



Food and Agriculture
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AgWA

Partnership for agricultural water for Africa



NATIONAL INVESTMENT PROFILE



**WATER FOR
AGRICULTURE
AND ENERGY**

KENYA

EXECUTIVE SUMMARY

Agriculture is the most important sector of Kenya's economy, accounting for almost 30 percent of the national GDP in 2012 ([WB 2014](#)) and employing about 69 percent of the total labour force ([FAO, 2014a](#)). Its performance greatly influences the overall economic development of the country. Small scale farmers, owning less than 3 ha of land, account for about 70 percent of the marketed agricultural output; however their yields are much lower when compared to large scale farmers that are responsible for the remaining 30 percent of marketed production. At times, small holders are even unable to produce enough food to meet family needs ([GoK, 2010b](#)).

Kenya has a large irrigation potential that, wisely used, could significantly contribute to food security in the country. It is estimated at 1.3 million ha, of which 540 000 ha could be developed with the available water resources, while the rest would require water harvesting and storage facilities (GoK, 2013a). The country has already developed around 169 000 ha (31 percent of the potential) according to the National Irrigation Board (NIB, 2014).

There is also significant hydropower potential in Kenya, estimated at about 5 257 MW, of which 807 MW have already been developed. The construction of multipurpose dams presents an interesting opportunity in unlocking Kenya's potential for agriculture and energy production.

The total annual renewable surface water in 2010 was estimated as 20.637km³/year which is expected to increase to 24.89km³/year in 2030. The NWMP 2030 study indicates that water demand will increase from 3.22 to 21.47 km³/year over the same period (GoK, 2013a). The country will experience a total water deficit calculated at sub-basin level of about 14.959 km³/year unless adequate storage facilities are developed.

Kenya Vision 2030 aims at transforming the nation into "a newly industrializing, middle-income country providing high quality of life to all its citizens in a clean and secure environment" ([GoK, 2008](#)). To achieve this, the agricultural sector strategy (2010-2020) and subsequently its medium term investment plans were launched to position the agricultural sector a key driver for delivering the 10 percent annual economic growth rate envisaged under the economic pillar of the Vision. In terms of agricultural water management, the Medium Term Plan (MTP) of 2013-2017 gives top priority to increased area under irrigation in order to reduce the country's dependence on rain fed agriculture ([GoK, 2013d](#)). The plan envisages that about 404 800 hectares will be put under irrigation within its implementation period. It also includes measures to be taken to mechanize agricultural production, revive cooperatives and farmers unions, and subsidize farm inputs to raise productivity.

To translate plans into action, Kenya is currently implementing 81 projects in water for agriculture and energy and will implement another 48 projects. The expected amount that the country will spend from now to 2019 (so called investment envelope) is US\$6.8 billion, of which irrigation infrastructure accounts for US\$4.15 billion (61 percent of the envelope) and hydropower infrastructure would add up to US\$1.6 billion (24 percent). The remaining US\$0.9 billion (15 percent) falls into the category *Others*, which includes projects related to drinking water supply, capacity building for farmers, strengthening or creating Water Users Associations, etc. It is to note that almost half (41 percent) of the investment envelope in Kenya is devoted to large scale irrigation development and that there is little attention to modernization and rehabilitation of irrigation schemes in pipeline projects. The country should not forget to invest in small holders when it comes to the planning of AWM projects and should pay more attention to keeping irrigation systems in good state. By implementing the whole project portfolio, the country would have reached about 80 percent of the targets set in the MTP 2013-2017.

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1. CONTEXT

1.1 AGRICULTURE AND FOOD SECURITY

Agriculture

Kenya lies approximately between latitudes 5° north and 5° south and between longitudes 34° and 42° east on the east coast of Africa. The equator bisects the country in almost equal parts. The altitude varies from 0 to about 5 000 m above sea level in the central highlands. It has a total area of 582 650 km², of which 13 400 km² is covered by water. About 17 percent of the total area of the country is land with high to medium agricultural potential and supports about 80 percent of the country's population. The remaining 20 percent of the population live in the other 83 percent of the total area that is arid and semiarid land (ASAL).

Small-scale¹ farming in Kenya accounts for 75 percent of the agricultural output and 70 percent of the marketed agricultural output. Small scale farmers produce over 70 percent of maize, 65 percent of sugar. Large-scale commercial farming accounts for the remaining 30 percent of marketed agricultural produce. Typical crops include tea, coffee, wheat and vegetables ([GoK, 2010a](#)). Sustained high use of input and better management have ensured that large-scale farmers attain high yields compared to the small-scale farmers, who at times are unable to produce enough food to meet family needs.

Out of the total cultivated area of 5.451 million ha in 2011, 4.309 million ha was under food crops², 0.559 million ha under horticultural crops³, 0.482 million ha under industrial crops and 0.101 million ha under oil crops. Maize which is Kenya's staple food was cultivated in 2.13 million ha with annual production of 3.5 million tons (MoA, 2012).

The country's climate is influenced by proximity to the equator, topography, the Indian Ocean, and the Inter-Tropical Convergence Zone (ITCZ). The influence of the ITCZ is modified by the altitudinal differences, giving rise to varied climatic regimes. Annual rainfall in Kenya follows a bimodal seasonal pattern with the long rains in March – May, while the short rains occur in October – December. The Country is divided in to seven agro ecological zones (I-VII), zones II-IV are humid to sub humid and receive adequate rainfall to support arable farming.

Kenya had a population of 43.1 million in 2012 ([FAO, 2014a](#)), largely rural, with 32.6 million people living outside urban areas ([FAO, 2014a](#)). The country's GDP has been increasing steadily from US\$30.4 billion in 2008 to \$40.2 billion in 2012, translating to a per capita GDP of US\$12 120 in 2012 ([WB 2014](#)). Agriculture is the main sector of Kenya's economy, accounting for about 29.9 percent of the GDP in 2012 ([WB 2014](#)). Its performance greatly influences the overall economic development of the country. Agriculture is also an important source of

¹ Small-scale farming is practiced in farms less than 3 ha

² Food crops include maize, beans, rice and potatoes, Industrial crops include coffee, tea and sugar.

³ Horticultural crops include fruits vegetables and flowers.

employment. Agricultural labour force increased from 12.84 million people in 2008 to 14.81 million in 2013 but its share in the total labour force decreased marginally from 71.6 to 69 percent respectively ([FAO, 2014a](#)).

Irrigation and Water Control

Kenya has an estimated irrigation potential of 1.3 million ha but only about 765 575ha can be developed with the available water resources (GoK, 2013a). The estimated irrigation area in Kenya varies depending on the year and the source ranging from 103 203 ha to 161 840 ha. The National Water Master Plan 2030 (NWMP 2030) carried a survey in 2011 on irrigated area in each County. The study showed that the total irrigated area was 141 900 ha (GoK, 2013a). Now, the National Irrigation Board affirms that the current irrigated area is 161 840 ha (NIB, 2014).

The NWMP 2030 study also indicates that of the currently irrigated area, 14 147 ha are public large scale schemes, 51 923 ha are small-scale (farmer owned and managed)⁴ scheme and 75 840 ha are private schemes. The main irrigated crops are vegetables, rice coffee and sugarcane.

The current total irrigated area falls short of the target for 2010 of 197 000 ha set by the National Water Master Plan 1992 (NWMP 1992) consisting of 123 300 ha public irrigation schemes, 34 200 ha of smallholder irrigation schemes and 39 500 ha of private commercial schemes (GoK, 1992). Comparing the target and actual figures for each category the large scale public irrigation schemes have not been developed as planned while the other two categories surpassed their target. There were 18 large scale public irrigation schemes covering 111 200 ha proposed to be implemented by the NWMP 1992 but none were implemented due to lack of investment.

Lack of sufficient operation and maintenance budget has led to the deterioration of irrigation and drainage infrastructure in most of the public and small holder irrigation schemes resulting underperformance and sometimes closure. Most national irrigation schemes were non-functional between 2000 and 2002 due to lack of funds for Operation and Maintenance (O&M) and when the schemes were revived by the government in 2003, O&M fees were introduced and Water User Associations were initiated in an effort to make them sustainable. Since then the fees have not been revised leading to widening deficit due to increase in inputs prices (fuel, machinery and parts, etc).

Food security

Though Kenya has the potential to feed its population, the share of undernourished people in the country during 2012-2014 is estimated at 24.3 percent. However it is important to note that

⁴ Small scale: 0-500 ha, large scale: > 500 ha

these figures have been going down ever since 2002-2004, when 34.2 percent of the population was undernourished ([FAO, 2013](#)).

Kenya has made gains towards the Millennium Development Goals (MDG), meeting a number of targets related to eradicating extreme poverty and hunger. However it is unlikely to meet other targets such as halving the baseline figures of 1990 for proportion living below US\$1.25 per day and the prevalence of underweight, stunting and wasting in children under five years of age. Poverty levels in Kenya declined from 56 percent in 2000 to 46 percent in 2006 mainly attributed to improved governance and management of public resources and key economic reforms but has remained at this level since then ([UNDP, 2009](#)). Prevalence of underweight in children under five years stood at 16.2 percent in 2011, going down from 22 percent in 1990 but still below the target of 11 percent. Prevalence of stunting was 5 percent in 2003 against a target of 3.9 percent for 2015 while prevalence of wasting stood at 19 percent in 2003 against a target of 11.05 percent for 2015 ([AfDB, 2014](#)).

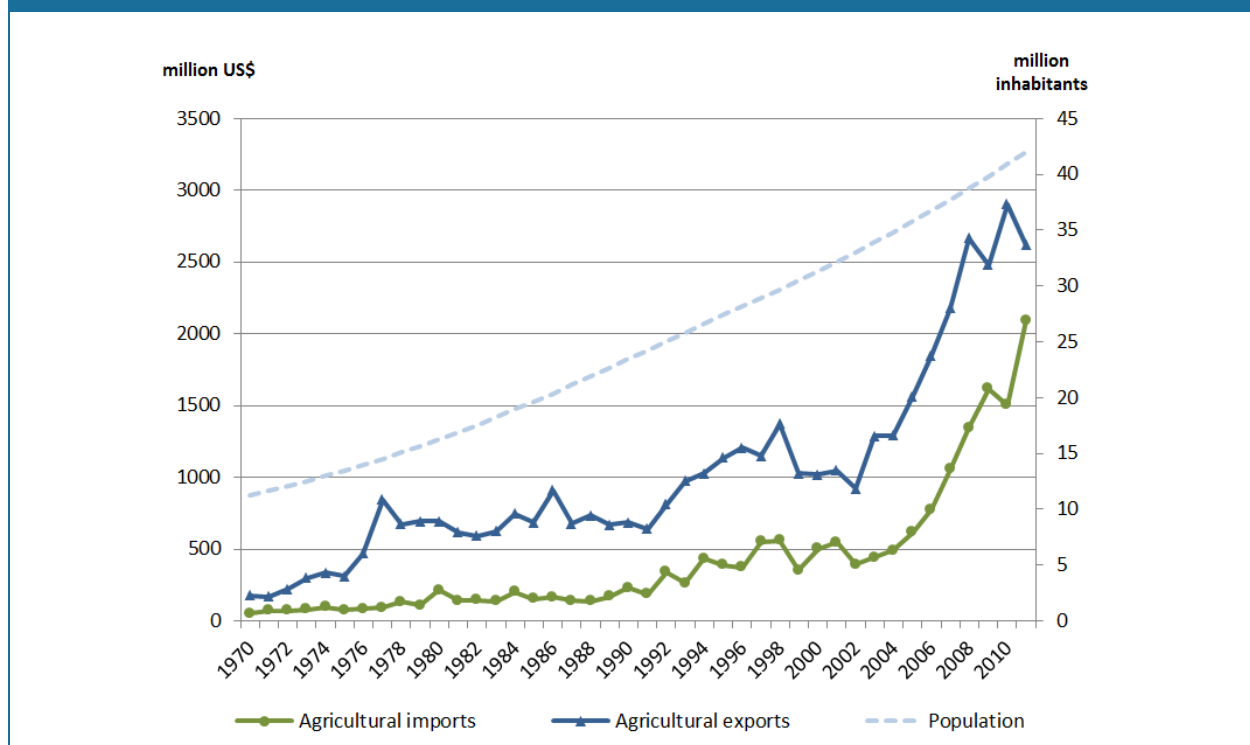
Food self sufficiency

Kenya's import dependency ratio (IDR) in cereals in 2011 was about 37 percent, which means that out of a 100 tonnes of cereal available for consumption in the country, 37 were imported (FAO 2014a). Food self-sufficiency in the country is affected by the fact that Kenya's agricultural production is mainly rain fed and subject to frequent droughts, among others. However, it is important to note that in order to reverse this trend the government has been increasing investment in irrigation projects to cushion production against droughts.

In spite of the country's dependency on imports when it comes to cereals, Kenya has traditionally been a net exporter of agricultural products⁵ as a whole. Figure 1 shows how in the past four decades Kenya's turnover from agricultural exports has surpassed its import bill. During 2009-2011, the main exported products were tea, crude materials, coffee, vegetables and cigarettes, while the main agricultural imports included palm oil, wheat, maize, rice and sugar.

Both exports and imports have been increasing in value with the sharpest increase between 2003 and 2009 coinciding with implementation of the economic recovery strategy (ERS) which emphasized economic growth and the creation of wealth and employment as a means of eradicating poverty and achieving food security. The value of exports have increased particularly driven by exports of cash crops mainly tea, coffee and tobacco. Imports increased as result of both increase in import volumes as well as increased prices, for example Maize imports increased from 0.81 million tons in 2006 to 2.55 million tons in 2009 whereas international wheat prices jumped from \$ 212 per ton in 2006 to \$361 per ton in 2007 before coming down to \$236 per ton in 2009 (MoA, 2012).

⁵ Refers to crop and livestock products

Figure 1. Trade in agricultural⁶ products in value 1970-2011

Source: FAO 2014a

1.2 WATER RESOURCES AND HYDROPOWER

Kenya is divided in five main drainage areas: Athi River and the Coast covering 11.5 percent of the country, Ewaso Ngiro North (36.3 percent), Lake Victoria (8 percent), Rift Valley and the inland lakes (22.5 percent) and Tana basin (21.7 percent) (FAO, 2014b).

Kenya shares rivers with a number of neighboring countries:

- Uмба, Mara and Pangani with Tanzania
- Sio, Malaba and Malakisi with Uganda
- Omo and Daua with Ethiopia
- The Nile basin is shared with nine other countries.

The total annual renewable surface water in 2010 was estimated at 20.637 km³/year while the sustainable yield of groundwater at 1.927 km³/year using a sustainable groundwater use of 10 percent of recharge, thus the total available water resources was estimated as 22.564 km³/year

⁶ Refers to crop and livestock products

in 2010 (GoK, 2013a). This is 586 m³/year per capita, considering the projected population of 2010. This figure is expected to fall further due to population increase and inadequate storage facilities. Kenya is thus regarded as water scarce country compared to its neighbors Uganda and Tanzania with 2 940 and 2 696 m³/year per capita respectively.

Using projected future climate scenarios the NWMP 2030 study shows that the renewable surface water resources will increase from 20.64 km³/year in 2010 to 24.89 km³/year in 2030 and sustainable yield of groundwater will reduce from 1.93 km³/year to 1.74 km³/year due to combined effect of increased precipitation and evapotranspiration, especially in the ASAL areas.

The NWMP 2030 study indicates that the estimated total water demand will increase from 3.218 to 21.468 km³/year over the same period (GoK, 2013a), this includes a demand of 0.114 km³/year in 2010 and 0.714 km³/year in 2030 to be supplied by water from international rivers draining into Kenya. This will present a rather tight situation where demand can equal or even surpass the available water resources especially on dry years, to cope with such a situation the NWMP 2030 proposes:

- a) Water resources development should be promoted to the maximum to meet the future water demand as much as possible and
- b) Water demand management such as water saving and effective and efficient water use, recycling of water should be fully introduced to control water demand increase. NWMP 2030 notes that it is important to control the irrigation water demand, as it account for 80 percent of the total water demand.

Kenya's effective power generation capacity⁷ in 2013 was 1 664 MW against peak demand of 1 354 MW ([GoK, 2014a](#)). The estimated hydropower potential of the country is about 5 257 MW comprising both large hydropower⁸ (2 257 MW) and small hydropower (3 000 MW). Of the large hydro, 807 MW have already been exploited, accounting for about 50 percent of installed total power generation capacity in 2013. Potential for small hydropower is over 3 000 MW, of which less than 25 MW has been developed. Of the estimated potential of small scale hydropower, studies so far have reviewed 300 sites with a potential of 600 MW (GoK, 2013b).

The major hydropower plants are Masinga (40 MW), Kindaruma (40 MW), Kamburu (93 MW), Kiambere (164 MW), Gitaru (225 MW) all along Tana River; Sondu and Sangoro (80 MW) along Sondu River and Turkwel (106 MW) along Turkwel River.

⁷ Including hydropower, fossil fuels, geothermal, bagasse cogeneration, wind and isolated grids.

⁸ Sites with capacity of more than 10 MW

1.3 CLIMATE CHANGE

Climate change is considered one of the most serious threats to sustainable development globally. Analyses carried out by the Government of Kenya show that over the last fifty years average maximum temperatures have increased by 0.1°C to 2.1°C while minimum temperatures have on average increased by 0.7°C to 2.9°C, except in the Coastal strip where it has decreased from 0.3°C to 1.0°C due to the proximity of the Indian Ocean ([GoK, 2010b](#)).

Annual rainfall shows a neutral to a slightly decreasing trend in many areas due to the decline in long rains. There is also an increasing trend in rainfall from September to February suggesting a tendency for the short rainy season to be extending in to what is normally hot and dry period.

Kenya is susceptible to climate related events and such events pose serious threats to the socio-economic development of the country. For instance, between 1997 and 1998 the El Niño floods cost an estimated KES 290 billion, or 14 percent of gross domestic product GDP for the period ([WB, 2006](#)). La Niña droughts in 1999-2000 resulted in 4.7 million Kenyans facing starvation ([GoK, 2010b](#)).

Using downscaled GCM models up to 2030 it was found that Kenya might get wetter and hotter but the increase in temperature and rainfall will translate into increased agricultural productivity in specific locations, mainly due to increased evapotranspiration. The study also found out that there will be increase in frequencies of drought in arid and semi-arid areas that could cause irreversible decreases in livestock numbers. Kenya will have significant areas within arid and semi-arid regions where cropping might not be possible due to climate change ([Mario et al, 2010](#)).

2 NATIONAL STRATEGIES FOR WATER, AGRICULTURE AND ENERGY

Overall development strategies

The main objective of Kenya's agricultural sector strategy has been to increase agricultural growth, vital for higher rural incomes and the assurance of equitable wealth distribution. In 2003 the government launched the Economic Recovery Strategy (ERS) which emphasized economic growth and the creation of wealth and employment as a means of eradicating poverty and achieving food security. This was followed by the Strategy for Revitalizing Agriculture (SRA) in 2004, with the vision of transforming Kenya's agriculture from a subsistence oriented activity to a profitable, commercially-oriented and internationally competitive economic activity.

In 2008 the Government launched Kenya Vision 2030 as a new long-term development plan for the country, with the aim of transforming Kenya into 'a newly industrializing, middle-income

country providing high quality of life to all its citizens in a clean and secure environment’ ([GoK, 2008](#)). Vision 2030 has three pillars namely economic, social and political. Agriculture has been identified as one of the key sectors to deliver the 10 percent annual economic growth envisaged.

In addition to this, the government enacted in 2013 a Public Private Partnerships (PPP) Act to mobilize funds for infrastructure and other development projects under PPP arrangements. The Act also provides for county governments to approve and undertake PPP projects which do not pose contingent liabilities to the national or county governments. For those programs that will generate liabilities, counties will seek clearance from National Government. The Government has prioritized the operationalization of the PPP Act (2013) to facilitate investment in infrastructure and in other development projects which is necessary for the country to achieve the targeted 10 percent annual economic growth rates under Vision 2030. ([GoK, 2013c](#)).

Agriculture and irrigation

The Agricultural Sector Development Strategy 2010-2020 was launched in 2010 to position the agricultural sector as the key driver for delivering the 10 per cent annual economic growth rate envisaged under the economic pillar of Vision 2030 ([GoK, 2010b](#)).

The ASDS has six thematic areas, four of them in line with Comprehensive Africa Agricultural Development Programme (CAADP) Pillars, these are: (i) Sustainable land and natural resource management (in line with Pillar 1); (ii) Agribusiness, access to markets and value addition (Pillar 2); (iii) Food and nutrition security (Pillar 3); (iv) Research and extension (Pillar 4); (v) Inputs and financial services and (vi) Legal, regulatory and institutional reforms.

The ASDS has outlined the following challenges among others as constraining Kenya’s agricultural productivity and competitiveness.

- Inappropriate policy and legal framework that are not fully supportive of private sector-led agricultural development in a liberalized economic environment;
- Low agricultural output and productivity resulting from low adoption of appropriate technologies such as high-yielding crop varieties, inadequate application of fertilizer and manure, inefficient tillage and cultivation methods, and high cost of inputs and productive resources such as credit and irrigation infrastructure; and
- Poor performance of research and extension systems due to low Government investment, restrictions on staff recruitment, and weak research–extension linkages.

In order to achieve food security, the ASDS proposes scaling-up of initiatives that involve developing appropriate technologies for the various agro-ecological zones, particularly in the

ASALs where drought-resistant and new and emerging crops will be promoted alongside with irrigation, water harvesting and farm forestry.

The targets of the ASDS are broken down to short term targets and elaborated in Medium Term Investment Plans (MTIP) prepared for a five year period. The current MTIP (2013-2017) is an update of the previous one prepared in 2010 to align it with Vision 2030. The MTIP groups priority investments into six pillars. Pillar 1 “Increasing productivity and commercialization” and pillar 3 “Promoting sustainable land and natural resources management” are those related to Agricultural Water Management (AWM). In particular, sub pillar 1.7 “water and irrigation development” is the most relevant to AWM with a total budget of KES 73.4 billion (around US\$800 million).

Investment in the irrigation sub sector has increased eight fold in the past three years because of the economic stimulus package and the expanded irrigation programme. This has facilitated rehabilitation and expansion of irrigation schemes throughout the country. For instance during the First Medium Term Plan 2008-2010, the area under irrigation expanded from 119 000 to 159 000 hectares in small holdings as well as large schemes thanks to flagship projects implemented under the Expansion of Irrigation Programme, namely: Bura, Hola, Kano, Bunyala, Perkerra and Mwea ([GoK, 2013d](#); NIB, 2014).

The Agriculture and Livestock Second Medium Term Plan of 2013-2017 gives top priority to increased area under in irrigation in order to reduce the country’s dependence on rain fed agriculture ([GoK, 2013d](#)). The plan envisages that about 404 800 hectares will be put under irrigation during the plan period. The Plan also includes measures to be taken to mechanize agricultural production, revive cooperatives and farmers unions, and subsidize farm inputs to raise productivity. In particular, the government plans to:

- Prioritize implementation of the Ending Drought Emergencies (EDE) plan,
- Prioritize increasing investment in irrigation to reduce the country’s dependence on rain-fed agriculture,
- Prepare strategies to mechanize agriculture, revive cooperatives and farmers unions and subsidize farm inputs,
- Develop a National Water Harvesting Policy,
- Finalize the Irrigation Policy and Bill which is currently at an advanced stage,
- Develop irrigation standards and regulations, and
- Finalize the Land Reclamation Policy and Bill.

After the enactment of the PPP Act in 2013, the Government is fast tracking the full implementation of the provisions of the Act. Request for proposals have already been sent out

through an advert in the media for investment opportunities under the PPP Act. Out of the 59 infrastructural projects advertised, eight are related to the development of irrigation schemes individually or under multipurpose water resources development project. The total area of irrigation development under this PPP announcement is 68 265ha and it includes Tana Delta irrigation project, Aror Multi-purpose dam and Nandi Forest Multi-purpose dam.

Water resources

Kenya's water resources planning and management is guided by the Water Act of 2002, which separates water resources management, water and sanitation and policy formulation. Water resource management relates to implementation of policies and strategies, development of catchment level management strategies, while water and sanitation deals with water supply and sewerage services. The Act gives the Ministry responsible for Water affairs the role of policy development. It also created the *Water Resources Management Authority* in charge of Water resources management and the *Water Services Regulatory Board* to take care of Water supply and Sanitation. In addition to this, there is the *Water Services Trust Fund* and the *Water Tribunal*. The Act is currently under review to align it to the current Constitution and in the new Water bill 2014, which has been published and is currently awaiting parliamentary debate; the same institutions are mentioned with slight changes in mandate and/or name with. These institutions are the Water Resources Regulatory Authority, Water Works Development Boards, Water Services Regulatory Authority, Water Sector Trust Fund and the Water Tribunal ([GoK, 2014b](#)). One additional institution, the National Water harvesting and Storage Authority will be created under this Act to focus on developing water harvesting and storage facilities.

The Draft National Water Policy 2012 ([GOK, 2012](#)), states the objectives of the water resources management for the country, among others:

- a) Ensure increased per capita water availability above the international benchmark of 1 000 m³ by 2030.
- b) Ensure progressive restoration and protection of ecological systems and biodiversity in strategic water catchments.
- c) Maximize use of trans-boundary water resources in coordination with other riparian countries.
- d) Enhance flood water management and rainwater harvesting.
- e) Enhance inter-basin water transfer in Kenya as strategic intervention for optimized used of water resources.
- f) Establish sound research and development in the water sector.
- g) Enhance enforcement of regulation and other IWRM actions.
- h) Sufficient funds for sustainable development and management of water resources.

The national development targets on the water sector in the Vision 2030 are as follows:

- a) Water and sanitation - to ensure that improved water and sanitation are available and accessible to all by 2030,
- b) Agriculture - to increase the area under irrigation to 1.2 million ha by 2030 for increased agricultural production,
- c) Environment - to be a nation that has a clean, secure and sustainable environment by 2030, and
- d) Energy - to generate more energy and increase efficiency in energy sector.

Energy and hydropower

The overall objective of the draft energy policy is to ensure affordable, competitive, sustainable and reliable supply of energy to meet national and county development needs at least cost, while protecting and conserving the environment ([GoK, 2014a](#)). The energy sector is guided by a number of policies principally the Energy Act of 2006.

The Draft Energy policy proposes several strategies and incentives to further develop and sustain hydropower production. These are also reflected in the Second Medium Term Plan of the Vision 2030. Among these strategies are:

- Establishment of an inter-ministerial committee comprising of relevant stakeholders to advise policy direction on ownership and management of dams.
- Implementation hydro power projects as multi-purpose projects. Consideration will also be given to leasing of such projects for operation through long-term concession.
- Encouraged Private Sector participation through attractive Feed-in-Tariff to develop potential sites to generate electricity for their own consumption and for export of any surplus to the national grid. The government will provide letters of comfort to investors which guarantee purchase of electrical energy on just and reasonable terms.
- Provision of incentives to promote the local production and use of efficient small hydro power systems.
- Development of small, mini, micro and pico hydropower capacities totalling 50 MW from various sites in the short term, 100 MW in the medium term and 300 MW in the long term.

3 INVESTMENT ENVELOPE

The **investment envelope** is a matrix that presents current and planned investment in the development of water resources for agriculture and hydropower production in a given country.

The investment envelope is produced through the application of a **Financial Diagnostic Tool**. This tool processes project-based information (section 4) to derive the investment estimates at country level. The necessary project information to plug in the tool includes: project description, funding partners, time-scale, total cost, type of project, etc. Project types that are included in the tool are the following:

1. Small scale irrigation development⁹
2. Rehabilitation/modernization of irrigation
3. Large Scale Irrigation development
4. Small/medium scale hydropower development
5. Rehabilitation of hydropower plants
6. Large scale hydropower development
7. Others (capacity building, drinking water supply, etc.)

The Financial Diagnostic Tool incorporates a number of assumptions amongst which are the project cost distribution over time and the relevance of the water component as a percentage of the total cost. A conversion rate (yearly average) to change to US dollars any other base currency has also been applied and projections have been made for the period after 2013 with the use of an exponential regression.

The tool also helps conducting **complementary financial analysis** including: investment by type of project, contribution of different sources of financing, hectares to develop/rehabilitate by crop, etc. This complementary financial analysis is also presented in this section in Figures 4 to 9.

The investment envelope is found in Table 2. It presents investment estimates according to the project typologies mentioned above with three time-scales: short term (less than 4 years), medium term (between 4 and 8 years), and long term (more than 8 years)¹⁰.

In the case of Kenya, the investment envelope has been calculated based on 81 on-going projects and 48 pipeline projects listed in section 4. The on-going projects range from a cost of

⁹ Small scale: 0-500 ha, large scale: > 500 ha

¹⁰The baseline year considered for the analysis is 2014. Therefore investment in the short term would be executed from 2015 to the end of 2018, in the medium term, from 2019 to the end of 2022 and in the long term, from 2023 onwards.

about US\$52 000 to about US\$260 million. The pipeline projects have, on average, higher investment costs which range between a minimum of about US\$44 000 and a maximum of US\$2 838 million (Table 1).

Table 1. Summary statistics of the Projects Portfolio		
	On-going	Pipeline
Number of Projects	81	48
Min (million US\$)	0.052	0.044
Max (million US\$)	260	2838
Average (million US\$)	8.5	163.6

A close look at the distribution of costs amongst on-going projects (Figure 2) shows that only one project (one percent of the on-going) have costs above US\$100 million. There are seven projects (seven percent) with costs between US\$100 million and a US\$10 million, 20 projects (23 percent) ranging from US\$10 million to US\$1 million, while the remaining 53 projects (64 percent) have investment costs that are lower than US\$1 million. As for pipeline projects (Figure 3), there are two projects (two percent of those in the pipeline) with costs above US\$1 000 million, nine projects (17 percent) have costs between US\$1 000 million and US\$100 million, 23 projects (46 percent) have investment costs between US\$100 million and US\$10 million. The remaining 14 projects (27 percent) cost less than US\$10 million.

Figure 2. Project Cost distribution – On-going Projects

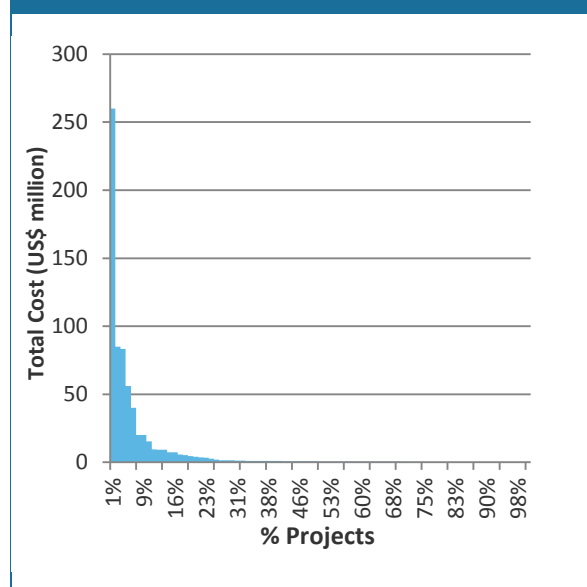
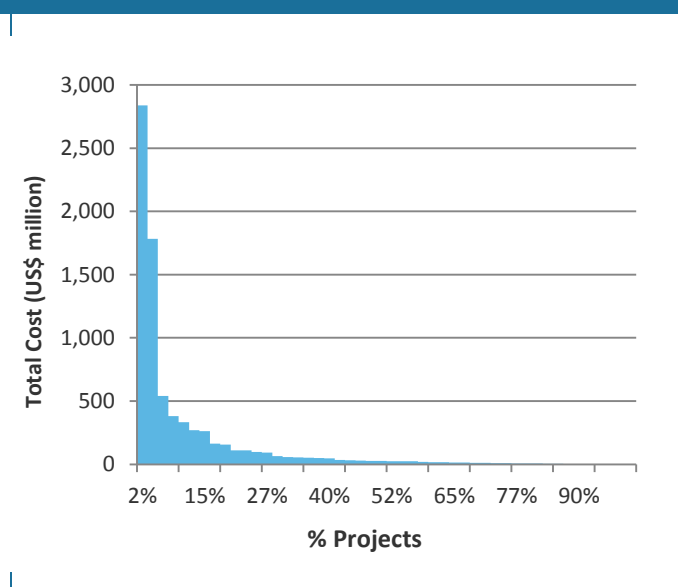


Figure 3. Project Cost distribution – Pipeline Projects



The total investment envelope for Kenya has been estimated at US\$6 761 million in which almost US\$9 67.39 million is allocated to the development of small scale irrigation systems, US\$402.45 million to the rehabilitation and modernization of irrigation schemes, US\$2 780.53 billion to large scale irrigation development, US\$778.27 million are allocated to the development of small/medium scale hydropower, US\$17.92 million to the rehabilitation of hydropower plants and US\$816.26 million to the development of large scale hydropower (Table 2). There is a total of US\$997.83 million dedicated to *others*, which in the case of Kenya mainly refer to drinking water supply, capacity building for farmers, strengthening or creating Water Users Associations, etc. If this last category is not considered the total envelope would add up to US\$5 762.82 million.

The total amount of the three irrigation categories is US\$4 150.37 billion (61 percent of the envelope), while the hydropower categories would add up to US\$1 612.35 billion (24 percent).

Table 2. Total Investment Envelope in US\$ million and in percentage (On-going & Pipeline projects)

Time Frame	Short-term		Medium-term		Long-term		Total	
	M US\$	%	M US\$	%	M US\$	%	M US\$	%
Small Scale irrigation development	961	14.2%	7	0.1%	0	0%	967	14.3%
Rehabilitation/modernization of irrigation schemes	402	6%	0	0%	0	0%	402	6%
Large Scale Irrigation development	2 713	40.1%	68	1%	0	0%	2 781	41.1%
Small/medium scale hydropower	778	11.5%	0	0%	0	0%	778	11.5%
Rehabilitation of hydropower plants	18	0.3%	0	0%	0	0%	18	0.3%
Large scale hydropower development	816	12.1%	0	0%	0	0%	816	12.1%
Others	998	14.8%	0	0%	0	0%	998	14.8%
Total	6 686	98.9%	74	1.1%	0	0%	6 761	100%

Almost the totality (99 percent) of the investment is expected to take place in the short term (within the next four years). It is anticipated that on-going projects will end by 2017. As for pipeline projects, none of them will go beyond 2019.

Cost distribution

Figures 4 to 6 illustrate the distribution of project costs in time by type of project for those on-going and in the pipeline. As stated before, the graphs show that almost the totality of investments will take place in the short-term. Figure 6 shows that pipeline projects account for most of the investment envelope (US\$6 585 million out of US\$6 760.7 million).

There are two pipeline projects that account for approximately half of the investment envelope: the *Increased food security project* with a total cost of US\$2 837.88 million – and the *Development and rehabilitation of Water harvesting and irrigation infrastructure* for a total cost of US\$1 783.74 million.

Figures 7 to 9 show the distribution of costs by type of project. At a first glance, it can be seen that the investment envelope has a majority of projects on large-scale irrigation development (41 percent) followed by the *others* category (15 percent). As it was stated before, in Kenya this category mainly refers to drinking water supply, capacity building for farmers, strengthening or creating Water Users Associations, etc. Both on-going and pipeline projects show a similar trend as for the typology of projects.

Figure 4. Cost distribution in time per typology – All Projects (US\$ million)

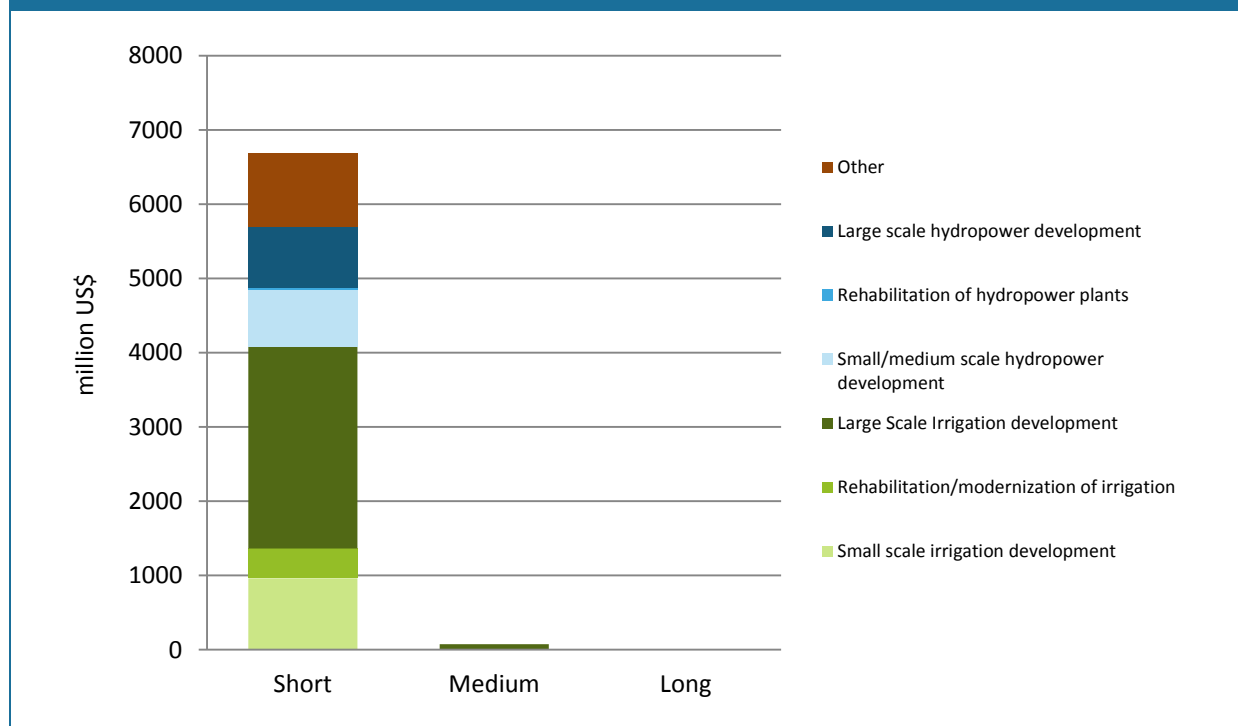


Figure 5. Cost distribution in time per typology – On-going Projects (US\$ million)

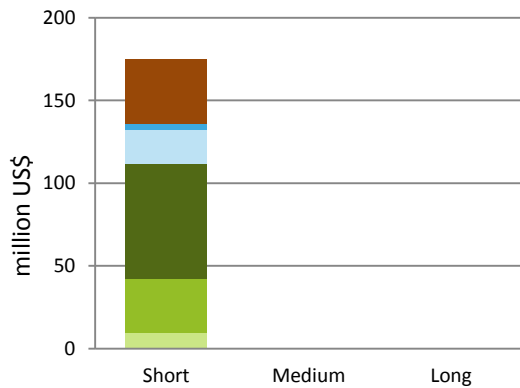


Figure 6. Cost distribution in time per typology – Pipeline Projects (US\$ million)

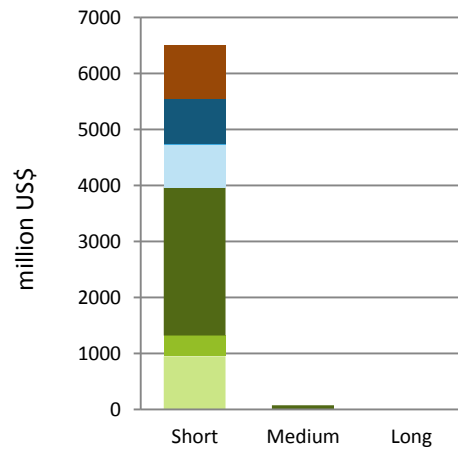


Figure 7. Cost share per typology –All Projects (%)

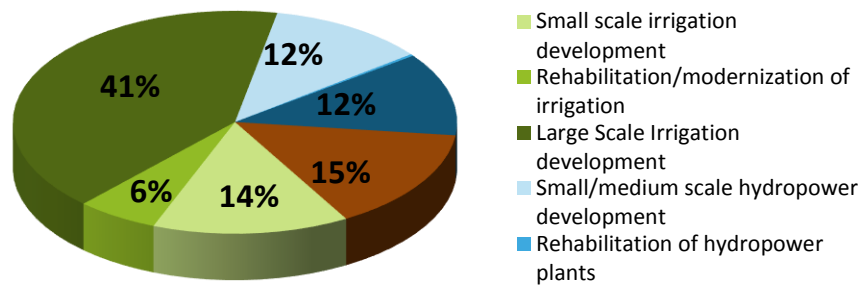


Figure 8. Cost share per typology – On-going Projects (%)

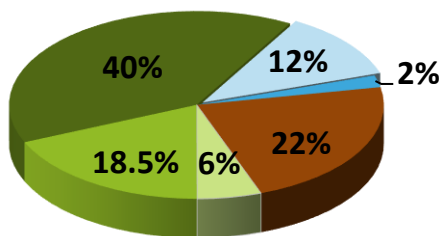
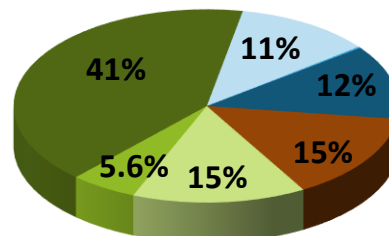


Figure 9. Cost share per typology –Pipeline Projects (%)



Source of funding

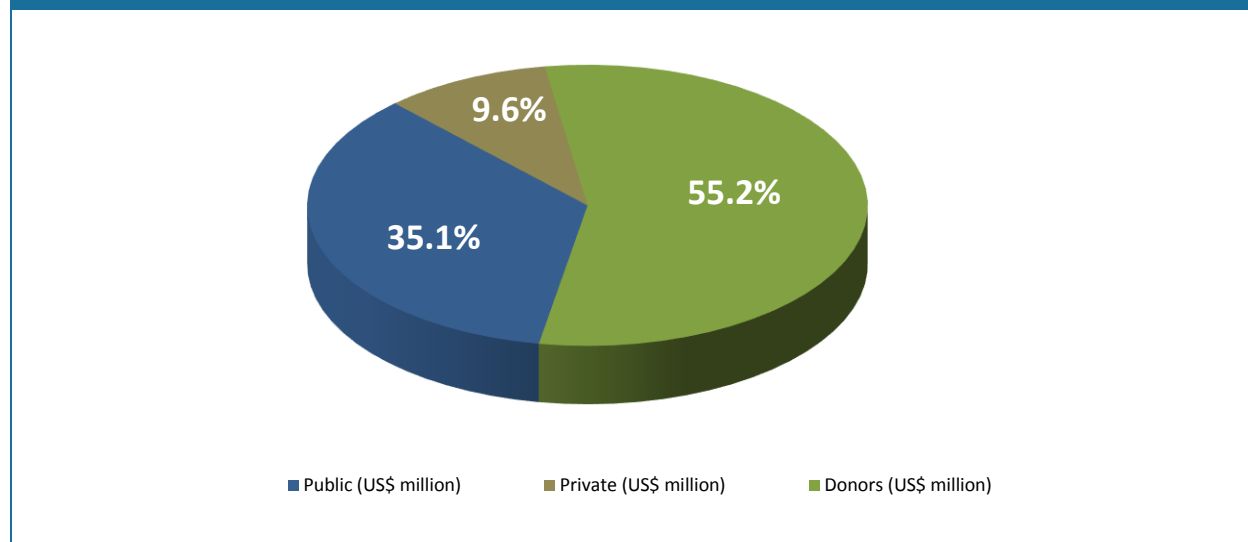
The analysis of sources of funding has only been conducted on on-going projects since the information for most of the projects in the pipeline on the funds committed by different partners is not available yet.

Figure 10 shows that more than half (55.2 percent) of the costs for on-going projects are covered by donors such as the Arab Bank for Economic Development in Africa, the Kuwait Fund, The Organization of the Petroleum Exporting Countries (OPEC), the Australian Red Cross, the African Development Bank, the World Food Programme (WFP), the U.S. African Development Foundation and the Japan International Cooperation Agency (JICA). Many donors in Kenya contribute to funding projects with higher costs such as the *Kimira-Oluch Small holder Irrigation Project* (US\$55.96 million) and the *Bura Rehabilitation of Irrigation Project* (US\$83.42 million).

The second largest funding source of on-going project costs are public sources like the government of Kenya or County governments which account for 35.1 percent. Private sector funding (farmers, the Kenya Tea Development Authority) accounts for 9.6 percent of the costs.

It is worth mentioning that 6 large scale multipurpose projects in the pipeline will be implemented under Public-Private Partnership arrangements.

Figure 10. Cost share per typology for On-going Projects (%)



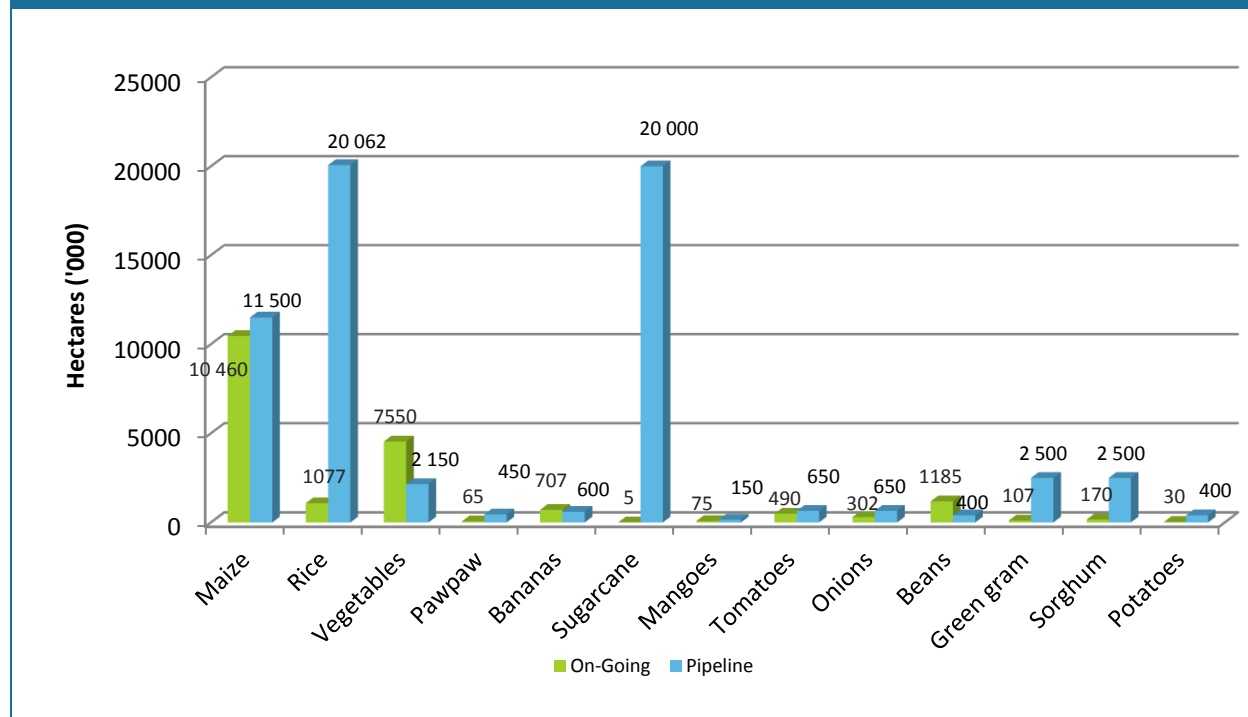
Hectares to develop/rehabilitate

The project portfolio will bring changes to about 176 405.3 ha of land in the country by 2019 of which 24 491.30 ha will be developed through on-going projects and 151 914 ha from pipeline

projects. Of those, approximately 72 584.3 ha will go towards the development of large-scale irrigation, 10 584.3 ha for rehabilitation of irrigation schemes and 24 696.7 ha for small-scale irrigation development. The total irrigation development planned added to the current irrigated area¹¹, would mean that more than 80 percent of the ASAL¹² targets on irrigation development would be reached.

Figure 11 shows the crop pattern (percentage of area to be developed/rehabilitated per crop) for those projects for which information was available¹³. Rice, maize and sugarcane are predominant in the project portfolio especially for pipeline projects. The rest of the projects will also focus on sorghum, green gram, beans, onions, pawpaw, potatoes, tomatoes and other vegetables.

Figure 11. Distribution of hectares by crop



¹¹ Taking the figure of the National Irrigation board of 169 000 ha.

¹² The ASAL target is to have a total of 404 800 hectares under irrigation by 2017.

¹³ Only half of the total hectares reported in projects had also disaggregated values by crop.

4 PROJECT PORTFOLIO

As it was explained before, the investment envelope was built with information from a national inventory of irrigation and hydropower projects currently on-going or in the pipeline. These projects are presented in Annex 1 (table 1.1 for on-going projects and table 1.2 for pipeline projects). The main sources used to obtain the information are: the Ministry of Agriculture, Livestock and Fisheries, the Ministry of Environment, Water and Natural Resources, the National Irrigation Board, County Governments and Non-Governmental Organizations.

The project portfolio and the projects in the ASDS Medium Term Investment Plan

Comparing the AWM projects mentioned in the ASDS MTIP (2013-2017) and the project portfolio in this report, one can see that few projects are included in both documents (Table 3). One reason is that the MTIP has just entered its second year (2014-2015 financial period) and it is possible that projects are still at the early preparation stages. The MTIP also includes general programmes rather than specific projects; however, certain projects at the time of preparing the MTIP are mentioned. For instance, the MTIP includes the rehabilitation and expansion of existing irrigation projects and this can be linked to the several projects carried out by the National Irrigation Board under the Expanded National Irrigation programme. The MTIP also mentions a programme to promote water harvesting and storage under the Ministry of Agriculture while there is an on-going project, the national water harvesting and storage programme under the Ministry of Devolution.

Table 3. Comparison between irrigation/AWM related projects in MTIP and the project portfolio

Agricultural Sector Development Strategy-Medium Term Investment Plan (MTIP) 2013			Project portfolio - National Investment Profile (NIP) (2014)		
Title	Time frame	Total cost (m KES)	Title	Time frame	Total cost (m KES)
Construction of Thiba Dam (C1.7.1)*	2013-2017	9 413	Mwea Irrigation Development Project ¹⁴ (pipeline # 5)	2015-2018	10 007
Rehabilitation and Expansion of Existing Irrigation Schemes (C 1.7.2)	2013-2017	49 235			
Promote Water Harvesting and Storage (C 1.7.3)	2013-2017	1 715	National Water Harvesting and Storage Programme (On-going # 42)	2014-2015	7 500
Promote Re-cycling of Waste Water (C 1.7.4)	2013-2017	6 299	-	-	-
Promote Efficient Use of Water for Irrigation (C 1.7.5)	2013-2017	2 984	-	-	-
Develop Underground Water Resources (C 1.7.6)	2013-2017	2 400	-	-	-
Capacity Building for Irrigation Development (C 1.7.7)	2013-2017	1 105	-	-	-
Support to Irrigation Research (C 2.5.5)	2013-2017	2 984	-	-	-
Multipurpose dams (2 large dams and 3 medium sized dams) (C 3.3.1)	2013-2017	35 229	-	-	-
Food for Assets Project (MTIP Project #51)	2013-2015	230	Food for Assets Project (On-going # 26)	2013-2015	260
Kimira Oluoch Small Holder irrigation (MTIP Project #78)	2007-2014	1 429.3	Kimira Oluoch Small Holder irrigation (On-going # 13)	2007-2014	3 677.8
Water Harvesting Project (MTIP Project #156)		4 121	-	-	-
Support to Vulnerable food insecure household through promotion of small scale irrigation (MTIP Project #161)		103.8	-	-	-
Water Conservation and Dam Construction (MTIP Project #163)		12 416	-	-	-
Kainuk Food security Irrigation Project (MTIP Project #316)		189.3	-	-	-

*C 1.7.1 refers to the MTIP investment pillar 1 (Increased productivity and commercialization and sub pillar 7: water and irrigation development

¹⁴ The project includes the construction of Thiba dam.

5 CONCLUSIONS

Based on the information and analysis presented in this report the following can be concluded

- a) Almost half (41 percent) of the investment envelope in Kenya is devoted to large scale irrigation development¹⁵. Considering their importance, the country should not forget to invest in small holders when it comes to the planning of AWM projects.
- b) It appears that little attention is given to modernization and rehabilitation of irrigation schemes in pipeline projects. This is evident from the fact only 2 of the pipeline projects are dealing with this matter. This is an issue that will affect performance of irrigation systems.
- c) When comparing the total investment from the project portfolio with the budget of the ASDS MTIP for agricultural water management projects, a big difference is observed. While the ASDS MTIP estimation of the budget requirement is US\$824.72 million for agricultural water management projects, the investment envelope shows US\$4.1 billion. This is because the MTIP does not mention most of the projects in the portfolio.
- d) The implementation of the project portfolio will bring changes to about 176 235 ha of land in the country by 2019. Of those, 161 075 ha would come from irrigation development projects, 1 677 ha from rehabilitation projects and 13 484 ha from both development and rehabilitation projects. This, added to the current irrigated area¹⁶, would mean that around 80 percent of the targets on irrigation development in the ASAL¹⁷ would be reached.
- e) Although the area under irrigation has been increasing, there is contradiction regarding the current irrigated area in Kenya. The National Water Master Plan (2014) estimates the area under irrigation at 141 900 ha. The National Irrigation Board (NIB, 2014) estimates indicate 161 840ha. It is thus important to get consistent and continuous data which is critical for planning and monitoring of irrigation projects.

The main scope of this profile was to conduct a financial analysis of on-going and planned projects to develop/rehabilitate irrigation and hydropower infrastructure in Kenya. Although the supporting policy and institutional environment is very much necessary to make sure these type of investments are successful, the available time and financial resources did not allow for such an analysis. The authors also wish to acknowledge the importance of undertaking additional investments in research and capacity building in order to promote innovation and optimize returns.

¹⁵ Large scale irrigation is considered to be over 500 ha and can also include the construction of a dam/water storage infrastructure.

¹⁶ Taking the figure of the National Irrigation Board (2014) of 169 000 ha.

¹⁷ The ASAL target is to have a total of 404 800 hectares under irrigation by 2017.

ANNEX 1. PROJECT PORTFOLIO

Table 1.1. ON-GOING PROJECTS

#	Project title	Funding Partners	Time Scale	Cost (million US\$)	Description
1	Gura Small Scale Hydropower	Nyeri Small Scale Tea Farmers- KTDA	2013-2014	15.45	A 5 MW hydropower plant to supply power to tea factories in Nyeri Tea zone owned by Kenya Tea Development Authority (KTDA) <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
2	Chania Small Scale Hydropower	Thika Small Scale Tea Farmers-KTDA	2013-2014	4.56	A 1.0 MW hydropower plant to supply power to tea factories in Thika Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
3	North Mathioya Small Scale Hydropower	Muranga Small Scale Tea Farmers-KTDA	2014-2016	20.01	A 5.60 MW hydropower plant to supply power to tea factories in Muranga County Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
4	Lower Nyamindi Small Scale Hydropower	Kirinyaga Small Scale Tea Farmers-KTDA	2014-2016	9.22	A 1.80 MW hydropower plant to supply power to tea factories in Kirinyaga Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
5	South Mara Small Scale Hydropower	Meru Small Scale Tea Farmers-KTDA	2014-2016	9.32	A 2.0 MW hydropower plant to supply power to tea factories in Meru County Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
6	Rapsu Irrigation Project	Government of Kenya	2013-2014	1.44	The project is located in Isiolo county. The work involves: rehabilitation works of intake, main and branch canals, construction of scheme roads and water user association's office building. The irrigated area is 71 ha with onion being the main crop. <i>Typology: Rehabilitation and Modernization of Irrigation Scheme</i>

7	Muringa Irrigation Project Phase 2	Government of Kenya	2013-2014	5.68	<p>This project is located in Meru County. The scope of works is to develop a sprinkler system (mainline pipeline, distribution and infield system) to grow 400 ha of bananas.</p> <p><i>Typology: Small scale irrigation development</i></p>
8	Lower Kuja Irrigation Project	Government of Kenya	2012-2014	9.41	<p>This project is located in Migori County. It includes: the development of headworks, canals and infield systems. The irrigation area is 625 ha to grow rice, vegetables and sweet potatoes.</p> <p><i>Typology: Large scale irrigation development</i></p>
9	Lower Sio Irrigation Development Project	Government of Kenya	2012-2014	20.07	<p>This is a new project in Busia County. The scope of works is to construct three intakes, steel pipelines and a drainage system. The target is to grow 4 330 ha of horticultural crops, fruits and vegetables.</p> <p><i>Typology: Large scale irrigation development</i></p>
10	Bura Rehabilitation	Government of Kenya, BADA-E-Kuwait, OPEC	2014-2016	83.42	<p>The Project is located in Tana River County and involves the construction of a gravity system, a 25 km conveyance canal, river bank protection, sedimentation basin and the rehabilitation of the main and secondary canal. After the expansion the total area under cultivation will be 5 600 ha of maize.</p> <p><i>Typology: Large scale irrigation development (80%); Rehabilitation and Modernization of Irrigation Scheme (20%)</i></p>
11	Mwingi Integrated and Food Security Project	Australian Red Cross	2013-2014	0.52	<p>The project is located in Kitui County will develop a small scale irrigation project and also provide bee hives as part of a school feeding programme. The irrigation area will be 405 ha to grow tomatoes, watermelon, onion, kales (Sukuma Wiki), Swiss Chard (Spinach), cabbage, pepper, squash and butternut.</p> <p><i>Typology: Small Scale Irrigation development</i></p>
12	Kagaari, Kyeni, Gaturi Irrigation Development Project Phase 1	Government of Kenya	2012-2014	7.45	<p>This project is located in Embu county. The scope of work involves the construction of an intake weir, an inlet canal, a conveyance pipeline, a mainline pipeline and an infield sprinkler system. The target area is 499 ha to grow fruits and vegetables.</p> <p><i>Typology: Small Scale Irrigation development</i></p>
13	Kimira-Oluch Small holder Irrigation Project	African Development Bank	2007-2014	55.96	<p>The Scheme is situated in Homabay County. The scope of works involve irrigation scheme development, formation and training of water users and farmers on farming and entrepreneurial skills. The target area is a 1 474 ha to grow mainly vegetables and rice.</p> <p><i>Typology: Large Scale Irrigation development (80%), Others: Farmers training (20%)</i></p>

14	Eldume Irrigation Project-Phase 2	Government of Kenya	2014-2014	0.61	The Project is located in Baringo County and the scope of this phase is the construction of conveyance canals and hydraulic structures to expand the scheme by 200 ha to grow maize. <i>Typology: Small Scale Irrigation development</i>
15	Githura-Kimathin and Ajibika Irrigation Projects	Muranga County Government	2014-2014	3.40	Kimathia and Ajibika irrigation projects are in Muranga County. The county will develop 600ha to grow rice and horticultural crops. <i>Typology: Small Scale Irrigation development</i>
16	Expansion of Nyalani Dam-Kwale County	Kwale County Government	2014-2014	2.64	The Dam is situated in Kwale county and will be rehabilitated through an MoU between the Kenya Red Cross Society and the County Government of Kwale. The objective of the project is to secure reliable water supply for both domestic purposes and irrigation. <i>Typology: Small Scale Irrigation development (20%), Rehabilitation of dams (50%); Others: Water supply (30%)</i>
17	The Multinational Drought Resilience and Sustainable Livelihoods Programme, Kenya Project	African Development Bank and Government of Kenya	2013-2017	40.0	The Project is implemented in Isiolo, Samburu, Marsabit, West Pokot, Turkana and Baringo counties. The project aims at protecting pastoralists against perennial food and water shortages by rehabilitating irrigation schemes and drilling of dams and boreholes. The project will extend over 1 530ha. <i>Typology: Small Scale Irrigation development (20%), Rehabilitation and Modernization of Irrigation Scheme (20%), Rehabilitation of dams (30%); Others: Fencing of pasture lands (30%)</i>
18	Agency for Pastoralist Development & Napak Irrigation Scheme	U.S. African Development Foundation	2012-2015	0.25	This project is located in Turkana County and focuses on 227 farmer pastoralists at the Napak irrigation scheme. The project will organize Napak farmers into a registered Water Users Association and Cooperative, develop irrigation infrastructure and educate farmers on best practices for farming as a business. <i>Typology: Small Scale Irrigation development (60%); Others: Training farmers on farming practice (40%)</i>
19	Agency for Pastoralist Development & Napeikar Irrigation Scheme	U.S. African Development Foundation	2012-2015	0.25	This project is located in Turkana County and focuses on 574 farmer pastoralists at the Napeikar irrigation scheme. The project will organize Napeikar farmers into a registered Water Users Association and Cooperative, develop irrigation infrastructure and educate farmers on best practices for farming as a business. <i>Typology: Small Scale Irrigation development (60%); Others: Training farmers on farming practice (40%)</i>

20	Morulem Water Users Association	U.S. African Development Foundation	2012-2015	0.24	<p>This project is located in Turkana County and will be focusing on organizing farmers into a cooperative so as to better bulk and sell their produce. Grant funds will be used to rehabilitate the main canal and intake, and to equip MWUA with a truck to better access markets for their crops.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme (60%); Others: Organizing farmers, buying truck (40%)</p>
21	Lokwaliwa Rural Savings and Credit Cooperative (SACCO) Society Limited	U.S. African Development Foundation	2013-2016	0.24	<p>The project is located in Turkana County and grant funds will be used to fund development of 18ha of sprinkler irrigation system and 2ha of drip irrigation system so as to enable farmers to grow a combination of subsistence and cash crops.</p> <p>Typology: Small Scale Irrigation development</p>
22	Kaputir Resources Management Authority (KARMA) & Naoyaregae Irrigation Scheme	U.S. African Development Foundation	2013-2016	0.25	<p>This project is located in Turkana County and will focus on organizing Naoyaregae farmers into a Cooperative so as to better bulk and sell their produce. Grant funds will also be used to place 33.6 ha of the Naoyaregae farm under center-pivot irrigation, allowing farmers to grow a combination of subsistence and cash crops.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme (60%); Others: Organizing farmers (40%)</p>
23	Kaputir Resources Management Authority (KARMA) Naoyatiira Irrigation Scheme	U.S. African Development Foundation	2013-2016	0.25	<p>This project is located in Turkana county to organize Naoyatiira farmers into a Cooperative so as to better bulk and sell their produce. Grant funds will also be used to place 12 ha of the Naoyatiira farm under center-pivot irrigation, allowing farmers to grow a combination of subsistence and cash crops.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme (60%); Others: Organizing farmers (40%)</p>
24	Kaputir Resources Management Authority (KARMA) Kapelibok Irrigation Scheme	U.S. African Development Foundation	2013-2016	0.25	<p>This project is located in Turkana County to organize Kapelibok farmers into a Cooperative so as to better bulk and sell their produce. Grant funds will also be used to place 33.6 ha of the Kapelibok farm under center-pivot irrigation, allowing farmers to grow a combination of sub-sistence and cash crops.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme (60%); Others: Organizing farmers (40%)</p>

25	Food for asset, Cash for assets	WFP	2012-2015	260.00	<p>The Project is running in 13 counties and includes rehabilitation of irrigation schemes that improve communities' resilience to common shocks/hazards. The target irrigation area to be rehabilitated is 730.1 ha.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme (40%); Others: Soil conservation (60%)</p>
26	Naarosoru Irrigation Project	Government of Kenya	2013-2014	0.51	<p>This project is in Narok County and will change the irrigation water conveyance system from canal to pipe to grow vegetables on a 40 ha farm.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme</p>
27	Kasokoni Irrigation Project	JICA and Beneficiaries	2014-2014	0.26	<p>This project is located in Taita Taveta County and involves the improvement of weir and intake works as well as the lining of main canal. The cropped area is 38 ha to grow maize bananas and tomatoes.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme</p>
28	Challa Tuhire Irrigation Project	JICA and Beneficiaries	2014-2015	0.14	<p>This is a project in Taita Taveta County and involves the improvement of weir and intake works as well as the lining of branch canals. The target area is 300 ha with maize, tomatoes and onions.</p> <p>Typology: Rehabilitation and Modernization of Irrigation Scheme</p>
29	Tumutummu Irrigation Scheme	JICA and Beneficiaries	2014-2015	0.58	<p>This scheme is located in Meru County. The scope of works is the construction of headworks and a conveyance pipeline. The target area is 90 ha to grow vegetables.</p> <p>Typology: Small Scale Irrigation development</p>
30	Olopito community projec	JICA and Beneficiaries	2014-2015	0.87	<p>The Project is located in Narok County and the scope of work is the construction of intake works and a conveyance system. Irrigation area is 77 ha to grow vegetables.</p> <p>Typology: Small Scale Irrigation development</p>
31	Murachaki scheme	JICA and Beneficiaries	2014-2015	0.05	<p>The Project is located in Embu County and the scope of works is construction of intake works and conveyance system. Area to be irrigated is 172 ha.</p> <p>Typology: Small Scale Irrigation development</p>
32	Kaben Irrigation Project	JICA and Beneficiaries	2014-2015	0.12	<p>The Project is located in Elgeyo Marakwet County and the scope of works is the construction of intake works and a conveyance system. Irrigated area is 372 ha.</p> <p>Typology: Small Scale Irrigation development</p>

33	Muungano Irrigation Project	JICA and Beneficiaries	2014-2015	0.09	The Project is located in Tharaka Niithi County and the scope of works is construction of intake works and conveyance system. Irrigated area is 167 ha. <i>Typology: Small Scale Irrigation development</i>
34	Gatitu irrigation Project	JICA and Beneficiaries	2014-2015	0.17	The Project is located in Laikipia County and it includes the construction of intake works and a conveyance system. Irrigated area is 57 ha <i>Typology: Small Scale Irrigation development</i>
35	Mudachi Irrigation Project	JICA and Beneficiaries	2014-2015	0.15	The Project is located in Kilifi County and it includes the construction of intake works and a conveyance system. Irrigated area is 30 ha. <i>Typology: Small Scale Irrigation development</i>
36	Support to small scale irrigation schemes and farmer groups	Mandera County Government	2013-2014	0.81	This project is located in Mandera County. Under the project 94 (1 piston) and 6 (3 piston) will be purchased and installed in small schemes. Canals will be lined in this schemes managed by farmer groups so that they can increase area under irrigation. The target area is 354 ha to grow a variety of crops including maize, beans and vegetables. <i>Typology: Small Scale Irrigation development (50%), Rehabilitation and Modernization of Irrigation Scheme (50%)</i>
37	(IFSAP) Improved Food Security in the Asal Project -Hareri Irrigation Scheme	Government of Kenya	2013-2014	0.41	This project is located in Mandera County. The scope of works is to install sprinkler systems in 6 small scale irrigation schemes. The target area is 40 ha to grow maize beans and pawpaws. <i>Typology: Rehabilitation and Modernization of Irrigation Scheme</i>
38	National Water harvesting and Storage programme	Government of Kenya	2014-2014	85.06	The project is undertaken in several arid and semi-arid counties. Its scope is to construct 743 small dams and pans for both domestic, livestock and irrigation purposes. <i>Typology: Large Scale Irrigation development</i>
39	Rehabilitation of Perkerra Weir Project	Government of Kenya	2013-2014	0.36	The Project is located in Baringo County. It includes the construction of a concrete weir and intake works for the Perkerra Irrigation Scheme. The target area is 400 ha to grow maize. <i>Typology: Rehabilitation and Modernization of Irrigation Scheme</i>
40	Katilu Irrigation Expansion and rehabilitation	Government of Kenya	2013-2014	3.49	The project is located in Turkana County. The scope of work under this project involves construction of new intake works, canal and road networks and a drainage system to supply water to expanded area. Target area is 400 ha to grow maize.

	project				Typology: Small Scale Irrigation development (50%), Rehabilitation and Modernization of Irrigation Scheme (50%)
41	Chebara Irrigation Project Phase 2	Government of Kenya	2014-2014	0.48	The project is located in Bomet County to lay pipelines for a gravity irrigation system. The target area is 400 ha to grow vegetables. Typology: Small Scale Irrigation development
42	Kamoskoi Irrigation Project Phase II	Government of Kenya	2014-2014	0.60	The project is located in Baringo County. The objective is to construct conveyance, hydraulic and offtake structures for irrigating 120 ha. The crops to be grown are maize and beans. Typology: Small Scale Irrigation development
43	Molo Sirwe 1 Irrigation Project Phase 1	Government of Kenya	2014-2014	0.42	This is a new project in Baringo County. It includes water intake works and a pipeline conveyance system to enable 120 ha to be irrigated to grow maize beans and vegetables. Typology: Small Scale Irrigation development
44	Turkwel Project	Government of Kenya	2013-2014	0.82	The project is located in Turkana County. The scope of work is the construction of a conveyance system and hydraulic structures to irrigate 160 ha of maize, sorghum and vegetables. Typology: Small Scale Irrigation development
45	Nadoto Irrigation Project	Government of Kenya	2013-2014	0.93	The project is located in Turkana County and the scope of work is the construction of a conveyance system and hydraulic structures to irrigate 200 ha of maize, sorghum and vegetables. Typology: Small Scale Irrigation development
46	Naoros Irrigation Project	Government of Kenya	2013-2014	0.86	The project is located in Turkana County and the scope of work is the excavation and lining of the main and secondary canals, construction of hydraulic structures, drains and fencing to irrigate 160 ha. The main crops grown are maize, sorghum and vegetables. Typology: Small Scale Irrigation development
47	Kalemunyang Irrigation Project Phase 2	Government of Kenya	2014-2015	0.50	The project is located in Turkana County and the scope of work is the construction of new intake works (for expanded irrigation area), the rehabilitation and lining of canals and setting river bank protection. The area to be irrigated is 160 ha to grow maize sorghum and vegetables.

					Typology: Small Scale Irrigation development (50%), Rehabilitation and Modernization of Irrigation Scheme (50%)
48	Morlem Irrigation Project Phase 2	Government of Kenya	2014-2015	0.54	This project is located in Turkana County and the scope of work is excavation and lining of main and secondary canals, hydraulic structures, drains and fencing to enable irrigation of 200 ha. The crops to be grown are maize sorghum and beans. Typology: Small Scale Irrigation development
49	Naremit Irrigation Project Phase 1	Government of Kenya	2014-2015	0.55	This project is located in Turkana County and the scope of work is bush clearing, construction of intake works, excavation and lining of main and secondary canals, hydraulic structures, drains and fencing to enable irrigation of 200ha. The crops to be grown are maize sorghum and beans. Typology: Small Scale Irrigation development
50	Flood Control for Loborot and Nakamane Irrigation Schemes	Government of Kenya	2014-2015	0.56	The project is located in Turkana County and the scope of work gully control, intake works protection, main canal excavation. Typology: Rehabilitation and Modernization of Irrigation Scheme (50%), Others; Flood control works (50%)
51	Ihindu Irrigation Project Phase 3	Government of Kenya	2014-2015	0.91	The Project in Nakuru County involves drilling of a borehole, laying of pipeline and open drip kits and auxiliary structures. The area to be irrigated is 22ha to grow vegetables. Typology: Small Scale Irrigation development
52	Isinet Irrigation Project Phase 2	Government of Kenya	2014-2015	0.41	The Project in Kajiado County is to excavate canals and construct auxiliary structures for irrigating 100ha to grow maize, beans and horticultural crops. Typology: Small Scale Irrigation development
53	Chepkosom Irrigation Project Phase 3	Government of Kenya	2014-2015	0.19	This project is in Uasin Gishu County and has a scope of bush clearing, laying out of conveyance and infield irrigation system for irrigating 30ha of Maize, beans and vegetables. Typology: Small Scale Irrigation development

54	Chesang'atat-Marich Irrigation Project Phase 1	Government of Kenya	2014-2015	0.61	The project is located in West Pokot County and scope of works is construction of intake works and conveyance system for irrigating Maize, beans and vegetables on 440 ha scheme. Typology: Small Scale Irrigation development
55	Soin Irrigation Project Phase 1	Government of Kenya	2014-2015	0.37	Soin Irrigation is located in Kericho County and in this phase the intake works and pipeline conveyance system will be constructed. The target irrigation area is 120ha to grow maize, beans and vegetables. Typology: Small Scale Irrigation development
56	Meteitei Irrigation Project.	Government of Kenya	2014-2015	1.55	Meteitei is small scale project located in Nandi County. The project involves construction of intake works, pipeline conveyance and infield system. The area is 200ha to grow maize beans and vegetables. Typology: Small Scale Irrigation development
57	Tunyo-Chemworor Irrigation Project	Government of Kenya	2014-2014	0.51	The Project is located in Elgeyo Marakwet County and the scope of work is construction of intake works and pipeline conveyance. The irrigation area is 240ha to grow maize, beans and vegetables. Typology: Small Scale Irrigation development
58	Rahole Irrigation Project Phase 1 and 2	Government of Kenya	2013-2014	5.16	This is a new irrigation project in Garissa County. The scope of works is construction of intake works, canal, road and river crossing bush clearing, initial land preparation and capacity building. The target irrigation area is 200ha to grow tomatoes, bananas and mangoes. Typology: Small Scale Irrigation development
59	Sangailu green water pan and greenhouse project	Government of Kenya	2014-2014	0.70	This project is located in Garissa County and the scope is construction of a water pan and installation of 8ha greenhouse to grow tomatoes and onions. Typology: Small Scale Irrigation development
60	Usueni Irrigation Project Phase 1	Government of Kenya	2012-2014	1.23	The Project is located in Kitui County with a scope of construction of canal, fence, a pump house, and bush clearing of 200ha to grow maize and green grams. Typology: Small Scale Irrigation development
61	Kondo Irrigation Project	Government of Kenya	2013-2014	0.27	The project is located in Kitui County and the scope of work is excavation, laying of irrigation pipeline and backfilling. The target area is 20ha to grow maize, beans and vegetable. Typology: Small Scale Irrigation development

62	Mwache Irrigation Project	Government of Kenya	2013-2014	0.19	The Project is located in Kwale County, the work is construction of intake, storage tanks and laying of pipeline. The irrigation area is 40ha to grow vegetables. Typology: Small Scale Irrigation development
63	Mabesheni Irrigation Project	Government of Kenya	2013-2014	1.05	Mabesheni irrigation project is located in Kwale County and the scope of works is construction of water harvesting pan. The target scheme are is 40ha to grow vegetables. Typology: Small Scale Irrigation development
64	Wajir South Cluster 2 Project	Government of Kenya	2013-2014	0.40	The projects are located in Wajir County and scope of works is drilling of two borehole to provide irrigation water to 8ha to grow maize, beans and bananas. Typology: Small Scale Irrigation development
65	Wajir South Cluster 3 Project	Government of Kenya	2013-2014	0.96	The projects are located in Wajir County and involve drilling of one borehole, one pan, a submersible pump, a generator, two 10 m ³ plastic tanks and green houses to provide irrigation water to 8ha. The crops to be grown are maize, vegetable and bananas Typology: Small Scale Irrigation development
66	Wajir West Clusster project	Government of Kenya	2014-2015	0.43	The projects are located in Wajir County. The scope of works is drilling of two borehole, purchase and installation of 2 submersible pump, 2 generator, 2 pump houses, two 10 m ³ plastic tanks and green houses to provide irrigation water to 8ha to grow maize vegetables, tomatoes, vegetables and green grams. Typology: Small Scale Irrigation development
67	Riamukurwe Irrigation Project Phase 3	Government of Kenya	2014-2015	0.68	The project is located in Nyeri County and this phase involves constructions of mainline for sprinkler system and two river crossing works. The target area is 400ha to grow beans. Typology: Small Scale Irrigation development
68	Kirungi Irrigation Project	Government of Kenya	2014-2015	0.32	This project is located in Nyeri County and the scope of works is construction of mainline and distribution network for a sprinkler system. The irrigation area is 60ha to grow vegetables. Typology: Small Scale Irrigation development

69	KiiNjoga Irrigation Project Phase 1 & 2	Government of Kenya	2014-2015	1.11	<p>This project is located in Kirinyaga County and the scope of work for phase 1 is construction of intake works and pipeline conveyance works while phase 2 involves laying of mainline. The target area is 275ha to grow bananas.</p> <p><i>Typology: Small Scale Irrigation development</i></p>
70	Kamuka Irrigation Project Phase 3	Government of Kenya	2014-2015	0.26	<p>The project is located in Kiambu County and the scope of work is laying of pipeline bench terrace to stabilize the pipeline network after landslide destroyed the mainline for the first six kilometers. The target irrigation area is 120ha to grow vegetables.</p> <p><i>Typology: Small Scale Irrigation development (50%), Rehabilitation and Modernization of Irrigation Scheme (50%)</i></p>
71	Nyanjigi Irrigation Project Phase 1 & 2	Government of Kenya	2013-2015	1.92	<p>The project is located in Muranga County and the scope of phase 1 was construction of intake work and conveyance pipeline. Phase 2 was meant to rehabilitate the same intake work after landslide destroyed the river diversion works. The target irrigation area is 200ha to grow vegetables.</p> <p><i>Typology: Small Scale Irrigation development (50%), Rehabilitation and Modernization of Irrigation Scheme (50%)</i></p>
72	Mirichu Murika Irrigation Project Phase 3	Government of Kenya	2014-2015	0.91	<p>The project is located in Muranga County and the scope of this phase is construction of pipeline conveyance system and road crossing for a sprinkler system. The irrigation area is 400ha to grow beans.</p> <p><i>Typology: Small Scale Irrigation development</i></p>
73	Kwa Majee Irrigation Project phase 2	Government of Kenya	2014-2014	0.35	<p>The project is in Makueni County and the scope of work is increasing the capacity of the existing dam, provision of green houses and electricity. The new irrigation area is 12ha to grow vegetables.</p> <p><i>Typology: Rehabilitation and Modernization of Irrigation Scheme</i></p>
74	Mukuku Irrigation Project	Government of Kenya	2013-2014	0.26	<p>This project is located in Makueni County and the scope of works is construction of intake works, main and sub main pipeline for open drip and sprinkler system. The target area is 18ha to grow vegetables.</p> <p><i>Typology: Small Scale Irrigation development</i></p>
75	Malkadalka Irrigation Phase 2	Government of Kenya	2014-2015	0.34	<p>The Project is located in Isiolo County and the scope of works is construction of conveyance main canal and 8 laterals, bush clearing levelling and access roads for 40ha to grow maize.</p> <p><i>Typology: Small Scale Irrigation development</i></p>

76	Oldonyiro Irrigation Project	Government of Kenya	2014-2014	1.06	The Project is located in Isiolo County and the scope of works is construction of intake works, sedimentation tanks, main canal and receptor basins. The target irrigation area is 64ha to grow maize, beans and vegetables. <i>Typology: Small Scale Irrigation development</i>
77	Kunati Irrigation Phase 2	Government of Kenya	2014-2015	0.67	The Project is located in Meru County and involves the extension of mainline pipeline, construction of break pressure tanks, lateral and infield system. The target irrigation area is 112ha to grow maize. <i>Typology: Small Scale Irrigation development</i>
78	Rwathu Karethani Irrigation Project	Government of Kenya	2013-2014	0.65	The project is located in Tharaka Nithi County and the scope of works is construction of intake works, sedimentation tanks, main, lateral and infield lines and office. The irrigation area is 86ha to grow pawpaw, bananas and tomatoes. <i>Typology: Small Scale Irrigation development</i>
79	Lehele Irrigation Scheme	Government of Kenya	2014-2015	1.43	The Project is located in Mandera County and the scope of works involves excavation of water pan, construction of silt trap, water abstraction wells and installation of green houses. Total irrigation area is 8ha to grow vegetables. <i>Typology: Small Scale Irrigation development</i>
80	Iraru Small Scale Hydropower	Meru S.Scale Tea Farmers-under Kenya Tea Development Authority	2014-2016	7.14	This is 1.5 MW hydropower project to supply power to tea factories in Meru Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
81	Kibwezi Clusters Irrigation Project	Government of Kenya	2014-2015	4.0	This project is located in Makueni County. The scope of work is construction of intake, conveyance, lateral and drip lines for 160ha. <i>Typology: Small Scale Irrigation development</i>

Table 1.2. PIPELINE PROJECTS

#	Project title	Funding Partners	Time Scale	Cost (million US\$)	Description
1	Kipsonoi Small Scale Hydropower	Kericho S.Scale Tea Farmers- under Kenya Tea Development Authority	2015-2017	16.79	This is a 3.6 MW hydropower project to supply power to tea factories in Kericho Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
2	Nyambude Small Scale Hydropower	Kisii S.Scale Tea Farmers- under Kenya Tea Development Authority	2015-2017	7.85	This is a 1.8 MW hydropower project to supply power to tea factories in Kisii Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
3	Kiringa Small Scale Hydropower	Kirinyaga S.Scale Tea Farmers- under Kenya Tea Development Authority	2015-2017	3.82	A 1.2 MW hydropower project to supply power to tea factories in Kirinyaga Tea zone owned by Kenya Tea Development Authority <i>Typology: Small Scale Hydropower development (80%), Others: transmission (20%)</i>
4	Mwea Irrigation Development Project	Government of Kenya, Japan International Cooperation Agency (JICA)	2016-2017	111.27	This project is located in Kirinyaga County. The scope of works is construction of a reservoir and conveyance canals, rehabilitation of existing canals to irrigated 8 000ha which is an expansion of the current Mwea Irrigation scheme. The main crop is rice <i>Typology: Large Scale Irrigation Development</i>
5	Kieni Irrigation Project	Government of Kenya , Arab Bank(BADEA)	2015-2018	28.91	This project is in Nyeri county. The scope of works is construction of six reservoirs and develop infrastructure for 3 500ha irrigation scheme <i>Typology: Large Scale Irrigation Development</i>
6	Thwake water and Sanitation project	African Development Bank (AfDB)	2015-2018	270.04	The project is located in Kitui and Makueni counties. The scope of works is construction of reservoir for, rural water supply and sanitation, irrigation canal and of take facilities from the dam and provision of power generation capability on the dam. <i>Typology: Large Scale Irrigation Development (10%) and Others: water supply (90%)</i>

7	Low Nzoia Irrigation Project	Government of Kenya World Bank (IDA), KfW	2015-2018	54.50	The project is located in Busia and Siaya counties. The scope of work is development of infrastructure for 4043ha. The main crops to be grown are rice, vegetables and fruits Typology: Large scale irrigation development
8	Chemase Ward Irrigation Project	Government of Kenya	2015-2018	1.11	This project located in Nandi county. The scope of works is develop a sprinkler system for irrigating 600ha of sugarcane Typology: Large scale irrigation development
9	Karura Hydropower Project	KENGEN, Government of Kenya, Donors	2015-2016	333.00	This is a 90MW hydropower project to be developed by the Government Typology: Large Scale hydropower development
10	Development and rehabilitation of Water harvesting and irrigation infrastructure	Government of Kenya, Public Private Partnership	2015-2018	1783.74	The programme's objective is to Increase production in ASAL by increasing area under irrigation; Water harvesting & storage dams. No target irrigation area or number of dams has been given Typology: Small scale irrigation development (20%), Rehabilitation and Modernization of Irrigation Scheme (20%), Large scale irrigation development (20%) and others: Water supply (40%)
11	Increased food security project	Government of Kenya, Public Private Partnership, Donors	2015-2018	2837.88	The objective is reclaim land for irrigation and construct Water harvesting and storage dams. No target irrigation area has been given Small scale irrigation development (30%) and Large scale irrigation development (30%) others: policy & legal reforms (40%)
12	Mwachi Multipurpose Project	Public-Private -Partnership investor (not yet identified)	2015-2018	94.00	The Project is located in Kwale County. The scope of works is construction of a reservoir, and irrigation area of 5 050ha Typology: Large scale irrigation development (30%), and others: Water supply (70%)
13	Turkwell Downstream Irrigation Project	Public-Private -Partnership investor (not yet identified)	2015-2018	111.19	The project is locates in West Pokot and Turkana counties. It entails development of 3 215ha under irrigation Typology: Large Scale Irrigation development
14	Aror Dam Multi-purpose Project	Public-Private -Partnership investor (not yet identified)	2015-2018	262.89	This is a multipurpose project located in Elgeyo Marakwet Count. The scope of works is construction of a reservoir, 80MW hydropower and 5 000ha irrigation Typology: Large scale irrigation development (50%) and Large Scale hydropower development (50%)

15	Munyu Multipurpose Dam and great Kibwezi Irrigation Scheme	Public-Private -Partnership investor (not yet identified)	2015-2018	9.56	The project is located in Kiambu and Makueni Counties and planned to be implemented under the Public-Private Partnership programme. The scope is construction of a 625MCM Munyu reservoir, 40MW hydropower and 13 000ha irrigation scheme in Makueni county Typology: Large scale irrigation development (50%) and Large Scale hydropower development (50%)
16	Tana Delta Irrigation Sugar Project	Public-Private -Partnership investor (not yet identified)	2015-2018	381.00	This Public-Private -Partnership Project located in Tana River County with a scope of constructing a sugar factory and development of irrigation area of 20 000ha to grow sugar cane Typology: Large scale irrigation development
17	Tana Delta Irrigation Project	Public-Private -Partnership investor (not yet identified)	2015-2018	25.57	A Public-Private -Partnership Project located in Tana River County with a scope of expanding the current irrigation area of 1 700ha to 5 000 to grow rice Typology: Large scale irrigation development
18	Nandi Forest Multipurpose Dam Project	Public-Private -Partnership investor (not yet identified)	2015-2018	57.12	The project is located in Vihiga, Kisumu and Nandi Counties and has a scope of construction of Nandi dam, 50MW HP and development of 7 000ha for irrigation Typology: Large scale irrigation development (40%) and Large Scale hydropower development (40%) Others: Water Supply (20%)
19	Magwagwa Multipurpose Dam Project	Public-Private -Partnership investor (not yet identified)	2015-2018	540.30	The Project involves construction of a dam, HP and development of 15 000ha irrigation area Typology: Large scale irrigation development (40%) and Large Scale hydropower development (60%)
20	Rachuonyo Clusters Irrigation Project	Not yet identified	2015-2018	24.13	This project is located in Homabay county. The scope of work is construction of intake works, sedimentation basin, conveyance, mainline, tertiary and infield system to irrigate 400ha Typology: Small scale irrigation development
21	Perkerra Irrigation Schemes	Not yet identified	2015-2018	13.12	The Project is located in Baringo County. The scope is to developing infrastructure to expand the current scheme by 2 000ha. Target crop is maize Typology: Large scale irrigation development
22	Maji Moto Irrigation Scheme	Not yet identified	2015-2018	0.47	The Project is located in Baringo county. The scope of work is to develop infrastructure for irrigating 120ha. Target crop not given Typology: Small scale irrigation development

23	Kisaluni Irrigation Scheme	Not yet identified	2015-2018	9.73	This Project is located in Bungoma County. It involves developing infrastructure for 1 000ha. Target crop information is not given <i>Typology: Large scale irrigation development</i>
24	Suba Clusters Irrigation Schemes	Not yet identified	2015-2018	27.80	The Project is located in Homa Bay county. The scope of works is construction of facilities to irrigate small scale irrigation projects with a total area of 2 100ha. Target crop information is not given <i>Typology: Small scale irrigation development</i>
25	Bondo Clusters Irrigation Schemes	Not yet identified	2015-2018	97.88	The Bondo Cluster Irrigation Development Project is located in Siaya County. The project consists of four schemes. The scope of works includes construction of abstraction, conveyance and regulation facilities. Target irrigation area is 5678ha, crop information is not given <i>Typology: Large scale irrigation development</i>
26	Bulesa Irrigation Scheme	Not yet identified	2015-2018	0.39	The Project is located in Isiolo county. The scope of works involves construction of irrigation facilities for 40ha irrigation area. Information on crops to be grown is not given <i>Typology: Small scale irrigation development</i>
27	Makiche Irrigation Scheme	Not yet identified	2015-2018	0.44	The project is located in Kericho County. The scope of works involves construction of irrigation facilities for 40ha irrigation area. Information on crops to be grown is not given <i>Typology: Small scale irrigation development</i>
28	Rwabura and Thiririka Dam Project	Not yet identified	2015-2018	13.34	The project is located in Kiambu county. The scope of works involves construction of irrigation facilities for 2 000ha irrigation area. Information on crops to be grown is not given <i>Typology: Large scale irrigation development</i>
29	Kisumu Cluster Irrigation Porject	Not yet identified	2015-2018	51.87	This project is located in Kisumu County in the areas bordering Lake Victoria, the project is composed of 15 schemes with a total area of 3 738ha. The Scope of works include construction of headworks, weirs, and conveyance and regulation facilities <i>Typology: Large scale irrigation development (40%), Small scale irrigation development (60%)</i>

30	Expansion of Ahero and West Kano Irrigation scheme	Not yet identified	2015-2019	33.16	The two schemes are located in Kisumu county. The scope of work is development of gravity abstraction system and expansion of the scheme. Target area is 5 120ha to grow rice Typology: Rehabilitation and Modernization of Irrigation Scheme (40%) and Large scale irrigation development (60%)
31	Wikithuki Usueni Irrigation Project	Not yet identified	2016-2019	23.55	The Project is located in Kitui County. The scope of works is to develop infrastructure to irrigate 4 000ha irrigation scheme. Information on crops to be grown is not available Typology: Large scale irrigation development
32	Kiziki Nzukini Irrigation Project	Not yet identified	2016-2019	3.89	This project is located in Machakos County. The scope of works is to develop infrastructure to irrigate 400ha irrigation scheme. Information on crops to be grown is not available Typology: Small scale irrigation development
33	Kithatani Irrigation Project	Not yet identified	2015-2017	19.08	This project is located in Machakos County. The scope of works is to develop infrastructure to irrigate 2 000ha irrigation scheme. Information on crops to be grown is not available Typology: Large scale irrigation development
34	Kanyata Irrigation Scheme	Not yet identified	2016-2019	12.89	This project is located in Machakos County. The scope of works is to develop infrastructure to irrigate 2 000ha irrigation scheme. Information on crops to be grown is not available Typology: Large scale irrigation development
35	Kvunyalalo Irrigation Scheme	Not yet identified	2016-2019	64.97	The Proposed Kavunyalalo Irrigation Development project is situated in Kilifi County. The scope of works includes construction of a dam, headworks and conveyance facilities for 10 000ha of irrigation area. Information on crops to be grown is not available Typology: Large scale irrigation development
36	Badasa Cluster Songa Dam	Not yet identified	2016-2019	26.71	The Project is located in Marsabit County. The scope of works is to develop infrastructure to irrigate 400ha irrigation scheme. Information on crops to be grown is not available Typology: Small scale irrigation development
37	Kingirwa Irrigation	Not yet identified	2016-2018	0.55	The Project is Located in Meru County. The scope of works is to develop infrastructure to irrigate 50ha irrigation scheme. Information on crops to be

	Scheme				grown is not available Typology: Small scale irrigation development
38	Mwithanga Irrigation Scheme	Not yet identified	2016-2018	1.20	The Project is Located in Meru County. The scope of works is to develop infrastructure to irrigate 160ha irrigation scheme. Information on crops to be grown is not available Typology: Small scale irrigation development
39	Suba Clusters Irrigation Schemes	Not yet identified	2016-2018	5.89	The Project is Located in Migori County. The scope of works is to develop infrastructure to irrigate 800ha irrigation scheme. Information on crops to be grown is not available Typology: Large scale irrigation development
40	Lower Subukia Irrigation Project	Not yet identified	2016-2019	34.45	The project is located in Nakuru County with abstraction from along Subukia River. The Scope of works include construction of intake conveyance and regulation works for irrigating 1 000ha. Information on crops to be grown is not available Typology: Large scale irrigation development
41	Bondo Clusters Irrigation Schemes	Not yet identified	2016-2019	49.06	This Project is located in Siaya County. The scope of works is to develop infrastructure to irrigate 4 000ha irrigation scheme. Information on crops to be grown is not available Typology: Large scale irrigation development
42	Hola Irrigation Expansion Project	Not yet identified	2015-2019	48.26	The project is located in Tana River County. The project scope is expansion of current irrigation area by 3 500 ha to grow maize Typology: Large scale irrigation development
43	Small Holder Irrigation Project-Mt Kenya Phase 4	KfW - Germany	2016-2019	7.89	This project is located in Kirinyaga, Embu, Tharaka-Nithi and Meru Counties. This is the fourth phase of a KfW supported Mount Kenya Irrigation Project. It scope is development of small scale irrigation project of 80-120ha Typology: Small scale irrigation development
44	Galana and Kulalu Food Security Model farm Project	Governments of Kenya and Israel	2015-2015	155.67	The Project is located in Tana River and Kilifi Counties. Its scope is development of a net irrigation area of 9 000ha under drip irrigation to grow maize and vegetables Typology: Large scale irrigation development
45	Lumi Luta	Government OF Kenya	2015-2017	16.68	This is a new project in Taita Taveta County, Design has been completed and it is awaiting implementation. The target area is 1 500ha to grow vegetables,

	irrigation project				pawpaw and bananas <i>Typology: Large scale irrigation development</i>
46	Radat Dam Project	Not yet identified	2016-2018	162.74	The Scope of this project is construction of Radat reservoir located in Baringo County. The reservoir will ensure stable water supply to Perkerra irrigation for expanded area <i>Typology: Large scale irrigation development</i>
47	Raising of Masinga Dam Wall	Government of Kenya	2016-2018	15.27	This project entails raising the Masinga Dam Wall so as to store more water and therefore increase power production <i>Typology: Rehabilitation of dams and hydropower plants</i>
48	Mitunguu Irrigation Project	Government of Kenya	2015-2015	0.12	This project is located in Meru County. The scope of work is development of irrigation infrastructure (main conveyance, distribution and sprinkler system) for 10ha <i>Typology: Small scale irrigation development</i>

ANNEX 2. MAP OF KENYA



FAO - AQUASTAT, 2005

KENYA

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The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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