



## High-Level Conference on:

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

Sirte, Libyan Arab Jamahiriya, 15-17 December 2008

## National Investment Brief

### KENYA

#### EXECUTIVE SUMMARY:

The main concern in Kenya is the dramatic increase in the number of people living below the poverty line of less than US\$ 1 per day, which rose from 11 million (48% of the population) in 1990 to 17 million (57%) in 2001. Kenya portrays a reducing level of undernourishment; 33 percent of the population classified as undernourished in 2000-2002. The national incidence of food poverty declined marginally from 48,7% in 1997 to 45,8% in 2005/06 according to the Kenya Integrated Household Budget Survey.

Kenya relies on rainfed agriculture for production of foodstuffs and other marketed crops. Rainfall is intermittent and unreliable in some years. Kenya's irrigation potential was estimated at 539,000 hectares, but by 2003 only 103,233 hectares (about 20 per cent of irrigable land) have been exploited for agricultural production. Kenya is affected by climate change with the effects likely to be more severe in the future since the economic is dependent on climate-sensitive sectors, such as agriculture, tourism and coastal zones.

Kenya has five main drainage areas: Lake Victoria, Rift Valley and Inland lakes, Athi River, Tana River and Ewaso Ng'iro North. The internal renewable surface water resources are estimated at 20.2 km<sup>3</sup>/year, while about 3.5 km<sup>3</sup> of groundwater is produced annually. It is estimated that 10 km<sup>3</sup>/year of water leaves the country via transboundary rivers. The country's hydropower stations supply was about 78 per cent of the country's electricity (670 MW in 1999) while the hydropower potential of Kenya was estimated in 1991 to 8860 GWh/year, representing 2107.5 MW of capacity.

The national development agenda, as distilled in Kenya's national development goals, focuses on reducing current levels of absolute poverty through rapid, and sustained economic growth, largely driven by a strengthened private sector and directed toward lowering social inequities and levelling regional development imbalances. Kenya aims to promote an innovative, commercially-oriented, and modern agricultural sector through: (i) transforming key institutions in agriculture and livestock to promote agricultural growth; (ii) increasing productivity of crops and livestock; (iii) introducing land use policies for better utilisation of high and medium potential lands; (iv) developing more irrigable areas in arid and semi-arid lands for both crops and livestock; and (v) improving market access for our smallholders through better supply chain management.

The financial envelope for the medium-term investment strategy is about 249 Million per year. There are more than 10 projects with large water component that range from US\$ 4 to 150 Million with various donors and financiers, including World Bank (IBRD/IDA), GEF, NEPAD (CAADP), IFAD, African Development Bank (ADF) and EU (EDF).

# 1. CONTEXT

## 1.1 AGRICULTURE AND FOOD SECURITY

### Agriculture

Kenya's GDP was US\$29.5 billion in 2007, of which the Agricultural sector contributed 24% and a further 27% through value adding by the sector<sup>1</sup>. The agricultural sector accounts for 73% of rural employment with women providing 49% of the labour force. The agriculture sector growth improved markedly from -3% in 2002, 5.4% in 2006 to 7.6% in 2007. Agricultural land holdings are classified into small (<10 ha), medium (10-60 ha) and large farms (>60 ha). Of the total 3.6 million agricultural holdings, 3.5 million (98%) are smallholdings and occupy 46% of the total agricultural land area. Within the smallholder sector, small farms under 2 ha total 2.9 million, or 83% of the total. In spite of the small farm size (average 0.9 ha per holding), smallholder producers dominate the agricultural sector accounting for 75% of total agricultural output, 60% of gross marketed output, and production of over 70% of maize, 65% of coffee, 50% of tea, 80% of milk, 70% of beef and related products, and 100% of pyrethrum, cotton and other food crops (millet, sorghum, pulses, vegetables, roots and tubers). However, households in this category experience frequent food shortages because they are unable to produce enough food to meet family nutritional needs.

### Irrigation and water control

Kenya relies on rainfed agriculture for production of foodstuffs and other marketed crops. Rainfall is intermittent and unreliable in some years. Kenya's irrigation potential was estimated at 539,000 hectares, but by 2006 only 105,800<sup>2</sup> hectares (about 20 per cent of irrigable land) have been exploited for agricultural production. The irrigation potential is limited by water since irrigable land is 13 million hectares. With the construction of water storage facilities, the available land for irrigation could be increased to 1.3 million hectares. The typology of irrigated agriculture is as follows: Smallholder 48,075 hectares (47%), Private commercial 42,700 hectares (41%) and government managed 12,458 hectares (12%). The main irrigated crops are rice, maize, sugarcane, vegetables, bananas, citrus, coffee, tea, cotton and flowers. Water abstraction fees have been introduced and calls for use of inappropriate technologies and cost ineffective design to improve scheme water efficiencies. The state of the physical irrigation infrastructure is however poor and efforts are required to modernise the water abstraction and conveyance canals.

### Food security

The main concern in the country is the dramatic increase in the number of people living below the poverty line of less than US \$ 1 per day, which rose from 11 million (48% of the population) in 1990 to 17 million (57%) in 2001. Of the 17 million poor people in 2001, 14 million (82%) were in rural areas and 3 million (18%) in urban areas. The national incidence of food poverty declined marginally from 48.7% in 1997 to 45.8% in 2005/06 according to the Kenya Integrated Household Budget Survey.

Kenya portrays reducing rate of undernourishment with 37 percent of the population classified as undernourished in 2000-2002 compared to 44 percent in 1990-92, the benchmark period of the World Food Summit (WFS) and the Millennium Declaration, the last period available. Among major challenges in the attainment of food security are unfavourable weather conditions, low and declining land productivity, high cost of inputs amongst others<sup>3</sup>.

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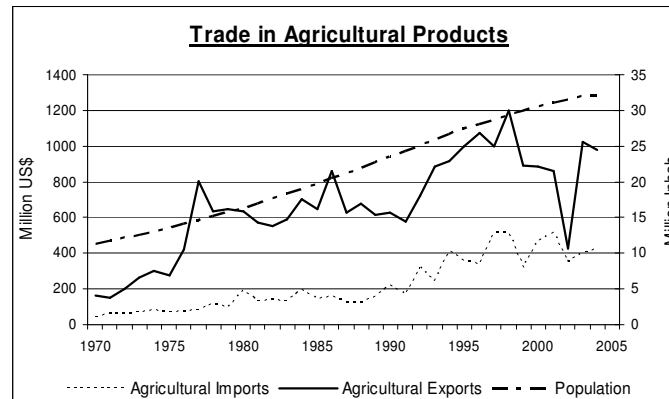
<sup>1</sup>GOK/MOA: Economic Review of Agriculture,, Min of Agric, 2007

<sup>2</sup> Kenya Vision 2030

<sup>3</sup> 2008 Min of State for planning, National dev. & vision 2030: Millennium Dev Goals, Status report for Kenya 2007

### Food and agriculture trade and import balance

Kenya has had a positive agricultural trade balance. The agricultural export-input has been positive. However the food import bill has been on the increase (see figure) from less than US\$200M in the 80s to around US\$400M in the periods 1995-2000 and 2000-2004. Food imports accounted for 12.1 % of merchandise imports in 2003. Major imports in the agricultural share were Oil of palm (32.6%), Wheat (17.90%) and Rice (6.0%)



## 1.2 WATER RESOURCES AND HYDROPOWER

There are five main drainage areas in the country: Lake Victoria, covering 8.0 percent of the country; Rift Valley and Inland Drainage, covering 22.5 percent of the country; Athi River, covering 11.5 percent of the country; Tana River, covering 21.7 percent of the country; Ewaso Ng'iro North, covering 36.3 percent of the country. The water distribution in the drainage basins is both skewed and uneven with, for example, 282 600 m<sup>3</sup>/ km<sup>2</sup> in Lake Victoria basin and 21 300 m<sup>3</sup>/km<sup>2</sup> in the Athi and Coast catchments. The internal renewable surface water resources are estimated at 20.2 km<sup>3</sup>/year, while about 3.5 km<sup>3</sup> of groundwater is produced annually. It is estimated that 10 km<sup>3</sup>/year of water leaves the country via transboundary rivers. The volcanic and quaternary geological formations are rich in groundwater. The annual safe abstraction yield of groundwater is estimated at 0.6 km<sup>3</sup>, out of which 0.4 km<sup>3</sup> is the estimated yield from shallow wells while the remaining balance of 0.2 km<sup>3</sup> is estimated to come from boreholes. The total capacity of large and medium dams (> 15 m) is about 4.1 km<sup>3</sup>. In order to augment water supply, 1 782 small dams and 669 water pans have been constructed. There are 9 lakes with a surface area of 10 747 km<sup>2</sup>. Most of the lakes are saline with the exception of Victoria, Naivasha and Baringo. The lakes Nakuru and Naivasha have been declared Ramsar sites as wetlands of international importance for conservation of biodiversity.

Kenya's current effective electricity demand is 923 MW (growth rate of 5% per annum) with total installed capacity of 1,115 MW with hydropower accounting for 61% (677.3MW) with the rest generated through thermal, geothermal and wind. The hydroelectric potential is estimated to be 6,000 MW (30,000GWh per year). Five major stations in the Tana River basin supply the bulk of power to Kenya. They are: Kindaruma (44 MW), Gitaru (225 MW), Kamburu (94.2 MW), Masinga (40 MW) and Kiambere (144 MW). The Turkwel Gorge Hydroelectric station in the Turkana district has a capacity of 106 MW. There are also several small hydro stations - Mescos, Ndula, Wanji, Tana, Gogo Falls and Selby Falls - all built before independence in 1963, with a combined generation output of 40 MW. Geothermal energy is generated using natural steam tapped from volcanic-active zones in the Rift Valley. Some 127 MW is fed into the national grid from three plants located at Olkaria. The Sondu Miriu Project is a 60 MW hydro power station in the least cost programme.

### **1.3 CLIMATE CHANGE**

Kenya is affected by climate change with the effects likely to be more severe in the future. This could slow down Kenya's projected economic growth for two main reasons. First, the economy is heavily dependant on climate-sensitive sectors, such as agriculture, tourism and coastal zones. Second, the means to cope with climate hazards is weak. Already, changing climate conditions are responsible for the melting of glaciers on Mt. Kenya, which in 1900 had 18 glaciers but now has only 7. This explains the decline in water levels in Athi and Tana Rivers and subsequent interruption in electricity generation.

On the other hand, extreme climatic changes that cause flooding and drought have an immense negative impact on both the social and economic fronts. Over 70 per cent of natural disasters affecting the country are weather-related. In the recent past, there has been an increase in frequency, magnitude, extent and severity of disasters. The impacts include loss of life and property destruction of infrastructure and food insecurity. The impact depends on the season with the short rainfall period experiencing negative effect in agricultural production while the long rains period, which include the low temperature months, have had varied effects. Farmers in the high rainfall areas have practiced crop diversification as a coping strategy while in the medium and low rainfall areas farmers practice soil and water conservation, irrigation and mulching/sheltering of crops.

The past government approach to disaster management are towards disaster response as opposed to disaster risk reduction. Kenya needs a consistent and reliable supply of water regardless of changes in climate. Inadequate water harvesting and storage has resulted in parts of the country having a lot of water during rainy seasons and little or no water during dry periods. Improved water harvesting and storage infrastructure will therefore be undertaken in exploiting the proposed irrigation potential in the country and in providing more water supplies to agriculture and energy . Improved water harvesting will also provide opportunities for the communities in the Arid and Semi Arid Lands (ASALs) to achieve and sustain food security.

## **2. NATIONAL STRATEGIES FOR WATER, AGRICULTURE AND ENERGY**

### **2.1 POLICY CONTEXT**

The national development agenda, as distilled in Kenya's national development goals (Vision 2030, ERSP, PRSP), focuses on reducing current levels of absolute poverty through rapid, and sustained economic growth, largely driven by a strengthened private sector and directed toward lowering social inequities and levelling regional development imbalances. Priority is given to rural development, with emphasis on agricultural, optimal natural resource use, and local economic development. The effort is based on three pillars: Economic; Social; and Political Governance. The economic pillar aims to achieve an economic growth rate of 10 per cent per annum and sustaining the same till 2030 in order to generate more resources to address the MDGs. The vision identifies Agriculture as a key sector in the strategy to achieve the targeted GDP growth rate of 10% annually. The vision 2030 has identified a number of flagship projects in every sector to be implemented over the vision periods in addition to flagging projects directly in key sectors such as agriculture, education, health, water and environment.

In the Agricultural sector, the Strategy for Revitalizing Agriculture (SRA) for 2004-2014 remains a key policy document supplemented by Specific Agriculture and Rural Development sector Ministries Strategic Plans. Kenya aims to promote an innovative, commercially-oriented, and modern agricultural sector. This will be accomplished through: (i) transforming key institutions in agriculture and livestock to promote agricultural growth; (ii) increasing productivity of crops and livestock; (iii) introducing land use polices for better utilisation of high and medium potential lands; (iv) developing more irrigable areas in ASALs for both crops and livestock; and (v) improving market access for our smallholders through better supply chain management. Vision 2030 aims at adding value to farm and livestock products before they reach local and international markets.

Under Vision 2030, productivity in the existing and proposed irrigated areas is expected to bring benefits to the economy and society, as proposed in the economic pillar. The national irrigation policy is in advanced stages of development and target is to develop the irrigation potential in a cost-effective and sustainable manner through enhanced private sector participation.

Consolidation of water sector reforms arising from enactment of the Water Act 2002 provides an opportunity for improving water service provision and resource management. The apex regulator for water resource management is the Water Resource Management Authority; while the apex regulator for water and sewerage service is the Water Services Regulatory Board. Taking advantage of the enabling environment for public-private sector collaboration, especially in the development and management of water projects, and accelerating the trend, will avail more funds for scaling up service provision and management. Appropriate use of the Sector-Wide Approach to Planning (SWAP) as a tool for coordinated approach to planning will also promote prioritisation of the various programmes and ensure that resources are provided to deserving areas. To enhance water storage capacity, the strategy will increase investment in the storage infrastructure and develop innovative community-based methods and technologies for water harvesting. In rural areas, specific focus will be placed on capturing and storing run-off water from tin roofs. In addition, the country will intensify catchment methods for ground run-off water.

Energy is one of the infrastructural enablers of the three “pillars” of Vision 2030. The level and intensity of commercial energy use in a country is a key indicator of the degree of economic growth and development. Kenya is therefore expected to use more energy in the commercial sector on the road to 2030. As incomes increase and urbanization intensifies, household demand for energy will also rise. Preparations have been made to meet this growth in demand for energy under the Vision. The challenges facing the power sub-sector include a weak power transmission and distribution infrastructure, high cost of power, low per capita power consumption and low countrywide electricity access. The petroleum industry is constrained by limited supply facilities for fuels including LPG, domestic production of motor fuels which do not meet international quality standards, inadequate distribution infrastructure in the remote parts of the country which contribute to high product prices, proliferation of sub-standard fuel dispensing facilities, under-dispensing of products including adulteration of motor fuels and dumping of export products. The government has continued to finance extension of electricity supply in the rural areas as part of the basic infrastructure to stimulate economic growth and employment creation. This is intended to increase electricity access in rural areas currently at 4% to 12% by the year 2012. The government is also encouraging the Kenya Power and Lighting Company to adopt affordable connection policies so as to boost the number of customers in the rural areas. A Rural Electrification Authority charged with the mandate of implementing the Rural Electrification Programme came into operation in July 2007. In addition, Ethiopia and Kenya have undertaken a feasibility study financed by several international development partners to facilitate the transfer of electricity to Kenya from a number of large Ethiopian hydropower projects that provide power at lower costs compared to local ones.

In vision 2030 Kenya targets the ASALs and other high-risk disaster zones with the aim of reducing the effects of desertification and disasters. The goals are to substantially reduce losses due to floods and droughts; to establish national trends and impacts of climate change on sensitive sectors; and to pilot 5 adaptation programmes on climate change and desertification. Steps have also been taken by the government in enacting policies such as the environment management and coordination act, the forest act, land policy, among others, that seek to protect the environment and natural resources.

## **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\$. These figures are based on CAADP investment projections. Small scale water projects, rehabilitation of irrigation schemes and large scale hydraulic projects would amount up to a total of 356, 101 and 203 million US\$, respectively.

Past funding has varied; for example, Kenya is estimated to have received USD 616 million in 2004 while it received US\$ 1.4 billion in 1990. The ratio of grants to loans is approx. 3:1. In Vision 2030, the area under irrigation is targeted to increase by 140,000 ha while water storage per capita is to increase to 16 m<sup>3</sup> (from the current 8 m<sup>3</sup>) by 2012.

Time scale	Type of investment (million US\$)			Total
	Small scale water control	Rehabilitation of irrigation	Large scale hydraulic projects	
Short-term	183	27	12	<b>221</b>
Medium-term	116	62	71	<b>249</b>
Long-term	58	12	147	<b>216</b>
<b>Total</b>	<b>357</b>	<b>101</b>	<b>230</b>	<b>687</b>

### 2.3 PROJECT PORTFOLIO

Section 3 presents recently achieved, active and pipeline projects related to the above investment Envelope. There are more than 10 projects with large water component that range from US\$ 4 to 150 Million. There many donors and financiers, among them World Bank (IBRD/IDA), GEF, NEPAD (CAADP), IFAD, African Development Bank (ADF) and EU (EDF). Some of the pipeline projects address environment, climate change and energy.

### 3. PROJECT PROFILES (ON-GOING AND PROJECTED)

Project title	Funding Partners	Lifeline	Total Budget	Description
<b>I. PROJECTS RECENTLY IMPLEMENTED</b>				
Ewaso N'giro River Catchment Conservation Study	TAF	2000 to 2000	US\$1.5 Million	Catchment conservation
Eastern Province Horticulture and Traditional Food Crops Project	IFAD, AfDB, Government, Beneficiaries	1995-2007	28 US\$ million	The project would have the following components: (a) horticultural development; (b) traditional food crop development; (c) extension services; (d) rural water supply and environmental sanitation; and (e) institution strengthening and project coordination.
Coast Arid and Semi-Arid Lands Development Project		Approval date: 12/12/90	19.2 US\$ million	Agricultural development
<b>II. ON-GOING PROJECTS</b>				
National Programme for Food Security	Kenya	2006-2015	US\$ 70 million	The programme consists of two components: 1) Community grants for agricultural productivity increase, capacity building, nutrition improvement and rural income generation; and 2) Home grown school feeding programme.
Kimira-oluch smallholder farm improvement project	ADF	2004 to 2011	US\$ 35 million	Smallholder irrigation schemes along the shores of Lake Victoria will cover about 400,000 households.
Kenya Arid and Semi Arid Lands Project	EU -EDF	2006 to 2010	€ 7.9 million	Targets poverty reduction in Arid and Semi- Arid Lands through improvements in the rural livelihoods.
Water and Sanitation Service Improvement Project.	IBRD/IDA	2007 to 2013	US\$ 150Million	To support the Athi Water Services, Coast Water Services and Lake Victoria North Services boards
Arid Lands Resource Management Project.	IBRD/IDA	2003 to 2010	US\$120 million	The project targets directly about 2 million people in 28 Arid and Semi Arid districts who are vulnerable to drought
Western Kenya Community Driven Development and Flood Mitigation Project.	IBRD/IDA	2007 to 2015	US\$86 million	Create new opportunities for communities in wealth creating livelihood activities and reduce their vulnerability to flooding.
Natural Resource Management Project	IBRD/IDA	2007 to 2013	US \$68.5 million	Better managed water and forest resources, and improved livelihoods of surrounding communities.
The Kenya Agricultural Productivity Project	IBRD/IDA	2004 to 2012	US\$40million	The project aims to revitalize agriculture. IDA Credit 27M, Grant 13M, GEF funded sustainable land management component US\$ 10M
Arid Lands Resource Management Project	IBRD/IDA	2003 to 2010	US \$60 million	Mitigate the risk posed by drought and other factors by strengthening natural resources and drought management systems.
Western Kenya Integrated Ecosystem Management Project	GEF	2005 to 2010	US\$4.1 million	The project has the objective to promote a set of integrated ecosystem management interventions in order to achieve local and global benefits.
The Energy Sector Recovery Project	IBRD/IDA	2004 to 2010	US\$80 million	Enhance the policy, institutional, and regulatory environment for private sector participation and sector development for efficient, reliability, and quality of services.
Mount Kenya East Pilot Project for Natural Resource Management	IFAD, Government, Beneficiaries	2004-2012	US\$ 25.7 million	The proposed project will finance a series of interventions under five main components: (i) water resource management. This component will provide support for the improvement of river intakes and installations of control structures to control water abstractions. In addition, the project's investments in the rehabilitation of faulty and inefficient water supply and irrigation systems will improve water-use efficiency and increase the availability of water for agriculture.; (ii) environmental conservation; (iii) rural livelihoods; (iv) community empowerment; and (v) project management.

Central Kenya Dry Area Smallholder and Community Services Development Project	IFAD, Belgian Survival Fund (BSF), Government, Beneficiaries	2001-2009	US\$ 18.1 million	The proposed project will finance a series of interventions under five main components: (i) water resource management. This component will provide support for the improvement of river intakes and installations of control structures to control water abstractions and for the investment in the rehabilitation of faulty and inefficient water supply and irrigation systems; (ii) environmental conservation; (iii) rural livelihoods; (iv) community empowerment; and (v) project management.
Sustainable Smallholder Irrigation Development and Management in Central and Southern Kenya	JICA, Government	2005 to 2010	US\$ 3 million	The project aims to promote the development and management of 581 hectares in 6 schemes of smallholder irrigation and drainage projects distributed in Loitokitok, Narok South, Mbeere, Kirinyaga and Makueni Districts.
Smallholder Irrigation Programme, Mount Kenya Region	KfW, Government	2005 to 2010	€9.4 million	The project aims to increase area under irrigation by 1,500 hectares through construction of 14 smallholder irrigation schemes in 10 districts in the Mount Kenya region; and capacity build the beneficiary communities to operate, maintain and manage the irrigation schemes.
Rehabilitation and Development of Hola Irrigation Scheme	BADEA, Government	2006 to 2009	US \$ 7.5 million	The project aims at rehabilitating the existing Irrigation Scheme that ceased to operate from 1989 and bring 1,000 hectares into production. Full production is expected to resume by 2010.
Agriculture Sector programme Support (ASPS-DASS)	Danida/GOK; Beneficiaries	2005-2010	US\$ 14.7M	Promote small scale water projects and irrigation; Farming as a business; Support rural infrastructure.
<b>III. PIPELINE PROJECTS</b>				
Integrated Land and Water Resources Management	NEPAD-CAADP/GoK	6 years	US\$ 58million	NEPAD – Comprehensive Africa Agriculture Development Programme. US\$ 9M external financing, local cost US\$ 49M
Kenya: Adaptation to Climate Change in Arid Lands	GEF		US\$ 5.5 million	General agriculture, fishing and forestry sector
Bura Irrigation and Settlement Scheme Rehabilitation Project	Kuwait Fund, BADEA, OFID, Government	2008 to 2012	US\$ 42.4 million	The project at bringing into production 2,500 hectares at the Irrigation Scheme which has been partially operational.
Natural Resources Management Project	World Bank, Government	2007 to 2013	US\$ 68.5 million	This is a water resources management project with a component that supports policy, legal and institutional reforms of the irrigation and drainage sector and construction and rehabilitation of agreed irrigation schemes

**ANNEX 1: MAP OF WATER CONTROL IN KENYA:**



## ANNEX 2: COUNTRY STATISTICS

Country and population								
Area of the country	2005	58037	1000 ha					
Cultivated area as % of the total area of the country	2005	9.9	%					
Total population	2005	34256	1000 inhab					
• of which rural	2005	58	%					
Population economically active in agriculture	2005	12714	1000 inhab					
• as % of total economically active population	2005	73	%					
• female	2005	49	%					
• male	2005	51	%					
Economy and Development								
Gross Domestic Product (GDP) (current US\$)	2007	29509	million US\$/yr					
• value added in agriculture (% of GDP)	2007	27.1	%					
• GDP per capita	2007	786	US\$/yr					
Access to improved drinking water sources								
Total population	2006	57	%					
Urban population	2006	85	%					
Rural population	2006	49	%					
Water Resources and management								
Average precipitation	2007	365.6	10 <sup>9</sup> m <sup>3</sup> /yr					
Total actual renewable water resources		30.7	10 <sup>9</sup> m <sup>3</sup> /yr					
Dependency ratio (transboundary rivers)		32.6	%					
Total actual renewable water resources per inhabitant	2007	896	m <sup>3</sup> /yr					
Total dam capacity	2003	4.079	10 <sup>9</sup> m <sup>3</sup>					
Total water withdrawal	2003	2.735	10 <sup>9</sup> m <sup>3</sup> /yr					
• as % of total actual renewable water resources	2000	8.91	%					
IRRIGATION AND DRAINAGE								
Irrigation potential	2007	539	1000 ha					
Water Management								
Area equipped for irrigation: full control - total	2003	103.203	1000 ha					
Equipped lowlands	2003	0.000	1000 ha					
Total area equipped for irrigation	2003	103.203	1000 ha					
• Area equipped for irrigation as % of cultivated area	2003	1.8	%					
• Annual increase rate	0	4.1	%					
• Power irrigated area as % of area equipped for irrigation	2003	46.2	%					
• Area actually irrigated as % of area equipped for irrigation	2003	94.2	%					
Non-equipped cultivated lowlands and flood recession	2003	6.415	1000 ha					
Total agricultural water managed area	2003	109.618	1000 ha					
• Agricultural water managed area: as % of cultivated area	2003	2.1	%					
• Drained cultivated area as % of total cultivated area	2003	0.52	%					
Typology of irrigation schemes								
Small-scale schemes (smallholder) (5 - 1000 ha)	2003	48.05	1000 ha					
Medium-scale schemes (private/commercial) (0.5 - 5950 ha)	2003	42.70	1000 ha					
Large-scale schemes (National Irrigation Board) (213 - 6200 ha)	2003	12.458	1000 ha					
Irrigated crops								
Rice	2000	13.229	1000 ha					
Maize	1990	3.45	1000 ha					
Sugar cane	2003	0.35	1000 ha					
Vegetables	1998	5.00	1000 ha					
Bananas	1990	1.00	1000 ha					
Citrus	1998	3.00	1000 ha					
Coffee	2003	14.533	1000 ha					
Tea	2003	0.172	1000 ha					
Cotton	1990	3.14	1000 ha					
Flowers	2003	3.262	1000 ha					
Other annual crops	2003	5.95	1000 ha					
Other perennial crops	1990	0.03	1000 ha					
ENERGY INDICATORS								
Energy Production	2005	13.89	Mtoe					
Net Imports	2005	3.40	Mtoe					
TPES	2005	17.25	Mtoe					
- TPES/Pop	2005	0.50	toe/capita					
- TPES/GDP	2005	1.14	toe/thousand 2000 US\$					
- TPES/GDO (PPP)	2005	0.46	toe/thousand 2000 US\$ PPP					
Electricity Consumption	2005	4.93	TWh					
- EC/Pop	2005	144	kWh/capita					
ENERGY SUPPLY AND CONSUMPTION								
	Coal	Gas	Crude oil	Petroleum	Hydro	Other	Others	TOTAL

	products				Renewable & Waste			
Production	0	0	0	0	260	13628	0	13888
Imports	66	0	1783	1800	0	0	1	3650
Exports	0	0	0	-249	0	0	-2	-251
International Marine Bunkers	0	0	0	-42	0	0	0	-42
Stock Changes	0	0	0	0	0	0	0	0
<b>Total Primary Energy Supply (TPFS)</b>	<b>66</b>	<b>0</b>	<b>1783</b>	<b>1509</b>	<b>260</b>	<b>13628</b>	<b>-1</b>	<b>17245</b>

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

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