Global Water Partnership Southern Africa

IWRM SURVEY AND STATUS REPORT:

<Angola >

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EXECUTIVE SUMMARY

Angola was the last country in the SADC region to establish a Water Partnership, and was also one of the countries that applied for help from the WSSD with the aim of launching its Millennium Development Goals. Informal research was conducted by the Global Water Partnership that was published in 2006 which stated that Angola still did not have a water resources management policy thereby showing that they had missed the targets set in 2005.

As a result, the SADC Water Department in conjunction with the United Nations Environment Programme (UNEP), through the Centre for Water and Environment (UCC ï Water) extended financial support for the development of the roadmap in 2007.

There was official and unofficial contact between the Global Water Partnership ï Southern Africa (GWP-SA) and the Ministry of Energy and Water (MINEA) through the Cunene River Hydrological Basin Administration Office (GABHIC), through which steps towards the development of a roadmap for IWRM in Angola were drawn up.

The Angolan Water Partnership (PAA) was launched in 2007, in the same year that the report on Angolaôs actual position on IWRM was analysed and a roadmap for the implementation of IWRM was developed.

In order to support IWRM activities, a national NGO, ACADIR with support from GABHIC, was named PAAôs host institution.

After the 2008 elections, the new government created the State Secretariat for Water (SEA), which has prioritised the following issues as key to the establishment of an efficient water resources management policy in the country:

Re-establish the national network of hydrometric stations; establish different basin commissions; create a national institute of water resources management; increase access to potable water by more than 30% and improve basic sanitation in urban and rural areas; establish a national strategy for the implementation of IWRM and to provide capacity building to employees in the sector with more modern technology.

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CHAPTER 1: BACKGROUND AND CONTEXT

1.1 Project Background

Regional consultant and GWP to provide a common introductory paragraph

1.2 Geographic Context

The Republic of Angola is situated south of the Equator between 4ę 22ô and 18ę 02ô South latitude and longitude 11ę 41ô and 24ę 05ô east of Greenwich, with a land area of 1.246.700 km^2. Angola is bordered by the Democratic Republic of Congo and the Republic of Congo to the North, the Republic of Zambia to the East and the Republic of Namibia to the South. To the West, Angola is bordered by the Atlantic Ocean over an area of approximately 1650km.

There are various factors which influence Angolaôs climate and the main ones are the cold Benguela current and the altitude. Due to the cold Benguela current, in the coastal area, especially in the Benguela province, the climate is more pleasant and this is also because of the predominantly south easterly winds which are responsible for the existence of the Namibe desert.

The countryôs average annual temperatures normally range between 16ęC and 26ęC. The lowest temperature recorded was -9ęC in the city of Menongue and the maximum 44ęC in the city of Ondjiva. For reasons already mentioned, the rainfall patterns vary greatly (figure 3). Effectively there is hardly any rain in the Namibe desert, whilst in higher zones and in the north eastern part of the country there is normal rainfall with annual average rainfall of 1500mm. According to studies conducted, the annual average weighted rainfall for the whole country is 1060 mm, which for an area of 1.246.700 km^2 corresponds to a volume of 1320km^3.

1.3 Social and Economic Context

Estimates suggest that the actual population stands at 16.5 million people who are spread over a total area of 1.246.700 km^2. Of these, 50.7% are women, 53.3% live in urban areas, and 50% are between the ages of 5 and 25. The country is the largest petroleum producer and the second largest producer of diamonds in sub-Saharan Africa, and is ranked 59th in the world economy in terms of gross domestic product.

After six years of peace, the government of Angola is investing heavily in reconstructing and renovating basic national infrastructure which is intended to have a positive impact on the living conditions of the population.

Angola is enjoying unprecedented performance in economic growth with a rate of 23.3% in 2007, while inflation dropped from 105.6% in 2002 to 11.9% in 2007. This shows large scale macroeconomic stability.

The global economic crisis has also affected Angola in terms of economic growth. A variety of international financial sources state that Angolaôs economic growth rate will be between 3-5% over the next 3 years.

Despite strong economic performance, Angola still has a low Human Development Index. Angola is still ranked very low in terms of human development. It is therefore necessary to pay attention to the human development challenge so that our economic efforts can be better reflected.

Angola held its second legislative elections on 5 September 2008 and the ruling party, the MPLA, won by more than 80%. The presidential election is due to be held in 2009. The approval of the new constitution is crucial to the presidential election process.

As part of the decentralisation process, it is expected that there will be local elections in the near future. The government has identified three national challenges which need to be treated as top priority and these are:

1. Peace, Justice, Democracy, Social Stability, Unified National Cohesion and Internal Security.
2. Eradication of hunger, poverty, unemployment and improvement of national wealth distribution.
3. Long term sustainable development, human development and the well being of all Angolans and the harmonious development of the territory.

Angola is one of the 191 countries that adopted the Millennium Declaration in September 2000. With this in mind, the MDGs will be launched in Angola within its development and strategic plans. For various reasons, focussing on the progress of the MDGs is still a daunting task in Angola, and lack of regular research worsens the situation.

CHAPTER 2: WATER RESOURCES SITUATION

2.1 Water Availability and Infrastructure

Angola has an extensive and complex hydrological network with 47 principal hydrological basins. Each drainage area ranges from between 254km^2 to 290 000km^2. Practically all the riversô sources are inland with the exception of the Zaire/Congo, Zambezi and Chiluango rivers.

Angolaôs surface run-off was estimated at between 120 and 150km^3 per annum, therefore resulting in distribution of 8000 to 10 000m^3 per inhabitant per year. The main rivers and tributaries of different hydrological basins originate from the High Plateau and many of these basins are shared with neighbouring countries e.g. the Cubango and Cunene river basins in the south east, the Zaire/Congo in the north and north east, and the Zambezi in the north east.

The 47 principal hydrological basins transport water from the wet region of the central plateau through 5 watersheds:

a) The Atlantic watershed, with an outflow area of around 41% of the total surface area. The rivers that make up this watershed all flow within Angola and discharge into the Atlantic Ocean without affecting other countries except for the Cunene River which forms a border with the Republic of Namibia.

b) The Zaire watershed, with an outflow area of 21.6% of the total surface area, feeds the Kassai River (in the Democratic Republic of Congo), one of Zaire Riverôs main tributaries which eventually discharges into the Atlantic Ocean.

c) The Etosha watershed, with an outflow area covering 3.8% of the total surface area, which runs through the Etosha plains in the Republic of Namibia.

d) The Cubango watershed, with an outflow area of 11.9% of the total land area, which feeds the Okavango region in Botswana.

e) The Indica watershed (Zambezi River basin, which makes up around 18.6% of the total surface area). From this basin in Angola, in the west coast of Africa, water flows through Zambia crossing through other countries. The Zambezi River discharges into the Indian Ocean in Mozambique on the east coast of Africa.

In terms of underground water, data published in 2002 by AQUASTAT ï FAOôs Information System on Water and Agriculture, clearly indicates that compared with the rest of southern Africa, Angola is ahead in water resources, with underground recharge values of 72km^3.

The lack of research and studies at national level dealing with underground water potential means that an increase in the level of current knowledge of underground water resources in Angola is needed. There are, however, a few specific studies related to the ñplan for the integrated utilisation of the Cunene Riverôs hydrological basin water resources: Characterisation and evaluation of underground water resourcesò (Novo et al.; 1996).

Water resource assessment surveying began in 1951 and underwent systematic reorganisation in 1967. In 1975 there was already a network of around 200 hydrometric stations for data monitoring, and these covered two thirds of Angolan territory, more specifically, the Central and South of the country. This quantity, however, falls short of the figures recommended by the World Meteorological Organisation (WMO) of a hydrometric station for every 2000 km^2 of land.

Currently there are less than 20 functioning hydrometric stations in Angola. As this is a period of reconstruction and socio-economic development, this is of concern to decision makers in the sector, as lack of water resources information may lead to delays in realising certain plans and actions.

2.2 Water Use, Demands and Requirements

Amongst the diverse uses of water in Angola, the following are considered the main ones:

Table 1: Estimated Water Consumption by Sector

SECTORS	CONSUMPTION	
	Million m^3/annum	%
Agriculture	2000	86
Livestock	70	3
Domestic	220	9
Industrial	40	2
TOTAL	2330	100

Source: Water Sector Master Plan

Supply of Water to the Population

The Multiple Indicators Enquiry of 2001 (MICS II), estimated that 61.6% of Angola's population had access to potable water and 59.4% to adequate sanitation services.

In the urban areas it is estimated that 70.9% of the population has access to potable water and hardly 34% have the minimum urban area standard of 70 litres per person per day. The rest access water from fountains, water points and water bowsers. The same estimates

show that 74.1% of the urban population, have sanitation services at their disposal and of these hardly 18.5% are connected to an adequate technical network with the remainder using latrines. In 2004, the Water Sector Development Strategy was approved. This strategy envisages major coverage of the population in terms of potable water supply as well as the expansion of basic sanitation services.

In the rural areas, it is estimated that barely 39.9% of the population has access to potable water. In reality, coverage of the rural population is still lower than the figures mentioned due to the fact that many of the water points are not operational. It is also estimated that 25.5% of the population in the rural areas benefits from using some type of water facility.

At present the Water For All Programme is being implemented in Angola. The Programme plans for 85% of the rural population to have access to piped potable water by the year 2015. The Water For All Programme started in 2007 and is being implemented in 17 provinces excluding Luanda which is not part of the programme.

The rate of access to potable water does not correspond to the rate of access to quality services. This is because the water supply systems do not operate as regularly as required due to power outages, poor management and insufficient maintenance. Such limitations lead to reduced water supply.

Due to the precarious state of the systems, current per-capita figures, show a reduced average figure of 25 litres per day, which shows that in reality, water supply in the majority of the systems is much less than the recommended standards. Forty litres per person per day is considered the bare minimum required to ensure acceptable levels of domestic consumption and personal hygiene (WHO recommendation).

Agriculture and Livestock

The combination of climatic conditions and fertile soil mean that there is increased agricultural potential which is superior to that of the majority of other African countries. The favourable rain patterns and the small traditional gravity-based irrigation systems, form the main base of water utilisation in agricultural production.

The coastal and southern areas have the large alluvial plains of the Dande, Bengo, Kwanza, Longa, Queve, Kunene and Cubango rivers. Due to the fertility of these areas, they are excellent places for large scale irrigation. There are some hydro-agricultural facilities covering an irrigable area of 163 000 ha.

Table 2: Existing principal hydro-agricultural systems

RIVER	DAM	RESERVOIR ($10^6 m^3$)	IRRIGABLE AREA (ha)
Bengo	Quiminha	1400	50.000
Cunene	Gove	2436	93.000
Cunene	Matala	70	20.000
Total		3906	163.000

Source: Water Sector Master Plan

Also shown are areas for large irrigation schemes in areas defined by the Ministry of Agriculture's policy and strategy staff. They are responsible for establishing the administrative irrigation grouping for the following regions:

- Southern region

  Huila – boundaries of Matal, Humpata, Sendi, Chicungo and Ganjelas

  Cunene – boundaries of Cova-do-Leão, Manquete and Xangongo

  Namibe – boundaries of Giraúl, Bero and Curoca

- Central North Region

  Malange – Baixa de Cassanje boundary

  Kwanza Norte – boundaries of Luínga, Mucoso and Capanda

- Central Region

  Benguela – boundaries of Cavaco, Catumbela and Dombe Grande

  Huambo – boundaries of Gove

- North East Region

  Luanda – boundaries of Kikuxe

  Bengo – boundaries of Ambriz, Caxito, Bom Jesus and Quiminha

  Kwanza Sul – boundaries of Wako-Kungo and Lucuso

- South East Region

  Kubango: Menongue Agro-industrial Pole, boundaries of Cuchi, Missombo, Bimbi, Calai, Dirico, Cuito-Cuanavale

The table above shows other regions with some irrigation potential in Cabinda, Zaire, Lunda Norte, Lunda South and Moxico. The boundaries have not been defined as they have not been studied.

Supply of water to highly concentrated livestock areas (South Angola) came from ñchimpacasò (artificial trenches/ water storage facilities dug by the local population) constructed in depressions in which rainfall and underground water accumulated.

Industry

Industrial water requirements can be divided into two groups. One of the groups covers industry based in urban areas and are generally accounted for in urban tax systems. The other group covers industries that are situated in the various hydrological basins. Within this group there are various subgroups such as: small isolated industry and agriculture and mining related industry. As a result of the war the country experienced, industry was almost completely paralysed. The industrial park is only now beginning to be restored. However, it can already be seen in the Industrial and Mining sectors that there is considerable utilisation of water resources.

Energy Production

Hydroelectric power production obviously does not consume water (the increase in evaporation linked to the increase in the waterôs surface area caused by the existence of reservoirs in the respective dams is not accounted for). Currently approximately 5 000 million cubic metres of water are used for the production of hydro-electric power (non wasteful usage).

In terms of identification of resources, energy production is not shown by the level of consumption, which is practically nonexistent, but through the identification of the most appropriate river. Currently, inexplicably, a large part of energy produced in Angola is from thermoelectric centres, thus there isnôt any water consumption worth noting.

Table 3: Key existing projects

River	*Dam*	*Type*	*Height*	*Reservoir* $10^6(m^3)$	*Goal*	*Potential MW*		*Energy (GWh)*	*Irrigable Area (ha)*
						Current	Future		
Bengo	Quiminha	T	42	1400	R,I	-	18,4	-	50 000
Catumb.	Biópio	G	13	-	E	14,4	14,4	35	-
Catumb.	Lomaum	G	15	-	E	35	185	400	-
Kwanza	Camb.	A	68(88)*	-	E	180	560	4100	-
	Capanda	A	110,2	4795	R,e		520		-
Cunje	Cunje I	-	-	-	E	0,5	-	2	-
C. da H.	Dunga	T	20	57	R,I	-	-	-	3000
Cunene	Calueque	-	-	350	I,G	-	10	-	-
Cunene	Gove	T	58	2436	R,E,I	-	60	-	93000
Cunene	Matala	G	20	70	E,I	54,4	81,6	100	20000
Dande	Mabuba	G	40	53	E	17,8	17,8	60	-
Luachimo	Luachimo	G	8	-	E	9,6	9,6	27	-

(1) G - Gravity; T - Land; A – Bridge (2) E - Energy; R - Regulation; I - Irrigation and Livestock (*) E – Forecast elevation.

2.3 Key Water Resources Issues, Concerns and Priorities

INSTITUTIONAL AND LEGAL ISSUES

The most appropriate way to end this chapter is to provide information on the institutions that are directly or indirectly involved in water resources management, as well as to describe and briefly analyse the most relevant legal issues in the management of water resources.

Institutional Issues

State Secretariat for Water (SEA)

According to Decree-Law no. 3/00 of 17 March 2000, the Ministry of Energy and Water (MINEA) is responsible for planning, co-ordinating, supervising and controlling development activities of water resources. It is also responsible for the supply of potable water to the population, as well as the development of national policy on water resources. During the formation of the new government in 2008, the Water division was separated from Energy thereby resulting in the formation of the State Secretariat for Water (SEA).

SEA currently has the following plans for the Water Sector:

- To propose and promote the execution of water policy;
- To satisfy potable water and waste water sanitation needs;
- To guarantee quality service provision of water and sanitation;
- To guarantee the rational and sustained use of water resources.

Institutions within the Water Resources Sector

National Directorate of Water (DNA)

The National Directorate of Water is the body that is responsible for the execution of all water resources activities nationally. The DNAôs main objective is to study, develop and follow up activities in the water sector. It comprises three departments which cover the areas of water resources, water supply and sanitation, and licensing and supervision.

Basin Offices and Other Institutions

The basin offices are responsible for promoting, coordinating and supervising the integrated utilisation of water resources at hydrological basins. Currently there are hardly any formally constituted institutions. Cunene Hydrological Basin Administration Office (GABHIC) was also taking on responsibility for the Cubango, Cuvelai and Zambezi basins especially in issues relating to international commitments. Despite the Cunene basin being the most studied and having a Water Resources Utilisation Working Plan, it is still not completely functioning in accordance with the requirements of the integrated management model. The Water Sector Development Programme aims to establish 25 hydrological basin offices by 2015.

There are other offices with specific objectives such as the Middle Kwanza Project Office which falls under the Ministry of Energy (MINERG). The officeôs objective is to develop the hydro-electric energy resources of the middle stretch of the Cuanza River which flows from Salto do Cavalo in Malange province to Dondo municipality, close to the Cambambe dam. The Kikuxe Agricultural Development Officeôs objective is to promote irrigation and

agricultural development around Kikuxe which is situated in the lower stretch of the Kwanza River. The office is managed by the Ministry of Agriculture (MINAGRI)

In 2001, the Ministry of Agriculture and Rural Development (MINADER) launched a diagnostic study on the supply of water to rural areas in South Angola which includes the provinces of Cunene, Huila, Namibe and Kuando Kubango. The main objective was to develop a Management and Development of Water Resources Plan (PDRH) to also be used by PLANAGUA with the intention of developing and managing all water management systems in the rural areas in an integrated manner. PLANAGUA was supposed to draw up a possible integrated water resources management strategy in rural areas and basin areas. Unfortunately, the shortage of financial resources led to PLANAGUA not being implemented.

Institutions involved in Water Supply and Sanitation

In urban centres, potable water supply and sanitation services are carried out by the respective provincial governments, through provincial water offices and community services. They can be assisted by public enterprises, as is the case in Luanda and Benguela. However there are plans to establish water companies in major centres where there is high consumption.

In the peri-urban and rural areas there are serious deficiencies in terms of service delivery, due to the nonexistence or the weakness of the bodies that are responsible for water supply and sanitation. In some areas, mainly peri-urban areas supply is guaranteed by water bowsers. The involvement of non-governmental organisations in water supply and in the sanitation process is prevalent in the peri-urban and rural areas and in small communities. It is important to note that in areas where there are boreholes, wells or fountains, community level Water and Sanitation Groups (GAS) have been formed.

Legal Issues

The management of natural resources ensures sustainable development, and it is up to the state to promote the defence and conservation of natural resources. As is stated in article 12ę2 of the Constitution (Law no. 23/92 of 16 September), exploration and projects must be for the benefit of the entire community.

It is within this context and in view of the integrated development of water resources, and the protection and preservation of these resources that the Government of Angola approved the Water Law (Law no. 6/02 of 21 June). The Water Law defines the general legal elements pertaining to management, planning and utilisation of water resources.

The Water Law stipulates that water resources are the property of the state and sets out priorities for the use of water resources. The law lays out the principle of integrated management of water resources and adopts the hydrological basin as the basis for water resources management.

The law also establishes some principles pertaining to the management of water, especially the right of citizens and collective enterprises to water, institutional co-ordination and community participation. Other principles include that of the complementary nature of water supply with sanitation; of water as a social asset, renewable, limited and with economic

value; of the relationship between pollution and the financial social responsibility of restoring environmental damage.

In response to the critical situation described and in the spirit of creating conditions for the sustained development of the country, as well as improving the social welfare of the population, the Government of Angola promulgated the Water Law (Law no. 06/02), which is a big step towards the reform and the development of the water sector. Likewise, the Water Sector Development Programme was approved in January 2004 and the respective Action Plan which runs until 2016.

INSTITUTIONAL MECHANISMS OF INTERNATIONAL COOPERATION

Due to Angolaôs geographical location, it is important and obligatory to scrupulously respect the sharing of common resources between Angola and neighbouring countries in southern and central Africa with whom Angola has common borders.

International co-operation is referred to in Article 19 of the Water Law and is of major interest to the Basin States. The article focuses on the fair and reasonable distribution of common waters, as well as the promotion, by the regulating agency, of international co-operation activities aimed at adequate management of international hydrological basins.

Inter-ministerial Commission for International Waters Agreements

The Inter-ministerial Commission for International Waters Agreements was established in September 2003. It is tasked with coordinating the different sectors with a view to implementing international agreements related to water as well as creating, following up and overseeing the work of Multi-sectoral Technical Commissions related to water resources.

Inter-ministerial Commission Technical Support Group

The Inter-ministerial Commission Technical Support Group (GATECI) for international waters agreements was set up in May 2004 to provide technical support to the Inter-ministerial Commission and the Multi-sectoral Commissions related to international basin water resources. The groupôs mandate is to ensure coordination, follow-up and improved performance of the Multi-sectoral Commissions.

Cunene Basin Joint Permanent Technical Commission (CTPC)

At Angolaôs independence there were already firm agreements between Portugal and South Africa over the Hydro Potential of the Cunene River Hydrological Basin that were endorsed by Angola and Namibia on 18 September 1990, as sovereign states. The Cunene Basin Joint Angolan Namibia Permanent Technical Commission was formed after the 18 September 1990 Agreement. The CTPC was formed with the objective of promoting the development and use of hydro potential in the Cunene hydrological basin.

The Permanent Okavango/Cubango River Basin Water Commission - OKACOM

The Permanent Okavango/Cubango River Basin Water Commission (OKACOM) was created under cover of the 15 September 1994 Agreement, signed in Windhoek between

Angola, Botswana and Namibia.

OKACOM was established with the objective of providing technical advice to the aforementioned governments in matters related to conservation, development and utilisation of water resources of common interest in the Okavango river basin.

Zambezi Watercourse Commission – ZAMCOM

The Agreement for the establishment of the Zambezi Watercourse Commission (ZAMCOM) was signed on 13 July 2003 in Kasane, Botswana by Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania and Zimbabwe. Zambia is the only country that still has not signed the agreement. The Zambezi River Basin is shared by eight Basin States and is the major system of African rivers flowing into the Indian Ocean. ZAMCOM was established with the objective of promoting equitable and reasonable utilisation of the Zambezi Watercourse water resources, as well as effective management and sustainable development of the river.

CHAPTER 3: ACTUAL STATE OF THE IWRM PROCESS

In the SADC region, Angola is one of the countries that applied for help from the WSSD with the aim of achieving the Millennium Development Goals (MDG). Unofficial research was conducted by the Global Water Partnership (GWP) and it was published in 2006. It stated that up until then Angola, did not have a water resources management policy, meaning that the country had not met the objectives set for 2005.

As a result, the SADC Water Division in collaboration with the United Nations Environment Programme (UNEP) through the Collaborating Centre on Water and Environment (UCC-Water) extended financial support for the roadmap to be achieved.

There was official and unofficial contact between the Global Water Partnership ï Southern Africa (GWP-SA) and the Ministry of Energy and Water (MINEA) through the Office for the Administration of the Cunene River Hydrological Basin (GABHIC), through which steps towards the development of a roadmap for IWRM in Angola were drawn up.

Consequently in March 2005, in the Benguela Room of the Tropico Hotel, the first workshop for the Angolan Water Partnership (PAA) took place. This was followed by a second workshop on IWRM, in April 2007, in the Cabinda Room of the same venue where a report on the current status of IWRM in Angola was analysed and PAAôs by-laws were outlined. The third workshop formalised PAAôs constitution. In December of the same year, in the Esmeralda Room of the Alvalade Hotel, the fourth PAA workshop took place, and dealt with the drafting of the roadmap for Integrated Water Resources Management in Angola.

At the launch of the PAA, the Minister of Energy and Water, Eng. Botelho de Vasconcelos officially appointed GABHIC and ACADIR as the PAAôs host institutions. Their role was to support the PAAôs activities.

Implementation of the roadmap will allow PAA to take steps towards achieving IWRM.

Ongoing IWRM Activities

Currently with the advent of peace, various IWRM related efforts are progressing in different areas ranging from legal to institutional aspects.

Of the legal issues the most important ones to refer to are the following:

1. Approval of the Water Law
2. Approval of the water sector development programme

Of the institutional aspects the following are important:

1. Moves by government for creation of catchment area authorities
2. Creation of mechanisms to allow for greater dialogue between the major sector water users (agriculture, industry, energy, administration etc.)
3. Restarting of the rehabilitation of the national hydrometric network, in order to facilitate major quantification of existing water resources.

The former Ministry of Energy and Water, now the State Secretariat for Water has failed to present these issues to government for them to be addressed.

Efforts are being extended nationally to include participants from the public and private sectors, universities and NGOs in PAA so as to gain the necessary capacity.

2. ROADMAP TO ACHIEVING IWRM

Fig. 1 IWRM cycle

2.1 Angola's Current Position in the IWRM Cycle

The fourth workshop on IWRM in Angola was held in the Esmeralda Room of the Alvalade Hotel in Luanda on 4th and 5th December. Angola's position in the IWRM cycle was included in the programme. The cycle starts from the Vision stage and ends at the Monitoring stage having passed through the stages of situational analysis, strategy, planning and implementation. The cycle corresponds with figure. 2. After a presentation on the Lesotho experience, the workshop participants discussed the staffing issue and agreed that Angola is either still between the Situational Analysis Phase and the Strategy phase, as can be seen from the cycle above.

The agreement in this phase is a result of the situational analysis mentioned in the aforementioned background. Despite the various constraints, some research was conducted and some investments were made. At governmental level, some strategies and action plans related to integrated water resource management in Angola were outlined. There are legal qualifications that have been created with the objective of rationalising the consumption and development of water resources.

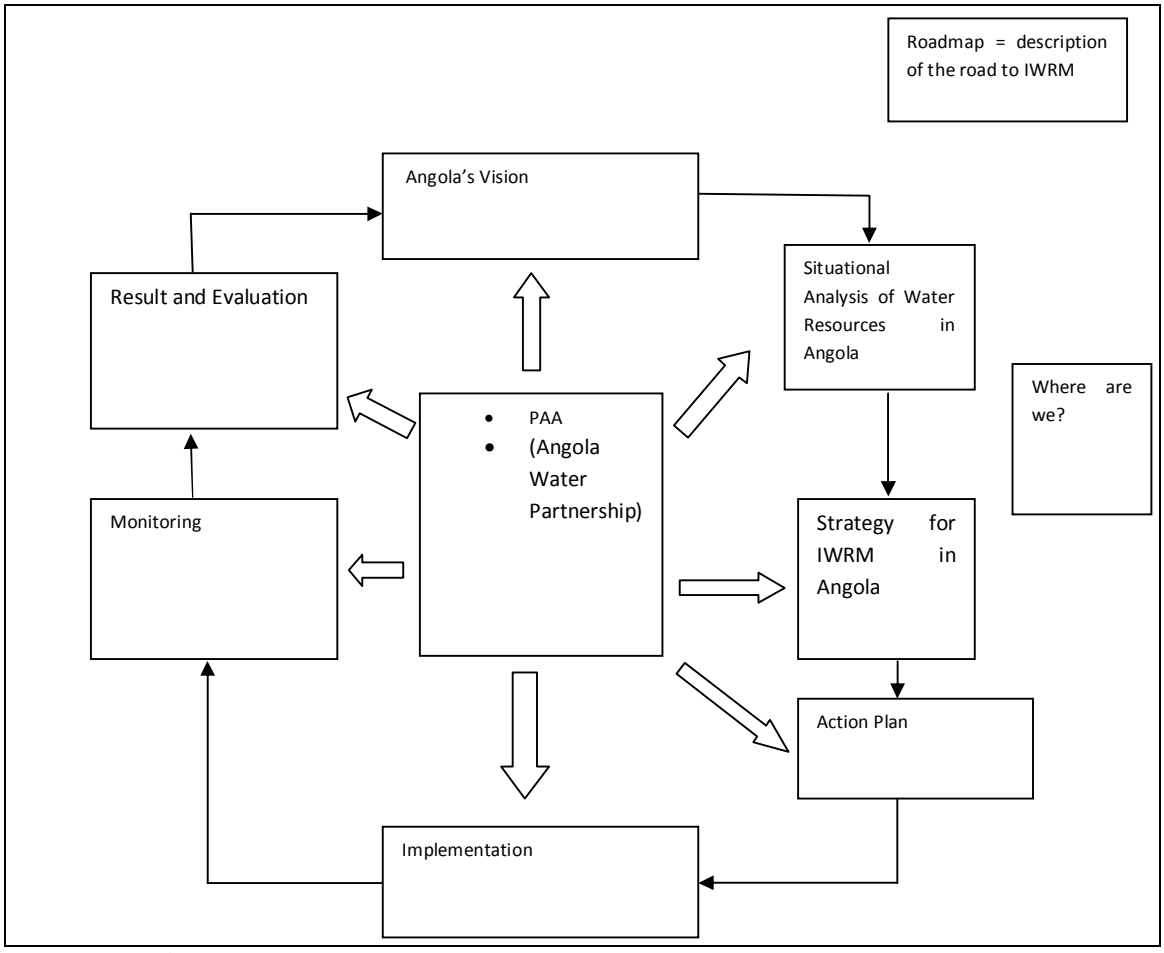

Fig. 2 Roadmap

2.2 Steps towards the implementation of IWRM

Through different work groups, the workshop mentioned above looked at the necessary steps for the implementation of IWRM in Angola. The following priorities were selected during the working group discussions:

1. Allocation of an active role to PAA;
2. Mobilisation of human, material and financial resources;
3. Completion of studies and research on the subject matter;
4. Regulation of the Angola Water Law;
5. Creation of a system of coordination and sharing of information for IWRM;
6. Creation of a financing system for the implementation of recommended programmes;
7. Hosting of events for exchange of experiences and training of staff;
8. Sharing of experience and knowledge in technical co-operation;
9. Creation of a management body;
10. Sharing of information, communication and data;
11. Identification of concrete projects;
12. Reactivation of technical resources.

2.2.1 Roadmap Elements

Six of the abovementioned priorities were selected as key reference points:

1. Strengthen the role of PAA;
2. Completion of water resource studies and research;
3. Regulation of the Water Law;
4. Training of Staff;
5. Creation of a management body
6. Rehabilitation of technical resources for :

a. The reestablishment and consolidation of hydrometric and hydro-meteorological networks;
b. Updating of databases with reliable information;

2.2.1.1 To strengthen the role of PAA:

Objectives:

- To enable the PAA to be proactive, by providing it with its own resources.

Activities:

- Hold IWRM workshops.
- Finalise and approve By-laws and Rules of Procedure of the PAA.
- Increase the network of members through involvement of more institutions;
- Strengthen the administrative capacity of the host organisation with technical personnel;
- Involve trained staff in the management body of the PAA;
- Mobilise internal and external financial and material resources.

2.2.1.2. Conduct studies and research on water resources

Objectives:

- To equip interested institutions and related entities with a reliable and updated database on water resources in Angola.

Activities:

- Develop database studies on hydrological basins in their multiple catchment areas so as to input current and reliable information into the database.

2.2.1.3. Regulation of the Water Law on issues related to the utilisation and quality of water resources.

Objectives:

- To ensure the competence of legal staff on issues relating to the utilisation and quality of water for human consumption, irrigation, hydroelectricity, industry, fisheries, tourism and other uses.

Activities:

- Form lobby groups with the National Assembly and the Ministry of Energy and Water
- Complete studies showing the vacuum created by the absence of the regulation of the law.

2.2.1.4. Training of Staff

Objectives:

- To train staff working in Water Resources Management;

Activities:

- Hold workshops on IWRM tools
- To develop training programmes for staff in water resources, both in and out of the country.
- To facilitate entry of Angolan staff into Masters courses offered by Waternet for SADC countries.

2.2.1.5. Creation of a management body;

Objectives:

- Creation of a National Institute of Water Resources Management

Activities:

- Creation of a specific project
- Mobilisation of resources to cover the project.

2.2.1.6. Rehabilitation of technical resources by:

a. Re-establishing and consolidating hydrometric and hydrometeorology networks;

b. Updating the database;

Objectives:

- Ensure there are adequate technical resources to allow for the collection of reliable data.

Activities:

- To complement governmentôs activities in the rehabilitation of infrastructure for water resources management

- To help government in obtaining funds for the rehabilitation and upgrading of structures and technical assets for IWRM.

CHAPTER 4: ACTUAL STATE OF WATER ACCOUNTING

Of its total budget in 2005 the government made available 1.08% to Agriculture, 1.67% to Water, 0.86% to public health, 1.97% to the Environment and Fisheries Sector, 0.8% to Industry and 0.01% to the Mining sector.

An Executive Decree from the Ministry of Finance had in 1998 delegated the responsibility of fixing potable water tariffs to provincial governments. The decree lays the basis for setting tariffs on the cost of extraction, storage, treatment and distribution of potable water. The Executive Decree makes provisions for 6 monthly increases provided that these increases do not exceed 15% on each occasion and that they are inflation adjusted. However it was noted that there was no consistency in administrative approval of price increases. Consequently, current water tariffs are low and water companies cannot cover expenses incurred whilst operating supply systems.

The Executive Decree also made provision for a ñsocial tariffò to be stipulated by the then Ministry of Energy and Water with the purpose of protecting poor and vulnerable people.

Table 4 : Potable water tariff increases in Luanda province in 2004

Type of consumer	Prices before April 2004 in *Kwanzas* (US$)	Prices in April 2004, in *Kwanzas* (US$)	Prices in July 2004, in *Kwanzas* (US$)	Prices in October 2004, in *Kwanzas* (US$)
Industrial, Commercial and Services	26.00 (0.33)	34.00 (0.43)	48.00 (0.59)	67.50 (0.79)
1st Category domestic consumors (0 ï 10 m³)	12.50 (0.16)	20.00 (0.25)	28.00 (0.34)	39.00 (0.46)
2nd Category domestic consumers (10 ï 30 m³)	18.00 (0.23)	25.00 (0.31)	35.00 (0.43)	49.00 (0.58)

3rd Category domestic consumers (> 30 m³)	20.00 (0.25)	34.00 (0.43)	48.00 (0.59)	67.50 (0.79)
Economic Consumers Consumers (fountains)	11.00 (0.14)	16.00 (0.20)	22.50 (0.27)	32.00 (0.38)

Source: Diário da República, (Official Journal of Angola) Series 1 – Nº 36, 04 May 2004

The prices shown in table 4 are much lower than those of the parallel water market where the price of water varies between US$2.00 and US$16. 00 per m^3. The majority of people paying higher prices for water are those living in peri-urban and some rural areas where the majority of houses do not have residential water systems.

There are no stipulated prices for water for agricultural use. Even though the National Water Directorate has a Licensing and Control Department. But all water abstraction for irrigation is done for free. All water users are obliged to obtain permission to use water but controls are not yet functional.

Apparently the vision of many local politicians and decision makers is that Angola has abundant water resources, and as such, water is considered a ñsocial assetò and not an economic asset. Therefore in the majority of urban areas water is subsidised by the government by more than 85%.

CHAPTER 5: FUTURE PERSPECTIVES

Due to the 27 years of civil war there was massive destruction of the hydrometric station network and currently there is very little up to date information on the actual water resources situation in Angola. Many critical areas in the water sector have not be given the priority they deserve due to various constraints one of them being that the Water Law has not been regulated.

Important lessons that have been learnt are as follows:

- It takes a minimum of 3 years for institutions to be functional
- National awakening on the need for IWRM
- Urgent training and capacity building on the importance of IWRM is needed for employees in the water sector
- Libraries with information on the countryøs water resources are needed
- Major involvement is required from the private and public sector as well as the IWRM community
- That the State Secretariat for Water must have a more active role in the Angolan Water Partnership (PAA) so that it can be effective in mobilising the different sectors in IWRM
- That the PAA must be given necessary support such as a forum where it can bring together the various parties involved in IWRM
- There is an urgent need for the creation of institutions that can support IWRM implementation
- Financial resources need to be made available to rehabilitate hydrometric stations
- Creation of a National Institute Water Resource Management

The new government formed in 2008 separated Water from Energy in such a way to allow for acceleration in implementing many national and regional programmes.

Due to Angolaøs economic growth, the need for investment in the water sector is increasing dramatically. For this reason there is an urgent need to present proposals and concrete plans that will allow for studies to be completed that will result in the effecting/implementing of an efficient IWRM.