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Sep 09 2013

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## Ethiopia's Nile dam project leaves Egypt with headache

By Syed Hussain



Photo Credit:Reuters/Stringer .

### **Egypt's new stimulus package highlights a major issue facing the country: rising need for water and power infrastructure in the country.**

The USD 3.2 billion program included sorely-needed investments in 131 potable water and sewage treatment plants, as the arid country looks to address its water scarcity issue on top of all the other economic trouble it faces.

While Egypt's electricity infrastructure is better than most other African nations, the country's power needs are expected to rise 6% till the end of the decade due to demographic pressures. In addition, agriculture produce demands a steady flow of water to ensure that the country's large food import bill is reined in.

But the rising demand for food and water may not be met due to a whole host of factors, including lack of resources and developments along the river Nile that could have dire consequences for the country.

"Egypt remains politically and economically unsettled and this is likely to affect the water sector in various ways - on the one hand funds are limited, however on the other there is a great deal of public pressure on the government to ensure the provision of basic affordable amenities like drinking water," said BMI in its recent report on the country's water needs.

"Further pressures stem from the continuing international debate over Ethiopia's dam project which would threaten Egypt's Nile resources. BMI is confident that the short-term future of the water market remains secure and lucrative - yet the long-term future of the nation remains precarious, and increasingly dependent on fickle foreign investment and resources."

EGYPT MACROECONOMIC DATA								
	2010	2011	2012	2013F	2014F	2015F	2016F	2017F
Population (m)	81.1	82.5	84.1	85.6	87.2	88.7	90.2	95.5
GDP (USD at market exchange rates)	214	231	255	252	296	357	446	651
GDP (USD billion at PPP)	499b	519b	540	567	615	670	733	1,012
GDP per head (USD at PPP)	6,154b	6,287b	6,418	6,625	7,055	7,547	8,120	10,600
Personal disposable income (USD billion)	169b	184b	211	213	241	278	338	–
Household consumption (USD billion)	160	175	202	203	230	267	323	463
Household consumption per head (USD)	1,970	2,110	2,400	2,370	2,640	3,010	3,580	4,850
Exports of goods and services (% change)	-3	1.2	-2.3a	7.6	12.5	14.9	13.5	9.1
Imports of goods & services (% change)	-3.2	8.4	10.8a	9.4	10.1	13.2	12.7	10.4

Source: Economist Intelligence Unit

#### THE GREAT ETHIOPIAN PROJECT

More than 90% of Egypt's energy consumption is being met by oil and natural gas - which makes a huge demand on its import bill.

In terms of electricity generation, natural gas represents over 80% of the total mix, the remainder being met mostly by hydroelectricity.

"Electricity in Egypt is generated mainly from thermal and hydropower stations," according to the African Development Bank. "However, the percentage of hydropower energy generated is gradually reducing due to the fact that all major hydropower sites have already been developed and new generation plants being built are mainly gas fired."

Indeed, there seems little scope for hydroelectricity expansion, especially in light of new developments along the river Nile.

While Egypt has been distracted with internal political disputes, other countries have moved ahead in taking advantage of the Nile basin.

Ethiopia is building the Grand Ethiopian Renaissance Dam (GERD), a USD 4.3 billion 6,000 megawatt hydropower plant set for completion by 2017-2018.

Located in the Benishangul-Gumuz region, 40 kilometers from the border with Sudan, the project is the centerpiece of a string of dams that could transform Ethiopia into a major energy exporter.

But the controversial project threatens an agreement brokered by Great Britain in 1929, which granted Egypt veto power over projects that could change the flow of the river Nile.

In addition, Sudan and Egypt had signed an agreement enacting water usage quotas for the Nile's water in 1959. Under the agreement, Egypt has a quota of 55.5 billion cubic meters per year and Sudan has a quota of 18.5 billion cubic meters per year.

AGRICULTURE IS A MAJOR ECONOMIC ACTIVITY IN EGYPT								
	2010/11	% of Total	2011/12	% of Total	Dec-July 2011/12	% of Total	Dec-July 2012/13	% of Total
Agriculture, Irrigation & Fishing	142,913.3	10.5	146,851.9	10.6	148,076.6	12.4	152,001.6	12.5
Oil & Gas Extractions	127,382.2	9.3	127,534.4	9.2	139,335.7	11.7	138,357.2	11.4
Manufacturing Industries	356,225.1	26.1	357,155.2	25.7	320,713.9	26.9	326,618.0	26.8
Electricity	21,329.4	1.6	22,500.8	1.6	15,903.1	1.3	16,877.9	1.4
Water	4,335.6	0.3	4,537.1	0.3	2,996.1	0.3	3,112.3	0.3
Sanitation	997.4	0.1	1,042.2	0.1	719.9	0.1	744.9	0.1
Construction & Building	102,878.2	7.5	105,954.0	7.6	74,038.6	6.2	77,042.1	6.3
Transportation & Storage	58,839.4	4.3	60,356.4	4.3	46,052.5	3.9	47,368.5	3.9
Communications	53,143.6	3.9	55,837.1	4.0	28,648.6	2.4	29,870.8	2.5
Information	3,373.2	0.2	3,507.5	0.3	2,657.3	0.2	2,751.5	0.2
Suez Canal	28,764.8	2.1	29,847.4	2.1	16,413.1	1.4	15,804.9	1.3
Wholesale & Retail Trade	132,739.3	9.7	134,952.2	9.7	123,389.1	10.4	126,547.5	10.4
Finance	41,370.9	3.0	42,286.8	3.0	32,783.3	2.8	33,506.4	2.8
Insurance	3,741.2	0.3	3,810.6	0.3	2,970.2	0.2	3,044.6	0.3
Social Insurance	30,529.0	2.2	31,302.9	2.2	24,045.9	2.0	24,811.6	2.0
Tourism	63,763.6	4.7	64,704.8	4.7	45,676.2	3.8	48,368.3	4.0
Real Estate	24,804.9	1.8	25,573.4	1.8	18,271.5	1.5	18,869.3	1.5
General Government	106,649.8	7.8	109,572.5	7.9	95,587.9	8.0	98,071.6	8.1
Social Services	62,276.0	4.6	63,951.0	4.6	52,563.4	4.4	53,649.6	4.4
<b>Total Domestic Production</b>	<b>1,366,056.9</b>	<b>100.0</b>	<b>1,391,278.2</b>	<b>100.0</b>	<b>1,190,842.9</b>	<b>100.0</b>	<b>1,217,418.6</b>	<b>100.0</b>

Source: Central Bank of Egypt; (Constant Prices, EGP)

But the Entebbe treaty signed by Ethiopia, Uganda, Rwanda, Burundi, Tanzania, Kenya and South Sudan, on May 19, 2010 has the potential to make the previous deal redundant.

The treaty gives each of its signatories a fair and reasonable access to the water resources to use for their economic benefit, which would eliminate Egypt's access to 55.5 billion cubic meters of water per year.

Ethiopia had unveiled the GERD project a month after Egyptian leader Hosni Mubarak was ousted in a popular revolt in 2011, leading many analysts to think the timing was not coincidental and was meant to push the project ahead just as Egypt was preoccupied with other pressing matters.

The project is expected to be Africa's largest hydroelectricity dam, but has already raised huge concerns among Egyptian and Sudanese authorities, who have objected to the project in the strongest possible terms.

AVAILABLE & POTENTIAL WATER RESOURCES IN EGYPT				
(in billion cubic meters)				
Source	Potential amount	%	Amount in use	%
Nile water	55.5	75.2	51.7	82.59
Ground water	11.3	15.3	5.2	8.3
Re-use of agricultural drainage water	5	6.8	3.7	5.91
Treated sewage water	1.5	2.03	1.5	2.4
Rain	0.5	0.67	0.5	0.8
<b>Total</b>	<b>73.8</b>	<b>100</b>	<b>62.6</b>	<b>100</b>

Source: UN Food & Agriculture Organization

#### SPECULATIONS OF MILITARY ACTION

The deposed president Mohammed Morsi has been on record saying that Egyptians will "defend each drop of Nile water with our blood".

But given that the dam will not be completed until around 2018, Egypt is not under pressure to make an immediate decision over whether to launch a strike, said Ben Peyton, head of Africa Practice at Maplecroft, a global risk analytics, research and strategic forecasting company.

"Yet military action is certainly an option that many of the key figures within Egypt's security apparatus would like to seriously consider, not least because a successful strike would help rally nationalist support for the military-dominated government."

However, it is unclear if Egypt has the political appetite or the international support to pursue this development in the midst of a severe domestic economic and political meltdown.

"Indeed, the security forces are already stretched as a result of the domestic situation and the regime is likely to be reluctant to completely burn its bridges with Washington by attacking a key US regional ally," Peyton said.

While Egypt and Ethiopia had been looking for constructive dialogue to resolve their dispute during Morsi's tenure, it is unclear how the new interim

governments and subsequent government view the issue.

Morsi and Ethiopia's prime minister Hailemariam Desalegn had even discussed the idea of Egypt funding a transmission line from the dam, with Ethiopia selling 2,000 megawatts of power to Egypt by 2020, according to Getachew Reda, a spokesman for Hailemariam.

However, Ethiopia's decision to divert the Nile immediately after a meeting between the two officials has taken Egypt by surprise.

"Perhaps most alarming to Egypt was not the announcement itself, but rather how quickly Ethiopia announced the diversion after the meeting," said risk consultancy Stratfor Inc. in a note.

#### **THE CONGO RIVER PROJECT**

The construction of Ethiopia's controversial Renaissance Dam project has meant that another project conceived more than a century ago will remain on the backburner.

The project was suggested by an Egyptian irrigation engineer as far back as 1902, but was taken up by former president Anwar Sadat in the 1970s as he believed dam-building was vital to moving the economy towards industrialization and managing the water flow from the Nile, which vacillated from flooding of agriculture lands to crippling droughts.

The 4,500-kilometer Congo River has the potential to supply Egypt with over 100 billion cubic meters of water, out of the trillion cubic meters that flow into the ocean yearly, according to Ismail Abdul Jalil, former president of the Desert Research Center.

According to Egypt's minister of agriculture, Ayman AbouHadid, researchers proposed the project to prime minister Issam Sharaf's interim government to prevent Egypt from facing a water shortage as a result of the Renaissance Dam.

The former prime minister saw in it an opportunity to turn more than 60% of Egypt to an agricultural land, but subsequent political events prevented any further discussion.

"This project is a major technical challenge as it requires rerouting the river against its natural flow. It also requires the approval of South Sudan, which is a signatory of the Entebbe Treaty, making any discussion of the project very difficult," AbouHadid said.

"This should not discount the idea that constructing the dam is now a viable possibility."

The project could save Egypt from a long-term drought and while interest in the project has been renewed after Ethiopia's Renaissance project, officials believe the development will remain mothballed for some time.

#### **NOT ON THE TABLE YET**

Egypt's ministry of water resources and irrigation is not currently considering the Congo River project, to replace the water shortage that might occur as a result of the construction of the Renaissance Dam, an official source told Zawya.

"It is difficult for the current transition government that has limited power, to make the final decision on such a large, long-term project," said Mohamed Abdel-Mottaleb, Egypt's minister of water resources and irrigation, in a statement to Zawya.

"Furthermore, the speed of the river flow presents a major technical challenge, especially the building of the water pumping stations; it is not a decision to be rushed."

It would also be considered hostile to make such an announcement, while negotiations with Ethiopia around the Renaissance Dam are still under way.

"The government is still committed to resolving the issue of the Renaissance Dam, and it would be inappropriate to talk about pressure means in the midst of diplomatic efforts," he said.

"The situation is very delicate, especially now that Egypt's membership in the African Union was suspended after Morsi was removed from power. Hence, we are very careful on how to approach this issue and we are very serious in our reassurance messages to the African Union."

In addition to the negotiations, the government will be meeting with the technical committee overseeing the Renaissance Dam project to discuss its details.

"The project is no doubt ambitious, however, there is currently no feasibility study to determine its cost which is an additional issue influencing the decision," he added.

Nasr EldinAllam, former minister of water resources believes the Congo River project is impossible to implement.

"In addition to the technical and financial difficulties, we will be facing major political challenges, he said. "Rerouting the river stream will require an approval from all the affected countries and there is currently no agreement if the Congo River belongs to Congo or is an international river."

He also emphasized the importance of acquiring approval from South Sudan which is difficult, especially as the project could flood its land. Furthermore, the agreement South Sudan signed with Israel last year involves plans to cooperate on water and irrigation projects would make it reluctant to approve the project.

#### **HUGE IMPACT ON FOOD SUPPLIES**

With the Congo River project on the backburner, Egypt will be severely impacted by the Renaissance Dam.

Analysts say there will be a short-term drop in water flowing into Egypt while the reservoir is being filled - a process that could take several years.

Depending on the extent of the shortfall, agricultural productivity in areas that rely on the Nile for irrigation could well be affected, which could result in higher spending on imported food and other agricultural commodities and could potentially drive up rural unemployment, according to Maplecroft.

EGYPT CEREAL STOCKS (Million Tons)						
	2009	2010	2011	2012	2013E	2014F
Egypt	5.6	6.6	5.9	8.1	6.1	5.6

Source: UN Food & Agriculture Organization

EGYPT CEREAL PRODUCTION (Million Tons)			
	2011	2012E	2013F
Wheat	8.4	8.8	9.4
Coarse Grains	7.8	7.8	7.3
Rice Paddy	5.7	6.5	6.8
Total Cereals	21.8	23.1	23.4

Source: UN Food & Agriculture Organization

Egypt clearly believes the Renaissance Dam would negatively impact the country's agriculture sector, lead to severe droughts and force the country to raise food imports, which would weaken the country's fiscal position and keep it dependent on volatile food prices.

Egypt is particularly sensitive to rising food costs. After all, its 2011 revolution was triggered partly because of rising food costs - among other grievances - which toppled Hosni Mubarak's government and ushered in a new era of volatility in the country.

Egypt is also the world's largest importer of wheat, half of which it distributes to its 84 million people in the form of heavily subsidized loaves of bread, which sell for less than 1 US cent.

Subsidies for food and fuel have risen by 73% and 63% respectively, since the outbreak of the revolution, and remain key drivers of the surge in government expenditure, according to estimates by the National Bank of Kuwait Capital.

The United Nations Food Agency Organization (FAO) notes that the country's cereal imports in 2013-14 comprise coarse grains and wheat, and are forecast to increase by 21% and 6%, respectively, compared to the 2012-13 levels.

The FAO says that while the harvest is progressing well, farmers have expressed doubts that the harvest will be as large as forecasted by the Egyptian Government.

The burden on Egyptian authorities is already visible, as annual food and beverage inflation rate in May 2013 reached about 9% compared to 7.9% in January 2013, as a depreciating exchange rate and bottlenecks in fuel distribution added to the woes.

"Although the country's macroeconomic fundamentals may have improved by 2018, the high current account deficit and low currency reserves will only be put under greater strain if Egypt has to increase imports of agricultural products," Maplecroft's Peyton said.

In the longer term, the downstream flow will be reduced as a result of evaporation from the reservoir, although the effects - while disputed - are likely to be relatively modest. Yet even a small reduction in flow will effectively end any possibility of Egypt breaking its dependence on imported wheat.

#### EGYPT'S LIFE BLOOD

Egypt's reliance on the Nile cannot be overestimated. Apart from being a symbol of the ancient country's identity, the Nile exclusively supports Egypt's production of wheat, fruits and vegetables.

The Nile accounts for 97% of Egypt's water source, especially as most of the population lives along the banks of the river.

However, it is Ethiopia that is the source of 86% of the water that flows into the Nile - one of the world's most famous rivers that run 4,160 miles and traverse through eleven countries, before emptying into the Mediterranean Sea.

And that creates a water security issue for Egypt at the most inconvenient time.

An international committee consisting of 10 experts, including two from Egypt, issued a report on the Renaissance Dam recently and concluded that there are no environmental impact assessment on the two downstream countries Egypt and Sudan.

But the Egyptian government has rejected the study.

The Group of Nile Basin (GNB) - a group of professors from the Department of Irrigation and Hydraulics, Faculty of Engineering at Cairo University recently outlined the grim impact of the Renaissance Dam on Egypt's resources in its own report.

The study noted that the Ethiopian dam will mean Egypt will have "no control" to the country's share of the Nile.

"As such, this plan shall subsequently include total control of the share of Egypt's share of the water in the Nile and the possible redundancy or at least dwarfing the role of the High Dam in securing the future supply of water to Egypt."

The project will also impact electricity output from the High Dam and the Aswan Dam during the filling period of the lake and its operation.

"This negative impact shall escalate during the drought period wherein the water supplies to both Egypt and Sudan shall conflict with the water needed to produce the electricity from the GERD."

The group notes that a decline in Egypt's share of the water will "result in abandoning huge areas of agricultural lands and scattering millions of families."

The project would also raise pollution in the water stream and affect quality of drinking water, while river transportation, Nile tourism and fish farms will be under threat.

#### RISING NEED FOR WATER

"Collapse of GERD will result in catastrophic effects in both Sudan and Egypt. This includes failures of dams, drowning of major towns and villages and exposing millions to the dangers of death and relocation."