High-Level Conference on:

Water for Agriculture and Energy in Africa: the Challenges of Climate Change

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National Investment Brief

ANGOLA

EXECUTIVE SUMMARY:

Despite high levels of poverty and an agricultural sector that has not kept up with population growth, Angola is generally food secure, with only regional pocket in the north west of the country and thin strip along the southern border with Namibia generally suffering from moderate food insecurity.

Agriculture, which provides the livelihood for some 85% of the population and largely comprises subsistence production and accounts for less than 10% of the GDP of this oil rich nation. Receiving only 1% of public expenditures, it is fair to say that the sector is marginalized, and of its vast 3.7 million ha of potential irrigation less than 10% is currently equipped.

Climate change is expected to result in less precipitation and run-off over most of the country with the exception of northern areas where these will increase. Soil moisture is expected to decrease everywhere, while some models predict temperature rises everywhere, leading to significant expansion of the southern African dune systems into significant areas of Mozambique by the end of the century.

The country's water resources are vast and generally undeveloped. This includes hydropower, total potential for which has been estimated to be 150,000 GWh/yr of which only some 600 MW capacity has been installed.

Angola's overall development agenda has been set by the Estratégia de Combate a Pobreza (ECP), which was prepared in 2003 and approved by GOA in February 2005. It is equivalent to the Poverty Reduction Strategy Papers prepared in other countries; includes development programmes already started in 2002 The ECP has ten specific objectives, but only one of these is explicitly directed at agriculture for which the objective is basically the enhancement of food security and rural development. In order to achieve these objectives, the priority areas of intervention as identified by the ECP are: strengthening the traditional production capacity of the agricultural sector; revitalizing the domestic market system; the sustainable development of natural resources; and institutional strengthening with a view to making the municipality the focal point for rural development.

The only available investment envelope consists of US$143 million for the short term, of which US$72 million is allocated for small scale water control, US$60 million to irrigation scheme rehabilitation and US$12 million to large scale hydraulic projects. For the medium term, the total is US$255 million (US$45 million, US$139 million and US$70 million). And for the long term the total is US$194 million (US$23 million, US$26 million and US$145 million). These figures do not however, reflect the US$6 billion of private, short to medium term investment called for under a new government initiative and which will almost certainly include irrigation or other forms of agricultural water management.

1. CONTEXT

1.1 AGRICULTURE AND FOOD SECURITY

Agriculture

Of the total surface area of 124 million hectares, 35 million ha are classified as potentially arable, of which 30 million ha is virgin land while the remaining 5 to 8 million ha is land that has been previously cleared and cultivated. Of this latter amount, only 2.5 million ha are estimated to be currently is use. The agricultural sector accounts for only 9.6% of Angola's gross domestic product and receives less than 1% of public expenditures. Nevertheless, it is a fundamental economic activity in a country with a large rural population and small industrial sector (excluding oil). It is the main source of employment and food supply and therefore is key to poverty alleviation and food security. It employs almost two-thirds of the working population and subsistence agriculture, which dominates agricultural production, provides the main source of livelihood for 85% of the population (MITC 2005).

Nonetheless, Angola's climatic diversity means a wide range of crops can be grown and prior to independence, the country was actually self-sufficient in all crops except wheat. It was a top commercial producer of coffee, sisal, palm oil, bananas, and sugarcane. Even now, Angolan farmers do produce a wide array of food and cash crops, albeit at low levels of output per hectare. Cereals, maize, millet, sorghum and rice are the main crops, with cassava, Irish and sweet potatoes comprising the main roots and tubers. These crops comprise the basic food diet of the population. Legumes, notably the common and kidney bean as well as peanuts and soybeans, also make an important contribution to the diet and incomes of small farmers. Oil crops (palm oil and sunflower oil), vegetables and fruits and some coffee production are the main cash crops.

Irrigation and water control

At 0.2%, total withdrawals from the country's internally renewable water resources are very low, with irrigation in 2000 itself accounting for only half of this total (FAO 2005). The county's topography, comprising as it does, a high inland plateau with average annual rainfall of over 1000 mm (FAO 1995), is ideal for dam development. But this so far has been limited.

Data with respect to irrigation and water control in Angola is scarce, and often old. According to FAO estimates, the total potential irrigable area is around 3.7 million ha (FAO 2005), but estimates with respect to how much of this is already equipped varies. In 2003 a SADC study suggested a total figure of 160,000 ha (SADC 2003) while SWECO Grøner, in 2005 suggested 340,478 ha (SWECO Grøner 2005). These figures should also be compared with SWECO Grøner's 2005 estimate of the total awaiting rehabilitation or ready for development: 783,338 ha. AQUASTAT moreover; suggests that an additional 350,000 ha of wetland is under some form of agricultural water management. The main irrigated crops are vegetables, tobacco, bananas and citrus (FAO 1995).

Irrigation is the principle water using sector, accounting for 62% of total withdrawals in 2000 (343 million m^3 - FAO 2005). The county's topography, comprising as it does, a high inland plateau with average annual rainfall of over 1000 mm (FAO 1995), is ideal for dam development. But this so far has been limited.

Food security

In 2003 FAO, described Angola as having a very high level of undernourishment, with 50% of the population being under nourished. The situation was improving however. In 1992 for instance the average food supply in kcal/person/day was 1730, whereas by 2001 it had increased to 1900. Similarly, in percentage terms, the undernourished comprised 61% of the population in 1992 and 49% in 2001. These figures nonetheless compare poorly with both the Southern Africa Region and Sub-Saharan Africa as a whole (41% and 33% respectively).

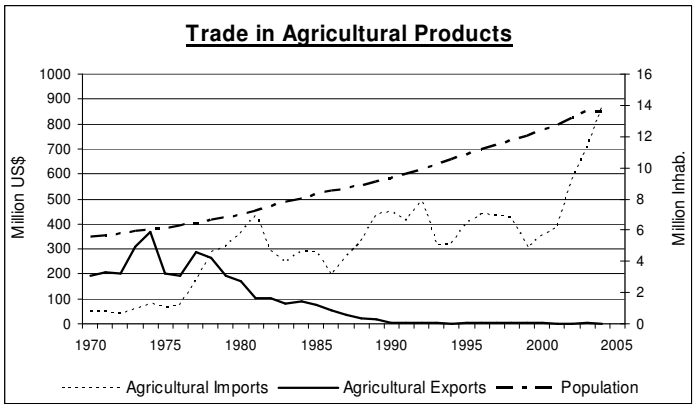
The largely subsistence agricultural sector has failed to keep up with rapid population growth yet despite this, the country is not characterised by widespread food insecurity. But the progress suggested by FAO 2003 would seem to have been maintained. However, though there are pockets of food insecurity in the North West of the country, the Southern provinces are all moderately food

secure. Where food insecurity is encountered, it is generally attribute to poor rainfall conditions or crop infections, especially the cassava mosaic virus.

Food and agriculture trade and import balance

Angola has become a country dependant on large-scale importation of food (commercial imports of wheat, maize and rice) and food aid donations (mostly in the form of maize and beans). Angola still suffers from a huge food deficit of 625 000 tonnes per year, partly owing to the inefficiencies of the distribution system. As a result, the country has to import three-quarters of its food requirements (OECD, 2006). The trend in agricultural imports exhibited a continuous increase over time and in 2004 reached the value of approximately US$ 850 millions.

There is no exportation of agricultural products as a source of foreign exchange (MITC 2005): the agricultural export of the country, in fact, rapidly dropped from level close to US$ 300 million in the mid seventies to levels close to zero in the beginning of the nineties.



1.2 WATER RESOURCES AND HYDROPOWER

Surface water resources are relatively abundant in the country. The Central High Plateau is a natural water tower from where the major home rivers descend either to the Atlantic coast (creating large irrigated river valleys such as the Kwanza, Keve, Catumbela, Kunene, among others) or forming a dense river network in the Southeast (including the Kuando Kubango, and Kuito rivers) before draining into the Okavango Basin. The Congo River and its tributaries in the North and Northeast, and the Zambezi River and its tributaries in the East, complete the vast water surface and underground resources. In total, Angola contains 47 river basins of which 26 are permanent rivers and the remaining (mostly in the south–west) are intermittent, flowing only in the rainy season.

Total internal renewable water resources have been estimated at 148 km^3/year, of which 145 km^3 are surface water resources and 58 km^3 are groundwater resources. The overlap between surface water and groundwater resources has been estimated to be 55 km^3.

Angola has vast quantities of undeveloped water resources which drain its hinterland by means of a highly dendritic drainage system. Although some of its rivers flow into neighbouring countries, Angola itself receives no transboundary flows. According to the World Bank, the pressing issues in water resources management have more to do with institutional issues, water supply and sanitation (World Bank Relief Web 2008).

Approximately 75 percent of Angola's power supply is generated by hydropower (International Small-hydro Atlas), but with its numerous powerful rivers and ideal topography, Angola has tremendous potential for generating much more. It has an estimated hydropower potential of 150 000 GWh/year (feasibility or otherwise not withstanding), of which about 65 000 GWh/year is considered to be firm potential. There are approximately 10 hydro plants constructed in Angola (International Atlas ibid). However, several were knocked out of action by the civil war at the end of which ENE, the generating authority (Empresa Nacional de Electricidade), had approximately 358.3MW of available capacity out of the 601.4MW nominal capacity at its stations.

1.3 CLIMATE CHANGE

As far as could be ascertained, Angola has yet to provide its first communication to the United Nations Framework Convention on Climate Change. Accordingly, there is little climate change information available of specific relevance to the country. Models developed or assessed by the Intergovernmental Panel on Climate Change as cited by FAO (FAO 2008) suggest that rainfall and runoff will reduce over much of Angola, with only the northern areas receiving more precipitation, with increased run-off. Soil moisture however, is expected to reduce over the entire country. Another source (SciDevNet 2005) also predicts that the southern areas of the country will share the increased temperatures that are expected to build up across the entire land mass of southern Africa by the second half of the century. This in turn is expected to increase significantly the area of sand dunes that currently characterises the Kalahari region, such that they may eventually be encountered throughout much of the Angola.

2. NATIONAL STRATEGIES FOR WATER, AGRICULTURE AND ENERGY

2.1 POLICY CONTEXT

There would appear to be no relevant specific sector policies as yet in Angola, and as far as water is concerned, any policy-like effort is largely directed at water supply and sanitation service expansion (see for instance KOSA). Nonetheless, it is understood that government is in the process of developing an agricultural policy. For instance in its "Production Report for the 2004/05 Programme" government stressed its commitment to the rehabilitation and/or construction of basis production support infrastructure; agricultural expansion; see propagation, production and multiplication; research for both arable and pastoral production; producer encouragement and capacity building (MITC 2005). To this end discussions have been underway with the country's development partners among which FAO for instance, has assisted the Ministry of Agriculture and Rural Development to prepare an agriculture sector review which was discussed and endorsed at a national workshop in December 2004. This review is expected to become an important input to the policy formulation exercise.

Angola's overall development agenda has been set by the Estratégia de Combate a Pobreza (ECP), which was prepared in 2003 and approved by GOA in February 2005. It is equivalent to the Poverty Reduction Strategy Papers prepared in other countries; includes development programmes already started in 2002 and constitutes a reference document for the definition of sectoral strategies as well as the basis for preparing medium-term development plans. The global objective of the ECP is to consolidate peace and national unity by improving standards of living, particularly for vulnerable groups, by motivating them to participate actively in the social and economic development of the country. The ECP has ten specific objectives, but only one of these is explicitly directed at agriculture as it states: "Minimize the risk of hunger, satisfy internal food needs and enable the rural economy as a vital for sustainable development". Some of the other objectives of the ECP also support the rural sector indirectly, particularly those related to the resettlement of the rural population; rehabilitation of basic infrastructure; demining of the rural areas; and improvement of basic education and health services.

The agricultural objective of the ECP is basically the enhancement of food security and rural development. In order to achieve these objectives, the priority areas of intervention as identified by the ECP are: strengthening the traditional production capacity of the agricultural sector; revitalizing the domestic market system; the sustainable development of natural resources; and institutional strengthening with a view to making the municipality the focal point for rural development. A key role for the private sector is anticipated, as evidence by a recently launched plan to attract US$ 6 billion of agricultural investments over the five years 2008 to 2013 (USAID 08).

2.2 INVESTMENT ENVELOPE

The investment envelope for the short, medium and long term is presented in the Table below and expressed in million US $ (based on CAADP investment projections).

Time scale	Type of investment (million US$)			
	Small scale water control	Rehabilitation of irrigation	Large scale hydraulic projects	**Total**
Short-term	72	60	12	**143**
Medium-term	45	139	70	**255**
Long-term	23	26	145	**194**
Total	**140**	**225**	**227**	**592**

2.3 PROJECT PORTFOLIO

Section 3 presents recently achieved, active and pipeline projects related to the above investment envelope.

PROJECT PROFILES (ON-GOING AND PROJECTED)

Project title	Funding Partners	Time Scale	Total Budget	Description
I. PROJECTS RECENTLY IMPLEMENTED				
Matala Irrigation Scheme rehabilitation	Government	2002-2004	US$27.0 million	10,000ha scheme in Huíla province
Neves Irrigation Scheme rehabilitation	Government	2002-2004	US$18.0 million	1,300ha scheme in Huíla province
Capanda Phase 2	Public Investment (SAPP)	End: 2007	US$ 344 million	Phase 2: (2 x 130 MW units) of hydro power development at Capanda
II. ON-GOING PROJECTS				
Bom Jesus-Calenga Smallholder Agricultural Development project	AfDB	2007-2012	US$27.5 million	27,000ha mixed rain fed and irrigation development on 2 sites, namely Bom Jesus (irrigation development) and Calenga (rainfed agriculture) in Bengo and Huambo provinces, respectively.
Gove (Including lines)	Public Investment (SAPP)	End: 2010	US$ 180 million	Rehabilitation of the Dam and Installation of the power station including 80 km Gove - Huambo and 152 km Gove- Matala 220kV lines. 60 MW capacity. Completed feasibility studies for power station. Tender process concluded.
Market Oriented Smallholder Agriculture Project	WB	2008-2014	US$ 49.35 million	There are three components to the project. The first component of the project is capacity building. The second component of the project is agricultural investment support. This component will provide demand-based support, in the form of matching grants, to rural communities and smallholder groups and associations, for village productive infrastructure (irrigation and drainage) and agricultural production, processing and marketing sub-projects. The third component of the project is project management.
III. PIPELINE PROJECTS				
Upper Okavango Water Management Project	AfDB/others	2010-2015	US$31 million	Main funding for roads ($17mill) and irrigation ($8mill). Project shared between Angola and Namibia
Irrigation Rehabilitation and Sustainable Water Resources Management	FAO-NEPAD	5 years	US$315 million	Component 1: Lowlands Water Conservation and Irrigation Perimeters for Large, Medium and Smallholder Farmers; Component 2: Increasing Availability of Water for Livestock; Component 3: Increasing Availability of Water for Human Use
Cambambe II	ENE, Public Investment, (SAPP)	End: 2011	US$ 772 million	Hydro power development at Cambambe (260MW). Detailed feasibility studies to be done

ANNEX 1: MAP OF WATER CONTROL IN ANGOLA:

ANNEX 2: COUNTRY STATISTICS

Country and Population			
Area of the country	2005	124670	1000 ha
Cultivated area as % of the total area of the country	2005	2.9	%
Total population	2005	15941	1000 habitants
• of which rural	2005	63	%
Population economically active in agriculture	2005	5218	1000 habitants
• as % of total economically active population	2005	70	%
• female	2005	54	%
• male	2005	46	%
Economy and Development			
Gross Domestic Product (GDP) (current US$)	2007	58547	millions US$/an
• value added in agriculture (% of GDP)	2006	9.6	%
• GDP per capita	2007	3440	US$/an
Access to improved drinking water			
Total population	2006	51	%
Urban population	2006	62	%
Rural population	2006	39	%
Water Resources and Management			
Average precipitation	2007	1258.8	10^9 m^3/an
Total actual renewable water resources	2007	148	10^9 m^3/an
Dependency ratio (transboundary rivers)		-	%
Total actual renewable water resources per inhabitant	2007	9284	m^3/an
Total dam capacity	2005	4.47	10^9 m^3
Total water withdrawal	2000	0.35	10^9 m^3/an
• as % of total actual renewable water resources	2000	0.24	%
IRRIGATION AND DRAINAGE			
Irrigation potential	2007	3700	1000 ha
Water Management			
Total/partial equipped areas, area equipped	1975	80	1000 ha
Valley bottoms equipped area	1975	0	1000 ha
Total area equipped for irrigation	1975	80	1000 ha
• as % of cultivated area	1975	2.4	%
• annual increase rate		-	%
• power irrigated area as % of total area equipped		-	%
• % of total area equipped actually irrigated	1994	29	%
Non-equipped cultivated wetlands and inland valley bottoms	1975	320	1000 ha
Total water-managed area	1975	400	1000 ha
• as % of cultivated area	1975	11.8	%
• drained area as % of cultivated area		-	%
Typology of Irrigation			
Small-scale schemes (<ha)		-	1000 ha
Medium-scale schemes (- ha)		-	1000 ha
Large-scale schemes (>ha)		-	1000 ha
Irrigated Crops			
Rice	1998	16.0	1000 ha
Sugar Cane **	1998	9.0	1000 ha
Vegetables	1998	15.0	1000 ha
Bananas	1972	7.7	1000 ha
Citrus	1972	3.5	1000 ha
Tobacco	1972	9.1	1000 ha
Other perennial crops	1975	11.2	1000 ha

ENERGY INDICATORS			
Energy Production	2005	70.70	Mtoe
Net Imports	2005	-59.34	Mtoe
TPES	2005	9.90	Mtoe
- TPES/Pop	2005	0.62	toe/capita
- TPES/GDP	2005	0.66	toe/thousand 2000 US$
- TPES/GDO (PPP)	2005	0.30	toe/thousand 2000 US$ PPP
Electricity Consumption	2005	2.27	TWh
- EC/Pop	2005	142.00	kWh/capita

ENERGY SUPPLY AND CONSUMPTION

	Coal	Gas	Crude oil	Petroleum products	Hydro	Other Renewable & Waste	Others	TOTAL
Production	0	612	63623	0	150	6315	0	**70700**
Imports	0	0	0	1119	0	0	0	**1119**
Exports	0	0	-59940	-516	0	0	0	**-60456**
International Marine Bunkers	0	0	0	-1	0	0	0	**-1**
Stock Changes	0	0	-1464	0	0	0	0	**-1464**
Total Primary Energy Supply (TPES)	**0**	**612**	**2219**	**602**	**150**	**6315**	**0**	**9898**

* in thousand tonnes of oil equivalent (ktoe) on a net calorific value basis.

(**) Currently there is no sugarcane production in Angola. All sugarcane irrigation schemes became unviable and were de-activated. They were converted into areas for production of vegetables. GOA has plans to re-start sugarcane production in Dombe Grande (an old sugarcane irrigation scheme) in Benguela province, in Cahama (Cova do Leão) in Cunene province, in Cuito-Cuanavele in Kuando Kubango province and in Pungo Adongo, in Malange province.

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