



AFRICAN DEVELOPMENT FUND

**PROJECT : THWAKE MULTI-PURPOSE WATER DEVELOPMENT
PROGRAM – PHASE I**

COUNTRY: KENYA

PROJECT APPRAISAL REPORT

OWAS DEPARTMENT

October 2013

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Currency Equivalents: July 2013

1 UA = KSH 127.5807
 1 UA = USD 1.50396
 1 UA = EURO 1.14982

Fiscal Year

1 July – 30 June

Weights and Measures

1 metric tonne = 2204 pounds (lbs)
 1 kilogramme (kg) = 2.200 lbs
 1 metre (m) = 3.28 feet (ft)
 1 millimetre (mm) = 0.03937 inch (“)
 1 kilometre (km) = 0.62 mile
 1 hectare (ha) = 2.471 acres

ACRONYMS

ADB	African Development Bank	MoEP	Ministry of Energy & Petroleum
ADF	African Development Fund	MOALF	Ministry of Agriculture Livestock & Fisheries
ASAL	Arid and Semi - Arid Lands	MTP-II	Second Medium Term Plan
CSP	Country Strategy Paper	NEMA	National Environmental Management Agency
CAAC	Catchment Area Advisory Committee	NPV	Net Present Value
DP	Development Partner	QPR	Quarterly Progress Report
EA	Executing Agency	PCR	Project Completion Report
EIRR	Economic Internal Rate of Return	PIP	Project Implementation Plan
ESIA	Environmental and Social Impact Assessment	PIT	Project Implementation Team
ESMP	Environmental and Social Management Plan	PEFA	Public Expenditure and Financial Accountability
GoK	Government of Kenya	RAP	Resettlement Action Plan
FIRR	Financial Internal Rate of Return	RMC	Regional Member Countries
IA	Implementing Agency	TAWSB	Tanathi Water Services Board
IWRM	Integrated Water Resources Management	UA	Units of Accounts
KENAO	Kenya National Audit Office	WSS	Water Supply and Sanitation
KenGen	Kenya Power Generation Company	WRMA	Water Resources Management Authority
MCM	Million Cubic Metres	WSTF	Water Services Trust Fund
MEWNR	Ministry of Environment Water and Natural Resources	WRUA	Water Resources User Association

Loan Information

CLIENT'S INFORMATION	
Country	Kenya
Borrower	Government of the Republic of Kenya
Executing Agency	Ministry of Environment Water & Natural Resources

PROGRAM FINANCING PLAN							
Program Phases	Amount Financed (UA millions)						Total
	ADF-12		Indicative ADF-13		Indicative ADF-14		
	GOK	AFDB	GOK	AFDB	GOK	AFDB	
1. Thwake Multi-purpose dam	119.29	60.00					179.29
2. Water Supply, Sanitation & Waste Water Infrastructure			41.33	42.00			83.33
3. Hydropower Generation			4.06	30.00			34.06
4. Irrigation Development					150.32	40.00	190.32
Total	119.29	60.00	45.39	72.00	150.32	40.00	487.00
Breakdown of Phase 1. Thwake Multi-Purpose Dam (UA millions)							
Component	GOK		ADF-12		Total		
C1. Thwake Multi-purpose Dam	96.25		56.13		152.38		
C2. Environmental & Social Support	22.05		-		22.05		
C3. Program Management & Capacity Building	0.99		3.87		4.86		
Total	119.29		60.00		179.29		

KEY FINANCIAL AND ECONOMIC OUTCOMES				
	FIRR	FNPV @ 12%	EIRR	ENPV@ 12%
PROGRAM (Phases: 1, 2, 3, 4)	19.54%	KES 25.53 M	20.56%	KES 27.06 M

KEY FINANCIAL INFORMATION			
Instrument	ADF Loan	Service charge	0.75%
Loan currency	USD	Repayment period	40 years
Commitment fee	0.50%	Grace period	10 years

TIMEFRAME – MAIN MILESTONES (expected)	
Concept note approval	18 May 2013
Program approval – Phase 1	30 October 2013
Effectiveness	March 2014
Last disbursement	31 December 2019
Completion	31 August 2018
Last repayment	February 2064

PROGRAM SUMMARY

<p>Program overview</p>	<p>The Thwake Multi-purpose Water Development Program (TMWDP) comprises a multi-purpose dam for water supply, hydropower generation and irrigation development. It will also provide regulation of flows on Athi River downstream of the dam for flood and drought mitigation. The TMWDP targets broad improvement in productivity and livelihoods over a ten-year period, ending 2023. The Program recognizes the symbiotic relationship between Kenya’s water secure and water insecure regions by spanning both the lower and higher levels of the economy to ensure national economic growth is both inclusive and sustainable.</p> <p>This appraisal report describes the four phases of the Program, with a detailed description of phase 1. The estimated cost of all four phases of Thwake Multi-Purpose Water Development Program is UA 487 million. Phase 1 is estimated at UA 179.3 million, and includes: consultant services for design and supervision of works; a panel of dam experts; construction of a 77 m high rockfill dam and associated structures; catchment rehabilitation / protection; studies and designs for subsequent phases and to enhance phase 1 implementation; climate change training; and technical assistance. For phase 1, ADB Group allocated a total of UA 60.00 million from ADF-12 resources and Government has committed to provide the remaining UA 119.3 million. Dam construction is expected to be completed by December 2018. The beneficiaries are mainly the rural population of two semi-arid counties and the urban population of the upcoming ICT city of Konza, in total about 1.3 million people. About 7,690 jobs are expected to be created.</p>
<p>Needs assessment</p>	<p>Kenya is classified as a water scarce country, with an annual water replenishment rate of 647 m3 per capita. The Athi River basin where the program is located has the lowest per capita water storage in the country, with the semi-arid counties of Kitui and Makeni being classified as food deficit and having poverty rates of 62.5% and 63.8%, respectively. Agriculture is mostly rain fed and there is no existing hydropower generation station within the Basin. People depend on excavating by hand into riverbeds for potable water for a large part of the year.</p> <p>In its struggle to reach a new economic level, Kenya set itself up to become the ICT leader throughout the region by establishing the ICT Konza City. Ground breaking for Konza is planned for October 2013 and Government has made the city dependent on Thwake dam for provision of bulk water supply.</p>
<p>Program outcomes</p>	<p>In phase 1, the program will increase water security by providing 681 million cubic metres (MCM) of water storage, earmarked for phases 2, 3 and 4 as follow: 34 MCM for human consumption, 625 MCM for double usage (power generation and downstream irrigation), 22 MCM for upstream irrigation, and an allocation for downstream conservation flow. The target population will benefit from an abundant supply of potable water which will lead to improved health and spur economic development throughout the area and in Konza City.</p>
<p>Bank’s added value</p>	<p>By playing a lead role in the preparation of the program, the Bank has positioned itself as a strategic partner in the development of multipurpose dams. The Bank has tapped its cumulative experience in the water, agricultural and energy sectors, making the design of TMWDP stronger than the sum of its individual phases. The program complements and will benefit from the synergy with the World Bank’s Water Security and Climate Resilience Phase 1. The provision of ADB Group financing reinforces the Bank’s support for the development programs of the three main government ministries involved in TMWDP implementation.</p>
<p>Institutional development and knowledge building</p>	<p>The program will ensure knowledge transfer through program management and supervision. The knowledge transfer mechanism is important for building the in-house capacity of institutional operation and management of the dam. GOK will manage other similar multi-purpose dams in order to meet its targets for increasing water security. The knowledge transfer and knowledge building provided by the panel of dam experts has created a base for the implementation stage and will be used for upcoming projects in the near future, such as the High Grand Falls dam, which is also a multipurpose water usage. GOK institutions will develop increased capacity and knowledge to respond to and manage climate related impacts, and increased ability to access climate change related funds.</p>

Results Based Logical Framework

Country and Program Name: Kenya – Thwake Multipurpose Water Development Program (TMWDP) Phase 1						
Program goal: To reduce poverty through increased water security for agriculture, energy and water supply developments						
RESULTS CHAIN		PERFORMANCE INDICATORS			Means of verification	RISKS, ASSUMPTIONS AND MITIGATING MEASURES
IMPACT	Contribute to:	Indicators	Baseline	Target		
			Poverty reduction	Reduction in people below the poverty line	2013: Urban – 33.7% Rural – 49.1%	2030: Urban – 16.9% Rural – 24.6%	Vision 2030 mid-term & completion reports Annual Water Sector Review Reports	Assumption: Envisioned inclusive economic growth is achieved. Risk: GOK delays or reduces expenditures Mitigation: water security is a priority investment sector.
	Water security	Per capita water storage	5.3 m3 per capita (2012)	25 m3 per capita		
OUTCOMES	Improved capacity to provide water for human consumption, hydropower generation and irrigation	1) Increased storage for water to: meet potable water needs of 1.3 million people, generate 20 MW hydropower to irrigate 40,075 hectares of land	2013: 1.1) 22 MCM water storage	2019: 1.1) Increase in storage for water by 681 MCM from Thwake reservoir, comprising: a) 34 MCM for human consumption b) 625 MCM for double usage: power generation and downstream irrigation c) 22 MCM for upstream irrigation	Phase 1 Completion Report WRMA License to abstract water from Athi River	Risk: Implementation delay due to Institutional reforms necessitated by new Legislation Mitigation: Strong well defined program specific coordination and implementation arrangements, capacity building, & close monitoring and supervision.
	Improved capacity to respond to and manage climate related impacts, and increased ability to access climate change related funds	2) No. of institutions able to manage climate related disasters, raise awareness and disseminate relevant information ¹ 3) Number of existing institutions trained on accessing climate funds ¹	2.1) 11 water sector institutions 3.1) 3 water sector institutions	2.1) 16 water sector institutions 3.1) 11 water sector institutions	MEWNR Annual Budget Performance Report Mid-term Review of Kenya National Climate Change Action Plan	
OUTPUTS	Component – C1 Thwake Multi-purpose dam with 681 million m3 of storage constructed & functional	1) Multi-purpose dam & associated works 2) Local employment created ¹	2013: N/A N/A	2019: 1.1) Construct Thwake dam with 681 million m3 storage, one intake tower with three penstocks for hydropower, one draught outlet for water supply, one draught outlet for irrigation; one service spillway and one emergency spillway ² 2.1) Of the 7,690 jobs, 100% of unskilled & 50% of skilled jobs to local people, with min 30% women.	PCR, Quarterly, Annual Reports NHS Reports	Assumptions: Satisfactory operation and maintenance of Thwake dam by the Government; Risk: Geotechnical- The extent of continuity of stable rock foundation at dam site Mitigation: Exhaustive investigations of the subsurface condition on dam axis before embarking on construction
	Component – C2 Environmental & Social Support with affected population fully compensated and the environment protected	1) Number of people compensated and resettled 2) Number of hectares protected 3) Number of Program sustainability & monitoring studies ³ 4) Communication campaigns	N/A N/A N/A N/A	2019: 1.1) 1,067 households compensated, of which 187 require relocation 2.1) 2,900 hectares of watershed protected / rehabilitated 3.1) Studies completed: Emergency Preparedness, Investment Opportunities; Baseline, Mid-term & End-line (gender sensitive & disaggregated) 4.1) 100% of contractor workers and communities sensitized about HIV/AIDS prevention annually 4.2) 12 monthly & 12 quarterly communications for local population on program activity progress		

¹ See Technical Annex B8

² See Technical Annex C

³ See Technical Annex B2, C

	Component – C3		2013:	2019:		
	Program Management & Capacity Building implementing agencies constituted, capacitated & functional	1) Number of hydrological, operational & geotechnical studies ² 2) Number of months Panel of dam experts gives guidance 3) Number of climate change trainings done	N/A Five months in 2013 N/A	1.1) Studies completed: Athi River model, Thwake reservoir model, Dam Operations & Sediment Harvesting 2.1) A panel of 3 dam experts (structural engineer, geotechnical engineer, hydrologist) for 60 months 3.1) 3 on climate change management with 50% female trainees 3.2) 3 on climate funds with 50% female trainees		
KEY ACTIVITIES	<u>Thwake Multi-purpose Water Development Program – Phase 1 Components</u> C1 – Thwake Multi-purpose dam: Civil works contract for embankment construction, procurement of consultant to check design & supervise works. C2 – Environmental & Social Support: Survey of catchment & develop a 5-year plan to initiate & maintain required buffer; procure undertake sustainability studies for emergency preparedness and Investment Opportunities for program affected persons; develop baseline, update at mid-term and do end-line studies that are gender sensitive and disaggregated; support WRMA in mobilization of Water Resources User Associations. C3 – Program Management & Capacity Building: procure or re-appoint panel of three dam experts, procure consultants for two hydrologic modelling studies, one Institutional Operation study and one Sediment Harvesting study; procure short term consultants for multi-year climate change training; training of young engineers in dam development, appoint staff for program implementation, procure vehicles, office equipment.				<u>Inputs (UA millions)</u> <u>ADF loan UA 60.0:</u> C1 - Dam Construction: UA 56.4 C3 - Program Management UA 3.6 <u>GOK: UA 119.3</u> C1 – Thwake Multi-purpose dam: UA 97.2 C2 - Environmental & Social Support: UA 20.4 C3 - Program Management & Capacity Building: UA 1.7	

REPORT AND RECOMMENDATION OF THE MANAGEMENT TO THE BOARD OF DIRECTORS ON A PROPOSED LOAN TO KENYA FOR THE THWAKE MULTIPURPOSE WATER DEVELOPMENT PROGRAM - PHASE 1

I – STRATEGIC THRUST & RATIONALE

1.1 Program Linkages with Country Strategy and Objectives

1.1.1 The Program is aligned to the Kenya’s Vision 2030: The economic and social pillars of Government of Kenya’s Vision 2030 and Kenya’s Medium Term Plan II 2013 – 2017 (MTP-II) acknowledge Kenya as being a water scarce country and both underscore the central role water plays in the performance of key sectors of the economy. The strategies further highlight the consequences of underinvestment in: water resources development infrastructure as a fundamental need for productive livelihoods; irrigation and hydropower developments on food and energy security; and ICT for its ability to place Kenya in a leading role of regional economic significance. The MTP-II further provides for irrigation of an additional one million acres (404,685 hectares) by the year 2018, the development of Konza City as an ICT hub, and provision of low cost electricity to rural households, promoting inclusive growth, green growth and addressing climate change. The 2010 Constitution also provides for economic and social rights which include access to reasonable standards of sanitation and access to clean and safe water in adequate quantities.

1.1.2 The Program is closely aligned to the Bank’s ten year development Strategy 2013-2022 and its outputs can be measured under the following Level 1 indicator results: access to improved water sources; access to electricity; access to improved sanitation; and water resources development. The Program also fits within the Bank’s current 2008 – 2013 CSP Pillar I focusing on infrastructure improvement for competitiveness and enhanced regional integration and, Pillar II addressing employment creation and poverty reduction.

1.1.3 Thwake multi-purpose dam is a flagship operation in the draft National Water Master Plan 2030. The program closely aligns with GOK’s new Water Security and Climate Resilience program (WSCRP) financed by the World Bank whose twofold focus is to enhance the institutional framework and strengthen capacity for water security and climate resilience in Kenya, and to increase availability of irrigation water.

1.2 Rationale for Bank’s Involvement

1.2.1 A recently completed Post-Disaster Needs Assessment estimated that the overall effects of the 2008-11 drought cost the Kenyan economy US\$12.1 billion, affecting the Arid and Semi-Arid Lands (ASAL) of Kenya. Kitui and Makueni counties are semi-arid and classified as food deficit, among the least water secure in the country and also having among the highest incidence of poverty (62.5% and 63.8%, respectively) in the country. They have minimal irrigation, little electrification and residents in their rural areas depend on excavating by hand into riverbeds for potable water for a large part of the year.

1.2.2 The urgency of addressing this situation is reflected in the Kenya Vision 2030, MTP-II and the new Government commitments which raise the following expectations: achieving equity of opportunity between counties, irrigating one million acres of land by 2018, achieving government’s Rural Electrification Program targets and increasing access rates for water and sanitation to 75%.

1.2.3 The storage capacity provided by the dam will make a noteworthy contribution to achieve these objectives: i) 10% towards the goal of irrigating one million acres of land, ii) 25% towards the goal of increasing water storage by 2.4 billion m³, iii) potable water for 674,700 rural people in the water basin with the lowest per capita water storage, iv) up to 20 MW of new capacity in support of Kenya's Least Cost Rural Electrification Program.

1.2.4 The first phase of the Program (2014-2019) comprises the construction of a 77m high dam for impounding 681 million cubic metres of water (Annex C describes phases 1 - 4). Phase 1 also includes the implementation of the Resettlement Action Plan (RAP), involving 1,067 households to be compensated by the construction of the dam.

1.3 Donor Coordination

	Sector or subsector*	Size		
		GDP	Exports	Labor Force
	Water Resources	NA	NA	NA
Players - Public Annual Expenditure (average 2010/11 to 2011/12)**				
	Government	All Donors	Individual Donors	
UA m	31.2	58.2	Worldbank	82.0%
%	34.9%	65.1%	IFAD	5.9%
			JICA (Japan)	3.9%
			Sweden	2.3%
			KOICA (Korea)	2.1%
			AfDB	2.0%
			Finland	1.8%
Level of Donor Coordination				
	Existence of Thematic Working Groups			Y
	Existence of SWAPs or Integrated Sector Approaches			Y
	ADB's Involvement in donors coordination****			M

1.2.5 Kenya has a very active Water Sector Development Partner's Technical Group (WSTG) composed of the different multilateral and bilateral development partners involved in water resources management, urban and rural water supply and sanitation. The Group meets every two months and is currently chaired by Sweden with WSP as the co-chair. The chair of the WSTG is selected by vote each year. The Bank, through the East Africa Regional Resource Centre (EARC), actively participates in this group. The main recipients of donors' support for water resources development are the Ministry of Environment Water and Natural Resources (MWENR) through special programs of the Water Resources Management Authority (WRMA), the Water Services Trust Fund and the Water Services Boards (WSB).

II – PROGRAM DESCRIPTION

2.1. Program Goal, Objective and Components – Phase I

2.1.1 The total estimated cost of the four phases of Thwake Multi-Purpose Water Development Program is UA 487 million. The four phases comprise: (1) construction of a 77 m high multi-purpose dam and associated preliminary works needed to enable the other three phases, plus implementing an Environmental and Social Management Plan, (2) water works to treat and distribute up to 34.6 thousand m³ of water to 674.7 thousand rural inhabitants of Kitui and Makueni Counties, and up to 117.2 thousand m³ to 640 thousand inhabitants of Konza City; (3) hydropower

and substation development for up to 20 MW of installed capacity, and (4) irrigation works for up to 40,075 hectares of land in Kitui and Makueni counties. See also Annex C.

2.1.2 The goal of the first phase is to enhance water security. The objective is to increase water storage for rural and urban human consumption, for irrigation and livestock and for hydropower, with a principal focus on the semi-arid counties of Kitui and Makueni.

Program Components – Phase I

2.1.3 The Bank will support implementation of the multi-purpose dam and RAP component mentioned below and elaborated in Annex C.

Table 2.1: Phase I program components

Thwake Multi-purpose Dam	Cost in UA (millions)	Description
Thwake Dam	153.6	Consultant services for checking the design and supervision of works; Civil works contract for construction of 77 m high rockfill dam, one intake tower with three penstocks for hydropower, one draught outlet for water supply, one draught outlet for irrigation; one service spillway and one emergency spillway
Environmental & Social	20.4	Develop catchment preservation; RAP implementation and compensation; undertake Emergency Preparedness study and Investment Opportunities study; develop base-line, mid-term and end-line studies; support WRMA in mobilization of Water Resources User Associations; liaise with MoH to sensitize stakeholders on HIV/AIDS prevention, sanitation and hygiene.
Program Management & Capacity Building	5.3	Procure panel of three dam experts, undertake two hydraulic modelling studies, one Institutional Operation study and one Sediment Harvesting study; undertake multi-year climate change training; train young engineers in dam development; appoint program implementation staff, vehicles and office equipment.

2.2. Technical Solution Retained and Other Alternatives Explored

2.2.1 The National Water Master Plan Sectorial Report (JICA, 1992) identified three sites along the Athi River Basin (Munyu, Baricho and Thwake) having potential for water supply, irrigation and power development. Analysis of the water demand and supply in the study area ruled out ground water and inter basin transfer with construction of reservoirs being recommended. Dam sites were further investigated during the Athi River Basin Water Resources Development study. The Thwake site was ranked second out of 16 sites evaluated for their potential to contribute to poverty reduction, suitability for multi-purpose water use and state of readiness.

2.2.2 A multi-purpose dam was selected as the technical solution because of its ability to leverage across several sectors at once, which could not be done with a single purpose dam. TMWDP is innovative in that it spans both the lower and higher levels of the economy (two low income ASAL counties and the high tech Konza City). It will further innovate by setting up a RAP Committee to ensure that the needs of women, children and the vulnerable are adequately met. The RAP Committee Coordinator will ideally be a Gender / Social Development Specialist.

Table 2.2: program alternatives considered and reasons for rejection

Alternative	Description	Reasons for rejection
Dam design height	1) More than 77 m	1.1) Financial modeling confirmed 77 metres as the height to impound water for optimal economic multipurpose use.
	2) Less than 77 m	2.1) GOK was not prepared to reduce the scope of program objectives for a non-optimal solution. Constructing the dam in stages involving substantial adjustment to its height was not practicable due to the need to provide a spillway of the same capacity at all stages of its development. Raising the dam in future limited the choice of type of dam structure.
Groundwater	Use aquifer water	Aquifer yields in the program area (JICA, 2013) were too low and could not provide volumes needed for multi-purpose, and were also too low to provide a viable partial solution.

2.3. Program Type

2.3.1 A programmatic approach was adopted because of the long-term nature of the expected impacts, the flexibility it provides the partner ministries and county governments, and the need to continue program support after the main investments, thus facilitating the attainment of Vision 2030 goals. It also recognizes the symbiotic relationship between the ASAL and non-ASAL parts of Kenya to ensure national economic growth is sustainable and inclusive.

2.3.2 This type of program requires an integrated water resources management approach to water quantity and quality, use of water information systems and early warning systems, cost recovery and especially sustained community dialogue, all of which the TMWDP attempts to follow. Phase 1 enables the achievement of subsequent phases and comprises construction of Thwake dam with 681 million m³ storage, one intake tower with three penstocks for hydropower, one draught outlet for water supply, one draught outlet for irrigation, one service spillway and one emergency spillway.

2.4. Program Cost and Financing Arrangements

2.4.1 The total program cost for the initial phase, net of taxes and duties, is estimated at UA 179.29 million, of which UA49.6 million is in foreign currency and UA129.68 million in local currency. The cost estimate is based on the design prepared in June 2013 and includes a 10% physical contingency and 5% price contingency. The tables below (See also Annex B2) show the Phase 1 cost estimates and financing arrangements for Thwake dam.

Table 2.3. Program cost estimates by component [million UA] Phase 1

Components	F.E. costs	L.C. costs	Total Costs	% Foreign
Thwake Dam	40.12	90.46	130.58	30.72
Environmental & Social	0.30	17.03	17.33	13.44
Program Management & Capacity Building	1.75	2.74	4.49	38.99
Total Base Cost	42.17	110.23	152.40	
Physical contingency	4.96	12.97	17.93	30.73
Price Contingency	2.48	6.48	8.96	30.57
Total program cost	49.61	129.68	179.29	

2.4.2 The Program will be financed by GOK and the ADF. Bank financing amounts to UA 60.00 million, or 33.46% of the first phase of the program. The main source of finance will be the GOK whose contribution is UA 119.29 million, or 66.54%.

Table 2.4 Sources of financing [amounts in millions UA] Phase 1

Financing Source	F.E. Costs	L.C. Costs	Total Costs	Percent (%)
ADF	49.61	10.39	60.00	33.46
GoK		119.29	119.29	66.54
Total Cost	49.61	129.68	179.29	100%

Table 2.5 Program cost by category of expenditure [amounts in millions UA] Phase 1

Category	F.E. Costs	L.C. Costs	Total Costs	% Foreign
Goods	0.25	0.61	0.86	29.41
Works	37.76	89.60	127.36	29.64
Services	4.16	20.02	24.18	17.22
Total Base Cost	42.17	110.23	152.40	
Physical contingency	4.96	12.97	17.93	27.67
Price Contingency	2.48	6.48	8.96	27.67
Total program cost	49.61	129.68	179.29	

Table 2.6 Expenditure schedule by component [million UA] Phase 1

Components	2014	2015	2016	2017	2018	2019	Total
Thwake Dam		23.03	30.00	31.60	32.10	32.06	153.59
Environmental & Social	13.82	4.96	0.41	0.41	0.41	0.41	20.40
Program Management & Capacity Building	1.06	1.06	0.80	0.80	0.80	0.80	5.30
Total	14.88	29.05	31.20	32.80	33.30	33.26	179.29

2.5. Program Target Area and Beneficiaries

The program target beneficiaries are the 674.7 thousand people in the rural areas of Kitui and Makueni (poverty rates of 62.5% and 63.8%, respectively) and the 640 thousand people to occupy the land reserved for the new urban ICT city of Konza. Other beneficiaries comprise the institutions managing the water resources in Athi River Basin and the economy of Kenya. The main expected outcomes are increased water security within the zone of influence of the dam, a firmer foundation for the development of cross-sectorial approaches to water management, and reduction in risk factors by increasing capacity for flood and drought related disaster preparedness. From the perspective of Kitui and Makueni, residents' priorities include an increase in vegetation cover, employment opportunities and good water supply, among others. Their concerns include the fear of economic loss to those people involved in sand harvesting.

2.6. Participatory Process for Program Identification, Design

Community consultative meetings and workshops began in 2008 to 2009, and continued from 2012 to 2013, led by TAWSB with support from the design and socio-environmental consulting firms assigned to the program. As part of NEMA requirements, this included a two month formal public disclosure period through notices repeatedly posted in two national newspapers. There were no objections to the proposed program. Also, at the request of the MEWNR, the Bank hosted monthly

and other periodic meetings which gave it a greater role during the design stage. Attendance included MEWNR, Ministry of Energy, National Irrigation Board, National Treasury, TAWSB, the expert panel, and the design and socio-environmental consultants. Community level consultations included TAWSB, county commissioners, political leaders, heads of departments, lead agencies including NEMA, religious groups, business men and women, and community based organizations. One of the outcomes of the community consultations was the advisability of having a gender expert lead the relocation activities.

2.7. Bank Group Experience, Lessons Reflected in Program Design

2.7.1 As of 28 August 2013, there are no PCRs due. For the past 3 years, four PCRs have been done: two in social sector, one in water and sanitation sector and one in transport. Relevant lessons from these PCRs have been taken into account. Currently, there are 28 on-going projects in the following sectors: eight in water supply and sanitation, seven in power, five in agriculture, five in transportation and three in social.

2.7.2 This being one of the very few multipurpose water development programs, the relevant lessons learned have been extracted from the Bank's past and current portfolio of projects of a similar nature, as described in Annex B1. The main lessons incorporated from completed single and multi-purpose dams are: 1) Provision of investment opportunities for people compensated under a RAP (OPEV, 1998) - areas adjacent to the reservoir will be irrigated for PAPs to take up as smallholder farms; 2) Ensure adequacy of dam design and safety (Massingir Dam, PCR 2010) - a panel of 3 dam experts review of designs and will provide guidance during implementation; 3) Compliance with Bank policies related to cultural property (Bujagali dam, IRM 2009) – RAP budget allows for costs incurred in relocation of gravesites to outside of the flooded area.

2.7.3 Experience in similar interventions in the energy sector has also shown the importance of ensuring the establishment of a Program Implementation Team (PIT) to avoid startup and implementation delays. For TMWDP, a Program Implementation Team will be constituted to follow-up day to day implementation.

2.8. Key Performance Indicators

The overall relevant performance indicators have been summarized in the Project Results Based Logical Framework. Detailed indicators are provided in the technical documents. Key Performance Indicators include, among others: i) the volume of water storage provided for supplying 1.3 million persons with clean and safe water; ii) the volume of water storage provided for double usage – generating 20 MW of hydropower and downstream irrigation of 36,900 hectares of land; iii) the volume of water storage provided for upstream irrigation of 3,175 hectares of land; (iv) the number of hectares of watershed protected / rehabilitated; (v) the number of institutions capable of managing responses to climate change related impacts, and (vi) the number of jobs created. The M&E Specialist in the PIT will track program progress against timescales and targets, as well as resource use against budgets. Her/his reports will include gender disaggregated data gathered through baseline, mid-term and endline studies.

III – PROGRAM FEASIBILITY

3.1 Economic and Financial Performance

Table C.1: key economic and financial figures

FIRR, NPV (base case):	19.54%, KSH 25.52 billion
EIRR, NPV (base case):	20.56%, KSH 27.06 billion

NB: detailed calculations are available in Annex B7

3.1.1 For purposes of assessing the financial and economic viability of the program, the construction costs for the dam were shared amongst the three revenue generating activities of the Thwake Multipurpose Water Development Program: water supply, irrigation and hydropower. The viability of each water usage was assessed taking into account its share of the dam construction costs.

3.1.2 The financial analysis confirmed that investment in the program is viable with an FIRR of 19.54%. This is based on engineering cost estimates, projected tariffs for water supply and sewerage and revenue collection efficiency rising from 80% to 95% during the program life. Revenue generated by irrigation is based on projected cropping patterns, assuming focus on high value crops for both domestic consumption and export. The energy revenue uses tariffs for the purchase of power by KPLC from KenGen, assuming 24 hours supply from an installed capacity of 20MW. The energy tariff, which is based on prevailing tariffs in base year, is conservatively assumed to increase 5% every 5 years.

3.1.3 The economic analysis assessed the real worth of the Program to the country looking at the benefits of the Program to the wider economy. The economic costs were based on financial costs, adjusted to reflect the value to society as a whole. The benefits quantified were (i) the economic value of water consumed, (ii) health benefits resulting from safe water provided, (iii) economic benefits from increased agricultural production, and the benefits of increased power supply. The economic rate of return of 20.56% is significantly higher than the 12% opportunity cost. (See Annex B7)

3.2. Environmental and Social Impacts

3.2.1 TMWDP was classified as Category 1 because of significant environmental and social impacts expected from the construction of a large rockfill dam which affects 1,067 households, of which 187 families have to be relocated while the rest are affected in terms of land expropriation. Classification was validated by ORQR3 on 22 February 2012. The ESIA and RAP reports were completed in June 2013 and their summaries disclosed on the Bank's website on 1 July 2013. A Strategic Environmental and Social Assessment (SESA) was prepared in December 2012 to ensure that the subsequent program phases were also understood.

3.2.2 The overall positive impacts of the full program will include minimisation/eradication of water-borne diseases as communities will stop relying on contaminated water sources, and provision of energy and irrigation water to villages whose main constraint to development has been scarcity of water. Potential negative impacts at the dam site include: reservoir siltation, water quality changes, biodiversity, hydrological modifications, and displacement of social and economic activities, such as sand harvesting. There will be downstream impacts associated with regulated flows. Mitigation measures include catchment rehabilitation / protection, water quality monitoring, engaging more with Kenya Wildlife Service to inventory existing biodiversity, complying with

WRMA low flow downstream discharge regulations, and maximizing employment and investment opportunities for local people, such as scaling up sand harvesting. Dam safety and emergency preparedness have also been budgeted for.

3.2.3 The TMWDP will help to mitigate climate change impacts by generating clean power and hence reduce on GHG emissions that would have otherwise been emitted from thermal power generating sources. The dam also addresses climate change adaptation in terms of both flood control management and drought management. The Program entails climate change risk management measures such as the reduction of the vulnerability of the surrounding communities to droughts that have caused huge crop failure and limited availability of potable water for human consumption. As Kenya's hydropower generation has also been impacted by severe droughts in the recent past, additional reservoir water storage capacity will make hydropower generation more resilient to climate change.

3.2.4 Coping with drought requires the availability of timely and reliable climate information to adapt to climate change. This program includes rehabilitation of hydro-met stations, establishment of early warning and response systems and training of agency staff to fulfil their institutional mandate through better understanding of climate change in Kenya. Land use planning will also be used to cope with drought, and flooding, hence catchment management is a key program activity.

Gender

3.2.5 Unequal access to and control of family resources, poor integration of gender perspectives in social discourse and the low score on gender equality (HDI, 2012), ranking Kenya 18th from the bottom out of 148 rated countries, are among the many challenges which women face in the program area. The following affirmative measures will be taken to improve the conditions of women during the first phase of the program: a) procurement or appointment of a Gender Expert to head up the relocation and compensation activities required under the program, b) establishment of a strong RAP Committee which collaborates with the MEWNR Gender Focal Point to ensure that: i) targets for female participation in program management are met, ii) employment opportunities and capacity building activities are gender balanced, iii) gender responsive socio-economic baseline, mid-term and endline surveys are performed and analyzed. The estimated budget is UA 60,000.

Social

3.2.6 Kitui and Makueni counties have poverty rates of 62.5% and 63.8%, respectively. Farmland is unproductive due to lack of pasture and lack of water. TMWPD will improve the well-being of the people in the area and adjoining towns including the future Konza City. Studies in the area revealed that 34% of households do not treat water for drinking and hence are prone to contracting water borne diseases such typhoid and cholera. Malaria and diarrhoeal infections are also present. It is estimated that TMWDP will create 7,690 employment opportunities for unskilled and skilled workers, drawing from the pool of labour in the two counties estimated 117,601 persons. The responsibilities of the RAP Coordinator will include having as many jobs as possible filled by the local population, with minimum 30% for women.

3.2.7 The main potential negative effects include the relocation of the affected population due to the inundation of the reservoir area and construction of the dam and its associated structures. Secondly, the influx of workers from the neighbouring areas may exacerbate the spread of HIV/AIDS within the construction workers and communities in the area. The estimated (2012) HIV/AIDS prevalence rate for Kitui stood at 4.8% and for Makueni 5.6%. The Program will implement an HIV/AIDS awareness and prevention program to ensure that the trend is reversed and will use existing MoH focal points in the area to deliver sanitation and hygiene messages. Pressure for water, food and accommodation may be triggered as the people speculating for jobs move to the area.

Involuntary Resettlement

3.2.8 The dam and water reservoir will occupy approximately 2,900ha of land covering Makueni and Kitui counties. Additional land will be obtained for the future water treatment site, powerhouse and irrigation way leaves. TMWDP will impact 5,736 persons (PAP) in 1,067 households, of which 187 families will be physically relocated while the rest of the PAPs are affected in terms on land expropriation. Special arrangement will be made for the vulnerable households, such as giving them priority in choosing when to relocate within the available time and to which site. The assets to be affected shall include homesteads, shops, a school, a clinic, graves, hand dug wells, crops, trees, and livestock. In accordance with the Bank's Involuntary Resettlement Policy, a full Resettlement Action Plan has been prepared which estimates RAP costs at UA 17.7 million, inclusive of administration and contingencies will be borne by GOK.

IV – IMPLEMENTATION

4.1. Implementation Arrangements

4.1.1 The executing agency will be the MEWNR, who will execute the program through a Program Implementation Team (PIT) located in Kitui. A senior officer in the MEWNR will be designated as Focal Point at the Executing Agency to coordinate program implementation activities. National level strategic guidance on program activities will be provided through a Program Steering Committee (PSC), which will include membership of the Principal Secretaries of the following ministries, most of whom are stakeholder of both the TMWDP and the WSCRП operations: Ministry of Environment, Water and Natural Resources (Chair), Ministry of Agriculture, Livestock and Fisheries, Ministry of Health, Ministry of Energy and Petroleum, Ministry of Information Communication and Technology, National Treasury and TAWSB. The TMWDP Coordinator will be the secretary to the PSC. The main task of the PSC will be to review the program's annual work plans and related budget to ensure adherence to the TMWDP development objectives. The PSC will also provide guidance to program management and resolve problems that might arise during implementation. The PSC will also monitor performance of the program and advise it on policy issues.

4.1.2 The PIT will be responsible for the day-to-day coordination and monitoring of program activities. It will be headed by a Program Coordinator (PC) who will be a senior engineer and who will make decisions to ensure timely progress of the Program. In addition to the Coordinator, the following additional expertise will be provided: Assistant Program Coordinator (Civil Engineer), Senior Financial Management Specialist, Senior M+E Specialist, Senior Gender / Social Development Specialist, Senior Environmental Safeguard Specialist, Accountant and Procurement Officer. These positions will filled through appointment with the Bank's No Objection at each stage.

4.1.3 The existing panel of three independent dam experts will continue to advise the PIT on matters concerning dam design, hydrology, environment, geotechnical, structural and any other related matter, as well as oversee safety aspects of the first phase of program implementation (i.e. dam construction). The panel has extensive experience in hydrology, geotechnical, structural and environmental engineering.

Procurement arrangements

4.1.4 All procurement of goods, works and acquisition of consulting services financed by the Bank will be in accordance with the Bank's Rules and Procedures: "*Rules and Procedures for Procurement of Goods and Works*", dated May 2008 Revised July 2012; and "*Rules and Procedures for the Use of Consultants*", dated May 2008 Revised July 2012, using the relevant Bank Standard Bidding Documents, and the provisions stipulated in the Financing Agreement.

Advance contracting is recommended for procurement of works and supervision services for construction of Thwake dam. (Procurement arrangements in Annex B5)

Disbursement arrangements

4.1.5 MEWNR will have access to all four disbursement methods (direct payment, special account, reimbursement and reimbursement guarantee) prescribed in the Bank's Disbursement Handbook. The opening of the special account will be a condition precedent to first disbursement. A USD denominated Special account will be opened at the Central Bank of Kenya as well as a Kenya Shillings denominated account at a commercial bank acceptable to the Bank. The Bank's disbursement letter will be issued stipulating key disbursement procedures and practices. (Annex B4)

Financial Management

4.1.6 The mission assessed the Financial Management capacities of the Ministry of Environment, Water and Natural Resources as adequate for the Program. The Ministry has proper structures in place as well as adequate staff to carry out the FM responsibilities of the Program. The MEWNR is currently implementing two World Bank funded projects and hence has recent experience with donor funded projects. The "Government Financial Regulations and Procedures" Manual was assessed and found acceptable for the program. TMWDP will substantially make use of the Kenya's Public Financial Management systems.

4.1.7 A Program Implementation team (PIT) within the existing structures of the MEWNR and reporting to the Principal Secretary at the Ministry will be established. The Program will provide a senior financial management expert as program accountant and an intermediate accountant. These two staff members will exercise overall quality control of financial operations and ensure appropriate reporting is made to the Bank.

4.1.8 The MEWNR through the PIT will prepare quarterly un-audited IFRs in form and content satisfactory to the Bank, as well as annual program financial statements in accordance with International Public Sector Accounting Standards. These statements will be audited and submitted to the Bank within six months after fiscal year end. A Value for Money Audit will be carried out at mid-term by the Auditor General based on Terms of Reference agreed with the Bank. (See Annex B4 for further details)

4.2. Monitoring

Monitoring and evaluation of TMWDP will be done through reporting on progress in implementation and achievement of key Phase I key outcome and output indicators. The Senior Financial Management Specialist will monitor the financial performance of the program and the environmental and social indicators will be monitored at the PIT level. A baseline survey building on the ESIA will be undertaken to collect gender disaggregated socio-economic data on PAPs so their progress can be monitored. Annual program evaluations will roll up individual achievements of experts at the PIT level, emphasizing adherence to cost and program schedule. A monitoring and evaluation specialist with appropriate qualifications and experience will be part of the PIT. As focal point for all data collection, the M&E specialist will liaise with the engineers, environmental specialist and other PIT members to ensure all program data collected is of good quality before analysis and submission to MEWNR and the Bank. Supervision missions will be carried out by EARC twice yearly. The program implementation schedule is presented in the table below.

Table 4.1: Implementation Schedule

ACTIVITIES	AGENCY	START DATE
Appraisal Mission	ADB	July 2013
Negotiations	ADB/GOK	September 2013
Board Presentation	ADB	October 2013
Signature	ADB/GOK	November 2013
Fulfillment of conditions	ADB/GOK	February 2014
1 st disbursement of ADF funds	ADF	March 2014
Last disbursement	ADF	December 2019

4.3. Governance

4.3.1 The Constitution of Kenya 2010 divides central power between the Executive, Legislature and Judiciary and devolved governance to 47 Counties. If implemented effectively, Kenya’s governance indicators will improve over the medium term as a result of increased political participation and more respect for human rights.

4.3.2 Some changes being driven by the 2010 constitution are reflected in the new Water Policy and Water Bill 2012, which provides for reorganizing, restructuring and rationalizing of key sector institutions, such as Water Service Providers, Water Service Boards and the National Water Conservation and Pipeline Corporation. Restructuring has caused transfer of the National Irrigation Board to Ministry of Agriculture, Livestock and Fisheries. The Ministry of Energy also now has petroleum included in its portfolio.

4.3.3 TMWDP will support governance principles such as participation in decision making on water use, transparency in water allocation, and accountability in relation to water abstraction, compliance and pollution through the following: i) undertaking a study on the establishment of an overall efficient and transparent governance and operational structure for the completed works, encompassing issues such as mutual accountability between MEWNR, MOEP and MOALF, equity, and consideration of longer term financial and technical sustainability, ii) supporting WRMA in its role in controlling and regulating pollution of water bodies, iii) making M&E data publicly available, and iv) strong financial management in the PIT.

4.4. Sustainability

4.4.1 GOK has committed Thwake dam to providing bulk water to Konza ICT City, which will have its ground-breaking in Q4-2013. This demonstrates its commitment to ensuring the success of TMWDP. GOK has also assured the Bank that it will provide two thirds of the first phase costs. This commitment is consistent with the high level of ownership already demonstrated by GOK through funding the Athi River Basin studies, preliminary designs and environmental assessments needed for the Program.

4.4.2 Institutional sustainability has been built into program design by recognizing that a transition period is needed to ensure the program gains will rests on a solid institutional and legal framework for the water sector. TMWDP supports institutional capacity building and development that will ensure the mainstreaming of PIT responsibilities and functions in the longer run, such that sustainability is achieved beyond the life of the program itself.

4.4.3 Increased water security brought by the dam and knowing its intended multi-purpose usage will attract people to the area, transform Kitui and Makueni counties to more desirable places to live and earn a livelihood.

4.4.4 The capacity of WRMA has improved, enabling the institution to focus on the human right to safe drinking water, cost-recovery and regulatory functions, in particular regarding pollution control, raw water abstraction and catchment protection. This helps WRMA become more self-sufficient and independent in carrying out its mandate of protecting water resources. WRMA has strong motivation to ensure the dam is successfully completed because of the downstream Athi River drought and irrigation benefits.

4.5. Risk Management

RISK	MITIGATING MEASURES
1. Delay from implementation of institutional reforms	A strong, well defined and program specific coordination and implementation arrangement, including capacity building and close monitoring and supervision.
2. Government funding.	GoK has funded several engineering and environmental studies in developing TMWDP. MEWNR has committed to budget the annual amounts required Letters of assurance from National Treasury, MWE&NR and MoEP commit to financing the gap.
3. Geotechnical risk of unforeseen subsurface conditions.	Bank approved an addendum for a 3 rd set of subsurface investigations prior to tendering the works. The civil works contractor will be required to undertake additional drilling. However, no major surprises in geological conditions are as yet evident.

4.6. Knowledge Building

4.6.1 Through training and support to MEWNR, NEMA, WRMA and other agency staff, TMWDP will contribute to increased institutional climate change knowledge comprising knowledge of risks and response options for communities in the counties benefitting from the program. Increased capacity to respond to and manage climate related impacts will be gained by the concerned agencies, as well as improved capacity to access the climate funds available for adaptation and mitigation.

4.6.2 Reporting on progress and any shortcomings will be undertaken on a quarterly and annual basis in order to build a learning platform to inform program management and the improvement of Program performance.

4.6.3 In addition, the first phase of the Kenya Water Security and Climate Resilience Project supported by the World Bank has included specific activities to support watershed conservation and management in the Athi Basin, including modernization of hydro-met stations, development of real time early warning systems and strengthening of GOKs Water Resources and Climate Risk Information Systems (WCIS). These information systems will be made available to the general public in accordance with Kenyan access to information regulations. The Bank will gain additional institutional experience through planning the implementation of an operation applying climate change, inclusive growth and green growth agendas, which contributes to the 2013 – 2022 Bank Strategy Level 1 indicator results.

V – LEGAL INSTRUMENTS AND AUTHORITY

5.1. Legal Instrument

An ADF Loan Agreement will be executed between the Fund and the Borrower.

5.2. Conditions Associated with Bank’s Intervention

Conditions Precedent to First Disbursement

- a) Open a special foreign currency account and a local currency account at a bank acceptable to the Fund for the deposit of proceeds of the Loan;
- b) Designation of a focal point within the MEWNR and establishment, after the Fund’s prior review throughout the procurement process, of a Program Implementation Team. The core staff to be procured under this condition comprise one Phase 1 Coordinator, one senior Financial Management expert, one senior Procurement Expert, and one senior Gender – Social Development Expert.

Other Condition

- a) Provide evidence of having compensated and / or resettled all PAPs in accordance with the Program RAP, prior to the commencement of any construction under the Program;

Undertakings

- a) Undertake to implement all conditions stipulated in NEMA approval letter and all the conditions in the WRMA License according to the timelines specified therein;
- b) Undertake to complete and adopt an emergency preparedness plan for the dam by 31 December 2015;
- c) Undertake to complete and adopt the findings from an institutional study on the ownership, management and operation of the Thwake dam, by 31 December 2015.

5.3. Compliance with Bank Policies

The Thwake Multi-purpose Water Development Program conforms to relevant Bank policies.

VI – RECOMMENDATION

Management recommends that the Board of Directors should approve the proposed UA 61.68 million ADF LOAN and UA 1.21 million ADF GRANT to the Government of Kenya, to finance the first phase of this program in accordance with the conditions specified in this report.

Appendix I: Kenya - Comparative Socio-Economic Indicators

Indicator	Year	Kenya	Africa	Developing Countries	Developed Countries	Charts
Basic Indicators						<p>GNI per Capita (US \$)</p>
Area ('000 Km ²)		580.4	30,046.4	80,976.0	54,658.4	
Total Population (millions)	2012	42.7	1,078.8	5,628.5	1,068.7	
Urban Population (% of Total)	2012	22.9	40.4	44.8	77.7	
Population Density (per Km ²)	2012	71.7	35.4	66.6	23.1	
GNI per Capita (US \$)	2011	820.0	1,594.2	2,780.3	39,688.1	
Labor Force Participation - Total (%)	2012	37.0	37.4	0.0	0.0	
Labor Force Participation - Female (%)	2012	46.3	42.5	39.8	43.3	
Gender -Related Development Index Value	2007	0.5	0.5	..	0.9	
Human Develop. Index (Rank among 169 countries)	2012	145.0	..	..	..
Popul. Living Below \$ 1 a Day (% of Population)	2005	43.4	..	25.0	..	
Demographic Indicators						<p>Population Growth Rate - Total (%)</p>
Population Growth Rate - Total (%)	2012	2.7	2.3	1.4	0.7	
Population Growth Rate - Urban (%)	2012	4.3	3.4	2.4	1.0	
Population < 15 years (%)	2012	42.4	40.0	29.2	17.7	
Population >= 65 years (%)	2012	2.7	3.6	6.0	15.3	
Dependency Ratio (%)	2012	82.1	77.3	52.8	..	
Sex Ratio (per 100 female)	2012	99.8	100.0	934.9	948.3	
Female Population 15-49 years (% of total population)	2012	24.2	48.6	53.3	47.2	
Life Expectancy at Birth - Total (years)	2012	57.7	58.1	65.7	79.8	
Life Expectancy at Birth - Female (years)	2012	58.8	59.4	68.9	82.7	
Crude Birth Rate (per 1,000)	2012	37.1	34.2	21.5	12.0	
Crude Death Rate (per 1,000)	2012	10.0	10.9	8.2	8.3	
Infant Mortality Rate (per 1,000)	2012	58.9	70.8	53.1	5.8	
Child Mortality Rate (per 1,000)	2012	90.3	111.3	51.4	6.3	
Total Fertility Rate (per woman)	2012	4.6	4.4	2.7	1.8	
Maternal Mortality Rate (per 100,000)	2010	360.0	417.8	440.0	10.0	
Women Using Contraception (%)	2012	49.6	30.8	61.0	75.0	
Health & Nutrition Indicators						<p>Access to Safe Water (% of Population)</p>
Physicians (per 100,000 people)	2004	13.9	53.6	77.0	287.0	
Nurses (per 100,000 people)*	2002	118.0	..	98.0	782.0	
Births attended by Trained Health Personnel (%)	2009	43.8	..	39.0	99.3	
Access to Safe Water (% of Population)	2010	59.0	65.7	84.0	99.6	
Access to Health Services (% of Population)	2000	77.0	65.2	80.0	100.0	
Access to Sanitation (% of Population)	2010	32.0	39.5	54.6	99.8	
Percent of Adults (aged 15-49) Living with HIV/AIDS	2011	6.2	4.6	161.9	14.1	
Incidence of Tuberculosis (per 100,000)	2011	288.0	233.8	..	..
Child Immunization Against Tuberculosis (%)	2011	92.0	81.7	89.0	99.0	
Child Immunization Against Measles (%)	2011	87.0	76.6	76.0	92.6	
Underweight Children (% of children under 5 years)	2009	16.4	..	27.0	0.1	
Daily Calorie Supply per Capita	2009	2,092.0	2,568.8	2,675.2	3,284.7	
Public Expenditure on Health (as % of GDP)	2010	11.1	5.9	4.0	6.9	
Education Indicators						<p>Secondary School - Total</p>
Gross Enrolment Ratio (%)		..	..	..	..
Primary School - Total	2009	113.3	101.9	106.0	101.5	
Primary School - Female	2009	112.0	98.1	104.6	101.2	
Secondary School - Total	2009	60.2	42.3	62.3	100.3	
Secondary School - Female	2009	57.1	38.5	60.7	100.0	
Primary School Female Teaching Staff (% of Total)	2009	43.9	43.3	..	..
Adult Literacy Rate - Total (%)	2010	87.4	67.0	19.0	..	
Adult Literacy Rate - Male (%)	2010	84.2	58.3	..	..
Adult Literacy Rate - Female (%)	2010	90.6	75.8	..	..
Percentage of GDP Spent on Education	2010	6.7	5.3	..	5.4	
Environmental Indicators						<p>Secondary School - Total</p>
Land Use (Arable Land as % of Total Land Area)	2011	9.7	8.4	9.9	11.6	
Annual Rate of Deforestation (%)	2000	0.5	0.6	0.4	-0.2	
Annual Rate of Reforestation (%)		..	..	..	..
Per Capita CO2 Emissions (metric tons)	2011	0.3	1.1	..	..

Sources : ADB Statistics Department Databases; World Bank World Development Indicators

Last update: July 2013

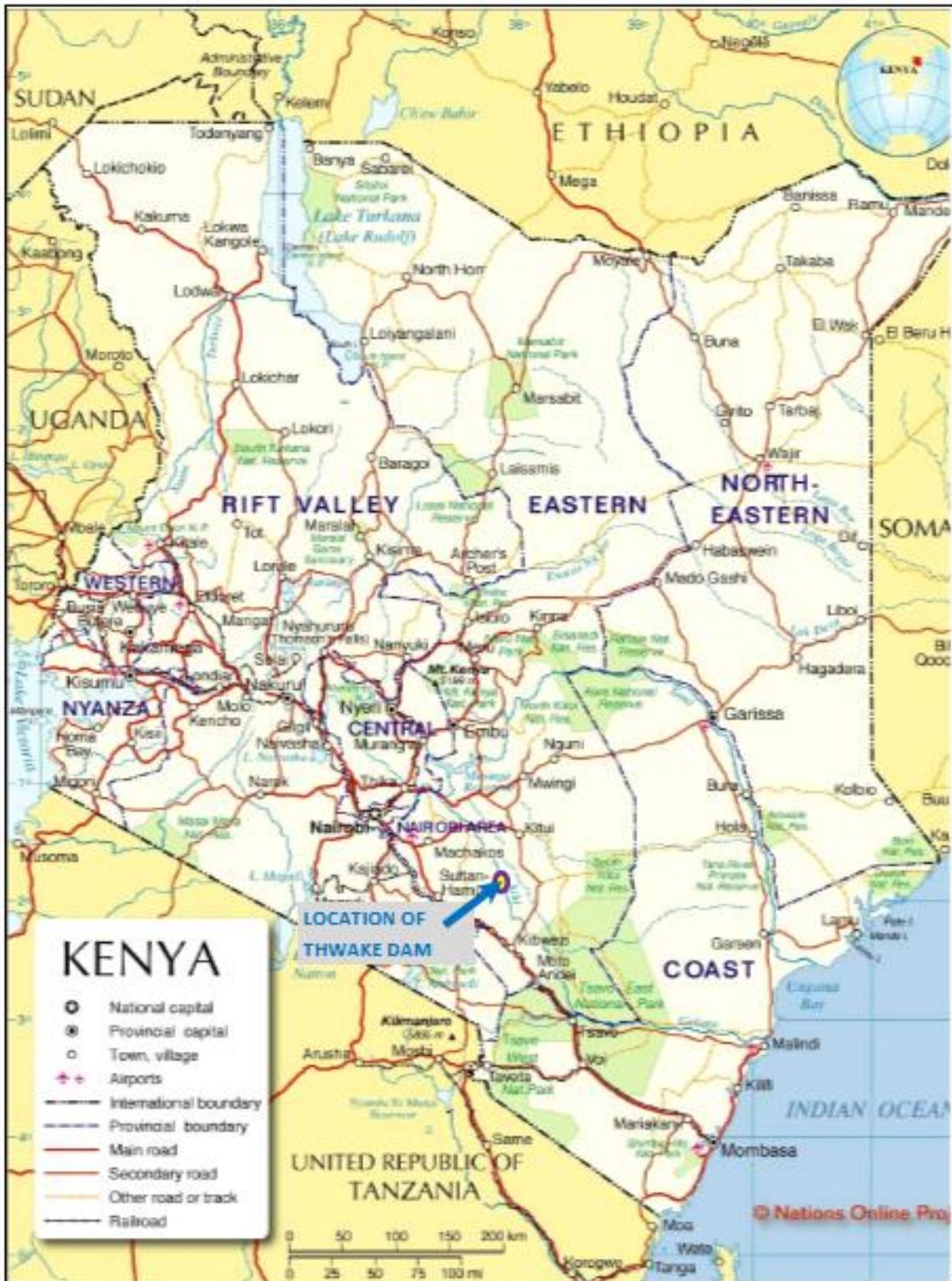
UNAIDS; UNSD; WHO; UNICEF, WRI, UNDP; Country Reports.

Note : n.a. : Not Applicable ; .. : Data Not Available.

Appendix II: Table of the Bank's Kenya Country Portfolio

Sector	Project Name	Approval Date	Disbursed Amount (UAm)	Disb: Ratio (%)	Supervision Ratings	Closing Date
Agriculture	Kimira- Oluch Smallholder Farm Improvement Project (Loan)	31-May-06	18.55	80.71	Satisfactory	30-Sep-14
	Kimira- Oluch Smallholder Farm Improvement Project (Grant)	31-May-06	1.05	91.20		30-Sep-14
	Small-Scale Horticulture Development Project	5-Sep-07	8.80	51.75	Satisfactory	31-Dec-14
	Multinational - Drought Resilience and Sustainable Livelihood	19-Dec-12	0.00	0.00	N/A	30-Jun-18
	Green Zones Development Support Project	12-Oct-05	21.58	86.18	Satisfactory	31-Dec-13
Agriculture Sub Total			50.0	48.2		
Power	Mombasa Nairobi Transmission Line	6-May-09	21.57	43.15	Satisfactory	31-Dec-13
	Kenya Electricity Transmission Project	6-Dec-10	0.85	1.82	Satisfactory	30-Jun-15
	Menengai Geothermal Development project (ADF Loan)	14-Dec-11	19.28	24.10	Satisfactory	31-Dec-17
	Menengai Geothermal Development project (SREP Grant)	14-Dec-11	0.00	0.00		31-Dec-17
	Menengai Geothermal Development project (SREP Loan)	14-Dec-11	1.00	8.57		31-Dec-17
	Multinational - Ethiopia /Kenya Power Interconnexion project	19-Sep-12	0.00	0.00	N/A	1-Jan-18
	NELSAP	16-Jun-10	0.40	1.00	Satisfactory	31-Dec-14
Power Sub Total			43.1	18.5		
Social	Community Empowerment and Institutional Support Project	17-Dec-07	5.5	32.09	Satisfactory	31-Jul-14
	Technical Industrial Vocational and Entrepreneurship Training	16-Dec-08	7.49	29.96	Satisfactory	31-Dec-13
	Support to Enhancement of Quality and Relevance in HEST	14-Nov-12	0.00	0.00	N/A	30-Jun-18
Social. Sub Total			12.9	30.8		
Transport	Timboroa - Eldoret Road Project	24-Nov-10	8.89	25.40	Satisfactory	29-Feb-16
	Mombasa-Nairobi-Addis Corridor II	1-Jul-09	26.32	21.05	Satisfactory	31-Dec-15
	Arusha- Namanga-Athi River Road Development	13-Dec-06	43.75	88.85	Satisfactory	31-Dec-13
	Multinational Holili-Taveta Voi Road	16-Apr-13	0.00	0.00	N/A	Not Yet
	Mombasa-Nairobi-Addis Corridor III	30-Nov-11	9.69	8.08	Satisfactory	31-Dec-17
Transport Sub Total			88.7	26.9		
Water Supply Sanitation	Integrated Land & Water Management (AWTF)	13-Jan-09	1.16	68.49	Satisfactory	30-Dec-13
	Water Services Boards Support Project	21-Nov-07	18.94	53.83	PPP	30-Dec-13
	Scaling up of integrated water rainwater harvesting and complementary livelihood systems in semi-arid districts of Kenya(AWTF)	06-Jul-12	0.56	29.01		07-Dec-15
	Water Services Boards Support Project (RWSSI)	5-Dec-07	5.94	60.70	Satisfactory	30-Dec-13
	Lake Victoria Water and Sanitation Programme (Regional*)	17-Dec-10	0.37	3.56	Satisfactory	31-Dec-15
	Nairobi River Basin Restoration	6-Dec-10	5.48	15.67	N/A	31-Dec-15
	Scaling-up Rainwater Management	5-Jul-12	0.17	29.01	N/A	7-Dec-15
	Small Towns Water and Sanitation	3-Nov-09	11.24	16.05	Satisfactory	31-Dec-14
WSS Sub Total			43.86	26.62		

Appendix III. Map of the Program Area



Appendix IV. Key Related Projects in the Sector in Kenya

Country/Agency	Project	Instrument	Finance (US\$ millions)	Est. Completion Date
World Bank	Mwache Multipurpose Dam	Loan	247	2018
Kenya	High Grand Falls Multipurpose Dam	PPP	1,822	2020
Kenya	Kiserian Dam	GOK	12	2016
Kenya	Umaa Dam	GOK	12	2013
Kenya	Chemususu Dam	GOK	57	2013
Kenya	Badasa Dam	GOK	30	2011
Kenya	Koru Dam	GOK	-	2019
World Bank	Nzoia Dam	Loan	155	2019
Kenya	Ewaso Ng'iro River Dam	GOK	120	-
Kenya	Magwagwa Multipurpose Dam	GOK	813	2022
Kenya	Nandi Forest Multipurpose Dam	GOK	486	2022
Kenya	Sang'oro Hydro Dam	GOK	78	2023