GIZ;
- Donors: EU;
- Academic institutions: UNAM and PoN;
- Technical Support, Research, Consultants: NamWater, CuveWaters, BGR, GOPA, Raison, NRC Contil, Creative Enterprise Solutions and EPOS.

A list of participants is attached as Annexure B.

## **2. FOLLOW-UP TO APRIL 2010 COORDINATION WORKSHOP: Ms B Xulu**

Ms Xulu explained that the focus of the annual coordination workshop held in 2010 was to:

- share information on:
  - the progress made in development initiatives in the CEB; and
  - water users' priority needs;
- identify gaps and cooperate opportunities and increase synergies; and
- harmonize coordination of common activities.

The outcomes achieved during the workshop were:

- 1<sup>st</sup> outcome: the development and prioritisation of a list of demand needs (refer p.7-8 of the workshop report)
- 2<sup>nd</sup> outcome: identification of areas for cooperation and coordination, voluntarily taken up by relevant organisations (refer p.9, 11-19 of the workshop report).

Ms Xulu asked organisations to present examples of initiatives taken up in the follow-up through of the 2<sup>nd</sup> outcome discussed, i.e. the implementation of cooperation agreements. There was no clear response from the floor, but an indication was given that some aspects of the areas identified were followed through by stakeholders. In other instances the some message did not get through to relevant organisation(s) and no relevant action was therefore taken.

## **3. WATER RESOURCE MANAGEMENT IN NAMIBIA: Mr A Nehemia**

### **Clarification of Terms**

Mr Nehemia quoted the Global Partnership definition of IWRM:

“IWRM is a process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.”

He went on to emphasise certain aspects from the definition, i.e.:

- Firstly, that IWRM is a process - aimed at promoting coordinated development, i.e. people are involved to get things done, and development is coordinated; and
- Secondly, management is involved. That does not imply being there as a boss, but to ensure that things happen in the right way, for an expected output. This is only achieved if targets and objectives are set and “what should be done to achieve” is made clear. This was the reason for the whole approach.

He went to explain that the definition was developed based on certain principles formulated in Dublin in 1992 with the aim to ensure an integrated effort, i.e.:

- (Fresh) water is a finite and vulnerable resource – essential to sustain life, development and the environment. The year 2011 had high rainfall, but in the years to follow that might be different and people has to plan accordingly. The regions in which the CEB falls has one of the biggest rural municipalities, e.g. the rural pipeline network is the largest in the world that Mr Nehemia has seen. One has to realise that without water there is no life and no sustenance of the environment;
- A participatory approach – every stakeholder must be on board and things should not be done on behalf of others. Water development and management should be based on a participatory approach, involving users, planners and policy makers;
- Gender/women play a central part in the provision, management and safeguarding of water. Most people in rural areas are women playing a major role in terms of the management and utilisation of water. Many technicians on the other hand are men, not necessarily considering the needs of women;
- Water has an economic value - in all its competing uses and should be recognised as an economic (and social) good, i.e. water does not flow by itself to the end user, but costs money to be carried. It must, however, also be applied for social good, i.e. even if a user cannot pay, s/he still has a right to water.

### **Overall Objective of DWAF**

Mr Nehemia explained that what government wanted was to create statutory bodies which would take policies forward towards implementation, i.e. the Ministries. DWAF was mandated as the body responsible for water-related issues in Namibia, with the aim to:

“Ensure that Namibia achieves a sustainable water and forestry resources management regime contributing to social equity, economic efficiency and environmental sustainability”

To achieve the above specific objectives were identified, i.e. to:

- Enhance the socio-economic development and environmental stability through participatory management of forest resources and other woody vegetation;
- Manage Namibia’s water resources according to IWRM principles; and
- Provide rural water supply services to rural communities in an improved, participatory and sustainable manner.

He went on to say that these were “heavy responsibilities” involving challenging functions due to e.g. the remote nature of services to be provided to even small numbers of service users, e.g. small villages in remote areas, and the need for fire wood due to electricity supply shortages across the country. In addition the ground water in Namibia is saline almost everywhere. CuveWaters was busy with desalination projects, but these involved expensive technology which needed to be investigated further to establish the viability and affordability to the country as a whole. Questions that arose were, for instance, whether government can install and sustain such technology.

### **Legislations, Policies and Strategies**

The following legislation was relevant to the mandate of the Department:

- The Water Act, i.e. the old colonial act, Act 54 of 1956 and the new act, Act 24 of 2004. Problems were experienced with implementation of the new act and the Ministry was busy reviewing the Act to make it implementable;
- The Forestry Act, Act 12 of 2001, amended in 2005;
- The Forestry Policy, 2001;
- The Water and Sanitation Policy (WASP) of 1993, revised in 2008;
- Namibia Water Sector Policy White Paper;
- The Community Based Management of Rural Water Supply (CBM); and

- MAWF Strategic Plan, 2008-2013

### **Operational Strategies**

The Ministry utilised the following strategies to implement its mandate:

- Community-Based Management (CBM):
  - On the water supply side new infrastructure was developed to improve access, aimed at 100% coverage by 2030. The 100% was, however, theoretical, e.g. due to breakages and replacements needed. This was the scenario even in most developed countries as all systems need maintenance;
  - The handover of facilities to communities for operation and maintenance, and eventually full ownership. The Ministry was, however, still investigating how to implement this principle in full;
  - Cost recovery for services provided;
  - Decentralisation; and
  - Gender mainstreaming.
- Forestry Management (refer to slide presentation for more bullets):
  - Establishing community forests, manage bush encroachment, minimize veldt and bush fires, tree nurseries and afforestation, and to prevent illegal logging.
- Water Resources Management towards sustainable water resources, including:
  - Pollution control: many countries do not have water for use due to pollution and protection against pollution is therefore a very important aspect of WRM. This is where IWRM comes in, e.g. water quality control of especially discharge and effluents. Waste must be dealt with in such a way that it does not pollute water resources.
  - Hydrological data collection and analysis to mitigate floods and drought impacts: One main function of WRM is the issuing of water permits, but there has to be an understanding of what one is dealing with and trends in development for the function to be performed efficiently. That information is based on the collection and analysis of hydrological data to mitigate e.g. the impact of floods and droughts.
  - Geo-hydrological investigation to understand the ground water regime: one questions, for instance, that arises is, “whose water is the water in the ground?” In the Ministry there is one division doing ground water research on the quantity, quality and utilisation of ground water resources for Namibia’s own development.
  - International waters according to SADC protocol, Africa Water Vision and other international instruments: perennial waters are only at Namibia’s borders, and these are shared with other states. As the country is part of the SADC family, the SADC protocol directed the sharing of resources with the country’s neighbours.
  - Planning as per GRN budget cycles as well as medium and long term planning; and
  - Establishing of River Basin Management Institutions: e.g. the establishment of river basin committees with other countries to deal with the needs of people after intensive negotiations and developing a sense of community.
- Bulk water supply: which is done through NamWater, ensuring that water is made available to big entities that require water in bulk e.g. municipalities, mines and agricultural schemes. This was a challenging task as water is not readily available at towns and the demand not evenly spread across the country. Specific challenges were experienced, e.g. a factory being set up in collaboration with MTI without prior consultation with MAWF. It was explained that Namibia has water, but not necessarily where it is needed e.g. by investors. NamWater was therefore responsible for bulk water supply across the country, whilst the other water related functions were allocated to e.g. the Directorates within MAWF.

- Bulk pipeline schemes: NamWater was responsible for the development of pipeline schemes, but Government was also involved in some development initiatives as NamWater was mandated to work on cost-recovery schemes and not all pipeline projects were viable for cost-recovery. Government involvement was therefore aimed to sustain the financial wealth of NamWater. After the initial capital expenditure and installation such projects were then handed over to NamWater to manage requiring them to recover operational costs from income generated.
- Desalination: there are areas in Namibia wherewith the country cannot do without, e.g. coastal towns, which was dependent on limited rainfall inland flowing to coast and underground aquifers. The design for the water supply of these areas was done in the 50's and 60's when there was sufficient supply for the demand at the time. These calculations did not take the world interest in the Namibian desert into consideration, e.g. the discovery of uranium, metals, etc. which resulted in a high demand for water. To address this challenge, the Government has endeavoured into desalination and was in the process of establishing a second desalination project together with NamWater.
- Large dams: due to the high levels of evaporation in certain areas of the country, the government has to invest in dams so as to reduce the potential evaporation of vast and shallow surface waters. Examples are Windhoek, Keetmanshoop and Gobabis which depended on large dams for their water supply and the Neckerthal dam being built near Keetmanshoop. These large dams came with their own set of problems, e.g. the Mariental-Hardap floods, which the country has to learn to manage. Such management is also dependent upon data capturing and cooperation with, for example, meteorological services.
- Earth dams – e.g. small excavations to retain waters. Earth dams have been in use for the last 50 years. Since there was a high demand on BMC's side, they have become part of the policy..
- Water Basin Management, according to the following principles:
  - Operational management of water resources shall be decentralised to the lowest practicable level. To give effect to this principle the basin approach was introduced to get everyone involved, through basin management committees, so that all parties would know what was happening on the ground, with the intent to utilise the knowledge of the people on the ground.
  - Sharing of water resources – the basin planning approach. Everyone sees water as “theirs”. The state, however, is everybody within the boundaries of the territory and the resource must be shared within these boundaries. Basin committees bring understanding of “what we are talking about”, help to ensure communication and information sharing, and contribute to access to water by all.
  - Involvement of stakeholders – through the basin management committees platforms are established to share and advise one another in a participatory manner.

## Conclusions

In conclusion, Mr Nehemia said that the GRN embraced IWRM and highlighted the following, regarding:

- Water Resource Management: according to the principles of IWRM, WRM is a process to achieve a sustainable water resources regime that contributes to social equity, economic efficiency and environmental sustainability. Thus, it has become a government policy.
- Water Supply, that:
  - storage, rainwater harvesting and desalination could have its own policies in future, but were at that point in time dealt with under bulk water development strategies;
  - water supply was aimed at developing reliable and accessible sources of safe water with sufficient capacity on a sustainable basis to serve all Namibians at an affordable cost;



- dams are examples of fresh water harvesting in Namibia;
  - technologies that can optimise the utilisation, e.g. at household and community levels, should be investigated further;
  - water supply in bulk was supplied at sufficient levels through dams at that point in time
  - water supply for the coast was harvested in the ground, e.g. from Ondell dam; and
  - it was a necessity that water should be provided at a cost that was affordable to the country as whole.
- Basin Management Committees: BMCs would be recognised for any purpose connected with the use, protection, development, conservation, management or control of a water resource in a basin or part of a basin and that BMCs were the only way to go, as they involved communities at basin level in water management. If all 13 basins would be managing water at basin level, Namibia as a country would be managing water and that would constitute Namibia having a water resources regime in terms of supply which meets demand and protects sources against pollution, and that the cycle would be sustainable through generations to come.

### **Plenary Discussion on the Presentation**

**Question:** There were three areas highlighted under water management. In the Netherlands two levels of challenges were experienced re the application of these principles as a result of development along rivers and dry land in lower lying polars culminating in the experiencing of limitations regarding land use planning and IWRM. The question is therefore posed as to how much leverage MAWF has re other line ministries to be leading the process, as the Netherlands learnt that water resource management should lead land use planning.

**Answer:** IWRM is a process and should be applied as such to overcome challenges. For example, the first thing one will notice when visiting ministries/departments was the attitude of “this is my territory”. It would therefore be problematic to go to Cabinet and state that these were the principles for development which should to be followed by all. A more realistic starting point was to obtain involvement of stakeholders at sharing platforms. After the floods serious meetings took place amongst ministries and problem areas were clearly indicated. Based on these discussions a submission was prepared to Cabinet highlighting the challenges faced re land use planning. The beginning would therefore be to raise awareness first in the process of overcoming resistance. It would be important to ensure that everything is right before doing the right thing, to ensure that the right things were implemented. It is therefore also the obligation of the forum to send out the same message that challenges that should not be existing were faced due to land use planning, e.g. that people could not be relocated every year because assets were lost, both at a personal level and as income to towns/municipalities. Raising awareness would rouse people to make the right decision at the right time. Leverage was not at that point as should be in Namibia as there were no policies re integrated planning in place, but the process was being facilitated through consultations.

**Question:** Earth dams cannot be established per constituency due to the high costs involved, but could awareness not be raised to harvest water the traditional way?

**Answer:** All effort should be undertaken in an integrated manner, and everything possible must be done at every level. The capital development section for earth dams was called earth dams and traditional wealth to allow for inclusion of traditional knowledge/wealth programmes. The Ministry was, however, not involved in developing traditional wealth at that point in time, but made provision for such initiatives to be added as projects.

Question: In terms of the principle of operational management decentralised to the lowest practical level, could more information be provided re the restructuring of the Ministry?

Answer: BMCs was a vision that was invented from “nowhere” of how Namibia would like things to work, with technical know-how provided to complement laymen knowledge. During the review of the sector new proposals were made re the institutional set-up to match the strategic vision. In government, resistance to change was experienced when change was suggested and strategies should be developed to deal with such resistance. In that specific instance the request for a review of the directorate lead to the restructuring of the whole Ministry. An expert was contracted in 2005 to do the restructuring, which was taken over later within the Ministry itself, and 2 years previously the Ministry formed a committee that was accountable at the time of the workshop. The new structure would establish a new division, i.e. a specific unit, which would deal with basin management through which resources could be allocated purposefully, as opposed to the current sharing of resources from various sources. The proposed structure was presented to the Secretary to Cabinet and suggested changes incorporated. The proposal was to be taken to the Cabinet Committee through the OPM and it was anticipated, with the next following budgeting to be undertaken in September/October, that the new structure would be in place. In the interim the arrangement of BSOs was in place to provide support until the full new structure could be implemented which would result in a complete office at basin level, dealing and channelling issues at basin level and providing continuity and consistency. Due to cost implications only four BSOs could be appointed as an interim measure. In the long term, however, one needs to employ people if the job is to be done and in the specific instance technical staff was needed which could only be obtained at high cost, e.g. the cost of engineers. The proposed structure contained the idea of decentralisation at basin level.

Question: The introduction of BMCs poses a real challenge in Namibia as the country was still much water supply driven, as opposed to the water resource management approach. It was also noted with concern that MAWF was not invited to the Land Use Planning Conference held two weeks prior to the workshop. The question to Mr Nehemia pertained to the content of the Cabinet Submission in view of the integrated nature of management, and whether other stakeholders e.g. land use, environment, etc. were consulted before the submission was submitted, especially since the aspect of integration was also identified during the Land Use Conference as the main challenge in Namibia.

Answer: The content of the Cabinet Submission emanated from the effects of the flood and was developed, but not finalised, the previous year to make Cabinet aware of the many issues involved in the flood disaster, including the design of the infrastructure. One of the recommendations contained in the submission reflected on the need for coordinated land use planning. A submission cannot be submitted to Cabinet without going to all relevant and/or affected O/M/As, with their written response included. No submission could therefore be submitted to Cabinet without being consulted on by all relevant line Ministries.

Question: Towns in northern Namibia, e.g. Ondangwa, were flooded by rainwater due to their low topography and would therefore, as a matter of course, be flooded during floods. Would drainage to another low area be a solution?

Answer: Ondangwa from the air looks like a tin roof. Money was needed to fill up the lower areas, employ a planner, etc. It was therefore a problem that could be solved by engineers, but which required money to solve.

**Question:** In terms of policy, coordination and implementation of research undertaken, how was the Ministry involved?

**Answer:** The research undertaken at that point in time was not up to standard. Previously a lot of research was done and data was available. In the early 90's the Ministry started looking at areas where specific information was needed and contracted consultants to undertake such research and with the creation of NamWater research was done only for the purpose of development. Previously the Ministry employed staff from all scientific areas with a clear mandate/task to graduates to do research work. The general research that was done in water affairs previously was therefore not undertaken anymore. The new development also limited interaction with research and others institutions e.g. UNAM. Under the new approach dialogue was undertaken only with the specific research institution contracted. The approach to research therefore needed to be re-looked.

## **4. PROGRESS SINCE 2010**

### **4.1 OHANGWENA REGIONAL COUNCIL: Ms Ndaitwa**

**General information** on the location and size of Ohangwena Regional Council was provided.

#### **The objectives of the Regional Council**

- To improve the provision of water supply and sanitation services;
- To stimulate regional economic development;
- To promote water conservation; and
- To ensure hygienic environment

**The Main Components** for each project were stated as inception, the procurement process (including specification re infrastructure), construction, community-based management (including training, participation, ownership of infrastructure and cost-recovery), coordination (as the RC was coordinator of all development in the region), and M & E (including water and sanitation).

#### **Challenges**

- Re piped water – the scarcity of potable water, where certain areas not covered yet, not even by boreholes. Construction was under planning by the Ministry as part of phase 6, and unaffordability of water;
- Re underground water – there was a high concentration of fluoride and pollution; the unavailability of data re the quantity of underground water and aquifers; and the high % of non-functional boreholes due to faulty infrastructure;
- Re flood water – it was destroying properties, e.g. about 96 schools were closed during the floods, and resulting in poor harvests and grazing;
- Re lack of resources – human: the regional structure was insufficient and staff was not yet enough for rural water supply and sanitation; and Niipele sub-basin did not have a BSO.

#### **Water Resources Plans**

- Re piped water - there was a plan to extend the water pipe throughout the region in collaboration with the Ministry. Some challenges were experienced in some areas where the pipeline could not be extended and the needs of the community were catered for by a reservoir. Another challenge was where communities could not afford to pay for water and where subsidies to vulnerable water users had to be introduced.

- Re underground water – a feasibility study would be conducted re the fluoride content in the water, for a desalination plant, and the quantification of underground water.
- Re flood water – a contingency plan for emergencies during heavy rain would be drawn up, and the harvesting of rain water for irrigation and aquaculture would be undertaken. One headman was committed to commit land and assist the MFMR with the implementation of fish farming.
- Re settlement areas:
  - Waste management would be looked at.
  - Oxidation ponds were old and needed to be rehabilitated. If money would be available the RC could be assisted by MRLGHRD to rehabilitate one point. At the time three boreholes were used to supply the Ministries of Police, Health and Education with water. Another oxidation point would be put in place through the Ministry, but another needed urgent attention and a request was tabled to MRLGHRD to avail money for its rehabilitation.
  - The sewerage system needed to be extended to accommodate the growing population, but the RC was doing relatively well in this regard.
  - Refuse removal was done through subcontractors.
- Re sanitation:

Constructing of dehydration toilets were undertaken through a programme in which approximately N\$20 million was availed from MRLGHRD. The programme aimed to address poverty levels, environmental sustainability and stimulate economic development.

  - The challenges experienced were:
    - scarcity of water or availability of piped water;
    - the risk of contamination of groundwater sources, for which a protective layer needs to be installed; and
    - that an awareness campaign on usage and maintenance would not be done as such a campaign was not included in the N\$20 million received.
  - The output and timeframe of the programme:
    - 1000 toilets at individual homesteads in all 11 constituencies;
    - 80 toilets at health outreach points;
    - 220 toilets at schools;
    - income generated by 22 local SME contractors;
    - utilization of local resources (labour, bricks etc.); and
    - improved health and quality of life.
  - Critical challenges facing the programme:
    - an environmental impact assessment was not done because of lack of funding and was still discussed by relevant parties;
    - pollution of groundwater – the toilets were constructed by MoHSS and the Red Cross, but the possibility existed that the toilets could contaminate ground water and the practice of using the bushes was still applied. An awareness campaign, including the use of facilities, was needed;
    - the scattered site location of toilets hampered project monitoring and evaluation. The Department of Works was conducting monitoring and evaluation interventions, but did not have sufficient staff to cover the whole region;
    - the cultural values and beliefs poses a threat when it comes to usage and maintenance of the toilets; and
    - the limited capacity in terms of qualified personnel re building inspections of the Regional Council; and
    - budget constraints resulting in the inability to provide toilets as required, or for extra items such as the basins.

- Future plans of the programme (Phase II):
  - construct toilets for public institutions This could, however, only be undertaken if clear guideline was provided by the Department of Works on which toilets had to be constructed, as different infrastructure was used in different regions at that point in time;
  - the hope was to have an environmental impact assessment done; and
  - to improve the sewerage system.
- Opportunities of programme:
  - improved health and quality of life;
  - poverty reduction;
  - employment creation; and
  - regional economic growth/sustainable development.

### **Plenary Discussion on the Presentation**

Comment: UNAM and CuveWaters were doing a study on water de-fluoridation of ground waters which should be completed towards September/October 2011.

Response: It would be good to involve extension officers in the project from the onset so that they could understand the processes from the beginning, which would facilitate information sharing at community level.

Question: The question was asked whether sanitation officers existed in the regions and how they were they involved, e.g. in awareness raising.

Answer: The structure still had to be approved, with the implication that no sanitation officers were employed at that point in time. Rural Water Supply Officials were fulfilling the function.

Question: There was a comment made in the presentation that toilets were too scattered. Was the reference to public or private toilets and was the intent to have toilets constructed for all households?

Answer: 1000 toilets were constructed for households during phase 1. Phase 2 would be the constructing of public toilets in health facilities and the next phase would be for education institutions. These should actually be done by the Ministries themselves, but due to the vulnerability of the people the RC was providing this service as the Ministries were taking too long to reach the communities.

Question: There was an indication that 78% of the community had access to safe water. How was that measured?

Answer: The statistics quoted were reflected in the 2001 national census and was therefore used.

Question: Ms Ndaitwa was involved in both the BMC and the RC. The question was asked on how the relationship was working and whether the RC was active in the sub-basin.

Answer: Ms Ndaitwa explained that she was working for the RC and that she was the chairperson of the Niipele sub-basin. As such she was reporting basin issues to the RC under the RDCC where all activities from all O/M/As were included in the action plan developed in consultation with all stakeholders. The Niipele sub-basin was newly constituted and still in the initial phase of development, but had an action plan to be implemented.

Comment: Pipelines were not the only solution re water provision. Catchment areas provided, for instance, was another alternative.

Question: The Red Cross toilets could be dismantled after use which was a more sustainable practice than the use of permanent toilets. Was this considered in the decisions made?

Answer: The Red Cross toilets were installed for VIPs. The issue under consideration, however, was the possible contamination of ground water. A guideline was needed re which toilets should be used, which could still provide for improvement and the use of temporary toilets.

Question: A question was asked re the community involvement in the two settlements where sewer system maintenance was applied.

Answer: The community was paying through monthly bills, but income collected was insufficient as it was a settlement. The maintenance team was doing what they could, but rehabilitation was needed before the next floods. With the help of the Cuban experts rehabilitation initiatives would be undertaken.

#### **4.2 NRC-CONTILL: Mr R Davis**

Namibia-specific Conservation Agriculture Conservation Tillage Project (CONTILL) is a conservation tillage programme aimed at the rehabilitation of soils. The project has been in existence for six years, with the first three years dedicated to trials, and the last three years involved in on-farm demonstrations on 500 farms. The results were greatly in demand and the project is doing well, but was facing some challenges.

##### **Initial Challenges:**

- making the best use of the only 300mm annual average rainfall, experienced during the early years of the project;
- reversing soil degradation due to many decades of poor agronomic practices; and
- involving both farmers and extension officers in finding the way out of an entrenched bad dry land crop production system.

Worldwide, agriculture (both crops and livestock) is the single greatest impact on the condition of land. In northern Namibia poor agricultural practices were leading to soil degradation, which leads to poor crop yields, loss of grazing, desertification and therefore poverty. Examples of such poor practices were demonstrated through photos (refer slide presentation for details).

##### **Economically viable Namibia-specific Conservation Farming**

The Namibian project has designed, developed and introduced economically viable Namibia-specific conservation farming through a number of practices, i.e.

- Soil pan breaking and in-field harvesting (tractor and animal drawn) ripper furrowing;
- Ripper furrowing before rains enabling early planting, without a 4 to 5 week delay, and establishes straight furrows for subsequent constant traffic;
- An animal drawn Magoye ripper fitted with wings for furrowing (2<sup>nd</sup> and following seasons);
- Use in the second season of the same lines, resulting in constant or controlled traffic, to ensure moisture and fertility build-up;
- A Namibian designed and developed mahangu planter mounted on a Magoye ripper with wings; and
- Applying of manure in furrows with a mixture of fertiliser. MAP at 75kg/ha and manure at 5t/ha has proved the most efficient method.

## The results

- Phase 1 – testing the technology: the rip furrow system through in-field water harvesting converts 300mm rainfall to an effective 520mm in the base of the furrow (refer slide presentation for diagram);
- mahangu root development to 30 cm (vs. 10 cm on compacted soil). With this system plants can deal more easily with floods as they are 6 weeks old and more established;
- good pearl millet germination;
- reduced workload per kg of food produced – which was of benefit to e.g. HIV/AIDS affected persons in Oshikuku;
- maize production in areas where this was not previously feasible;
- on-farm demonstrations on 226 farms would be undertaken during 2010/1 and assistance would be provided to extension technicians in the establishment of 60 on-farm demonstration (12 in each region). (The difference in results yielded is depicted in photos on the slide presentation);
- a market for omakunde was being established to promote the necessary production;
- the manufacturing of a local implement to the project's NSCF designs which was tractor and animal drawn. The different implements used in the CONTILL method were depicted in photos in the slide presentation;
- use of Lima Nawa methods which incorporate the following: mahangu timeously and properly spaced planting and good manure /fertilised mixed applications;
- better weed control and timeous thinning;
- a good start on crop residue incorporation;
- farmer members have risen from 17 in 2005 to over 500 in the current season;
- yield increases ranging from 200 to 500 per cent (300 kg/ha to 1800 kg/ha and more);
- increased agriculture technician acceptance;
- 17 AETs were practising NSCF on their own farms at the time;
- dissemination of materials, "Conservation Agriculture in Namibia, an Introductory Guide", including hand-outs, posters, calendars, etc.; and
- small holder farmers were taking up Namibia-specific conservation farming.

Mr Davis concluded that the main theme of CONTILL was the method used for tilling which left more soil on the land and prevented the top soil from being washed away by rainfall.

## Plenary Discussion on the Presentation

Question: The question was asked whether it was bad practice to plough with a tractor.

Answer: The answer was no, but that the problem lay in the method used in current practice. The CONTILL method required that a tractor be used in the first year, where after either a tractor or donkey/cow could be used.

Question: An enquiry was made on how many hectares and farmers were involved in the project until that date?

Answer: The method used was on-farm research. The initial control system involved 17 farmers in Omusati, which has grown to 500. The results were achieved with one tractor and one set of implementers through on-farm demonstrations on 1-2 ha per farm/field. The preparation of the fields was paid for by the farmers. One of the good outcomes was that 17 agriculture extension officers have also applied to use the method.

Question: It was enquired whether any salination was found on the top soil.

Answer: The answer was no re in-field harvesting, but rather the contrary. Another spin-off achieved was that there was no top soil loss and quicker drainage of water. A 30 cm

ripping depth was required to break the layer and obtain deep roots as a result. Transportation of water also was a positive factor. The technique should, however, not be applied during the rainy season, but must already be applied before the first rain so that there is a 5 weeks lead time before the heavy rains fall for the plants to grow thick stems that can withstand heavy rainfalls.

Question: It was enquired where rippers could be obtained.

Answer: Both rippers for tractors and animals were manufactured in Namibia, and the details of service providers could be provided.

Question: There were many complaints by farmers re birds. It was enquired whether CONTILL has found any solutions to the problem.

Answer: Birds on farms were an enormous problem, especially in some areas. CONTILL has imported a professionally developed bird scarer from RSA and tested it in collaboration with the Ministry, but the results were negative. A solution to the problem has, unfortunately, not yet been found.

Comment: There was a planting project undertaken in collaboration with UNAM, which was demonstrating good yield and was therefore a system with potential that could be further investigated.

Comment: Shield erosion was contributing to the problem, e.g. with oshanas getting shallower.

Comment: It was important not to forget agriculture in water management.

#### **4.3 THE BIO-PHYSICAL AND SOCIO-ECONOMIC CHARACTERISTICS OF THE CUVELAI-ETOSHA BASIN: Mr J Mendelsohn**

Mr Mendelson informed the delegates that posters would be put up and that inputs would be valued in order to make possible improvement. .

His presentation was on a broader basin, i.e. the Cuvelai Basin as it was of relevance to the CEB. He explained that there was no other place in world like it and that the presentation would present the wider context within which the CEB operated.

##### **A Sub-Continental perspective on the Cuvelai**

The Cuvelai was part of a bigger sand basin called the Kalahari Basin which was like a big sand pit. Over the years the pit progressively filled up with sediments, i.e. sand blown in by wind and carried in by water. The Cuvelai is an outlier of South-Central Africa with the basin situated amidst the highlands in Angola and central Namibia. The sediments in the basin, over years, made their way to the lowest point. As the basin is a flat landscape, water do not escape easily, with the rainfall being higher in Angola and lower in Namibia. One of the remarkable features is that the basin supports a large numbers of people in relation to the rest of Africa.

##### **The Kunene Cuvelai**

- Namibia shares water with Angola

The Kunene is a perennial river, one of two rivers in the whole system.

The iishana are very unique and found nowhere else in world.

The Namibian side of the basin was more deforested than Angola.

It might be worthwhile to consider sharing basin management with Angola in the future



- Namibia shares electricity with Angola (Hydro power station Ruakana on Kunene)
- Namibia shares fish with Angola
- Namibia shares grazing with Angola  
Animals come from the Angolan side, and grazing takes place also across the border. The Namibian Kwanyama take their cattle to Oshimolo every year for grazing.
- Namibia shares a history with Angola, e.g. Mandume Ndemufayo.

### **The Namibian Side of the Basin**

In 2010 there were 1,2 million people in the basin, which is a higher density than in the rest of Namibia, with approximately 70% of the population living in the Namibian part. The high population density is linked to the soil-conditions. In Angola large parts of infertile sands are found. In Namibia eastern Oshikoto and Ohangwena are also very sandy for most parts. In between the infertile sandy parts there are different kinds of soils, e.g. alluvial soils (i.e. clays), and a mix of alluvial and windblown soils. People are concentrated on the comparatively rich soils, which is a fundamental reason why people settle in the basin and why the basin can support people, i.e. the soil is a fundamental building block of the Cuvelai. Water drainage systems for surface water flow are found in the broad open iishana in the west, with its wide grasslands which are very saline and results in a lot of evaporation. In the central areas the north-south drainage is blocked by the delta and water comes together and flows directly south, ultimately towards Oshakati, resulting in floods from the local rains and the inflow of water from the north. The water, therefore, is a fresh water system (as opposed to a saline system).

The land use and tenure system in the whole southern area is almost completely freehold communal area, but also includes the Etosha National Park. The land use system has interesting consequences for tenure, development, etc. as communal land principally provides for a “free for all”.

There is a strong indication that in the past, millions of years ago, the Kavango water flowed into the central areas. During these periods heavy water flow was normal, forming the kinds of soils the basin now depends on. Other periods were very arid, indicating that the basin had a long history of extreme climatic change. The comment was made that one should reflect on change during these evolutionary stages in terms of the definition of dramatic climatic situations in the current day.

### **Some Ideas on Water Management**

The presence of shallow wells is fundamental to the presence of people in the basin, with some of the wells producing water for hundreds of years. The existing challenge was that more needed to be known about aquifers to improve access, but, in principle, one could be too dismissive about their importance in the basin.

Flooding, especially of Oshakati and the effect it had on the poor, was a big concern. The floods, in the north needed to be taken seriously and required attention from those involved in planning, especially in the Oshakati area where the effect on the poor was serious. Dykes were being built around Ondjiva which prevented a lot of flooding into the area, but the water dammed up outside against the dykes which resulted in consequences for the surrounding areas. A solution developed by engineers was needed. Broader issues also need addressing, e.g. with the huge numbers of people affected in rural areas the focus should not only be on business and the more urbanised areas. Special care is needed by those who do not have external resources to help themselves. An effort was needed to go out and find resources to help the poorest of the poor and to address existing inequalities. The processes introduced by CONTILL provided some solutions. The floods pose interesting opportunities and needs.

### **Plenary Discussion on the Presentation**

Comment: Flooding does not affect all areas in the north equally. To concentrate on building higher areas was a coping strategy, which was not necessarily sustainable. An effort should be made to zone land in a flood year and to teach people in affected areas strategies to cope.

Response: For small households floods have huge consequences on the welfare of the people. One example is the resources needed to plough fields, which was not necessarily readily available in a small vulnerable household.

Comment: A comment was made that the manure created in Angola due to Namibia cattle grazing in Angola should be imported back into the country.

Response: Namibia has lots of manure.

### **4.4 FLOOD MANAGEMENT PLANNING BY MRLGHRD: Mr P Roque**

Mr Roque explained that he was part of a team of 32 Cubans helping MRLGHRD. A team was sent out to do field work over a period of 12 days and to come up with recommendations re the flood affected areas. In his introduction he explained that understanding of the catchment area, where the water was coming from, was important in terms of developing solutions to the flood-stricken areas.

#### **Areas Visited and Observations Made**

During the visit the following areas were visited, key findings made and specific preliminary recommendations developed:

- Oshakati Town
  - Oshoopala and Ekuku Relocation Camps were located in high topographical points and have been used to relocate the population coming from flood affected areas. Floods in these areas were mainly caused by heavy rains and the overflow of the Kunene River. Floods have affected the population, road systems and crop fields.
  - Okatana
    - The Cuvelai basin with its oshana system allows the water coming from the south of Angola to pass through to the Etosha Pan. This has a significant effect on the penetration of the waters in Oshakati through Okatana, with the waters flooding Oshakati, Ongwediva, Ondangwa and its surroundings settlements.
  - Oshoopala (Relocation Camp)
    - Oshoopala is an informal settlement, located in a low lying area; where there are around 10 000 people living. The place was almost entirely under water during the floods.
  - Okandjengedhi
    - Due to a dike that was built the area was protected from severe impact during the floods, although a part of the area was affected by a break of the dike.
    - The Oshoopala-Oneshila-Okandjendhi area was the lowest part in Oshana leading to the accumulation of the flood waters in that area and resulting in the school, housing and roads being disabled. Specific reference was made to the insufficiency of bridges, e.g. one bridge on the Oshakati main road that had too few culverts for proper water drainage with resultant effects on the surrounding areas.
  - Ekuku (Relocation Camp)
  - Etale Lyambango Bridge

- Upindi  
This low lying area was affected due to the extent of the flood waters in the iishana.
- Ongwediva Town  
Damages in Ongwediva caused in 2008 led to the Town Council deciding to build canals to evacuate the flood waters. One bridge was submerged by flood waters and one of the accesses to the bridge was destroyed.
- Ondangwa Town  
The town was affected by the waters coming from Omashaka to Onguta and flood waters have to pass through 5 culverts located under the railroad, resulting in the slow drainage of water from the iishana beyond the railroad. A small dam in the area has a canal which was not working properly. In some areas the floods were persistent because the water could not pass through due to the slight slope within the evacuation course.
- Uukwangula Settlement  
As the extension area for housing was flooded at the time it was advised that the people should be relocated to higher areas. A sewer pumping station located in the area would be connected with an oxidation pond which was under construction at the time. A football stadium located in a high area of the town sustained slight damages due to the heavy rains. These damages should be repaired through a “vegetable cover” in the tiers area and systematic maintenance to the drainage systems.
- Eheke Settlement  
Roads were flooded by flood waters and some roads were washed away due to the insufficiency of the number of culverts in the roads. This resulted in the disabling of the settlement school due to lack of road access to the school.

### **Recommendations for Oshana Region**

The most important factors contributing to the floods were listed, with mitigating solutions suggested:

- Influence the river overflow:
  - Increase the rivers and their main stream sections;
  - Control the overflow in the riverbanks and their main streams by means of dikes;
  - Define waters evacuation points from the rivers;
  - Build canal systems from evacuation points to allow the water to pass through to the Etosha Pan in order to preserve the ecological balance.
- Influence of topography:
  - Allow the waters to pass through;
  - Where possible, limit the expansion of flood waters outside of the oshanas’ limits by means of earth dikes;
  - Locate sites to reserve some of the flood waters for their later use.
- Intensity of rains:
  - Take into account in future planning the annual average of rainfalls over the last 50 years or more for the development of towns and settlements.
- Influence of road’s characteristics:
  - Elevate road levels, where necessary, to avoid flood waters overflowing and destroying some sections;
  - Take into account flood waters’ natural lines of flow, according to the topography, to locate the culverts through the roads;
  - Increase the number of culverts, where necessary, for the waters to pass through;

- Where necessary, increase the bridge dimensions and elevate their circulation board levels for the waters to pass through and to avoid overflow.
- Influence of drainage characteristics in towns and settlements:
  - Build gutters with appropriate slopes to force the waters to pass through;
  - Build kerbs in all paved roads of urban areas;
  - Build gutters in all unpaved roads.
- Influence of informal settlements:
  - Avoid informal settlement constructions;
  - Establish construction limits in order to avoid the proliferation of housing in the Oshana area;
  - Elevate floor levels in all housings and buildings;
  - Eliminate all informal settlements.
- Physical Planning Influence in Perspective Town and Settlement Development:
  - Increase and improve all the studies and analysis for town and settlement development taking into account the topography, the rainfall behaviour and flood characteristics.
- Influence of the location of crop fields:
  - Redefine the location of crop fields taking into account the influence of the floods;
  - Guarantee the correct location of drainage systems in crop fields which allows for an appropriate humidity level in them and to avoid the water from accumulation.
- Influence of indiscriminate building materials extractions:
  - Avoid building material extractions in low areas, near to bridges, roads and urban areas;
  - Establish specific areas for building material extractions.

### **General Conclusions**

- Carry out the necessary studies in order to find permanent solutions;
- Build a dike in the peripheral area of Oshakati Town in order to reduce the floods into the Town;
- Flood waters should be driven outside of populated area, through canals, to the Etosha Pan;
- Global solutions would contribute to local site solutions and reduce the number of challenges faced.

### **Plenary Discussion on the Presentation**

Question: In terms of the recommendations made, were strategies developed to achieve implementation, e.g. a communication strategy, financial strategy, etc.?

Answer: The work was done over a period of 12 days only and it was therefore difficult to develop more detailed information due to time limitations, especially with the amount of information that was available and had to be collected.

A tender was put out by Oshakati Town Council to build a dike which would be included by the Ministry in its recommendations.

Comment: The MAWF was conducting approximately the same survey as the one carried out by MRLGHRD.

Response: A survey was conducted approximately 2 years earlier and more or less the same recommendations were made, but there was no money to implement the findings. A tender was put out by the Town Council to build the dike and deepen the canal, but there was also a need to look at the local drainage system after these 2 contracts have been completed. The master plan for Oshakati, however, involves ½ of the country's budget, which was not viable with the resources available. Stakeholders had to be involved to sign off on and implement viable recommendations.

Comment: Dikes could transfer the problem to another area(s). Scientific simulations were needed otherwise Namibia might make the same mistake as Germany/The Netherlands, and recommendations had to be looked at in terms of their inter-dependencies. This should be done through simulations and the development of models.

Response: Many factors need to be taken into consideration and further investigations were required based on the information available. The recommendations made in the report were just a beginning, but information was needed to substantiate the recommendations.

Question: Was any research done on the profiling of any given oshana, e.g. through dry drilling?

Answer: No research was conducted. The recommendations were built on previous experience and expertise. Information would have to be obtained to develop recommendations further. Solutions were not easy and mixed expertise was needed to develop such.

Response: The canal was not working properly. The problem needed to be explored to find solutions e.g. topographical analysis and maintenance.

Question: There were some interesting points raised in the recommendations. To comment on one or two: e.g. to increase the discharge capacity would not be solving the problem, as it would increase erosion. Insufficient storage was more the problem. Rural and urban inter-dynamics need to be taken into consideration, e.g. the urban discharge question might impact rural consequences. What should be looked into was increased storage and controlled discharge into e.g. Etosha.

Response: Two dams existed at the time, but was not working properly, resulting in a storage problem. A bigger problem, therefore, was maintenance.

Comment: A sense of purpose was needed, e.g. behind all the surveys. People must be serious about addressing the problem, which was currently not the case. Some initiatives could be undertaken over the short term at low cost, but needed will to undertake and implement.

Comment: Some issues needed immediate action as were identified by the Ministry. This led to the creation of the CEB, i.e. to raise the levels of awareness and involve the people. The need to monitor and manage had to be developed over time, e.g. sediment builds up. It was important, however, to ensure that solutions were not “quick-buck”-driven (e.g. consultants posing solutions where they did not have sufficient expertise). The stakeholders had to be the eyes on the ground and should therefore be involved to ensure viable solutions. It was important to do a proper job, i.e. the right things must be done, thinking cause and effect and long term consequences.

Comment: During the floods lives were lost. It was therefore important that the social responsibility be included in the approach/response.

#### **4.5 WATER SUPPLY INFRASTRUCTURE DEVELOPMENT AND CAPITAL REPLACEMENT MASTER WATER PLAN FOR THE CENTRAL NORTH WATER SUPPLY AREA (CNWSA): NamWater, Mr Frans Ihuhua**

Mr Ihuhua said that the original document consisted of 600 pages which he would try to summarise in the short time allocated for the presentation.

##### **Geographical Distribution of Water Development and Supply Plans**

NamWater was a bulk water supplier to industries and town/regional councils, including Kunene North, Omusati Region, Oshana, Ohangwena and Oshikoto. The CEB consisted of approximately 26

million hectares, spanning five regions, with the main supply being the Kunene catchment area (which spanned 20 km into Angola). This included the canal of 152 km from the Calueque dam, through a pipeline and open canal up to Oshakati. There were four water treatment plants in the 4 regions and the population 800,000 included 12,000 customers. Volumes of water were extracted from the Calueque station and one other minor station and supplied to the four treatment plants. This involved 40 pump stations and over 300 pumps/motors running the whole time. NamWater's staff has also been reduced over the years from 600 to the current 137 employees, i.e. almost 1 employee per 12 customers. Such a ration was difficult to sustain. The network of pipelines put in a straight line would be a 4,000 km network. In the CEB two sectors of customers were found, i.e. the bulk users and individual/private households, with bulk customers forming only 1% of the customers, and individual households being 99% of the customer base. This required of NamWater to fulfil a municipal function. 96% of the revenue generated was from the 1% bulk users and only 4% income from individual customers. To operate such a system in a cost-effective manner was a tricky business.

When NamWater was established in 1997/98, its customer-base was 2,000. It had since grown to 12 000. The growth has been therefore been tremendous, especially in recent years, where growth was almost 20% per annum. The workforce of NamWater has, however, decreased from 1200 to 600 (i.e. 50% after 20 years). This challenge was currently being addressed in collaboration with the Ministry. NamWater was reporting to Ministry.

NamWater also supplied water to Etunda, for fish farming and small scale farming/vegetation projects. The work load was divided into 8 zones, i.e. the canal formed zone 1 because it was the source of supply from Calueque and required civil engineering work. The other zones were determined by the nature of work to be done and the costs involved, which was based on the demand. The cost and budget for the Water Development and Supply Plans was summarised and displayed in tabular format (for more details refer to the slide presentation).

### **The Status of the Plan Implementation**

The spending plan (19,399,432) covered the period 2010-2015 and was depicted on a slide during the presentation. (Refer to slide presentation for more detail.)

### **The Five Most Pressing Challenges towards achieving the Plan**

- Water meter deficiencies and shortcomings, e.g. no cages resulting in vandalism and causing losses, needed serious addressing;
- Sustainability of potable water supply, especially in view of 99% of the customers being individual households, including vulnerable groups e.g. the old age, who could not pay for water use;
- Project area mapping: as the CEB was a vast area and properly recorded information was not readily available, e.g. the proximity of pipelines were not always indicated on maps, information capturing in an organised manner and shared with teams working in the CEB was needed;
- The mixture of customers, which included bulk (urban) and rural users (through their off-take);
- The open canal system and annual repair work (due to e.g. the extent of the infrastructure and the impact of the floods); and
- Shortage of expertise, which was a global trend, also experienced in RSA. The challenge was, for instance, to find electricians and in that regard NamWater was competing with town councils, private companies, mines, etc. The situation was worsened through the low supply of qualified persons from tertiary institutions into the market.

### **Five Key Actions to address the Challenges**

- Installation of caged water meter boxes and electronic flow meters (which would be replacing manual meters);

- Different tariff structures for customers, which would be proposed at the end of the month to stakeholders. The existing price structure was for bulk supply, but the increasing responsibility of NamWater obliged them to revise the structure to benefit vulnerable groups;
- Cooperation and assistance from central GRN to manage individual customers, i.e. where NamWater could not meet infrastructure construction requirements, e.g. at Opuwo, where the cost of investing surpassed the recovery potential, the Ministry would undertake such initiatives, as NamWater was working on a cost recovery basis;
- Proposed pipelines for flood prone (vulnerable) canal sections, e.g. Oshikoko town was affected each year due to the super-passage of flood waters half way between Oshakati and Oshikoko where continuous damage was sustained due to flood waters; and
- 14 engineers and over 300 water artisans were trained over the past 10 years. Some losses to other institutions were experienced, but this was an attempt to develop capacity.

#### **Five Opportunities NamWater sees to Strengthen Actions**

- Electronic meter installations working with telemetry which would successfully monitor all main reservoirs in the Cuvelai basin. Good strides were made with the installations;
- Collective research to pursue brackish water desalination e.g. in the Gobabis area. At that time 96% of the water supply was from Calueque and only 4% from groundwater sources, but that resulted in a potential vulnerable situation. A project was therefore initiated to look at the Kunene transboundary situation;
- The capturing of data in AutoCAD or ArcGis format, which would result in better information sharing. At the time information sharing was not well-coordinated;
- Creation of irrigation off-takes from piped canal sections to meet small scale farmer demands. Meters would be installed to monitor usage;
- Regarding the open canal system and annual repair work it was realised that the solution of 20 years ago was not working anymore and that a credible alternative had to be explored. An alternative that was being investigated was desalination projects; and
- The extension of capacity through the exchange of international experts and students.

#### **Plenary Discussion on the Presentation**

Question: It was asked whether alternatives were explored in the master plan re the operational costs and cleaning of the canal.

Answer: Five to ten years previously water off-take points existed, but they were no longer in existence due to vandalism. Animals were removed from the canal and grids were installed to prevent animals from entering the canal at certain points. The Kunene transboundary project looked at the canal too and suggested that a pipe be installed, but it was realised that the canal was a source of livelihood for many and that such an option was not viable. A long term plan should therefore still be found. The cost of laying a pipeline would be N\$2 billion. An alternative which was being explored was to look at installing a pipeline only in the critical areas.

Comment: The closing of the pipeline would help with illegal harvesting and curb operational costs.

Answer: It was often a case of terminology which was difficult to define, e.g. in the definition of illegal off-take, the economic viability of the area should be taken into account to determine whether it was an illegal practice or not.

Question: In the chapter on water resources in the plan, what were the main characteristics identified, e.g. did NamWater consider the selling of raw water to small scale farmers as well?

**Answer:** Underground water was considered to be unsuitable for use and the most reliable source was still Calueque. No work was done by NamWater to extract groundwater due to the international protocols that were in place re the sharing of water. Raw water was therefore not sold at small scale, but people have been extracting such. Only in the case of large scale extracts, e.g. Etunda, do contracts exist and was extracting invoiced. Ground water sources presented an opportunity that could be investigated. There was a need to talk with industry players to bring small scale users on board, but some were of the opinion that such users should get the water for free.

**Question:** What were the challenges faced in the four water treatment plants?

**Answer:** With the one new plant there were no challenges experienced at that point in time. Olushandja, however, needed refurbishing and its capacity had to be increased. At Ombalantu the storage facility needed to be improved. Oshakati was the heart of the supply to even places like Ongwediva and the Region. Its capacity over the next 20 years needed to be increased. Ohongo was a back-up for Oshakati and the oldest facility, and needing refurbishment and increased capacity. The project had to get off the ground as soon as possible and the two countries needed to be looked at as part of the whole, complete system.

**Comment:** Groundwater research was a relatively new study and a plan re the use of groundwater was being developed which could provide a possible supply back-up. It was a cheap water source. More communication/interaction was needed in this respect. Drilling was undertaken at that point in time at Eenhana.

**Question:** It was said previously that Opuwo received class C water. Was that still the case?

**Answer:** At that point in time the water received by Opuwo was of the best quality in the country. In the past boreholes used to be used which resulted in scaling of pipes and high concentration of sulphur, which resulted in diarrhea where people were not accustomed to the water. Since the introduction of RO plants in 2009, Opuwo was receiving class A water.

**Question:** How many water artisans were being educated at that point in time and at which cost recovery rate was NamWater operating?

**Answer:** Approximately 30 water artisans, from all disciplines, were being trained per year. The water-side had been scaled down in recent times in favour of the other disciplines. Re the cost recovery rate: the central-north was being subsidized (due to the individual users to whom water had to be supplied) by the other two sectors (i.e. central and south, which could be run cost-effectively due to Windhoek and the mining sector). Over N\$82 million was currently owed by water point committees.

**Question:** Was there a project in operation or investigation with Angola to take water from the (Kunene) river?

**Response:** Namibia met the previous week with Angola and consultants were, at the time, developing terms of reference for the project. There were two projects that would be meeting at Ondjiva, one from Angola's side and one from Namibia. These would provide a back-up system to avail more water, but were only in concept stage and no concrete proposals were developed yet.

**Question:** Was there an existing back-up plan/system should the canal be interrupted?

**Answer:** Storage capacity of four days was available at the treatment plant(s), as well as a back-up supply line and a fore-dam that could pump one million cubic meter water into the canal. This capacity was sufficient to safely meet the demand for a period of two weeks.



Question: What were the annual maintenance costs on the canal?

Answer: Approximately N\$10 million, including desalination of treatment plants, etc.

#### **4.6 GROUNDWATER MANAGEMENT IN THE CUVELAI-ETOSHA BASIN (CEB): BGR: Mr M Quinger**

**The Results Chain for Groundwater for the North of Namibia: Phase 2**

Mr Quinger introduced the project at the hand of a diagram (refer slide presentation for details) depicting the objectives and expected outputs and emphasised the following points, i.e. that the:

- 1<sup>st</sup> pillar was information on ground water, but that the whole area was not covered;
- 2<sup>nd</sup> pillar was capacity building and that progress made was remarkable; and
- 3<sup>rd</sup> pillar was information transformation to management.

##### **Expected Results of the Project:**

- Defining of the boundaries of the different groundwater bodies in the CEB;
- Elaboration of strategies for drinking water supply (fresh water), water supply for livestock and irrigation (fresh and/or brackish water), and desalination solutions in specific cases (in support of CuveWaters); and
- Sustainable integrated water resources management (IWRM) using well founded groundwater information.

##### **Steps from Groundwater Investigation to Management**

As it was difficult to get exact data re groundwater, the following steps were important:

1. A desk study of available data, including maps;
2. Field research / hydro-census, e.g. through water samples;
3. Geophysical investigations;
4. Drilling of boreholes;
5. Monitoring quality and quantity to get feedback on how the aquifer was reacting to use; and
6. Evaluate (throughout and at the end) and disseminate information (e.g. for decision making)

##### **Results from the Hydro-Census**

The results from the hydro-census on the water quality classification per region were depicted in a bar chart and interim-result quality map in the slide presentation. Various methods for obtaining the data were depicted for indirect geo-physical investigations. It was reported that the best results were obtained through direct investigation, i.e. drilling and monitoring of boreholes which provided:

- insight to calibrate and verify indirect investigation measures;
- first assessment of yield;
- assessment of the quality of the water; and
- for the monitoring of the development of water resources while being used (quantity and quality).

An evaluation of the investigation data was displayed in graphical format in various slides during the presentation. The importance of not upsetting the sensitive balance between salt and fresh water were emphasised. For this purpose a sealed pipe was used for abstraction of fresh water. This concept was very crucial and had to be understood by e.g. the BMCs, due to the severe implications and importance for the protection of the resources.

## **Develop Conceptual and Numerical Hydro-Geological Models**

Once again, the concept was explained at the hand of graphic slides. The importance of water level monitoring was emphasised as calculations could not be based on calculations based on data not available. Substantive information had to be obtained for credible sustainable abstraction of ground water. Data management and dissemination was another important element through which central data was brought to everyone. Such data needed to be updated frequently, also for the use by users.

## **Preliminary Results**

Preliminary results indicated that there were clusters/layers of aquifers and that the central area was unfortunate re groundwater as it was not usable. There was a rough indication that there might be a deeper layer which could provide for better groundwater sources. The green layer (as depicted in the slide) was already in use which was very promising. A set of boreholes had just been completed which indicated that water resources could be extending further into east with sustainable abstraction rates between 4 to 20 million m<sup>3</sup>/annum. These results were preliminary and could not be verified with surety at that point in time, but looked very promising, i.e. that the upper aquifer might provide a good opportunity to be developed as an agricultural area. These sources could possibly also feed into the central area (depicted in orange). It was hoped that better insight would be obtained into the coastal areas, where the estimated yield were still unclear, but the geophysical interpretation at that point in time gave the impression that the yield could be 100 – 200 meters, as opposed to previous indications, which provided good prospects for further exploration. The Oshivelo region (depicted in blue) indications were of a possible yield of 10-15 mil m<sup>3</sup>/annum, but as the area was not a current priority, it was not explored at that point in time.

## **Overview of Potential Aquifers**

Rough figures were developed by looking at the ground quality, e.g. water vs. rocks, and for sustainable use re the recharge capacity, e.g. run-off of floods. It was, however, difficult to calculate renewable recharge data as water had to be abstracted to have data on the availability and recharge-capacity. Some recommendations about potential use of ground water sources were presented to decision makers, who were careful to abstract from these sources as the data was not accurate yet. This presented a catch-22 situation as abstraction was needed to complete the data. Groundwater has the advantages that it is piped and do not need treatment. It is therefore a safe and economic source which was not used sufficiently in Namibia.

## **Outlook and Recommendations**

- Ongoing exploration should be undertaken in the Ohangwena and Omusati areas;
- Abstraction recommendations and plans should be developed with local authorities / stakeholders;
- A monitoring network should be designed and implemented;
- Abstraction options should be re-assessed; and
- Groundwater should be integrated into the holistic water resources management.

## **Plenary Discussion on the Presentation**

Question: A graphical profile for all constituencies, including quality variation of water, was depicted. Was such information available per aquifer?

Answer: The charts containing such information were drafted, but needed official completion. The information was therefore available. In some areas the fluoride content of the water was found to be too high and BGR was working with CuveWaters to develop technical solutions in this regard.

- Question: Was the estimated volume indicated in the slide 15 billion?  
Answer: Yes, but the figure referred to stored water which has high salt deposits and the use of the water was therefore not looked into due to expensive process of desalination. The deposits were also in an area where there was no high need for water at present due to the surface water received from Ohangwena. The pipeline was also close in proximity and could easily be connected. The possibility of a deep-seated aquifer in the area, however, existed.
- Question: How can cooperation with BMCs be improved e.g. re research and management? Can cooperation with BMCs be included in the next operational plans of BGR?  
Answer: Cooperation could easily be undertaken. For geo-hydrology such cooperation was essential especially regarding research, as the section was completely under-staffed and the assistance of the BMC was needed to support e.g. data collection. The BMCs could be supported with equipment. What was important, though, was for stakeholders to understand that the research could only be conducted in undisturbed circumstances, i.e. where there was no off-take. 100% support was thus needed from the people living in the area. The BMCs could provide support in this regard.
- Comment: A new aquifer was found which was fed from the Caprivi, where data-capturing from within the Caprivi could be of great support. It would be of great help if BMCs could provide support in that regard. NamWater has 118 schemes in which abstraction was only undertaken when data was known. Such information was often required before groundwater sources were utilised. A very reliable back-up supply existed e.g. for small scale irrigation in groundwater resources. Such supplies were available e.g. in Oshivelo. In the north there was no monitoring system in existence. Such a system would form part of a bigger system. Challenges re obtaining research data was experienced, e.g. tapping/take-off from the resource.
- Question: It was always the understanding that ground water was not a sustainable resource for water supply. At that point in time there was a project under consideration for funding by KFW, Angola and Namibia to supply water from Calueque to Oshakati at a rough estimate of N\$1 billion submitted to the EU. This was not a request for back-up, but rather substitution of water supply sources. The information provided in the presentation raised questions re the requested project. Was ground water considered in the Cuvelai-Etoshia strategy? It was realised that political/government policy also plays a role and impacts on decisions and requests for funding.  
Answer: KFW contacted GBR in 2010 and was informed about the potential, as a pipeline, in principle, was vulnerable and that the option to substitute such through ground water sources existed. Engineers, however, want hard figures which could not be provided at that point in time. Options could, however, be discussed as it was always better to use water available per site, than to transport such from another destination.
- Comment: Quality water should be used for human consumption and others for green schemes.
- Question: The impact of drainage systems was questioned.  
Answer: All draining took place into Etoshia which was the lowest point.  
Comment: Etoshia was like a sink. There was, however, fresh water underneath and others options were to source water from Angola. The flow of water from Angola into Namibia was, however, not completely clear yet. The Tsumeb area recharged quickly.

Comment: Water inflow was higher on the eastern side of the Etosha pan. Collaborative studies were, however, needed to understand the basin and should be made available to all stakeholders.

Question: Information was needed so that bore holes drilled would not be drying up after a couple of years.

Answer: Recommendations could be made for rural areas. Drying up could also be the result of the way the borehole was drilled and it would be important to also share best practices with stakeholders on drilling of boreholes.

Question: In the development of a guideline for licensing, were the stakeholders involved? And does BGR have enough staff to train BMCs re monitoring so that they could be involved in the processes?

Answer: Yes, BGR would be making technical inputs to the licensing policy, but inputs from law and administration would also be obtained. The guidelines could, however, only be developed once the Water Act was passed as it needed to be in line with the Act. The role of GBR in licensing would be to verify the sustainable abstraction from the site in areas where such verification can be verified.

Re training – BGR did not have enough staff, but could start with capacity building and would be going into the field over the next following two week and could include staff to develop understanding of the process.

Comment: Guidelines were drafted, but it would be good to involve local people in the implementation and verification processes. The first implementation would be in the Oshivelo areas.

Question: Etosha National Park have over 200 clients per camp per night, 500 elephants, etc. but no dam. What suggestions could be explored to substitute the absence of a dam? And would the construction of a dam hinder supply to the Etosha Park? Etosha was at the time dependant on underground water.

Answer: A dam should have no effect on Etosha.

Comment: Both a dam and ground water were sources for bulk water supply, and a dam was therefore not required for bulk water supply.

Answer: Groundwater has a buffer effect and could be used in combination for sustainable development.

#### **4.7 WATER STORAGE AND SUPPLY IN THE CUVELAI-ETOSHA BASIN: CUVEWATERS, Dr F Kluge**

##### **Regional Challenges**

Mr Kluge started his presentation by highlighting regional challenges experienced, i.e.:

- rising population growth and urbanization;
- dependency on water transfer;
- lacking wastewater treatment;
- high climate variability;
- land use pressure; and
- coexistence of traditional and modern Institutions.

The above factors resulted in rising demands for management of natural resources.

### **Approach by CuveWaters**

The aim was to improve the livelihoods of the people through innovative water supply and water re-use technologies adapted to regional conditions (economic, ecological, and social). Achievement of the aim was approached through a multi-resources mix, complementing the work of GIZ and BGR, and was based on four pillars, i.e. three pillars on gardening and one on drinking water (health improvement).

The aims of the pilot phase: phase II were community-based implementation of chosen technology lines. The approach included much work in capacity building and decision support systems related to IWRM at a regional scale.

### **Successes Achieved in Rainwater Harvesting (RWH)**

Rainwater harvesting could not substitute permanent supply, but enabled more resources for the region. Efforts were, however, not only concentrated on water, but also focused on capacity development e.g. gardening as a dominant goal of the project was income-generation. The main work under the project was to do research work for development.

### **Household tanks in Epyeshona and Okatana**

Pictures of ground catchment and underground tanks were provided in the slide presentation depicting, amongst others, how the tanks were covered against evaporation and vandalism.

### **The Green Village at the Ground Catchment**

The green village had a water storage capacity of 200 m<sup>2</sup>, with a 160 m<sup>2</sup> irrigated garden inside the greenhouse and a 900 m<sup>2</sup> irrigated garden area in the outside garden and was completely equipped with drip irrigation. It was built together with Kenyan engineers and was jointly managed by six farmers from Epyeshona. The green village was successfully producing tomatoes. A complementary 1000 m<sup>2</sup> irrigated area was constructed around the green house. The 120 m<sup>2</sup> underground tank in the green village could provide for the irrigation of the gardens for a 7 month period. This provided for the bridging of the dry period and the continued production of vegetables. The staff at the green house was communicating through pictures with Germany who provided technical inputs re e.g. ingredients that were needed for better yield.

### **Cost benefit with Gardening**

The cost-benefit analysis and recovery system was depicted in tabular format in the slide presentation. One finding was that the income over the long run was not as anticipated and that costs had to be decreased for the system to be (more) viable. In Brazil and Kenya costs were half of that in Namibia. Namibia was costly due to the costs of wood, cement and sand. On the financing side three elements played a role, i.e. tariffs, transfers and taxes. In water infrastructure systems these three components had to be looked at as full cost recovery was the ideal in the water sector. Job creation for the poorest of the poor should also receive attention. This was not achieved in the green scheme as it was not driven down to the poor and implemented on a large-scale. The project was focusing on working on a micro scale with the poor and rainwater harvesting. The covering of investment costs was a political question and transfer from the north to the south would be interesting to explore. Such an investment would be small for the state, if compared against the green scheme which was N\$3 million/year. Economically, the green scheme could make a good spill-over to the regional economy and income-generation.

### **The Benefits of RWH**

- Economic:
  - Broad spill-over effects for the regional economy;
  - Job creation;
  - Tank and garden construction and maintenance;
  - Education of tank builders, gardeners etc. improves own (career) prospective for future life;
  - Income generation for poor rural and peri-urban communities due to sale of crops;
  - Increased water productivity through higher crop yields.
- Social
  - Improved availability of food and nutrition particularly during the dry season;
  - Increased household and community self-sufficiency;
  - Improvement of living conditions for vulnerable or marginalized groups through a better diet and the possibility to engage in a productive activity;
  - Time saved for productive activities through availability of water near the house;
  - Additional income can be used to improve children's education and health conditions;
  - Enabling communities to adapt to droughts and declining availability of drinking water.
- Environmental
  - Effective adaptation strategy to climate change and climatic variability;
  - Maintains and enhances ecosystem functions and services;
  - Contributes to the regeneration of landscapes by increasing biomass for food, fodder, fibre and wood for human consumption.

### **The Way Forward**

- RWH an important part of Namibia's future water infrastructure:
  - Decentralisation, as especially suitable for rural areas;
  - Easy to maintain - local communities can do it on their own;
  - An effective adaption to climate change - better use of rainfall;
  - Pro-poor - improves income and/or food security;
  - National - it is independent from other countries.
- A national strategy is needed to address the challenges for RWH, including the conceptualizing, financing and training of technicians.

### **Subsurface Water Storage (SWS)**

- SWS was considered for storage of flood water in areas without suitable perched aquifers;
- SWS was independent of local groundwater and therefore did not interfere with fresh or salt water aquifers;
- The elements of SWS are supposed to be constructed from local or easy accessible materials;
- To that date there was no state of art documented for SWS. Therefore a test was necessary to clarify the method, constructional elements and the boundary conditions of operation and maintenance.

### **Design and Construction**

The design and construction of the SWS were depicted in the slide presentation. What was specifically noted was the different coverage techniques used as evaporating posed the biggest problem. The plans for the SWS were discussed with the community in 2011 upon which inputs were made re shaping of storage facilities. These inputs were of benefit to the facility.

### **2011 and Way Forward**

- 2nd situation assessment in the village lipopo in March 2011
- Community of lipopo visited RWH pilot site in May 2011
- Construction team was selected by the community
- Construction will start in September 2011
- First harvest of Oshana flood water in February/March 2012

### **Desalination**

Projects would be undertaken in Akutsima and Amarika. The plans were to give the people good water quality, but desalination was a very expensive technology. Two techniques were being tested, i.e. the cement drain method where water was pressed through a filter, and another technology which required energy to heat the water to distil. The operation and maintenance concept for the projects were also depicted.

An overview of the sanitation concept, to be erected in the following year, was also shown. Technologies like vacuum sewer, biogas utilisation, waste reuse etc. would be implemented.

### **Conclusion**

The topic of water use was very important to water-scarce countries and the Uutapi project was important, especially in regards to floods and gardening, for water re-use and income-generation.

### **Plenary Discussion on the Presentation**

Question: Did the cost-benefit analysis for rainwater harvesting demonstrate the profit over 30 years?

Answer: In Namibia profit was only shown after 9 years. This period needed to shrink and the project was looking into lowering the costs so that profit could be attained over 3 years. In the 3<sup>rd</sup> year stakeholders could start earning for their own pockets from the project. Micro-financing should be brought into the African concept. GRN support was needed for covering of investment costs. The real problem was how to deal with cost-structures and e.g. the social implications of such.

Question: In development projects the importance of creating a supply was emphasised. Looking at creating a market should receive more attention. E.g. the calculated income from the project was less than N\$1 per day for person. People might be more responsive and projects more sustainable if the demand side was also invested in.

Answer: The Polytechnic was doing a study on the peri-urban system re the demand and supply to small markets. Updated data would be available in October. The project, however, does offer the prospect of work every day for which the person receives an income and that in itself was an incentive.

Question: Why was there less water capacity at the one project site than the other?

Answer: Different techniques were used. In one site the membrane technique was used, which was more effective. In the other site the evaporation-technique was used, which was simpler to maintain, but which used more energy and delivered a lower yield.

Question: How was it ensured that sufficient minerals were contained in the water? Was the water re-mineralised?

Answer: Yes, minerals were added where needed.

- Question: Was there a direct relationship between the size of the tank and the land irrigated?  
Answer: The combination of the infrastructure in the green village project was explained. This combination led to success.
- Question: Can this project be linked with the CONTILL and the horticultural project?  
Answer: Determining the capacity of tanks was not easy and required engineers. At the time 9 farmers were being trained by Kenyan experts in this respect. The other projects could, however, provide interesting competition.
- Question: On desalination, what happened to the contaminated extracts?  
Answer: Two technologies were explored, i.e. in evaporation ponds where the salt was used for salt stones for e.g. animals and reinjection, under expert advice, into the underground water supply (aquifer recharge and recovery).
- Question: With rainwater harvesting during the rainy season, how was it ensured that gardens/systems were not flooded? In sewer system maintenance and proper use this was a big problem.  
Answer: Measurements were made in the ground to protect against flooding during the rainy season. Some systems can work only with smaller amounts of sewerage. Two problems were experienced, i.e. behaviour and construction maintenance. Re construction maintenance, independent control of all installations were done and re behaviour, the project was working with Botswana re best practices and learning and capacity building of local caretakers, i.e. the sanitation officer, and 8 engineers on the health club concept. M&E will be done after implementation to evaluate results.
- Question: EU funding went towards sophisticated systems e.g. as installed in Luderitz. In hindsight funding might have been towards too sophisticated systems in terms of maintenance capacity. Was the suggested solution not too sophisticated for the village capacity?  
Answer: In Windhoek a highly sophisticated system was maintained. Why could a sophisticated system not work in Luderitz? This project was, however, a research project, and not a developmental project, and the results would be open also regarding the improvements needed. Research projects should be separated from developmental projects.
- Comment: More documentation was needed per project to better separate research from development. Learning was really important, and the focus should not only be on making the project work. Problems should be narratively documented to optimise learning.

## 5. THE WAY FORWARD

As a closing session the way forward was discussed on the basis of the key issues raised during the previous one and a half days. Participants were asked to identify the main issues, themes and points to be addressed for further deliberation and planning of the way ahead.

### Key Issues identified by Participants:

- There was a greater need for research consolidation across projects and inter-connection of all stakeholders, i.e. a central information system for the country/basin was needed;
- There were many good initiatives in the water sector/CEB;
- What was needed for the future within the CEB was more than coordination, but integrated planning; and
- A WRM platform was needed, not only the CEB.



To stimulate discussion the note takers of the workshop listed the key issues as identified from presentations and during discussions. The following were listed:

**Key Issues as summarised by Note-Takers:**

- 3 dimensions were identified in IWRM, i.e. socio-economic, environmental and biodiversity, hydrological and meteorological requirements. How were these three balanced during implementation?
- The need for annual (participatory) planning vs. coordination meeting;
- Progress made since the April 2010 workshop and the usefulness of the coordination workshops;
- Research and data management strategies (research for/vs. development work);
- Awareness raising (“noise”) towards a leading role of IWRM/water in natural resource management, including Land Use Planning;
- The role of the BMC/CEB in doing the right thing/integrated holistic long-term planning re IWRM and national planning and land use in the CEB/Namibia;
- Strategies to deal with resistance to change;
- A supply vs demand driven approach to water management;
- The unaffordability of water/paying for water demand/use (“my water”);
- Hard and soft engineering solutions;
- Major shortcomings in maintaining and refurbishing water infrastructures;
- Guidelines needed on toilets to be built/used (i.e. to unlock the latent demand);
- Flooding should receive more attention, especially vulnerable households;
- Action to be taken before the next rainy season;
- The role of smaller wells and ground water in the CEB;
- Cross-boundary IWRM, especially with Angola; and
- Financing strategies and multi resources mix for WRM.

**Plenary Discussion on the Key Issues Listed**

Some of the key issues listed were highlighted by participants for further discussion. The following was said and/or concluded, with resultant follow through actions identified:

• **Research and data management strategies**

Information-exchange platforms took place only once per year, which did not meet the information exchange needs. Web-page exchange should form the core of information exchange. The main challenge with such a platform was that it had to be maintained. It was said that this should be the role of the Ministry, but that all stakeholders should be involved and the information used by all for such an intervention to be successful and sustained. At the time a decision making platform was being looked into through the GIZ project, where funds were available and a terms of reference was being drafted. The need for an information sharing platform would therefore mean that two levels would be needed i.e. an information platform and a decision making platform. It was suggested that the topic be looked into for feedback at the next workshop. It was then decided that a small working group would be formed to investigate the options, and report back to the delegates at the next forum. The working group would consist of: Mr Greg Christellis from MAWF, John Mendelson, Dr Frans Kluge from CuveWaters, Mr Martin Quinger from BGR – who will also serve as initiator and contact person, and Sonja from the GIZ office.

Mr Mendelsohn shared that an information portal on environmental issues existed that could be utilised and/or useful to the workshop participants, i.e. the-eis.com. Another possibility would be to host a web-link from the site for CEB purposes. Through such cooperation sustainability would

be enlarged. The portal was created through funding from NamPower and John Mendelsohn could be contacted for further follow through.

The use of vs. in the bullet was questioned and it was requested that “for” should be used, i.e. research for development. It was explained that the “vs.” was in relation to previous discussions that indicated the difference between research and development, but that for the purposes of a summary of the workshop both words (“vs.” and “for”) should be used.

A comment was made that narrative research was at the time well-documented and that it was available on the web page and also included in capacity building interventions.

- **Annual (participatory) planning vs. coordination meeting**

Each institution’s planning was done beyond their activities for the CEB, but it would be of help if the activities relevant to the basin could be “put on a wall” and integrated by all role players into one integrated plan. These could also include the activities for the Okavango basin. Such an integrated plan could then become the plan for the relevant activities for the Regional Council. It was further suggested that planning could be done as normal during August/September and final plans be aligned to be submitted as an integrated plan by March and evaluated by the forum regarding progress made by July. Working groups could be formed by the forum to look at the resolutions, coordinate activities and make recommendations, e.g. a Biodiversity or Water Quality Working Group as was done by Integrated Land Use Planning (ILUP). The planning for the next workshop would have to be re-thought through in view of the suggestions, e.g. timeframes in terms of the workshop itself and preparation for it. It was decided that the Steering Committee would look at the practical implementation of the recommendations and provide feedback on the next steps to all stakeholders.

NamWater expressed sincere appreciation for such cooperation to integrated planning in future. The EU representative said that such exchange would lead to better formulation and optimal use also of financial resources.

There was concern that the decision might require of some stakeholders to plan and then re-plan in terms of inputs received from other stakeholders and the question was raised whether capacity for re-planning was available to all stakeholders. The response was that consultation was necessary for planning and that the approach would only provide the basis for a more coordinated effort.

There was no proper legal framework for integrated planning in Namibia which posed a challenge.

Participants were informed that such coordination towards integrated planning was also done within GIZ, e.g. in the Fish River Basin, where consultation took place prior to the planning phase.

A concern was raised that key stakeholders were not always present at platforms and that full participation by all key stakeholders was a requirement for comprehensive integrated planning and that the relevant delegates had to attend, e.g. in terms of seniority. In this regard town planners needed to be involved in the fora, as well as the OPM: Disaster Management Unit.

The question was raised as to how participation could be ensured and the suggestion was made that key/such stakeholders should be invited as speakers. This was however attempted for the current workshop and did not succeed. It was then said that the incentive for attending the workshop should be the objectives of the workshop. Another suggestion was that overlapping structures should be built involving simulations of future scenarios, so that stakeholders have to be involved in their own interest. The interim should therefore be used to plan together and to

produce and present a common picture of the future at the next forum, so as to entice/compel role players to be involved.

The BMC was an advisory platform and mandated to do coordination. It was therefore required that the BMC be more and more representative of all stakeholders involved. Fora should also be practical and feasible – as not all parties could plan together in a workable model. Bodies for cooperation already existed and it would be better to align effort than to start new initiatives. The relevant people should be integrated into the existing bodies to ensure efficiency.

It was further suggested that Ondjiva, Angola also be invited to information exchange platforms as it would be interesting to share ideas at such fora. In response it was cautioned that the involvement of Angola needed to be approached in a sensitive manner as there was a technical committee that looked into cross-boundary cooperation and SADC protocols would have to be adhered to. Information sharing, however, was not a problem and communication channels had to be shortened, but such interaction needed to be formalised to ensure that no breach of protocol occurred. This caution was expressed based on previous experiences where exception was taken against *modus operandi* applied.

The relationship between the CEB and the Kunene Basin was important and should be optimised. It is important to stakeholders to have a picture of where and how they fit into the bigger picture, and that the ultimate destination to be achieved and be explained in laymen's terms to all stakeholders.

- **Awareness raising towards a leading role of IWRM/water in natural resource management, including Land Use Planning**

Planning should be taken into communities and should be championed to create excitement and relevance. Platforms should design strategies for such championing. Sensitization should be proactive to mobilise towards participation. This was the role of Extension Officers.

ICT should be used more, e.g. cell phones. Involve network providers, such as MTC in the promotion of IWRM and awareness raising.

The interest of farmers in the CEB must be reflected in the agendas, e.g. disaster preparedness. Critical issues of common interest must be identified and results must be produced at household level, i.e. leverage need to be identified towards improving the living conditions at the micro scale.

Ground water was supply side driven, but it would be important to mention the recharge levels very carefully to look into optimising the resource.

- **Flooding should receive more attention, especially vulnerable households; and Action to be taken before next rainy season**

**It was requested to have a workshop, e.g. in August, to discuss what action should be taken before the next rainy season, e.g. for parties to meet each other half-way re resources and to work out implementable solutions prior to the next rainy season/flood.** In response it was said that FAMCO was the coordinating committee for floods and that it resorted under the custodianship of the OPM. Ms Beata Xulu and Mr Ihuhua would follow up with the OPM to ensure that an initiative towards preparation and planning would not be overstepping mandates or take over the responsibility of FAMCO. It was also said that FAMCO had to be invited to the next forum.

## 6. CLOSURE

Ms Beata Xulu thanked all exhibitors for their effort and dedication in making the market place a success. She also thanked the facilitator and minute takers, Christian Mesmer and Heide Kerber from GIZ, for their hard work, the Cooperation Partners for their support, the HIV/Aids representatives for the lively involvement of all delegates and the CEB Office Team for their wonderful cooperation and work. They were a wonderful team to work with.

Mr Martin Neumann and Ms Maria Amakali together officially closed the workshop as a token that it was a shared project between GIZ and MAWF. Ms Amakali thanked the participants for their lively discussion of the topics, for sharing and forging the way forward and extended a word of inspiration as the basin was the way to reach the country and therefore important for all to stakeholders to be playing a role. Mr Neumann thanked the moderator, the CEB Team, presenters and the MAWF Team for making the workshop a success.

The workshop was officially closed.

## 7. WORKSHOP EVALUATION

As a means of feedback and input to the next workshop participants were asked to indicate their experience of the workshop by ticking the most appropriate response and provide their inputs in an open question. The following feedback was received on the questions posed:

- **The relevance and usefulness of the topics presented to your needs:**
  - Very relevant: 15
  - Relevant: 6
  - Needs Improvement: 0
  
- **The technical input vs. the learning/sharing-balance was:**
  - Very good: 10
  - Acceptable: 8
  - Needs Improvement: 2
  
- **The moderation of the workshop i.t.o. achieving the objectives and creating a conducive environment was:**
  - Very good: 13
  - Acceptable: 7
  - Needs Improvement: 0
  
- **The delegates to the workshop in terms of CEB coordination were:**
  - Very relevant: 0
  - Acceptable: 15
  - Needs Improvement: 4
  
- **Content/process and topics to be included in future:**
  - Issue-related focus
  - Truly representative body with all stakeholders represented
  - Development into professional organisation with mandate(s), operational capacity and own financial resources and income

- Prove of added value in advocacy over time, i.e. real benefit/impact
- Flexibility to achieve above
- BMCs representation
- Flood impact assessment on infrastructure
- Sustainability of CEB activity drivers
- Planning with relevant stakeholders

## ANNEX A

### Final Programme: IWRM in CEB Annual Coordination Workshop, 6 – 7 July 2011, Ondangwa Town Lodge

*Objectives: Follow-ups on 2010 workshop; sharing & learning on IWRM in Cuvelai-Etosa Basin*

#### DAY 1, WEDNESDAY 06 JULY 2011

Time	Topic	Resource Person
08h00	Registration of participants	C Mesmer
09h00	<i>Introductory Session</i> a. Opening & Welcoming remarks  b. Background to coordination workshop, objectives, programme & knowing one another	Facilitator Facilitator/A Nehemia/F von Kuehne M Amakali & M Davel (Facilitator)
09h40	a. Follow-up to April 2010 coordination workshop	B Xulu
10h00	Refreshment Break	All
10h30	<i>Water Resource Management Agenda in Namibia</i> a. Policy direction in water resource management b. Policy provisions on water storage, water harvesting, desalination c. Policy provision in respect of basin management committees d. Discussions	A Nehemia    Facilitator
12h00	<i>Progress since April 2010: flood, sanitation management, waste management, regional water planning, results, challenges, specific &amp; practical points for coordination</i> a. Omusati RC b. Oshana RC c. Ohangwena RC d. Oshikoto RC e. Discussion	T Mbangula B Munalye D Kashikola I Namugongo Facilitator
13h00	Lunch	All
14h00	<i>Progress since April 2010: water plans, results, challenges, partners, specific &amp; practical points for coordination</i> a. Flood management planning by MRLGHRD b. NamWater Master Plan for Cuvelai c. Rural water supply master plan for northern central region d. Kunene transboundary water project: implementation status  e. Discussion	MRLGHRD F Ihuhua R Kaheka K Tjipangandjara & A Gibelhauser Facilitator
16h30	End of Day 1 & announcements	Facilitator
18h00	Supper & Networking	All
<b>Day 2, Thursday 07 July 2011</b>		
08h00	a. <i>Instructions for market place sharing session</i> b. <i>Market place session: sharing on related topics and activities by:</i> NRC, CuveWaters, UNDP Programmes, GOPA Livestock Prg, Communal Land Support Prg, Contil, Creative Solutions, IWRM in CEB, BMCs, BGR, DRM  c. <i>Plenary discussion on market place observations</i>	Facilitator Programme Leaders   Facilitator
11h00	Refreshment Break	All
11h30	<b>WAY FORWARDS; 2012 PROGRAMME EXPECTATIONS CLOSURE</b>	<b>FACILITATOR H KOCH</b>
13h00	Lunch	
14h00	<b>ARRIVAL/REGISTRATION: OTHER BMC MEMBERS &amp; PRESS FOR LOCAL SUBSIDY CONTRACTS HANDOVER</b>	<b>T HALUDILU &amp; C MESMER</b>
14h30	Welcoming remarks	M Amakali
14h35	Handover remarks by: GIZ, EU, MAWF	M Neumann, J Deboer, A Nehemia
15h05	Local subsidy contract handover to BMCs	MAWF/EU/GIZ
15h15	<b>VOTE OF THANKS, REFRESHMENT &amp; DEPARTURE</b>	<b>B XULU</b>

## ANNEX B

Confirmed Attendance List of Stakeholders - IWRM CEB Coordination Workshop 6th - 7th June 2011, Protea Hotel, Ondangwa

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50		Saari	Mbango	Heroes Private School	Pupil	
51		Webster	Mazila	Heroes Private School	Pupil	
52		Nelson	Haimbili	Heroes Private School	Pupil	
53		Ayo	Alagba	Heroes Private School	Pupil	
54		Basilius	Shivute	Heroes Private School	Pupil	
55		Silicky	Amwaama	Heroes Private School	Pupil	
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## ANNEX C

Stakeholders' Presentations - IWRM CEB Coordination Workshop 6th - 7th June 2011, Protea Hotel, Ondangwa