High-Level Conference on:

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

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National Investment Brief

NAMIBIA

EXECUTIVE SUMMARY:

Namibia portrays a moderate level of undernourishment with seven percent of the population classified as undernourished. Both the proportion and the number of undernourished have decreased from 1990-92 (benchmark period of the World Food Summit, WFS and the Millennium Declaration, MD) to 1999-2001, the last period available.

Agricultural output from Namibia is extremely sensitive to climatic conditions. Periodic droughts cause considerable stock losses and reduced grain production, mainly because most Namibians engaged in agriculture undertake subsistence cropping and pastoralism characterized by rainfed production. Around 45,000 ha have been identified as suitable for irrigation in Namibia. In 2007, 8,000 ha were equipped for irrigation. In addition to that, flood recession cropping is practised in the flood plains of the Okavango and Zambezi rivers (in 2007, this activity covered 2,000 ha).

Perennial rivers in Namibia are found only on the southern and the northern boundaries, all shared with other countries. It is estimated that shared rivers currently provide around one third of the water consumed in Namibia. The total storage capacity of the major dams is about 0.71 km^3. In addition to these larger reservoirs, there are hundreds of small farm dams scattered around the ephemeral river basins. The 240 MW installed capacity hydropower plant at Ruacana could supply up to 60% of the electricity needs in 1995 of Namibia.

The agricultural sector overall objective as defined in the Second National Development Plan (NDP2) is to contribute to the improvement of levels of household and national food security, and to create employment opportunities. This is to be reached through immediate objectives like increasing and stabilizing agricultural productivity and farm income. The Third National Development Plan (NDP3), meant to start 2007, but yet to be finalised, fosters the objective to optimally and sustainably utilise natural resources in enhancing the potential of agriculture to contribute to economic growth and overall national development, particularly through the improvement of the production systems of both communal and commercial farmers, the improvement of marketing conditions, the effort for halting soil erosion, the promotion of soil fertility enhancement technologies, the development of new virgin lands.

The financial envelope for the investment strategy is estimated at US$64 million. Currently there are three recent and ongoing projects with water component that range from 12.0 million US$ for the expansion of irrigation schemes to 150 million US$ for Green schemes. Among the pipeline projects there are also two Bankable Investment Projects with large water component, one for US$2.4 million and the other for US$524 million.

1. CONTEXT

1.1 AGRICULTURE AND FOOD SECURITY

Agriculture

Namibia's GDP was US$6740 million in 2007. The value added by agriculture and forestry was 6.1 percent of GDP, of which 75-80 percent are attributed to livestock farming. The sector provides occupation for 38 percent of the economically active population and 58 percent of the population working in agriculture is male.

Growth in the agricultural sector has averaged 1.2 percent per year since independence in 1990, while since 1993 growth has averaged 2.8 percent per year. The sector is strongly influenced by climatic conditions and as a result the contribution to GDP has varied between 6.8 percent and 12.3 percent since 1990, with low contributions in drought years. Since 1995, agricultural growth has barely kept pace with population growth, which can be attributed directly to the below-average rainfall in Namibia over the past few years.

Agriculture is segmented in two very different sectors: the commercial sector, with around 4,000 mostly white freehold farmers concentrating on livestock, and the communal sector, mainly in the north, supporting around 140,000 families. It is characterized by low levels of agricultural productivity, high incidences of poverty, food insecurity, lack of appropriate farming methods and high unemployment levels. Farmers in communal areas engage in rainfed crop and livestock production, making the sector vulnerable to climatic variability.

Irrigation and water control

Around 47,300 ha have been identified as suitable for irrigation in Namibia. In 2002, 7,573 ha were equipped for irrigation. In addition to that, flood recession cropping (mainly maize) is practised in the flood plains of the Okavango and Zambezi rivers (in 1992, this activity covered 2,000 ha).

In 2007, the major irrigated crops were maize, alfalfa and pasture, wheat, table grapes and fruit. Irrigated land areas may be characterized by low-value crops such as maize and alfalfa, and high-value crops including grapes, dates, and melons. The bulk of irrigated areas is under low-value crops. Currently, irrigation development is taking place along the Orange River for the production of table grapes and dates for the European and USA markets.

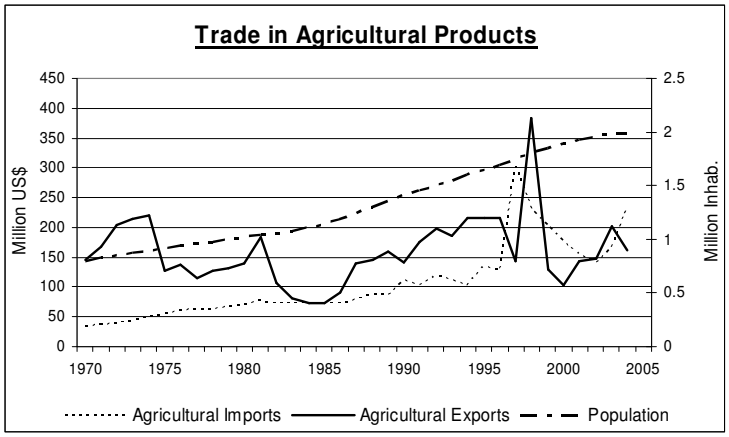
Food security

Namibia portrays a moderate level of undernourishment with seven percent of the population classified as undernourished. Both the proportion and the number of undernourished have decreased from 1990-92 (benchmark period of the World Food Summit, WFS and the Millennium Declaration, MD) to 1999-2001, the last period available.

Food and agriculture trade and import balance

The food commercial bill in the country shows a linear increase over time to mirror the increase in the population. In 2004 the value of the bill reached US$ 184 million. The agricultural exports remained roughly stable over the years, while the agricultural imports steadily increased: traditionally the trade balance for Namibia was positive, but in 2003 this trend inverted and agricultural imports overtook exports.

Food imports amount to about seven percent of the total value of imports (2005). Namibia imports sugar, maize, edible offal, wheat, concentrated milk and cream, cheese and butter. Agricultural exports comprise mainly livestock and meat products and account for about 15 percent of all Namibian exports and 54% of the agricultural exports.



1.2 WATER RESOURCES AND HYDROPOWER

The whole of Namibia experiences a net water deficit (mean annual rainfall minus potential evaporation), ranging from - 3700 mm in the south east, to -1800 mm in the northeast. There are no perennial rivers arising in Namibia. Perennial rivers are found only on the southern boundary (the Orange, which is shared with South Africa and Lesotho) and the northern boundary (the Kunene, Okavango, Kwando, Chobe, Linyanti and Zambezi which are shared with Angola, Botswana and several other countries). Therefore, Namibia is highly dependent on its neighbouring countries for securing its water supply, particularly South Africa and Angola due to the large portion of the country's population living near or along the banks of the rivers shared with these countries. It is estimated that shared rivers currently provide around one third of the water consumed in Namibia.

The total storage capacity of the major dams in the country is about 0.71 km^3 and the 95 percent assured combined yield is 95.83 million m^3/yr. In addition to these larger reservoirs, there are hundreds of small farm dams scattered around the ephemeral river basins. No hydropower dam exists in Namibia. Nonetheless, the large dam of Ruacana on the Kunene river in Angola, with its 240 MW installed capacity, supplies up to 60% (1 134 GWh in 1995) of Namibia's electricity, although in dry years this has fallen to 45% (672 GWh in 1994). A tunnel with 85m drop from the dam carries water across the border to power the 3 turbines on the Namibia side. Studies have been carried out to identify and estimate cost and production for all potential hydropower projects in the Lower Kunene, Kavango and Lower Orange rivers.

1.3 CLIMATE CHANGE

All the models that were considered by the Ministry of Environment and Tourism in order to estimate the impact of climate change in Namibia predict an increase in the mean annual temperature (and in both the minimum and maximum monthly temperatures), under all scenarios. An increase in temperature will be associated with an increase in the potential evaporation rate of around 5% per degree of warming. There is less agreement amongst the various models regarding future rainfall in the Namibian region. The projections range from small increases of less than 30 mm per year to severe decreases in annual rainfall (200 mm per year less than the current average).

The Namibian people, economy and environment are extremely sensitive to climate change effects and, due to institutional and financial constraints, are considered highly vulnerable to these effects. Regarding the agricultural sector, periodic droughts cause considerable stock losses and reduced grain production. Also hydropower is affected by climate change as demonstrated by the electricity production from the Ruacana plant which is already severely curtailed during periods of drought and low flow.

2. NATIONAL STRATEGIES FOR WATER, AGRICULTURE AND ENERGY

2.1 POLICY CONTEXT

The agricultural sector overall objective as defined in the 2001-2005 **Second National Development Plan (NDP2)** Mission Statement is to contribute to the improvement of levels of household and national food security, and to create employment opportunities. According to NDP2 this mission is to be accomplished through achieving the following immediate objectives:

- Increase agricultural production at national and household levels.
- Improve the agricultural balance of trade by raising the volume and value of agricultural exports and reducing those of imports.
- Promote complementary farmer livelihood opportunities.
- Increase the in–country value added to agricultural output.

In addition to the sector objectives spelled out in NDP2, Namibia's agricultural development is also guided by the **National Agricultural Policy of 1995**, the objectives of which are:

- Achieve growth rates and stability in farm incomes, agricultural productivity and production levels that are higher than the population growth rate.
- Ensure food security and improve nutritional status.
- Create and sustain viable livelihood and employment opportunities in rural areas.
- Improve the profitability of agriculture and increase investment in agriculture.
- Contribute towards the improvement of the balance of payments.
- Expand vertical integration and domestic value added for agricultural products.
- Promote the sustainable utilization of the nation's land and other natural resources.
- Contribute to balanced regional rural development based on comparative advantage.

These objectives are to be pursued through the following strategies as proposed in a **2003 review of the National Agricultural Policy**:

- The role of government is to create enabling macro–economic and institutional setting.
- Refocus government support towards communal area farmers and vulnerable groups.
- Free market environment and border/opportunity cost pricing.
- Diversification to non–traditional crops and value adding.
- Human resource development (HRD).
- Privatization of support services to farmers.
- Community/farmer participation in resources management.

In the long term, the agricultural sector's vision is to modernize agriculture in line with the country's **Vision 2030**. Specific strategies highlighted include:

- The improvement of animal heath, production and marketing in the communal areas, and hence the integration of domestic livestock markets.
- The cultivation of high value crops.
- Improved value adding to meat products.
- The adoption of integrated pest management strategies.

The Third National Development Plan (NDP3), meant to start 2007 but is yet to be finalised, is the first systematic attempt to translate the Vision 2030 objectives into concrete policies and actions. It proposes "accelerating economic growth and deepening rural development" with integrated results based management. Concerning agriculture, it fosters the objective to optimally and sustainably utilise natural resources in enhancing the potential of agriculture to contribute to economic growth and overall national development, particularly through the improvement of the production systems of both communal and commercial farmers, the improvement of marketing conditions, the effort for halting soil erosion, the promotion of soil fertility enhancement technologies, the development of new virgin lands. Also the promotion of the sustainable use of water resource is a core element of the NDP3. This will be achieved through the promotion of Integrated Water Resources Management (IWRM), the harmonization of policies, legislation, and regulations regarding water resources management; a greater use of groundwater resources and water reuse and desalinization.

The overall investment required to implement NDP3 is estimated at, on average, N$76 billion considering an average annual growth of the GDP 5.0 percent, and at N$94.6 billion considering an average annual growth of the GDP of 6.5.

Specific sub–sector policies are also in place:

- The **Namibia National Water Policy White Paper of 2000** aims at achieving equitable access to, and the sustainable development, of freshwater resources by all sections of the population especially the rural and urban poor.
- The **Crop Diversification Policy** encourages the growing of high–valued crops with potential to add to the export market or to reduce the volume and value of agricultural imports.
- A **Cotton Development Plan (2000)** approved by government aims to increase production of cotton in the medium term.
- The **National Drought Policy** of November 1997 was developed to reduce excessive government expenditure on relief programmes during periods of drought.
- The **National Horticulture Development Initiative (2002)** is to promote increased local production and marketing of fruit and vegetables and other horticultural products;
- The **Mahangu and Sorghum Action Plans**, updated in 2004, have similar objectives of production and marketing;
- The **National Small Stock Development Plan (2004)** is a coordinated approach to the development of the small stock sector in such a way as to increase its contribution to national agricultural output, agricultural value added and improved balance of trade.
- Namibia's unique biodiversity is to be exploited by implementing the **Indigenous Plants Development Strategy of 2003**.

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	23	3	0	**26**
Medium-term	14	6	3	**24**
Long-term	7	1	6	**14**
Total	**44**	**11**	**9**	**64**

2.3 PROJECT PORTFOLIO

Section 3 presents recently achieved, active and pipeline projects related to the above investment envelope. Currently there are three recent and ongoing projects with water component that range from 12.0 million US$ for the expansion of irrigation schemes to 150 million US$ for Green schemes. Among the pipeline projects there are also two Bankable Investment Projects with large water component, one for US$2.4 million and the other for US$524 million.

3. PROJECT PROFILES (ON-GOING AND PROJECTED)

Project title	Funding Partners	Lifeline	Total Budget	Description
I. PROJECTS RECENTLY IMPLEMENTED				
Etunda Irrigation scheme expansion	Government	1995-2003	US$12.0 million	Expanded the scheme from 203ha to 640ha. Main crop wheat
II. ON-GOING PROJECTS				
Green Schemes	Government	2003-2012	US$150 million	Many schemes proposed under the current Policy.
Tandjieskoppe Irrigation Project	AfDB/Badea/Opec	2005-2012	US$61 million	720ha grape/date project for export.
National Programme for Food Security	FAO	5 years	US$ 625 million	The long-term goal of the National Programme for Food Security is to ensure that "All people in Namibia at all times, have physical, economic and social access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". The Priority Programme has a horizon of five years and is tentatively estimated to cost US$625 million. It is divided into seven components where the "natural resource management" accounts for US$8.3 million.
III. PIPELINE PROJECTS				
Bankable Investment Project Profile (BIPP): Infrastructure Upgrade of Rural Water Supply	FAO-NEPAD		US$2,4 million	The primary focus of the project is on upgrading of water infrastructure. The project will be developed in the Omaheke region and will cover an area of 44,038 km^2.
Bankable Investment Project Profile (BIPP): Support to Smallholder Irrigation Schemes	FAO-NEPAD	10 years	US$524 million	The project intends to improve smallholder farmers' income, from their current levels, to crop farming through irrigation development. It will cover six regions of Namibia to produce high value cash crops on areas adjacent to the three northern border rivers.
Eastern National Water Carrier Project		1978-2009		The Project will set up a long-distance water pipeline between the city of Grootfontain in the Otjozondjupa Province and the city of Rundu in north-central Kavango. The pipeline will be 260 kilometres long and will abstract water from the Okavango River to serve Windhoek and its surrounding areas.
Popa Falls hydropower project				The project concerns the realization of a large dam (height 7.5 –9.75 m and volume 16.7-24.4 Mm^3) in a site lying between Andara (south of the Angolan border) and Popa falls (in-between Divundu and Bagani), approximately 210 km west of Rundu. Power transmission would be linked to the city of Mukwe, and from there to Rundu, with possibility of further extension to Katima Mulilo (Caprivi Strip).
National Programme for Food Security	Government/Private sector	2010-2015	US$625 million	Significant small scale irrigation projects proposed in the US$537 million budget for improved cropping.
Caprivi Strip Sugar Cane Project	TBA	TBA	TBA	10,000ha irrigation project. EIA completed 2007.
Upper Okavango Agricultural Water Management for Food Security Programme	ADB/others	2010-2015	US$30 million	2 green schemes plus 135ha peri-urban irrigation. Main funding is in access road to farming areas.

ANNEX 1: MAP OF WATER CONTROL IN NAMIBIA:

ANNEX 2: COUNTRY STATISTICS

Country and population			
Area of the country	2005	82429	1000 ha
Cultivated area as % of the total area of the country	2005	1.0	%
Total population	2005	2031	1000 inhab
• of which rural	2005	67	%
Population economically active in agriculture	2005	311	1000 inhab
• as % of total economically active population	2005	37	%
• female	2005	41	%
• male	2005	59	%
Economy and Development			
Gross Domestic Product (GDP) (current US$)	2007	6740	million US$/yr
• value added in agriculture & forestry (% of GDP)	2006	6.1	%
• GDP per capita	2007	3250	US$/yr
Access to improved drinking water sources			
Total population	2006	93	%
Urban population	2006	99	%
Rural population	2006	90	%
Water Resources and management			
Average precipitation	2007	235.3	10^9 m^3/yr
Total actual renewable water resources	2007	17.715	10^9 m^3/yr
Dependency ratio (transboundary rivers)	2007	65.2	%
Total actual renewable water resources per inhabitant	2007	8722	m^3/yr
Total dam capacity	2001	0.709	10^9 m^3
Total water withdrawal	2000	0.3	10^9 m^3/yr
• as % of total actual renewable water resources	2000	1.65	%
IRRIGATION AND DRAINAGE			
Irrigation potential	2007	47	1000 ha
Water Management			
Area equipped for irrigation: full control - total	2002	7.573	1000 ha
Equipped lowlands	2002	0.000	1000 ha
Area equipped for irrigation: total	2002	7.573	1000 ha
• Area equipped for irrigation as % of cultivated area	2002	0.9	%
• Annual increase rate		2.1	%
• Power irrigated area as % of area equipped for irrigation	2003	59.4	%
• Area actually irrigated as % of area equipped for irrigation			%
Non-equipped cultivated lowlands and flood recession	2002	2.000	1000 ha
Agricultural water managed area: total	2002	9.573	1000 ha
• Agricultural water managed area: as % of cultivated area	2002	1.2	%
• Drained cultivated area as % of total cultivated area	2003	0.24	%
Typology of irrigation schemes			
Small-scale schemes (<ha)			1000 ha
Medium-scale schemes (- ha)			1000 ha
Large-scale schemes (>ha)			1000 ha
Irrigated crops			
Wheat	2008	3.115	1000 ha
Maize	2008	8.217	1000 ha
Vegetables	1991	0.250	1000 ha
Cotton	2008	0.110	1000 ha
Fodder	1991	1.400	1000 ha
Date palm	2008	0.150	1000 ha
Grapes	2008	1.000	1000 ha
Other annual crops	2008	0.600	1000 ha
Other perennial crops	1991	0.150	1000 ha

ENERGY INDICATORS			
Energy Production	2005	0.33	Mtoe
Net Imports	2005	1.05	Mtoe
TPES	2005	1.38	Mtoe
- TPES/Pop	2005	0.68	toe/capita
- TPES/GDP	2005	0.33	toe/thousand 2000 US$
- TPES/GDO (PPP)	2005	0.10	toe/thousand 2000 US$ PPP
Electricity Consumption	2005	2.88	TWh
- EC/Pop	2005	1420	kWh/capita

ENERGY SUPPLY AND CONSUMPTION (2005)*

	Coal	Gas	Crude oil	Petroleum products	Hydro	Other Renewable & Waste	Others	TOTAL
Production	0	0	0	0	143	186	0	329
Imports	2	0	0	920	0	0	135	1057
Exports	0	0	0	0	0	0	-7	-7
International Marine Bunkers	0	0	0	0	0	0	0	0
Stock Changes	0	0	0	0	0	0	0	0
Total Primary Energy Supply (TPFS)	**2**	**0**	**0**	**920**	**143**	**186**	**128**	**1379**

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

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