

1 USD billion Master Plan to Tap City's Water Woes

By Mbugua Njoroge

Persistent water woes in Nairobi will soon be a thing of the past, when 1 billion US Dollars-Nairobi Water Master Plan is implemented. The Master-plan, which was presented to stakeholders on August 30, 2011 at a Nairobi hotel, provides a 24 four years blueprint (2011-2035) and hopes to alleviate current water problems in the city and 14 satellite towns.

List of Satellite Towns

No.	Satellite Town	District
1	Kikuyu	Kikuyu
2	Ruiru-Juja	Ruiru and Thika West
3	Kiambu	Kiambu East
4	Karuri	Kiambu East (Kiambaa)
5	Githunguri	Githunguri
6	Mavoko Municipality (Athi River)	Machakos
7	Ngong Township	Kajiado North
8	Ongata Rongai	Kajiado North
9	Thika	Thika West
10	Gatundu	Gatundu
11	Limuru	Kiambu West
12	Lari (Uplands and Kimende)	Lari
13	Tala-Kangundo	Kangundo

Nairobi houses about 3 million people and hosts an additional 2 million who come in and out daily. It also generates almost 50 % of the nation's GDP.

The water supply problems therefore not only impact the health and welfare of the many million's of the city residents – rich and poor like - but also entail a huge cost on the nation's economic base, including its industrial base and service sectors.

Currently the city has a shortage of 200 thousand cubic meters of water and needs a minimum of 80 thousand cubic meters per day to meet the demand of its over three million residents.

The Master plan seeks to deliver over 750,000 m³ per day additional capacity of water supply to augment the current water supply that stands at about 410,000 cubic meters a day.

Yield of Existing Water Sources

Source	Yield (m³/d)	Yield (m³/s)	Remarks
Sasumua Reservoir	56,000	0.65	Existing
Chania River / Mwagu Intake	104,000	1.20	Existing
Ruiru Reservoir	21,000	0.24	Existing
Kikuyu Springs	4,000	0.05	Existing
Ndakaini Dam (Thika 6 +kiama + Kimakia)	225,000	2.60	Existing (70 Mm ³ Storage).
Total Available Yield	410,000m³/d	4.74m³/s	

The Water and Irrigation permanent Secretary Eng. David Stower said that the government and the stakeholders have been lagging behind in addressing the shortage but made assurances that the ministry has put in place corrective measures aimed at combating the crisis

“As you are aware, Kenya is classified by the UN as a chronically water scarce country. The current level of water resources is low at only 15%. ” Stower said.

He added that the Ministry of Water and Natural Resources has earmarked 25 large dams for completion by 2015, which will support irrigation projects and flood control devices. He added that the government has invested heavily in allocating resources towards the creation of water schemes.

Stower noted that the government is aware of the rising population and the corresponding demand for the availability of resources. He called on the private sector to chip in and assist in addressing the crisis.

The Permanent Secretary added that the situation is further complicated by rainfall variability and increasing pressure on land and water resources. According to a UN report, Kenya has less than 1,000 cubic meters of water per capita of renewable freshwater supplies.

“We have heard that Kenya’s endowment for water is very limited. Let me put this into perspective. Basically for every glass of water each Kenyan has, each Ugandan has 6 glasses and each Tanzanian

has 5 glasses. It simply means that while Kenya celebrates its amazing Sprinters and Marathon Runners (its fantastic endowment), water remains a limited endowment. Your neighbors can afford to throw and waste 4 to 5 glasses of water per person and still be at the same level as a Kenyan. This fact that water is a scarce resource cannot be changed. Kenya simply needs to learn to value and manage its water resources. It currently is not!," stated Dr. Rafik Hirji, World Bank Senior Water Resources specialist.

He added that even as Kenya houses the largest water aquifer in the Horn of Africa that lies in Daadab area, the country has the largest water deficit in the region. Hirji said the situation is complicated by the cyclic changes in climate that have seen recurrent droughts being experienced and compounded by continued reduced investment in water supplies and storage infrastructure.

Water Sources Available Options

The Chief Executive Officer of the Athi River Water Services (AWSB) Eng. Malaquien Milgo, said that the planning for Development of Future Water Resources for Nairobi and the Satellite Towns involves a comparison between known sources availability and projected water demands.

"Six (6) main Scenarios have been established based on potential sourced under context of meeting the water demand for Nairobi up to Year 2035. These Scenarios have been prepared in view to meet the water demand of Nairobi City without considering the surrounding areas for which other local water resources are considered," indicated Eng. Milgo.

The scenario are: Northern Collector Phase I with different sub-alternatives (whole collector from Maragua R. to Thika Reservoir, from Irati R. to Thika Reservoir only) Diversion from S. Mathioya to Maragua River to supplement Maragua Reservoir; Northern Collector Phase II either connected to Northern Collector I to supplement the supply to Thika reservoir or to Maragua 4 Reservoir; Ndarugu 1 Dam on Ndarugu River; and Diversion from Chania River to Komu River to supplement Ndarugu 1 Reservoir.

Proposed Potential New Water Sources

Source	Yield (m³/d)	Yield (m³/s)	Remarks
Proposed Groundwater Wellfields in Kiunyu & Ruiru	64,800	0.75	
Proposed Northern Collector – Phase I	138,240	1.6	Diversion and transfer from Irati, Gikigie and Maragua Rivers
Proposed Northern Collector – Phase II	151,200	1.75	Diversion and transfer from South Mathioya, Hembe, Githugi & North Mathioya Rivers
Proposed Maragua 4 Reservoir	45,792	0.53	the yield of Maragua Dam is dependent on cross basin transfer and varies for different Scenarios

Proposed Ndarugu 1 Reservoir	397,440	4.60	With Chania - Komu River Transfer, (300 Mm ³ Storage).
Total Potential Yield	797,472 m³/d	9.23m³/s	

There is also a plan to exploit two well fields in Kiunyu in Gatanga and Ruiru with potential yields of 34,560m³/day and 30,240m³ respectively.

Eng. Malaquen Milgo AWSB Chief Executive Officer disclosed that the Board in partnership with the World Bank and the French Development Agency undertook a feasibility study and called upon the two financiers and other donors to consider funding implementation of the masterplan.

At this stage, I can confirm that AFD will study the feasibility of financing part of the future system, probably part of downstream infrastructure of Phase 2 of the Northern Collector.

In a positive note Mr. Olivier Delefosse, AFD Acting Regional Director confirmed that AFD will study the feasibility of financing part of the future system, probably part of downstream infrastructure of Phase 2 of the Northern Collector.

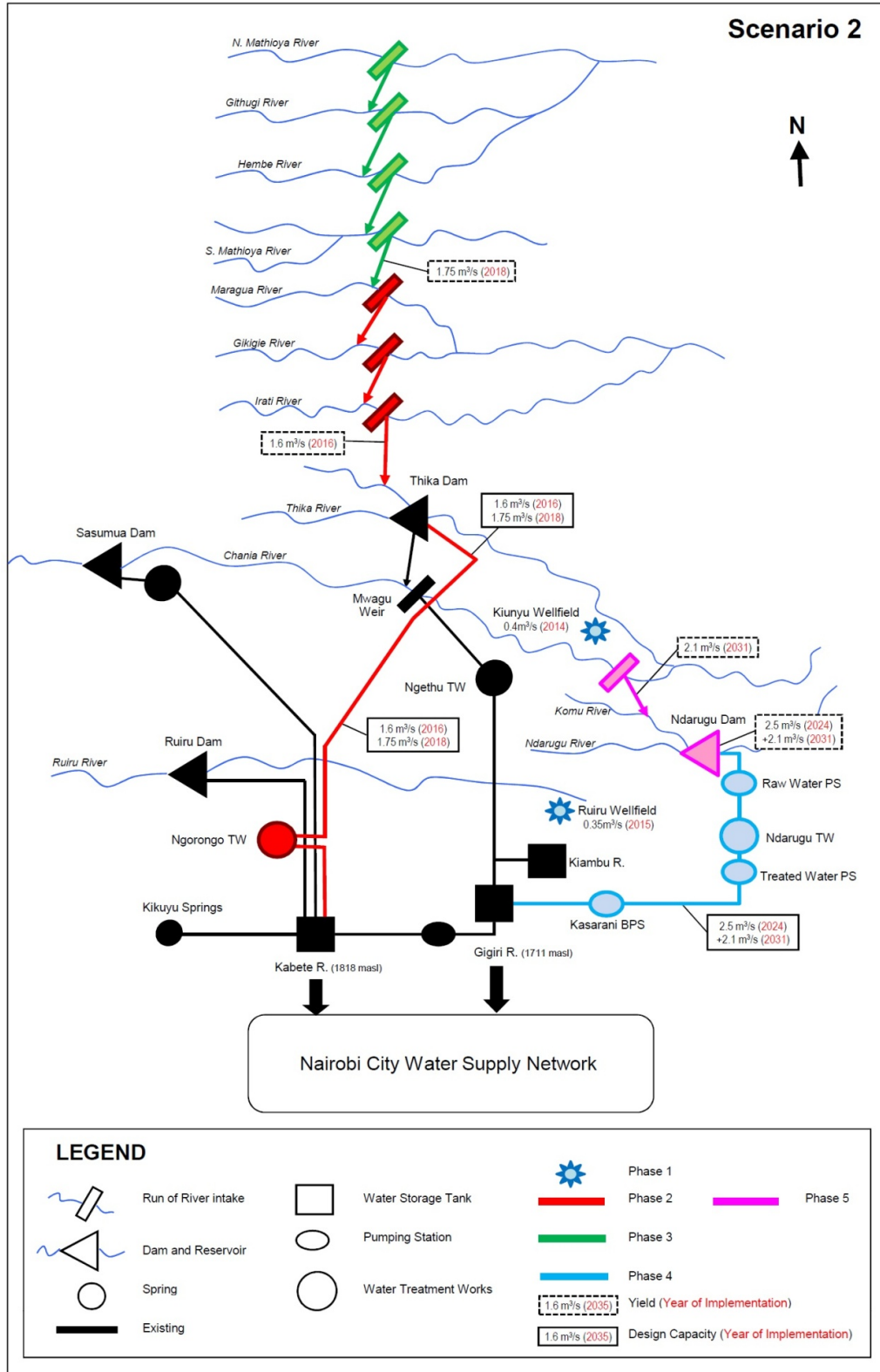
Athi Water Services board chairman Hon. Reuben Ndolo said that the Water Master Plan project is vital and its value will be measured by the changes it will bring to the millions of water consumers in Nairobi.

“Its impact will be felt in the informal settlement of Nairobi’s metropolitan region, and rural areas within Nairobi.” Ndolo said.

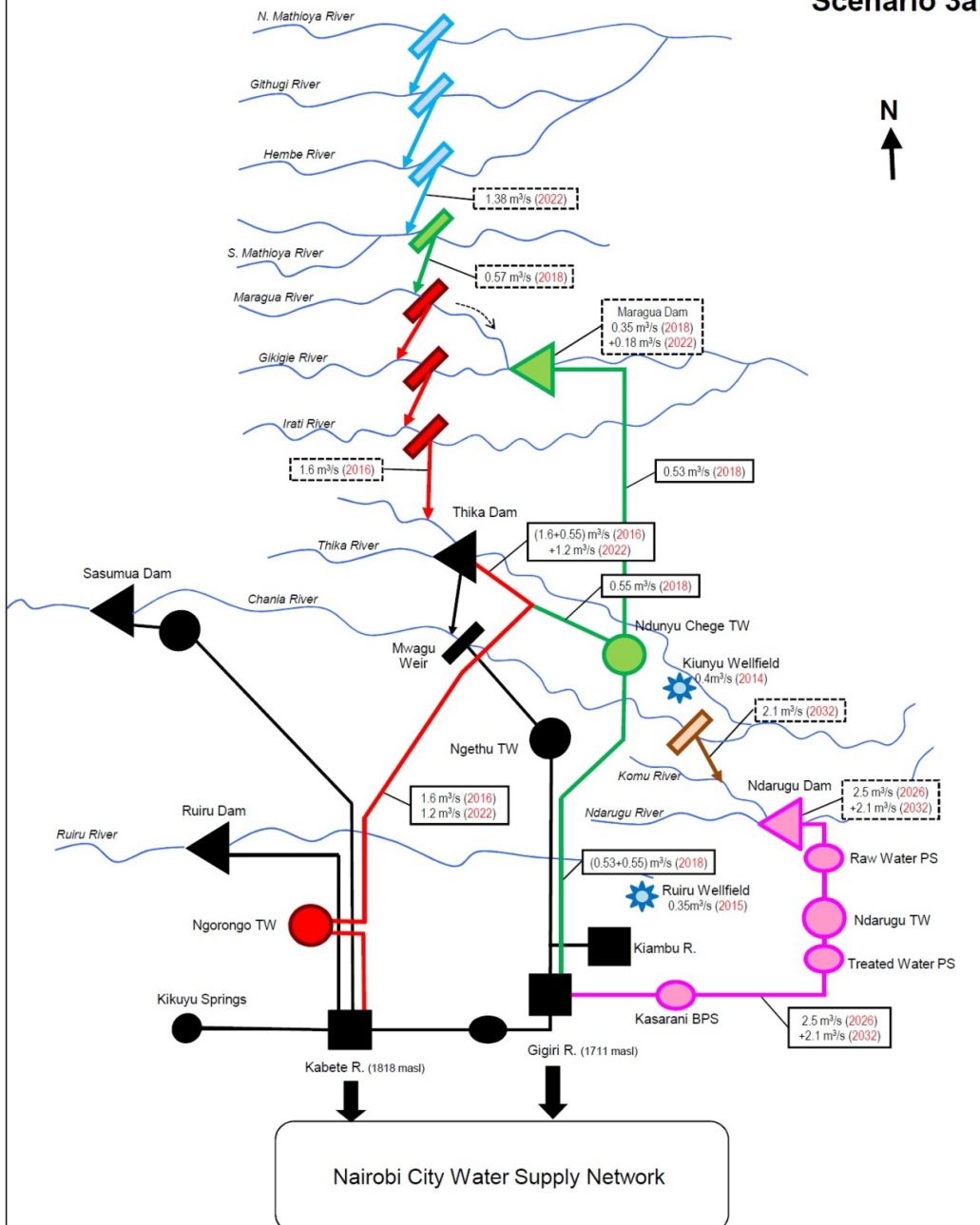
He also said that this will go on to feed the local economy through the skills and labor by those who will be involved in the construction work. He stated that the project will open up areas which have not been served with basic infrastructure such as roads, water and electricity adding that the aspirations of Vision 2030 such as economic growth, accessibility to basic human needs like education, health, water and sanitation are the conditions of joint endeavors to bring development and prosperity.

(The writer is Athi Water Services Board’s Corporate Communications Manager)

ILLUSTRATIONS FOR USE



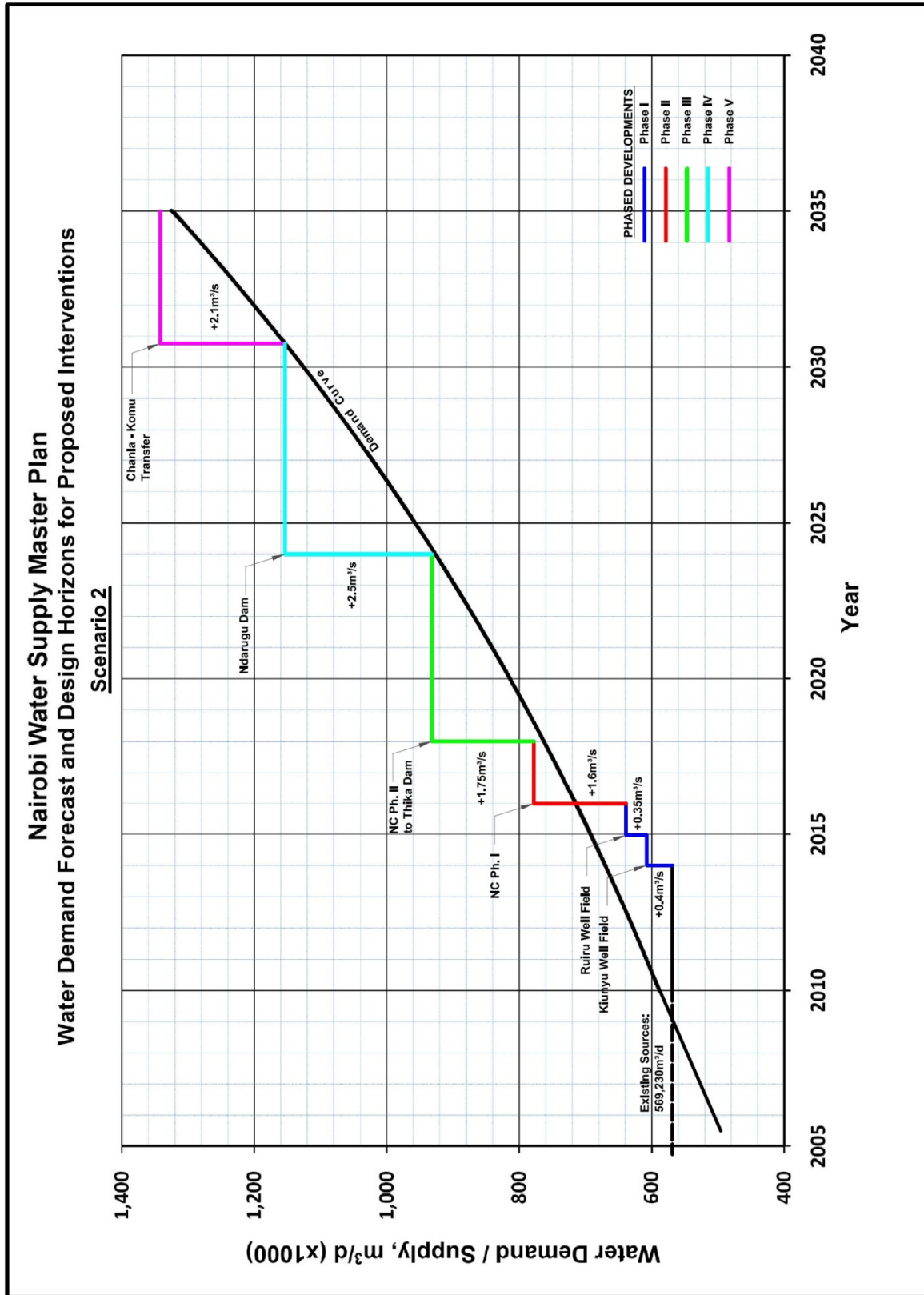
Scenario 3a



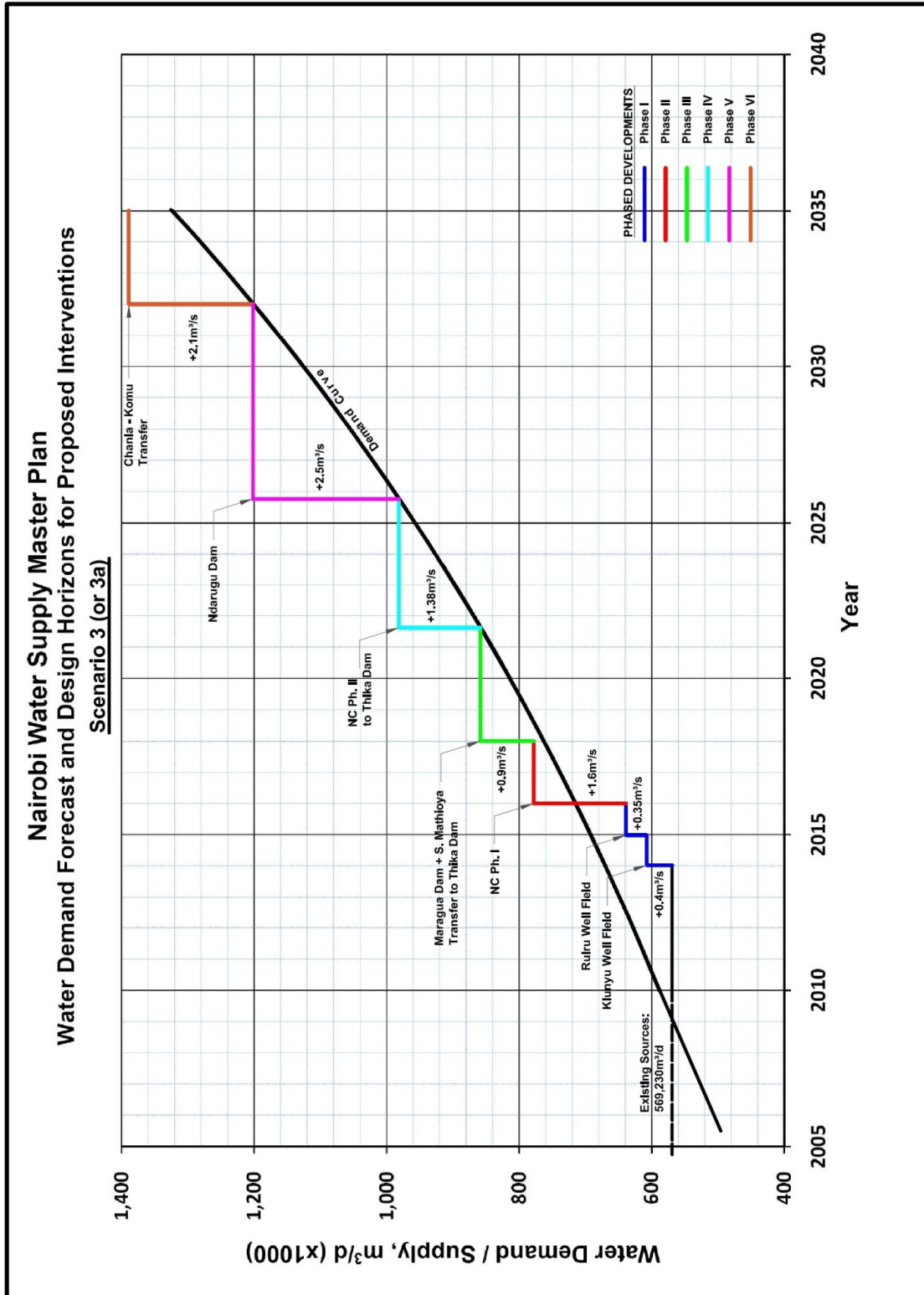
LEGEND

	Run of River intake		Water Storage Tank		Phase 1		Phase 5
	Dam and Reservoir		Pumping Station		Phase 2		Phase 6
	Spring		Water Treatment Works		Phase 3		
	Existing				Phase 4		
					Yield (Year of Implementation)		
					Design Capacity (Year of Implementation)		

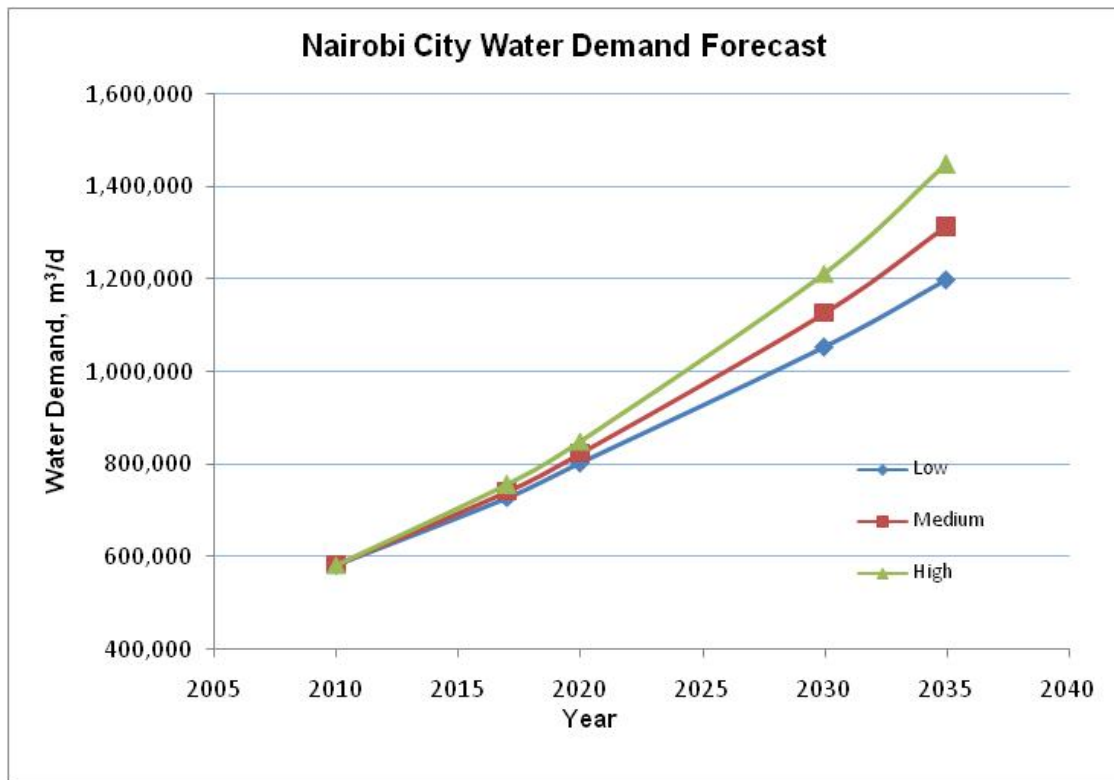
Scenario 2 - Water Demand and Implementation Schedule of Planned Interventions



Scenario 3a Water Demand and Implementation Schedule of Planned Interventions -



**Water Demand for High, Medium and Low Population Projections Scenarios –
Nairobi City**



Water Demand Forecast – Nairobi City

Population Projections						
Year		2010	2017	2020	2030	2035
Low scenario	Population	3,250,338	4,035,762	4,398,910	5,687,515	6,438,453
	Growth Rate	3.6%	3.1%	2.9%	2.6%	2.5%
Medium scenario	Population	3,257,615	4,107,466	4,517,800	6,086,401	7,063,903
	Growth Rate	3.8%	3.4%	3.2%	3.0%	3.0%
High scenario	Population	3,260,647	4,193,984	4,666,816	6,555,578	7,783,445
	Growth Rate	3.9%	3.7%	3.6%	3.5%	3.5%
Income Distribution						
Low Income - 44%		Medium Income - 50%			High Income - 6%	
Population Served by Public Water Service Provider (Individual Connections)						
Year		2010	2017	2020	2030	2035
Percentage as I.Cs		65%	68%	72%	78%	80%
Water Demand Forecast, m³/d						
Year		2010	2017	2020	2030	2035
Low scenario		581,912	728,293	802,206	1,053,452	1,198,674
Medium scenario		582,928	740,870	823,488	1,126,797	1,314,493
High scenario		583,351	756,322	850,479	1,213,417	1,448,104

Year 2009 Nairobi City Census Population - 3,138,369