The American University in Cairo

School of Global Affairs and Public Policy

Political, technical and economical contexts of the Government of Egypt’s approaches towards the Nile Basin Countries

A Thesis Submitted to

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Abstract:

Economic development and water security is considered one of the toughest equations to answer, when it comes to transboundary water management. The case in the Nile Basin reflects such conflict, where most of the Nile Basin countries are considered within the poorest countries in the world and are facing a major hydro-hegemony, especially between Egypt and Sudan. In 2010, the whole scene in the Nile Basin has changed, with the signing of the new Cooperative Framework Agreement by five riparian countries (Ethiopia, Tanzania, Uganda, Kenya and Rwanda), without the approval of Egypt and Sudan. Through my thesis, I tried to understand and plot the possible political, technical and economic approaches for Egypt towards Nile Basin and the level of coordination between the different Egyptian actors involved in the dealing with the Nile Basin. In my thesis, I am focusing on the period of 2000-2011, which includes the launching the Nile Basin Initiative, signing the new CFA and the post-25 January revolution. Quantitative methods were used investigate the economic development indicators in the Nile Basin. Qualitative tools such as interviews and Wikileaks documents were used to investigate the possible changes in the Egyptian government approaches towards the Nile Basin countries, either in the policies or the actors. Some of the recommended solutions include encouraging the private sector participation in the cooperation between Egypt and the Nile Basin countries and setting an integrated policy towards the Nile Basin countries.
# Table of Contents

Chapter I - Introduction, problem statement ................................................................. 7

Chapter II - Background, Literature Review and Methodology: ................................. 11

Water, Development and the Millennium Development Goals ................................ 11

Water and Economy ........................................................................................................ 11

Water scarcity .................................................................................................................. 13

Nile Basin ....................................................................................................................... 17

Hydropolitics of the Nile Basin ...................................................................................... 18

Potential Water-related economic development in the Nile Basin ............................... 20

Nile Basin Initiative: Road to regional cooperation ....................................................... 22

Overview on the Policy making in Egypt ........................................................................ 24

Methodology .................................................................................................................. 27

Chapter III - Recent Nile Politics and Egypt’s Main Players and Policy changes: .......... 31

I. Recent Developments in the Nile Basin dispute: ...................................................... 31

II. Domestic Policies and their impact on International Relations ............................... 36

III. Role of the Egyptian players: .................................................................................. 40

IV. Policy Coordination: ............................................................................................... 49

Chapter IV - Water-related development in the Nile Basin ........................................ 54

Empirical studies for the relation between water withdrawal and economic development factors in the Nile Basin countries: ................................................................. 55

Descriptive Statistics of the Nile Basin countries ....................................................... 59

Water-related Development Projects ............................................................................ 71

Chapter V. Policy recommendations towards the Nile Basin countries ...................... 76

Summary and Conclusion: ............................................................................................ 84

References ..................................................................................................................... 87

Annex 1: Figures ............................................................................................................ 94

Annex 2 – Semi-Structure Interview questions ............................................................ 98
List of Figures

Figure 1: Conceptual Framework ..............................................................................................................10

Figure 2: Water Scarcity levels in the World; UN Water, 2007 .................................................................14

Figure 3: International rivers Basins of Africa; Source: Transboundary Freshwater Dispute Database 2000 published by UNEP IN Africa Atlas 2008 .................................................................16

Figure 4: Provisional mapping of the Members of Supreme Council for Nile Water, based on the press releases of Cabinet of Ministers and consultation with experts ..........................................................44

Figure 5: Nile Basin Main frontline Egyptian Players after the 25 January 2011 – Status quo ..............47

Figure 6: Provision of the Nile Basin Policy coordination between Egypt’s MWRI and MFA for the Nile Basin negotiations and Nile Basin Initiative .................................................................51

Figure 7: Provision of the Nile Basin Policy coordination between Egypt’s main players for the Bilateral Cooperation with the Nile Basin countries ...........................................................................52

Figure 8: GDP at Market price in the Nile Basin Countries (2000-2008) ..................................................59

Figure 9: GDP (at market price) annual growth rate (%) in the Nile Basin countries (2000-2008) .......94

Figure 10: Annual growth rate (%) of Agricultural Land in the Nile Basin countries (2000-2007) .......95

Figure 11: Electricity production by Hydropower (% of total electricity production) in the Nile Basin countries (2000-2006) ...........................................................................................................63

Figure 12: Population and % Annual population growth rate in the Nile Basin countries (2000-2008) ..............................................................................................................................................96

Figure 13: % of population in Urban and rural areas in the Nile Basin countries (2000-2007). World Bank, 2010 ...........................................................................................................................................97

Figure 14: % of population with access to improved water sources in the Nile Basin countries (2000-2005). World Bank, 2010 ................................................................................................................67

Figure 15: UNDP HDI progress in the Nile Basin countries (2000-2010). UNDP, 2011 .........................69

Figure 16: Idea for establishing an Egyptian Agency for the Nile Water ..................................................79

Figure 17: Provisional Egypt’s approach towards the Nile Basin countries ..............................................83
**List of Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMCO *</td>
<td>African Ministers' Council on Water</td>
</tr>
<tr>
<td>BCM</td>
<td>billion cubic meters</td>
</tr>
<tr>
<td>CEDARE</td>
<td>Centre for Environment and Development for the Arab Region and Europe</td>
</tr>
<tr>
<td>CFA</td>
<td>Cooperative Framework Agreement</td>
</tr>
<tr>
<td>EIU</td>
<td>Economist Intelligence Unit</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>HDI</td>
<td>Human Development Index</td>
</tr>
<tr>
<td>IWRM</td>
<td>Integrated Water Resources Management</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MoFA</td>
<td>Ministry of Foreign Affairs</td>
</tr>
<tr>
<td>MoPIC</td>
<td>Ministry of Planning and International Cooperation</td>
</tr>
<tr>
<td>MWRI</td>
<td>Ministry of Water Resources and Irrigation</td>
</tr>
<tr>
<td>NBI</td>
<td>Nile Basin Initiative</td>
</tr>
<tr>
<td>NBTF</td>
<td>Nile Basin Trust Fund</td>
</tr>
<tr>
<td>NGOs</td>
<td>Non-Governmental Organizations</td>
</tr>
<tr>
<td>sq km</td>
<td>Square Kilometer</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
</tr>
<tr>
<td>UNEP</td>
<td>United Nations Environment Program</td>
</tr>
<tr>
<td>USAID</td>
<td>US Agency for International Development</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WWAP</td>
<td>World Water Assessment Programme</td>
</tr>
</tbody>
</table>
Chapter I - Introduction, problem statement

During the past few months, Egypt has been confronted with a new challenge over an old problem – the transboundary water management of the Nile. Egypt is 97 percent dependent on the Nile water; and that 86 percent of Egypt’s Nile water is originating from outside the Egyptian borders (UNEP, 2005), more specifically, from Ethiopia. Since 1960s, Ethiopia has been looking forward to build dams on the Blue Nile, in order to use it for hydropower generation, agricultural development and urbanization of the area surrounding the Blue Nile. However, Egypt is opposing any attempt of building dams on the Blue Nile, and have stated in the 1970s, that it is ready to use any means necessary to stop it (UNEP, 2005). In 2010, the whole scene in the Nile Basin has changed, with the signing of the new Cooperation Framework Agreement (CFA) by five riparian countries (Ethiopia, Tanzania, Uganda, Kenya and Rwanda), without the approval of Egypt and Sudan. The CFA threatens the regional cooperation adopted by the Nile Basin Initiative (NBI) and threatens its existence, especially with only two years away from the end of the Nile Basin Trust Fund. The Nile Basin Trust Fund is a multi-donor trust fund to support the Nile Basin Initiative, which is managed by the World Bank and includes Donor countries such as Germany, UK, Norway and Denmark.

The main question is: What would be the possible political, technical and economic approaches for Egypt to pursue towards the Nile Basin Countries for better Transboundary management of the Nile Water? A sub-question to that would be about the coordination between the different Egyptian agencies and players when dealing with the Nile Basin countries. The research is considered well-timed, especially with the current status of deadlock between upstream and downstream countries, especially concerning the water security and sharing principles that led to the signature of the new CFA without the agreement of, mainly, the downstream countries.

The study is expected to provide practical contributions to solving the issue that might have greater impact on the future of Egypt. The research will discuss the different approaches that the Egyptian government is trying to pursue to reach a deal with the Nile Basin countries. The problem is a clear example of conflict of interests, where the full-scale economic development of the upstream countries conflicts with the water security...
in downstream countries. This dilemma has its impact on Egypt’s Framework for approaching the Nile Basin countries. To do this, I employ the current literature on hydro-politics and the different visions of development suggested for the Nile Basin. Because Egypt does not seem to have a clear vision or policy towards acting with the Nile Basin countries, in my paper, I juxtapose the roles of different Egyptian actors towards the Nile on technical and political basis to suggest to tackle the Nile Basin issue constructively and how their actions and policies are coordinated in that sense.

The hydropolitics of the Nile Basin are shaped by three main players: Egypt; Sudan; and Ethiopia. More specifically, the Blue Nile, originating from Ethiopia is supplying 86% of its water flow towards Egypt and is the main vein for Egypt’s water resources. All the upstream countries of the Nile Basin, considered within the low income earners list, are willing to utilize all the available resources for their economic growth and poverty alleviation. The water demands focus on agricultural development, electricity generation from hydropower, and urbanization.

There is a need for economic development, especially with the high rate of population growth in the upper stream countries. Projects in those three fields are considered essential for the fulfillment of the Millennium Development Goals, set by the UN in 2000; therefore, it might be interesting for the donor groups to work proactively within these countries. Different visions of development in the Nile Basin will be discussed in the literature review, including extremes between full cooperation between the Nile Basin countries and ignoring the downstream countries. Some visions of development, especially those ignoring the downstream countries are considered, by Egypt and Sudan, a threat to national security. This is reflected in their continuous request for “acknowledgement of historical rights in the Nile”, prior notification and approval” and “unanimous agreement” in the new CFA, in order to secure its water shares. This was refused by the upstream countries, who are also arguing that the Nile water agreements signed in 1929 and 1959 are considered ineligible because they were signed during the colonial era and not by the national governments.

Egypt is considered the main spin-off player in shaping the Transboundary water management and hydropolitics of the Nile Basin. Egypt has the largest water share in the Basin and is considered the most economically-developed country in the Basin.
Therefore, to answer the question concerning the Egypt’s Framework of approaches towards the Nile Basin, there is a series of investigative questions that would help me to grab the broader picture. **First, what are the main economical development indicators in the Nile Basin?** Second, **what are the different large, water-related development projects in the Nile Basin countries, which would have an impact on the flow of water?** This would reflect the economical and technical drive for requesting an equitable share of water in the Nile Basin, as a mean of supporting economical development and better water governance in more sustainable way.

**Third, what are the main policies and actors and involved in the Nile Basin and their possible roles?** This will answer the political context for the government approaches towards the Nile Basin. I will answer this question by reviewing Egypt’s water and foreign policies towards the Nile Basin and their trends during the Nile Basin Initiative (2000-present) and after the signing of 5 riparian countries for the new CFA in 2010. A lot of changes were spotted when discussing the type of cooperation with Nile Basin countries; the main players from the Egyptian side concerning these set of policies; and the policy coordination between the different Egyptian players. The changes in these policies show how the role Ministry of Water Resources and Irrigation in the negotiations for the new agreement has diminished due to its failure to steer the negotiations in favor of Egypt, especially during the period of 2009-2010 and the post-25 January revolution. The negotiations of the agreement are now in the hands of the Ministry of Planning and International Cooperation and the Ministry of Foreign Affairs.
I will use quantitative methods in order to show the correlation between the water use (as in annual water withdrawal) and different economic development indicators, as well as describing the changes of the economic development indicators throughout the period of 2000-2007. I will also use semi-structured interviews, as well as Wikileaks documents in order to describe the policies, politics, players and their roles in setting government approaches towards the Nile Basin countries.

Answering these three key questions will help in understanding Egypt’s different approaches for dealing with the Nile Basin countries and the status of cooperation with the Nile Basin countries.

Figure 1: Conceptual Framework
Chapter II - Background, Literature Review and Methodology:

Water, Development and the Millennium Development Goals

Water is considered the most important constituent of life on earth. With the importance of freshwater for life, it only makes about 2% of the whole amount of water on earth. The amount of freshwater on earth is limited and the distribution of the available water varies, depending on the water’s natural cycle (World Water Assessment Programme, 2009). Water resources are different, ranging between rainwater; groundwater; lakes; reservoirs; wetlands; wastewater; and desalinated water. Water has many uses that sustain economic development, such as uses in agriculture; hydropower generation; transportation; and Industry (UNEP, 2006).

All those elements are considered the key for the economic development in any country around the world. On a broader scale, we can find that those elements are also the basis to achieve the Millennium Development Goals by 2015. At the UN Millennium Summit in 2000, 189 Heads of States declared the adoption of the Millennium Goals for Development, in order to end extreme poverty by 2015 (UN Millennium Development Goals, 2000). Eight MDG goals were set with 18 targets to achieve. Under goal no. 7, target no. 10, half the number of poor people around the world should have access to safe drinking water and basic sanitation. However, water is an important constituent for the success of the eight MDGs (World Water Assessment Programme, 2010). Based on the MDGs report for 2010, it is still a long way to achieve the MDGs by 2015 (UN MDG, 2010). There is some progress in some of the goals and there is a slow progress in others, especially with the global economic crisis affecting the economies of the donor countries. The relationship between MDGs, Development and Water shows that water is not only a social product that is related to the MDGs, it is an economic product also and has to be valued and has to be governed in an efficient and sustainable way.

Water and Economy

The global economic growth affects the natural resources, especially water. Increasing number of consumers changes the consumption patterns, increasing the demand for different products, in which, water is an important element. According to the
UNESCO’s World Water Assessment Report for 2003, the average world consumption of water for industry has reached 22%, where the developed countries have water consumption in industry of about 59%, while in the low and middle income countries is about 10% (World Water Assessment Programme, 2003).

<table>
<thead>
<tr>
<th>Water uses</th>
<th>World Consumption of water</th>
<th>High Income countries of water</th>
<th>Low-Middle Income of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>70%</td>
<td>30%</td>
<td>82%</td>
</tr>
<tr>
<td>Industry</td>
<td>22%</td>
<td>59%</td>
<td>10%</td>
</tr>
<tr>
<td>Domestic (household consumption)</td>
<td>8%</td>
<td>11%</td>
<td>8%</td>
</tr>
</tbody>
</table>


During the last decade, more interest has been shown in “treating water as an economic good” (Hellegers, 2005). The concept of treating water as an economic good has two meanings; either the efficient use of water based on socioeconomic needs; or selling water as a product to control the water supply and demand. Now, with the trend of converting water management systems from the public sector to the private sector, more worries towards the overpricing of water and foreign companies managing resources would also add more concerns concerning water security in the country (Gleick P., 2002) being in the hands of private sector, especially in weak and authoritarian states that are not well structured. In the case of river Basins and groundwater aquifers, the case of “treating water as an economic good” is also dependent on whether the Basin or aquifers is a property of only one country, or it is shared between different countries. The latter case is a critical issue, when it comes to transboundary water management and water shares of every country.

However, with the increased water withdrawal, especially in the developing countries, water scarcity appears as a threat to the efforts for improving the water sanitation efforts and using water for economic development. It is projected by different UN agencies that Water withdrawals are predicted to increase by 50% by 2025 in developing countries, and 18% in developed countries (UNEP, 2007). The Food and
Agriculture Organization (FAO) has mentioned that by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world population could be under stress conditions.

**Water scarcity**

As a factor of the extensive exploitation of water resources in an unsustainable way, water scarcity is the result. Water scarcity is a cause of increased water withdrawal from the freshwater resources, leading to inadequate supply of water that cannot satisfy the human demands. There are many factors that are affecting the now available water resources, which are possibly going to lead to a world-wide crisis and water scarcity, such as; high rates of population growth; increasing food productivity to cover the demand; climatic change and variability; extensive land use; low Water quality; increasing water demand; sectoral resources and institutional capacity, especially in the developing countries; Poverty and economic policy affecting Africa in principle; Legislation and water resource management, which is considered a major concern, especially for International waters; Sectoral professional capacity due to lack of capacity building in the developing countries; and Political realities in non-democratic countries around the world, especially in Africa (Africa Water, 2010).

Out of the abovementioned causes of water scarcity, there are some factors which are considered the major, or the most important causes of water scarcity; **Increase in the world population** during the last century by three times and the possible increase by 50% during the coming fifty years (the world population by then would reach 9 Billion). This increase would lead to the increase on water for domestic uses; the demand for more food, which means more water would be needed for agriculture; demand for more electricity and so increasing the use of hydropower generation; different industries which are withdrawing almost 22% of the world water consumption. Another factor is the **Climate Change and Global Warming**, where the rising temperatures increase the amount of water lost by evaporation and so redistributing the water precipitation around the world. With climate change, water resources can be a tool of destruction. According to the FAO, climate change contributed to the increase of water scarcity by almost 20%. (Time for Change, 2010) A factor that would touch the peace and regional cooperation is the **Water transboundary management** is an important factor in the water scarcity
dilemma, with 145 countries sharing 261 river Basins mostly without adequate legal or institutional arrangements (World Water Council, 2003). With the water scarcity facing the world (Fig.1), especially the developing countries, transboundary water conflicts might raise, ranging between verbal hostility to extensive military acts (World Water Assessment Programme, 2003). Water scarcity affects the food security as well, as it might reduce the food production and so affecting the food supply. This would cause a very significant increase in the food prices and so countries with high poverty rate would suffer from famine.

Now, after shedding the light on the importance of water for economic development, alleviating poverty and raising the standards for living in developing countries, I would like to narrow down the focus more on Africa, which is suffering economic water scarcity in most of the countries.

More specifically, the Nile Basin is considered one of the most unusual river Basins on earth, due to having ten countries within the Basin and its complicated hydropolitical history and status quo.
<table>
<thead>
<tr>
<th>Water Scarcity level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Water Scarcity</td>
<td>Water resources development is approaching or has exceeded sustainable limits. More that 75% of the river flow are withdrawn for agriculture, industry and domestic purposes.</td>
</tr>
<tr>
<td>Approaching physical water scarcity</td>
<td>More than 60% of the river flow are withdrawn.</td>
</tr>
<tr>
<td>Economic water scarcity</td>
<td>Due to limited economic capacities, only 25% of the river flow is withdrawn, however, food security is a major issue.</td>
</tr>
<tr>
<td>Little or no water scarcity</td>
<td>Less than 25% of the river flow is withdrawn for different activities, allowing for the availability of water.</td>
</tr>
</tbody>
</table>

Comprehensive assessment for water management in agriculture, 2007
Africa, with almost 62% of its area is covered by 60 International river Basins (Wolf, Natharius & Danielson, 1999) is the most vulnerable area with physical and economic water scarcity is Africa. Africa’s lakes and rivers captured the attention by their significant socio-economic importance and the challenges they are facing in term of management. In 2000, Africa has adopted the “African Water Vision 2025”, which tries to set targets for “An Africa where there is an equitable and sustainable use and
management of water resources for poverty alleviation, socioeconomic development, regional cooperation and the Environment” (Economic Commission for Africa, 2000). Out of the 60 International river Basins, we are going to focus on the Nile Basin, which is considered a hot topic nowadays, especially with its hydropolitical deadlock, especially between Egypt and Sudan from one side and “mainly” Ethiopia from the other side. In our discussions, we are going to focus more on the economic factors that pushed the upstream countries to request an equitable share and what are the major projects, especially in Ethiopia.

**Nile Basin**

The Nile River, rises south of the equator and flows northward through northeastern Africa to drain into the Mediterranean Sea. It has a length of about 4,132 miles (6,650 kilometers) and drains an area estimated at 1,293,000 square miles (3,349,000 square kilometers). The Nile Basin, which covers around 10% of Africa, is flowing through ten countries; Kenya; Uganda; Rwanda; Burundi; Dem. Rep. Congo; Ethiopia; Eritrea; Sudan; and Egypt. The Nile is formed by three principal streams, the Blue Nile and the Atbara, which flow from the highlands of Ethiopia to Sudan, and the White Nile, the headstreams of which flow into Lakes Victoria and Albert (UNEP, 2005).

According to the latest study done concerning the population living around the river banks, 160 million people, out of the total population of 300 million people in the ten countries are living in the Nile Basin (FAO, 2005). According to the number collected from the World Bank, the total population in Nile Basin countries has reached 400 million people by the end of 2008 (World Bank databases, 2010). The average population growth rate in the Nile Basin is around 2.3%. The population growth indicates that the Nile Basin is going to need more resources and more development to accommodate the population and use their human resources for the economic development. The following table reflects the water flow from Burundi to Egypt (FAO, 1997).
<table>
<thead>
<tr>
<th>Country area within the Nile basin</th>
<th>Actual flows</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inflow</td>
</tr>
<tr>
<td></td>
<td>(km$^3$/yr)</td>
</tr>
<tr>
<td>Burundi</td>
<td>0.00</td>
</tr>
<tr>
<td>Rwanda</td>
<td>1.50</td>
</tr>
<tr>
<td>Tanzania</td>
<td>7.00</td>
</tr>
<tr>
<td>Kenya</td>
<td>0.00</td>
</tr>
<tr>
<td>D.R. Congo</td>
<td>0.00</td>
</tr>
<tr>
<td>Uganda</td>
<td>28.70</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>0.00</td>
</tr>
<tr>
<td>Eritrea</td>
<td>0.00</td>
</tr>
<tr>
<td>Sudan</td>
<td>117.10</td>
</tr>
<tr>
<td>Egypt</td>
<td>55.50</td>
</tr>
</tbody>
</table>

Table 1: Water inflow and outflow in the Nile Basin (FAO, 1997)

Hydropolitics of the Nile Basin

According to the UNEP report on Hydropolitics in Africa, the Nile Basin is considered an unusual situation, due to two reasons; the first reason is that more than half the Nile river flow comes from Ethiopia; the second reason is that Egypt is almost totally dependent on the Nile water as the source for agriculture and so for its own economic development which gives Egypt the privilege of being the most powerful country in the Basin (UNEP, 2005). The main two pillars of the hydropolitics in the Nile Basin are; Nile water agreement in 1929, where Egypt and the British agreed on recognizing the historic legal rights of Egypt, assuming the full rights to the natural dry season flow of the Nile; the second agreement, was in 1959, where a new Nile treaty signed between Egypt and Sudan on the distributing the Nile water between Egypt and Sudan, where Egypt’s share is around 86% of the flow; while Sudan would benefit from the remaining 14% (Yohannes, 2009). Egypt refuses the construction of any dams that would hinder the Nile flow, especially from Ethiopia.

The upstream countries, after gaining their independence, started rejecting the 1929 Nile water agreement that was signed between Great Britain and Egypt, because this agreement was signed during the colonial era (Waterburry, 2002). The upstream countries were calling for redistribution of water shares between the Nile Basin countries.
equally in order to use the water for developmental projects, including agriculture, hydropower and urbanization of rural areas. In the 1970s, Ethiopia was planning to build dams on the Blue Nile for hydropower generation, when Egypt strongly refused and threatened to use military force to protect Egypt’s historical rights in the Nile water (Waterburry, 2002), which is considered a mark that water is a top national security issue for Egypt. During the 1980s and 1990s, the upstream countries continued their frequent requests for revising the 1929 and 1959 agreements, while Egypt and Sudan refused to discuss the two agreements, sticking to their claims of historical and legal shares in the Nile water.

The Nile Basin Initiative, which started in 1999 was considered a first step for setting concrete multilateral cooperation between the ten countries, in addition to negotiating the legal framework that would satisfy the stakeholders of the Basin. The upstream countries, led by Ethiopia and Tanzania are requesting a new agreement, known as “Cooperative Framework Agreement” (CFA), which would secure an equitable share of water for all the countries and would be the first step to establish a permanent Nile Basin Commission that would replace the Nile Basin Initiative and set a legal framework for transboundary water management. Egypt and Sudan had two points that have to be resolved before signing the new CFA, which are; the water security issue, where a prior notification about constructing dams on the Nile river and a VETO right for the downstream countries on project that might have an adverse effect on the water flow; and agreement on decisions by unanimous agreement, rather than majority (ElQuosy, 2010).

In 2010, the Nile Basin negotiations reached a dead end, when Ethiopia, Tanzania, Rwanda, Uganda and Kenya signed a new CFA, without reaching an agreement with Egypt and Sudan about the Water security issue. Egypt threatened that all the options to solve the problem are on the table, including the Military option. The International donors of the Nile Basin Initiative, especially the EU and USA, declared that they are going to take no sides and will push the Nile Basin countries to return to the negotiations table.

This shows that the water-related development projects are the main motive for the upstream countries for requesting an equitable share of water. Water can be a tool for cooperation and can be a cause of war. It shows also the steadiness of the Egyptian policy
towards the Nile Basin countries. This raises the question on how Egypt’s Nile policy towards the Nile Basin countries is changing from bilateral cooperation with Sudan, into a multilateral cooperation between all the Nile Basin countries through the Nile Basin Initiative. However, after mentioning the hydropolitics of the Nile Basin, it is important to mention the different options of economic development and cooperation within the Basin. This will also shed some light on what could be a preferred option for Egypt when cooperating with the Nile Basin countries.

Potential Water-related economic development in the Nile Basin

The estimated potential direct gross economic benefits from the Nile water utilization in hydropower and irrigation projects ranges between $7 and 11 billion (Whittington, 2005). This economic benefit depends on the degree of cooperation among the Nile Basin countries, based on Whittington’s paper about the economic development in the Nile Basin, there are four economic pressures;

1. **“Using the water upstream, instead of losing it by evaporation”** which is based on the concept that if water is not withdrawn for irrigation or for other economic development purposes, it is going to be lost by evaporation, thus better use it than lose it; especially with the climate change and there are a number of studies taking place to study the impact of the climate change on the Nile Basin countries.

2. **“Opportunity cost option: Downstream countries would withdraw water for irrigation, while upstream countries would use it for hydropower”** is based on trading concepts, where the upstream countries can use the water for hydropower generation (with minimum water storage capacity) before the water flow towards the downstream water, where they can use it for irrigation.

3. **“Store water upstream to reduce evaporation losses”** is better at the upstream than the downstream countries because the heights of water reservoirs at the upstream can reduce the amount of evaporation, compared to the downstream countries.

4. **“Withdraw water where it is used value is greatest”** is a basic rule, where the countries that should have a higher share are those who can use the water efficiently and in a more productive way.
The abovementioned four economic pressures can be considered four different methods of cooperation between the Nile Basin countries. For example, if we consider the second option “irrigation traded by hydropower between the upstream and downstream countries”, a possible “hypothetical” cooperation would be the downstream countries use the water for irrigation of the land and the crops are sold to the upstream countries, in exchange of hydropower produced by the upstream countries. In the case of the Nile Basin, a regional cooperation framework was maintained by the Nile Basin Initiative (NBI). In another paper, Whittington was discussing five visions for development in the Nile Basin (Whittington, 2003), based on the fact that the Nile Basin countries are willing to cooperate and economically develop a shared vision. The five visions are very similar to the four economic pressures mentioned above, since they are written by the same author. The five visions are:

1. **Century storage plus**: full control of the Nile water flow from the upstream countries. This would mean that water is going to be demand-driven, based on the requests of the each country for water they require to achieve different economic development goals.

2. **Southern light**: based on using hydroelectric power for rural electrification of the upstream countries of the Nile Basin. The vision is basically supporting the upstream countries only for economic development. From the cost benefit analysis, Whittington argues that the economic benefits for the upstream countries are much more from the reduction of the water flow to Egypt.

3. **The Green Nile**: this vision sights the preservation of environmental assets (The Sudd swamps, Lake Victoria ecosystem and the great canyons of the Blue Nile gorges), in a sustainable way, without focusing on the short-term economic potential.

4. **Economic partners on the Nile**: this vision looks into treating water as an economic good, meaning water should be provided based on the market demand, depending on the different water uses. The water used is going to be valued and governments would pay for it.
5. **Water for peace**: based on the concept that cooperation between all the Basin countries will be a win-win situation for economic development and overcoming disputes.

**Nile Basin Initiative: Road to regional cooperation**

The Nile Basin Initiative idea followed after the two projects of HYDROMET and TECCONILE\(^1\) which were aiming at identifying the meteorological and hydrological data of the Nile Basin and use it for simulating different scenarios for water management. These two projects included some of the ten Basin countries. The Nile Basin Initiative is considered the first time the nine countries are all involved in initiating the process (ElQuosy, 2010). The initiative had a number of goals including; to develop a water management system that would enable using the water in a sustainable and efficient way; ensuring that water is shared in an equitable way; poverty reduction; and cooperation and joint action on projects that put the riparian countries into a win-win situation. The Nile Basin Initiative was considered a transitional state before establishing a permanent Nile Basin Commission, based on a legal framework agreement discussed by the NB countries (Belay, 2010). The Nile Basin had a shared vision programme which had around 8 regional projects: Water Resources Management Project, Regional Power Trade Project, Applied Training Project, Confidence-building and stakeholders involvement project, Socio-economic and benefits project, Transboundary environmental action project; efficient water use for agriculture, and shared vision coordination project. The mentioned range of projects shows that almost all the topics were covered under the shared vision program. The other programme which is known as “Investment Programme” has two sub-regional subsidiary action programmes; Eastern Nile Subsidiary Action; and Equatorial Nile Subsidiary Action. The aim of the Subsidiary action is to contribute to the promoting

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\(^1\) UNDP’s HYDROMET Project, started in 1967 and ended in 1992, was the first regional project (Henfy M., 2005). HYDROMET Project’s aim was to collect hydro-metrological data about the Nile Basin catchments. The partners in this project were Egypt, Kenya, Sudan, Tanzania, Uganda, Congo, Rwanda and Burundi, while Ethiopia participated as an observer. The second project, TECCONILE “Technical Co-operation for the Promotion of the Development and Environmental Protection of the Nile Basin” (1993-1999) was considered an evolution towards water management cooperation for development. Egypt, Sudan, Uganda, D.R. Congo, Rwanda and Tanzania were active participants, while the rest of riparian states were observers (Metawi AF., 2004).
poverty reduction, economic development and reversing environmental degradation (Nile Basin Initiative, 2010).

The Nile Basin Initiative receives its funding from the Riparian states from one side and from the Nile Basin Trust Fund. The Nile Basin Trust Fund was established in 2003 and managed by the World Bank, where a number of Donor countries, such as Sweden, Norway, Denmark and the United Kingdom contribute. The riparian countries contributed only with almost 10% of the total $150 Million of the Trust Fund. The three level game in the Basin, where the national agencies, donors and transnational firms would play a major role in transboundary water management (Waterburry, 2002).

A paper published by Belay discussed a SWOT analysis and challenges on the Nile Basin (Belay, 2010). The SWOT analysis showed that, theoretically, the NBI is working on achieving the MDGs for the NB countries; NBI shows a strong commitment from the countries to work out a regional cooperation that would benefit all and harm none. However, it also shows that the lack of coordination between the Basin countries internally and the coordination between the different activities of the NBI and the Lake Victoria Basin Commission. The fact that the CFA has reached a deadlock due to the “water security” issue that was raised by Egypt and Sudan would threat the existence of the NBI. The ten countries of the Nile Basin are all at different economic levels, meaning that the economic development methodology for each country is different and this might lead to lacking a real shared vision based on common status, goals and methodology. Another problem would appear in the horizon is that the NB Trust Fund is going to end by 2012, which means that the NB countries should start discussing the next step for sustaining the NBI, if possible. The NBI might have put aside the hydropolitics of the Nile Basin Countries and the historical disputes and focus more on the economic development and regional benefit, however, political well and support are the main pillars for sustaining the NBI efforts.

With the current status of signing the Cooperation Framework Agreement without consensus of all countries, strong opposition of Egypt and Sudan and the aggressive language of threats transmitted by the media (Al-Ahram Newspaper 2010; Al-Masry Al-Youm Newspaper 2010; UPI, 2010), the future of the Nile Basin Initiative is surely uncertain. If the main driving force of the Nile Basin countries from signing the
agreement was based on economic development, we have to study the reaction of the Egyptian policy makers to respond to those requests, as being a dominating economic power in the Nile Basin, Egypt has a number of instruments to be used to solve the emerging disputes.

**Overview on the Policy making in Egypt**

According the Economist’s Intelligence Unit index for Democracy for 2010, Tanzania, Uganda, Burundi and Kenya are considered a hybrid state system. Egypt, Sudan, Ethiopia, Rwanda, Eritrea, D.R. Congo are considered Authoritarian states (EIU Index for Democracy, 2010). This reflects the Nile Basin is divided between an authoritarian regime and a hybrid regime, which affects the policy-making process at large in those countries. Egypt was an authoritarian state (Greene, 2010), means that the power is concentrated in the hands of only one leader, or one group of elites, which is the National Democratic Party. However, after the 25 January revolution, there is a possibility of transforming to a democratic state.

**Water-related Policy-Making Process in Egypt**

Most transboundary river case studies that refer to the importance of domestic policy-making processes provide subjective rather than systematic evidence for the influence of domestic actors and institutions. Several authors elaborate on linkages between the domestic and international levels of water policy making. (Luzzi, 2008; Moravcsik, 1993).

In general, there are three major policy processes or mechanisms, which are the rational choice; organizational process; and governmental policies (Birkland et al., 2005). The rational choice is based on the fact that the policy makers have all the required input to produce an output policy that covers all the aspects concerning the issue and the recommendations. The decision makers are looking towards maximizing the benefits from their policy (Luzzi, 2010). The organizational process is based on bureaucrats working on implementing a certain policy, where the changes are incremental and predictable in order to make sure that the policy is well-implemented and updated. The Governmental policies concept is based on the negotiations between the different actors in a certain policy, seeking a common interest that would satisfy the majority of the actors, which means that it is going to take a long time of negotiations and so more
fragmentation within the policy makers. When it comes to the Water policy, there is a long list of actors dealing with water policy (Luzi, 2008) starting with the Presidential Cabinet, Parliament, and a long list of Ministries starting with the Ministry of Water Resources and Irrigation (MWRI) and ending with the Holding Company of water and different NGOs and governorates.

According to the NWRP, the actors discuss the water demand in Egypt for the different sectors, such as housing and agriculture. Based on their needs and requirements, MWRI would set the main objectives of the water policy in Egypt. The other ministries prepare the objectives concerning their national plans, taking into consideration the water demand for their sector. Objectives are set and the different development strategies are provided in the policy. NWRP also contains the implementation process and an estimation of the financial needs to carry out the plan for the period of 2005-2017. In his paper, Samuel Luzi, showed the network of water policy main actors and their positions towards the center of the policy making (Luzi, 2008), showing also a range of donor groups (USAID, WB and the Dutch Embassy) playing a role in supporting Egypt’s National Water Policy for 2002-2017.

However, when it comes to dealing with the Nile Basin Countries, it is more sensitive and requires diplomacy and a well-defined foreign policy, which is the role of the Ministry of Foreign Affairs. When different Ministries are involved in a certain policy, which is as sensitive as water security, for a country which is 97% dependent on a river originating from another country, critical policy coordination should take place. Policy coordination is basically avoiding any overlapping between two institutions working on a closely-related policy issue. Water can be a tool for cooperation or a tool for threat.

The Egyptian Foreign Policy towards the Nile Basin is based on the importance of protecting Egypt’s Southern borders and the lower parts of the Red Sea, especially near the horn of Africa. It also focuses on insuring the water flow from the Nile Basin and protecting Egypt’s interests in the Nile Basin Countries (Hassan, 2007). The Nile Basin became a diplomatic and investment battlefield between Egypt and Israel, where Israel, being involved in water development projects in Ethiopia that involved building dams on the Blue Nile (Mason, 2001). The other plans are related to diverting Nile water to Israel
or selling water to Israel, which is against Egypt’s foreign policy (Mason, 2003). The main coordination between Ministry of Water Resources and Irrigation and the Ministry of Foreign Affairs is in the setting agenda and Policy formulation (Luzi, 2010). The Ministry of International Cooperation did not have a major role in the Nile Basin; however the status of the Ministry has now changed, with the change of the scene in the Basin.

The signing of the five countries shocked the Egyptian government and a number of statements announced by the government officials, ranging between aggressiveness and low-marking the action taken by the upstream countries. According to experts, the profile of handling the Nile Basin countries negotiations has changed from the Ministry of Water Resources and Irrigation to the Ministry of International Cooperation, together with the help and support of the Ministry of Foreign Affairs and the Egyptian General Intelligence.
Methodology

Qualitative and quantitative research methods are being used to answer the question concerning the political, economical and technical contexts of Egypt’s approaches and actions towards the Nile Basin countries.

**Quantitative analysis: Answering the Political context**

The qualitative research method has been planned for answering questions concerning the political context for Egypt’s approaches towards the Nile Basin countries. The methodological tools I am using here would answer this question: **what are the main policies and actors involved in the Nile Basin and their possible roles?**

The interviews (in annex) were conducted on three different levels, based on the institutions representing Egyptian government institutions, Donor community and Non Governmental Organizations. In addition, some documents from Wikileaks were used to highlight the Egyptian officials’ coordination and views concerning the cooperation in the Nile Basin and the negotiation in 2009.

Interviews were to be conducted with officials from the Ministry of Water Resources and Irrigation. The aim of the interviews is to get more knowledge, information and data about the institutions, its internal structure and their roles in setting the national policies towards the Nile Basin countries, as well as understating to what extent do the different ministries coordinate their actions and policies towards solving the issue.

In addition, interviews were made with officials from the donor community and international institutions such as the Delegation of the European Union to Egypt and the United Nation Environment Programme aiming at getting different points of view of the international community and the level of cooperation between Egypt and the Nile Basin countries and their views on the different stands of the Nile Basin countries and the approaches of the Egyptian government in order to solve the issue.

To represent the regional dimension, an interview was conducted with officials from the Centre of Environment and Development in Arab Region and Europe (CEDARE). The importance of this interview lies in the fact that CEDARE is highly involved in the social policy network diagram set by Samuel Luzzi in his paper on “Water
Policy Networks in Egypt and Ethiopia” (Luzi, 2008), giving another different perspective of independent experts towards the issue.

I also used eight documents from Wikileaks concerning the communication between officials from the US Embassy in Cairo and the Egyptian government, concerning the views of the Egypt towards the cooperation with the Nile Basin countries, future of the NBI, as well as the Egypt funding instrument for the cooperation with Africa.

Based on the interviews, meetings and the data collected from the different research papers and Wikileaks documents, the vagueness of Egypt’s policies towards the Nile Basin countries can be made clearer. This would help in analyzing the status of Egypt and what could be the next steps for Egypt, as the spin-off country, in order to solve the problem.

Being an employee at the Delegation of the European Union to Egypt, one important privilege was the ability to discuss, continuously, the Nile Basin topic with the different officials and specialists, even outside the framework of the interviews. Such series of discussions enabled me to understand more about the situation, its complications and the different approaches set on the table. However, there some limitations that faced me while conducting the work.

Limitations to Qualitative analysis:

First limitation was being an employee at the Delegation of the European Union to Egypt. Conducting the interviews with Government officials in the different ministries was difficult, due to sensitivity of the Nile Basin issue, being a national security issue. Therefore, most of the interviews were conducted with officials and specialists at the Delegation of the European Union to Egypt and the United Nations Environment Program.

The second limitation was the timing of the study itself, where it came while there was the pace of changes in the Egyptian policies towards the Nile Basin countries (after the Sharm El Sheikh meeting of 2010); the 25th of January revolution and the dramatic preliminary shifts in the Egyptian foreign policy.

The third limitation was the access to policy documents, especially those concerning: the policy coordination between the different ministries involved in the
process; and policy changes and trends. Therefore, the outcomes from the interviews, together with related government newspapers articles and reports were a reliable combination of information, especially when it comes to the new policies and the new players in the Nile Basin. I also used Information from Wikileaks concerning meetings between Egyptian and US officials discussing the Nile Basin cooperation and the negotiations during 2009.

**Quantitative analysis**

The reason for quantitative analysis is to highlight the relationship between the water withdrawal and the economic development in the Nile Basin countries. In addition, to highlight the main water-related development projects in the Nile Basin countries. This would answer my questions concerning: **what are the main economical development indicators in the Nile Basin?** And **what are the different large, water-related development projects in the Nile Basin countries, which would have an impact on the flow of water?** The results would highlight that the Nile Basin countries are aiming for economical development, with a fairly high potential. This will indicate how Egypt’s economic and technical contexts towards the Nile Basin countries should be channeled. The quantitative analysis is based on two sections: empirical and descriptive studies. The empirical study aims to find the relationship between the annual water withdrawal and the irrigation land, urbanization, Human Development Index and Gross Domestic Product in the Nile Basin countries. SPSS is used to run correlation between the different variables. Datasets were collected from the World Bank database, FAO’s AQUASTAT database and UNEP GEO data portal.

The second component of the quantitative analysis is the descriptive time-series patterns, where I compare the differences between the countries and their economic growth. Based on the concept that water-related economic development is affected by many variables, I will focus on the Agricultural Development (growth rate of agricultural land and productivity; percentage of cropland irrigated; irrigation proposed investments for the future); Hydropower Energy production from dams (percentage of the total energy production in the country; potential hydropower electricity generation in the Nile Basin countries; dams in the Nile Basin); and Urbanization (percentage of urban population
compared to the rural population; growth rate of urban population; and Human Development Index).

Secondary data collected from the research papers, World Bank and Aid tracking databases concerning the economic development indicators and Water-related development projects in the Nile Basin countries. Analyzing these data would highlight the water-related development priorities and the economic drive for development that was the cause for requesting an equitable share of water.

Limitations to Quantitative analysis:

The lack of data in some variables made it difficult to run a linear regression. Therefore, correlation would provide some indication concerning the significance of the independent variables.
Chapter III - Recent Nile Politics and Egypt’s Main Players and Policy changes:

Nile Basin issue is not only a problem of sharing natural resources; it is considered one of the sophisticated issues where politics and interests play a major role in solving the disputes. For Egypt, the Nile water is considered the only surface water available, which makes the Nile water and its continuous flow to Egypt a matter of national security. For Ethiopia, the Nile water is considered one of the major sources that would support the economic growth challenges and develop one of the poorest countries in the world. With such a conflict of interest on natural resources, the only possible solution for such a bottleneck is enhancing the cooperation between the 10 countries.

The aim of this chapter is to understand the main role of the players and the main policies that are directly related to the Nile Basin. By understanding the different roles of the players and the main policies to be involved, it is possible to map the approaches that Egypt would possibly take towards the Nile Basin countries within the three main axis of regional cooperation, bilateral cooperation and the negotiations of the CFA. Therefore, the chapter will discuss the following issues:

• The recent developments in the Nile Basin dispute
• Egypt’s Water and Foreign Policies.
• Different Egyptian players in the Nile Basin
• The possible coordination between the different players.

I. Recent Developments in the Nile Basin dispute:

Introduction to hydropolitics and cooperation in the Nile Basin

The Nile Basin has been always famous for its hydropolitics throughout the years. Ten countries, with a population of 360 Million (in 2005) are sharing the Nile Basin water in an inequitable way. Ethiopia total water input in the Nile Basin is 55% (UNEP,2006). Egypt, considered the most economically developed and powerful country in the Basin, is vulnerable when it comes to water security, as it depends on Nile Water for supplying 97% of the total water supply in Egypt. Therefore, Egypt considers the Nile water as a matter of national security.
During Egypt’s post-colonial era, the Egyptian government institutionalized the water arrangements, in 1929, set by the British Government in favor of Egypt, during the Colonial era. During President Nasser’s era, Egypt influenced the development and hydropolitics of the Nile Basin by two actions: (i) Bilateral Nile Water treaty with Sudan in 1959, regulating the 84 bcm flowing into Egypt’s Nile, setting Egypt’s historical rights of 55.5 bcm and 18.5 bcm in Sudan; (ii) Building the High Dam to regulate the water flow in Egypt, and hence use the water for agricultural development and hydropower electricity generation (Tvedt et al, 2010). Because of the Water agreements that were signed agreements of 1929 and 1959, where the upstream countries are not allowed to utilize the Nile Basin water without the prior approval from Egypt (UNEP, 2006).

**Nile Agreement for 1929:** Nile Waters Agreement signed between Egypt, Sudan, and the British colonies/proctorates in East Africa. Belgian colonies (Zaire, Rwanda, and Burundi) are not signatories. This agreement creates historic legal rights, with Egypt assuming full rights to the entire natural dry season flow of the Nile, relegating Sudan’s use to the water that it can store from the end of the seasonal flood (Turton 2000).

**Nile Agreement for 1959:** Nile Water Treaty signed. This Bilateral Agreement on the Full Utilization of the Nile Waters distributes the total flow of the Nile into the Aswan High dam, consisting of 84 bcm, as follows: Egypt, 55.5 bcm; Sudan, 18.5bcm, with the remaining 10 bcm lost to evaporation and seepage (Postel 1999). The wording of agreement is based on the legal concept of “historic rights”. The agreement, does however, contain provisions on the inclusion of upstream riparians over time and allocations for upstream uses.

On the other hand, upstream countries, especially Ethiopia, are looking for their economic development, especially through building dams on the Blue Nile, mostly, for hydropower generation and agricultural development projects (Tvedt et al, 2010). However, Egyptian politicians have had made clear messages concerning any project that would reduce Egypt’s historical rights (conserved with the Nile Water agreements of 1929 and 1959).

Nile Basin Initiative is considered an evolution for regional cooperation with the Nile Basin countries, with large scale development projects and capacity building programmes. These regional projects included water management, regional power trade, capacity building, efficient use of water for irrigation and environmental actions. The
Nile Basin Initiative, which is considered the platform for cooperation and discussions of the legal issues concerning the Transboundary water management, has two main programmes; Nile Basin Share Vision Programme; and the Subsidiary Action Programme. The Donor community has created the Nile Basin Trust Fund, in order to support the Nile Basin projects, based on the two programmes between all the Nile Basin countries. The main challenges faced the Nile Basin Initiative were the hydro-political disputes between some of the countries of the Basin (Egypt, Sudan and Ethiopia); and absence of legal framework for water sharing and allocation.

A Cooperative Framework Agreement (CFA) was submitted in 2007 to the Nile Committee of Ministers (Nile-COM), for discussing the legal and institutional framework to achieve NBI shared vision and establishing a permanent Nile Basin Commission in 2002 (Mokennen, 2010). Out of 18 Nile-COM meetings (since the beginning of the NBI), discussions concerning the new CFA took place three times only during the period of 2007 and 2009. According to Mokennen, Egypt’s insistency on the “Historical rights and prior notification” were the main hurdle for negotiations to continue. As a consequence, they failed to agree on common position, and during the ministerial meeting in, Sharm El Sheikh, in 2010, the upstream countries announced setting new CFA for signature (Al-Ahram Newspaper, 2010).

Conflict of interests: Development of upstream countries vs. Water security for downstream countries

The arguments of the Nile Basin countries concerning the Nile Basin dispute is that they are facing poverty and are underdeveloped. The main sectors that the riparian countries need to develop are the agriculture, hydropower and urbanization.

As it was discussed in the economic section of the thesis, building dams on the Nile River provides a broad spectrum of development programs for the riparian states. The riparian states depend mainly on the rain-fed agriculture, while Egypt and Sudan depend on the irrigation agriculture. The rain-fed agriculture underestimates the possible potentials for the Riparian states, compared to using irrigation agriculture approach. When it comes to hydropower, building dams would allow the generation of more electricity, especially in Ethiopia, which has a very high potential for hydropower,
compared to the rest of the Nile Basin countries and is totally dependent on hydropower for electricity generation. More electricity means better services and urbanization, together with better opportunities for investments in the field of electricity transmission (for a regional interconnection with other riparian countries), industry and infrastructure. The availability of electricity and water for agriculture would help in providing better services and access to water and power for urban and rural areas as well. What the downstream countries are requiring are the blue water, or known also as “easy water”, which does not require any water harvesting technologies. Out of 1600 bcm rain falls on the Nile Basin, 5% runs into the river as blue water, while the rest are considered green water, which are used in rain-fed agriculture and not shared with other neighboring countries.

**Mistrust between upstream countries and downstream countries**

The main problem between the upstream countries and downstream countries is the mistrust between both sides. This mistrust appeared in Nile-COM meetings of the Nile Basin during the last 8 years (Mekonnen, 2010), where the Nile Basin countries were asking for equitable shares of water and building dams for their economic development, while the upstream countries wanted assurances that their historical rights will not be affected, prior notification and approval of any projects that might affect the Nile flow. However, some observers argue that the mistrust appeared in 2009.

The mistrust between the upstream and downstream countries, concerning the signature and approval of the new CFA, caused the negotiations to fail and 5 Riparian states (Ethiopia, Rwanda, Tanzania, Uganda and Kenya) to sign the agreement in May 2010. The CFA ratification required 6 countries to sign the agreement; however, the status was stationary, until Burundi decided to sign the agreement in February 2011. According to an Article by a Sudanese expert, Dr. Salman Mohamed Salman, Burundi signed when South Sudan voted for separation and announced the birth of a new state in July 2011. Burundi wanted to be the 6th country to sign, to have the privilege of being one the pioneers who signed the agreement, before South Sudan would sign (Salman, 2011). During the same time, the uprising in Egypt gave a chance for Burundi to sign the agreement, while the Egyptian politicians were focusing on the internal issues in Egypt.
Development Partners and their role in solving the Nile Basin disputes

There are many efforts carried out by the different international organizations or donor countries to solve the Nile Basin problem. The European Union has offered to play the role of a mediator trying to bring the Nile Basin countries back to the negotiation table if all the parties are willing to do so. In a news report, the Minister of International Cooperation and the Commissioner for European Neighborhood discussed extending the EC support to include the Nile Basin Countries, through a possible trilateral cooperation (Al-Ahram Newspaper, 2010). This would require the agreement of the Council of the European Union and the majority of the Member States.

The United States has also expressed its willingness to support what is known as “Camp David for Horn of Africa” in 2011, where the different countries of the Nile Basin and Somalia will discuss the mutual regional cooperation in order to maintain peace and security in the region, which is under man made conflicts and natural disasters. Other international and regional institutions are also showing support to solve the potential conflict between the Nile Countries. UN organizations (such as FAO, UNEP, UNDP and others) are enhancing the regional cooperation for sustainable use of transboundary shared water resources. Similar efforts are being done through regional ministerial foras such as the African Ministerial Conference on Water (AMCOW) Such initiatives from the different players in fact reflect the size of the problem and the urgency to work together to face the challenges. As it was obvious from the interviewees which were met during this study, there is no other way than real cooperation on bilateral and multilateral levels. Egypt should really focus on the available tools of cooperation and diplomacy to solve the problem. This reflects the Transboundary water management three level game in the Nile Basin, that was explained by the interaction between the National agencies, donor countries and transnational firms (Waterbury, 2002).

Ethiopia’s Hydropower Dams facing Egypt’s Hydro-hegemony:

Ethiopia made plans for building dams on the Blue Nile River: Fincha hydropower development project; Tekeze hydropower project (Arsano, 2010); Mandaya hydropower project; Border hydropower project; Baro and Karadobi (MOWR, 2011). The recent developments in the Nile Basin disputes, followed by the youth revolution in Egypt in 2011, Ethiopia announced the inauguration of a new dam, called the Great Millennium
Nile Dam project (known before as Project X), which would have the capacity of producing around 5,250 MW on the Abbay river. Egypt has expressed its concerns about the project; however, the Ethiopian government assures that the dam is going to be only for hydropower purposes. According to different experts, those are considered critical for Egypt, as they might possibly hinder the flow of water. Some experts also expressed their concerns about the possibility of changing such hydropower dams into multipurpose use dams, which would have an impact of reducing the flow of water to Egypt by around 10%.

The main problem for Hydropower is the high cost of building the Dam. For example, the new “Grand Millennium Nile Dam” Project in Ethiopia would cost around $4-6 Billion. In addition, the sites for building the dams are limited, based on the topology of the targeted area. Another problem, especially in the case of Egypt, building dams require temporary diversions of the water flow for the construction, which would reduce the flow of water until the dam is built (a number of experts estimate that it would take around 4-6 years for construction work to be done).

II. Domestic Policies and their impact on International Relations

Most Transboundary river case studies refer to the importance of domestic policy-making processes provide subjective rather than systematic evidence for the influence of domestic actors and institutions. Several authors elaborate on linkages between the domestic and international levels of water policy making in rather general terms (Luzi, 2008). Ignoring domestic policy processes significantly constrains the ability to explain – and predict – the foreign policy behavior of states (Moravcsik 1993).

In Egypt, The main two ministries involved in the Nile Basin issues, are the Ministry of Water Resources and Irrigation and the Ministry of Foreign Affairs. The two ministries apply the policies formulated by the relevant stakeholders. To understand Egypt’s policy directions and position, the policies of the two ministries have to be briefly revisited.

Egypt’s Water Policy:

Egypt’s water policy is determined by the National Water Resources Plan (2005-2017), which was set by the Ministry of Water Resources and Irrigation. The Water
Policy focuses on: increasing the water intake; improving the efficiency of water resources; protecting public health and environment; and institutional measures. The NWRP is oriented towards an integrated water resources management (IWRM) approach, where all the socioeconomic factors that are dependent on the water availability and quality are taken into consideration. Ministry of Water Resources and Irrigation (MWRI) is being supported by the several members of the donor groups, such as Netherlands, the European Commission and USAID providing technical support and policy guidelines towards achieving optimum water management and sustainable use of the limited resources of water. Due to decrease in agricultural land and increase in urbanization and decrease in rural population, agricultural production is not the first priority. This has been mentioned during the Development Partners Group periodical meeting for water and wastewater management, in March 2011, where the Egyptian side presented a draft summary of the new water strategy for 2050.

In the new strategy, the focus is on: developing the water resources; rational use of water; the quality of water delivered; rehabilitation and renovating the irrigation network; decentralization; and applying Integrated Water Resources Management approach. Agriculture is becoming a third priority, after developing the water sector and using of water for industry. MWRI has changed its water policy in that sense to balance the new water demands with the limited water supply, ensuring a good quality of water and reforming the water sector institutional capacities.

The water policy scene in Egypt is based on a mix of three different policy processes on three different levels:

- Rational choice, where the Ministry collects all the data and information concerning the water status in Egypt, supply and demand. The Ministry carries out a series of internal discussions on the different pillars of the policy, such as increasing the water intake, water pollution, irrigation, Cooperation with the Nile Basin countries and other pillars. This would be based on cost-benefit analysis and follows the broad guidelines set by the Government.

- Governmental politics, where other stakeholder ministries have their own policies and they negotiate or bargain with MWRI on the terms of the technical issues that would help in streamlining the different policies. Such policies are the agriculture
policy, local development, housing and urban planning, environmental policies and other policies that are related to the issue. Although they play a role in the Cooperation with the Nile Basin countries, MFA is part in the policy setting for the NWRP.

- Organizational policy process, which sets the procedures and the standards for the NWRP planning and implementation process, based on the institutional setup of the organization.

Egypt’s draft Water strategy for 2050 is taking into consideration the possible changes, especially the impact of climate change and reshuffled the priorities for Water policy towards developing water resources, Integrated Water Resources Management approach-oriented, more decentralized approach, capacity building for all staff, especially the top management of the Ministry.

Egypt Foreign Policy:

According to International Relations (IR) theories, the foreign policy behavior of a state is determined by two aspects: (i) its ‘national interest’, sometimes narrowly defined in terms of national security, and (ii) the relative power and influence of the state in the geo-political system, defining the incentive structure for cooperative or antagonistic behavior in pursuit of the ‘national interest’ (Luzi, 2008; Moravcsik 1993). Egypt’s foreign policy towards the Nile Basin countries is based on the following concepts (Hassan, 2007):

- Nile River is considered the only source of water for the Egypt, supplying it with 97% of its needs, with almost 86% of it is used in agriculture. This sets the water security is one of the top priorities of Egypt’s National Security.
- Transboundary nature of the Nile River, passing through ten countries, which means that Egypt has to maintain good relations and more cooperation with the other nine countries. Egypt is a downstream country, which means that it only receives water from the riparian countries and does not contribute to the water flow.
- Having the Nile Basin within region of continuous disputes and conflicts, especially at the Horn of Africa, determines the fact that Egypt has to keep an eye on the borders, especially near the Red sea. Any disputes near the shores of the
Red sea, might disrupt the flow of ships into the Suez Canal, one of Egypt’s major sources of income.

MFA’s main arm for cooperation with the Nile Basin countries is through the Egyptian Fund for Technical Cooperation with Africa (EFTCA). The Technical funds provides technical support projects for around 43 countries, especially in the fields of health, water resources and irrigation, agriculture and education (Ministry of Foreign Affairs, 2011). The Fund also supports scholarships for African students and training opportunities for African trainees in different thematic priorities of mutual interest. Most of the money of the fund targets the Nile Basin Countries. According to the Wikileaks US Cable, the Fund has increased its budget from $17 Million per year in 2008 to $27 Million in 2010, (Wikileaks, 2011). However, after the 5 riparian states signed the new CFA, Egypt tried to provide more assistance to the Nile Basin countries by announcing the increase of the budget for EFTCA to EGP100 Million ($1= EGP5.5 in 2010).

Egypt has seven embassies and consulates in the 7 Nile Basin countries (Ethiopia, Uganda, Kenya, Tanzania, Sudan, Eritrea and Rwanda). The main activities of the embassies are to: strengthen the bilateral relations, monitor and implement the agreements and memorandums of understanding signed between the two governments and provide assistance to Egyptian investors willing to invest in the Nile Basin countries (Ministry of Foreign Affairs, 2011). Strong criticisms were made recently to the role of the Egyptian embassies in the Nile countries.

The link between Water Policy and Foreign Policy is based on: increasing the water intake and develop Egypt’s water resources, where Egypt was planning to increase its water share (NWRP, 2005); strengthening the cooperation with the Nile Basin countries, either on bilateral basis, or through the Nile Basin initiative; maintaining Egypt’s historical rights in the water, which is preserved by the 1929 and 1959 Nile water agreements.

However, MWRI and MFA are not the only Egyptian actors, when it comes to the Nile Basin negotiations and cooperation with the Nile Basin countries. Actors change with the change in the political scene on the ground, based on the government approach to move the stagnating situation.
III. **Role of the Egyptian players:**

The Nile Basin issue is like any challenge that needs to be managed strategically and on scientific basis. In order to do that, Strategic Management principles are being used in this study. As the study is focusing on how Egypt is dealing with the challenge strategically, the rest of the Nile Basin countries are not included. The current situation raises a number of questions concerning the efficiency of the Egyptian negotiations tools and instruments, during the last decade. To answer such a question, the role of the Egyptian players has to be studied in order to know the power of the different stakeholders in the negotiations.

In this study, the highlight is on the role of the different ministries and agencies in the Nile Basin negotiations and cooperation and to what extent was the linking and coordination between the ministries. The actors are being divided into traditional and new actors, based on who were the main players before the signing of the new CFA and after signing the new CFA.

**Traditional players:**

**Ministry of Foreign Affairs:**

As discussed before, the main role of the MFA in the negotiations was to ensure that Egypt’s historical rights and water security are conserved and considered “untouchable”. MFA “eyes and ears” in the Nile Basin countries are the Egyptian embassies in the Nile Basin countries, whose main role should be collecting information about the different political stands, new development projects within the Nile Basin. MFA uses the Technical Fund for Cooperation with Africa, in order to provide assistance to the Nile Basin countries. The Fund has a budget of around EGP100 Million. During the last session of negotiations, in Sharm El Shiekh 2010, the MFA failed to convince the upstream countries about Egypt’s demands for assuring the historical rights and the right for prior notification and approval when building dams on the river. MFA movements after the signing of the new CFA in 2010 included active diplomatic pressure on a wide range of donors, such as Italy, France and other countries, in order to play a role in reversing the action of the Nile Basin (Al-Masry Al-Youm Newspaper, 2010).

The MFA’s relations with the Ministry of Water Resource and Irrigation (MWRI) are maintained one national position towards the Nile water issues through exchange of
information between the two ministries and reporting on the latest developments in the arena. However, the two ministries had two different stands with the media, during the period April-May 2010, where the MFA has maintained a clam and diplomatic tone on the situation, while the MWRI had an aggressive tone and strong position, at the beginning of the crisis and has calmed its tone by time (Al-Masry Al-Youm 2010; Al-Ahram Newspaper 2010; UPI, 2010). Such overlap gave some wrong indications and incorrect signals to the media about the current situation, its seriousness and future impact.

**Ministry of Water Resources and Irrigation**

The Ministry of Water Resources and Irrigation (MWRI) main role is to regulate the water governance system in Egypt, in order to secure unpolluted and sufficient water needed for different human activities and the economic development nationwide. As mentioned before, MWRI has set a National Plan for Water Resources 2005-2017 and a National Water Strategy for 2050; with a lot of controversy concerning the methodology such strategy was set, according to some experts. MWRI has different sectors to cover the different mandates of the ministry; however the sector which is involved in the Nile Basin cooperation and Nile Basin Initiative is the Nile Water Sector.

In terms of the Nile Basin Cooperation, MWRI works on regional and bilateral cooperation with the Nile Basin countries. Regional cooperation through the different activities and studies via the Nile Basin Initiative funded by the Nile Basin Trust Fund and Nile Basin countries’ contributions. According to the NWRP (2005-2017), around EGP 2.5 Billion ($400 Million in 2011 USD-EGP exchange rate) were dedicated for the bilateral collaboration with the Nile Basin countries for the period of 2005-2017, in order to increase the water intake. The bilateral cooperation includes aquatic weed control, watershed management, rain water harvesting dams, water resources development, excavating ground wells, technical assistance, exchange of expertise, water management projects in Kenya, Tanzania, Sudan (and South Sudan), Uganda and Ethiopia.

MWRI was the second arm for Egypt’s negotiations on the new CFA, together with the Ministry of Foreign Affairs. MWRI handles the technical aspects of the Nile water, when it comes to Transboundary water management and reports to the Ministry of Foreign Affairs about the possible changes in the Nile water inflows and the technical
cooperation with the Nile Basin countries (either bilaterally or within the framework of the NBI). MWRI represents Egypt in the NILE-COM (Nile-Council of Ministers) and the NILE TAC (Nile-Technical Advisory Committee) of the Nile Basin Initiative. MWRI reports on the latest developments to the Ministry of Foreign Affairs and the Intelligence as well, in order to analyze the outcomes, trends and possible future actions of the Nile Basin countries.

Although MWRI’s main role is technical, a political advisor to the Minister is present in order to provide assistance when it comes to the possible actions and replies to be carried out, in coordination with the Ministry of Foreign Affairs. The Ministry is always approached by the media for press releases concerning the latest developments in the Nile Basin and the state of negotiations. Sometimes, due to absence of clear communication strategy the response of the Ministry was not consistent when talking to the media. For example, after the failure of the negotiations in April 2010, the Minister of MWRI gave aggressive press releases concerning Egypt’s position that gave an impression of possible escalations to the situation.

**Egyptian Intelligence:**

The Egyptian Intelligence involvement in the Nile Basin disputes highlights the fact that water is a top national security issue. The Egyptian Intelligence main role is collecting information in a dual route communication network with MWRI, MFA, the Presidential cabinet and any other entity that the Egyptian government thinks would be of benefit to get out of the bottleneck. Dual route communication means that Information is flowing in two ways from and to the institutions. However, implementing a certain policy is done via the Presidential Cabinet, Prime Minister and the Supreme Committee for Nile Water.

**Supreme Committee for Nile Water:**

The Supreme Committee for Nile Water is a Ministerial Committee, under the Prime Minister, where the different Ministers concerned with Nile Water issues (Ministry of Water Resources and Irrigation; Ministry of Agriculture; Ministry of Planning and International Cooperation; Ministry of Foreign Affairs; Ministry of State for Environmental Affairs; Ministry of Housing Utilities and Urban Development; Ministry of Electricity and Energy; Ministry of transport; Ministry of Defense; Egyptian
Intelligence; and Council of State. However, the ministries involved in the Committee sometimes differ, based on the situation. For example, in the meeting for July 2010, Minister of Finance and the Minister of Health were invited for the meeting (The Cabinet of Ministers, 2010). The Committee discusses all the issues related to the Nile Water, especially the cooperation with the Nile Basin countries. The Supreme Committee of Nile Water coordinates the National water priorities, based on the experts’ opinions and the Ministries reports on the recent development, state-of-play and alternative policy options, especially those relevant to the Nile Basin cooperation and negotiations. The Supreme Committee also works on coordinating between the different ministries to overcome any overlapping in actions and policies. Some experts has also mentioned there was a lack of coordination within the Supreme Committee for the Nile Water, especially in the Water (Fig 4)
Figure 4: Provisional mapping of the Members of Supreme Council for Nile Water, based on the press releases of Cabinet of Ministers and consultation with experts.

The top of the executive branch in the Egyptian authorities, the presidential cabinet, plays a major role, as the decisions that concern the National security are taken by the President and his advisors, based on the reports from different ministries and agencies. The Parliament also plays a role in setting the different policies through thematic committees to discuss the different issues and problems and set it for discussion. For example the foreign policy issues are discussed through the Parliament’s Committee for Foreign Affairs. Since Egypt is Single party dominance, authoritarian state, the National Democratic Party, with the majority of the sets in the parliament, sets the policies either in the parliament, or within the Policies Committees of the NDP. Therefore, the presence of the NDP, as one of the actors, would be justified only due to
the parliament and the presidential palace presence as players in Egypt’s front-line policy makers for the Nile Basin dispute.

**Newly-favored players:**

**Ministry of Planning and International Cooperation:**

The Ministry of Planning and International Cooperation (MoPIC) was introduced recently in order to coordinate and monitor the different technical cooperation projects between Egypt and other countries, either in Egypt or outside Egypt (MoPIC, 2011). MoPIC works together with the EU, for example, and other relevant ministries in the implementation of major projects in Egypt. An example of such projects would be the Water Sector Reform Programme, funded by the EU, with €80 Million in order to change Egypt’s water sector into a more sustainable system and implement the IWRM approach in Egypt, based on Egypt’s National Water Resources Plan. Implementing such projects, funded by foreign aid, are done under the umbrella of MoPIC, within a previously-set political framework set by the donor agency and the Ministry of Foreign Affairs.

Involving MoPIC in the Nile Basin disputes, have two main goals: (i) assure that Egypt is willing to upgrade and strengthen its relations with the Nile Basin countries into technical cooperation in building infrastructure and pilot scale projects; and (ii) adding a new factor into the scene (not in the negotiations), which is mutual interests. However, some experts also believe that involving MoPIC was more of an involvement of the Minister herself, as a person for discussing the Nile Basin matters. Although Egypt was providing small scale technical projects through the Technical Cooperation Funds for Africa, managed by the MFA, MoPIC would add the capacity of including Egypt and the Nile Basin countries into trilateral cooperation. Trilateral cooperation concept is based on involving only three countries into the technical cooperation, where the third country would be one of the donors. An example of that was the proposal done by the Minister of Planning and International Cooperation, to the EU Commissioner for Enlargement and Neighborhood Policy, in September 2010, to involve the European Union into a trilateral cooperation with the Nile Basin countries (Al-Ahram Newspaper, 2010).

The MoPIC is also going to coordinate, together with the MFA and other Ministries, such as the Ministry of Electricity and Energy and the Ministry of Communication and Information Technology towards enhancing the relations with the
Nile Basin countries through investments in the field of power generation (Akhbar Al-Youm Newspaper, 2010) and information technology infrastructure (Ministry of Communication and Information Technology, 2011).

**Private Sector**

The Egyptian Businessmen could be one of Egypt’s new tools towards enhancing cooperation with the Nile Basin countries. Since Egypt cannot support the Nile Basin countries, financially, through grants and aid in large amounts, Egypt has started encouraging the Egyptian business community to invest in the Nile Basin countries, especially in Agriculture, communication, transportation and infrastructure.

However, the main problem that might face them is that the security and stability in Africa is always putting some hurdles and problems towards investing in Africa. According to several media reports, Egypt’s investments in the Nile Basin countries have reached $4 Billion in 2010, where around $3 Billion went to Sudan and $1 Billion in Ethiopia (Al-Ahram Newspaper, 2010; Egyptian Embassy to Ethiopia, 2011). It was highlighted in one of the Wikileaks Cable documents, from the US Embassy in Addis Ababa, in January 2010 that the Egyptian push for investments was discussed. According to this cable communication, Egypt’s former Prime Minister, Ahmed Nazif, visited Ethiopia, with several cabinet ministers and 26 Agricultural companies to invest in cultivating cereals in 49,400 acres, through loans of $40 Million from the National Bank (Wikileaks, 2010).

**Civil Society and Religious entities:**

Civil society, such as the Coptic religious groups travelling to the different countries in the Nile Basin and provide help and assistance, in the name of the Egyptian Coptic church. Assistance provided includes medical treatment, setting hospitals, such as the Coptic Orthodox Church of Africa hope Center Missions and the Coptic Hospital in Kenya. In addition, Al-Azhar missions to different African countries, to teach Islam and Arabic language (Ministry of Foreign Affairs, 2011). The involvement of civil society would help in creating a cultural dialogue. In addition, Egypt is a member of the Nile Basin Discourse, which is a network of the civil societies of the Nile Basin countries, where they promote sustainable development and water management to the population in the Nile Basin countries.
The 2\textsuperscript{nd} National Nile Forum that took place on 19 April 2011, where different witnessed representatives from the national civil societies, especially those involved in environmental protection, representatives from MWRI, MFA Ambassadors of the Nile Basin countries, university professors and media. in addition to group from the 25\textsuperscript{th} of January youth. The meeting reflected the interest of the civil societies in playing a role in Egypt’s new People’s/Public Diplomacy approach; focusing on media awareness and avoid falsified media information concerning the cooperation with the Nile Basin countries; enhancing the efforts for public awareness, especially in schools, in order to reflect the importance of cooperation with the Nile Basin countries.

![Diagram](image-url)  
**Figure 5: Nile Basin Main frontline Egyptian Players after the 25 January 2011 – Status quo**

From Fig. 5, the Supreme Committee for Nile Water sets the broad objectives to the different Ministries, especially MWRI, MoFA, MoPIC and other Ministries. Meanwhile, the Egyptian Intelligence transforms information to and from the different ministries involved. All the communication includes exchanging information and implementation
process. Three different approaches for cooperating with the Nile Basin countries include:

1. **Regional Cooperation through NBI**: MWRI is involved in this process, through its NBI-TAC Egypt and NBI National office at the Nile Water Sector. On the other side, the Nile Basin Discourse plays a parallel role in the engagement of the Civil Society in the NBI, especially in the component for Stakeholders strengthening.

2. **Negotiations of the CFA**: MWRI and MoFA are involved in the negotiations process concerning the CFA. Cross-ministerial coordination is explained in the figure 13.

3. **Development and Cooperation package with the NB countries**: The ministries in the Supreme committee for Nile water are involved in the process. For example, MWRI provides funding for bilateral cooperation, as well as the MFA’s ETFCA and the MoPIC acts as a coordinator for some of such projects. Other ministries are involved, such as the Ministry of electricity in technical assistance and training of experts as well. Other players are the civil society and the religious entities play a role. Business investments mentioned before are involved as well.

Due to the sensitivity of the Nile Basin case, as a matter of national security, the policy making within the scene stayed in a black box, where all the input are provided by the different players in the scene, either ministries or relevant national security agencies, processed within the Supreme Committee for Nile Water, especially with the main Ministries and agencies involved. The output is implemented by the front-line Ministries (MWRI and MFA) for the negotiations and the Nile Basin Initiative, while the MoPIC for the soft arms of Egypt’s diplomacy towards the Nile Basin countries.

**Post-Revolution period: Youth involvement and people’s diplomacy:**

However, with the rapid developments in Egypt, due to the 25th of January revolution, that toppled Mubarak’s regime, the scene of the Egyptian players in the Nile Basin case has changed. While the Presidential Palace, National Democratic Party and Parliament do not exist in the scene, due to the transition of power to the Supreme Council of Armed Forces, new power emerged after the 25th of January youth revolution.
Another new player that was admitted, but has no institutional setup, is the “People’s Delegation”, where key political figures in the post-revolution scene, key experts, members of the 25th January Youth are trying to bring the Nile Basin countries to the negotiations table again. They are representing the Egyptian people, not the Egyptian government. Some experts believe it might be efficient if it is supported by the Government and the Government should build on the achievements of the Delegation. Based on several media interviews set with representatives of this delegation and the National Nile Forum held in April 2011, they are trying to build upon the gains of the revolution and bring back Egypt to Africa, as it was during Nasser’s era, when Egypt had a major role in Africa. People’s diplomacy is ideal method for breaking the political ice by the public visits and mediation. A famous example of People’s, or Public diplomacy was the “Ping-Pong” policy, which was undertaken by the US with China in the 1970s, in order to facilitate the return of US-China relations (USC, 2011). Egypt, during Mubarak’s era, adopted a similar model, by making a “Nile Basin Soccer tournament”, where Egypt and the rest of the Nile Basin countries participated in the tournament (Al-Ahram Newspaper, 2011); however the tournament was not successful because: some key countries did not participate, such as Ethiopia; and there was no enough time to follow up on that outcomes because of the 25th January revolution.

IV. Policy Coordination:

As it has been discussed in the previous section, the Ministry of Foreign Affairs and the Ministry of Water Resources and Irrigation are the main negotiators in the Nile Basin. Based on the interviews and information collected from different sources, the MFA and MWRI coordinate on two different levels: Supreme Council for Nile Water (with the Prime Minister and the different Ministers involved); and Joint Committee of the Ministers and top senior officials of MWRI and MFA.

According to the government officials, the joint committee meets frequently to discuss the latest developments in the Nile Basin dispute and the possible options available. An evidence on such collaboration was revealed by one of the Wikileaks leaked US Cable documents, leaked from the US Embassy to Cairo in December 2009 (Wikileaks, 2009), concerning the visits of a number of Egyptian officials to the Nile Basin countries to present a new investment package in order persuade the countries to
re-discuss the new CFA, after failing to negotiate it in Alexandria in 2009 and before the Nile-COM in 2010 Sharm El Sheikh meeting. These visits included officials from the MFA, MWRI and the Egyptian Intelligence as well. The relationship between the three institutions based on sharing information and trying to unify the opinions into one opinion to represent the Egyptian government (Fig 6). Based on the information collected from different interviews, the three institutions analyze and discuss the possible options available (Fig.6). Such options are then presented to the Supreme Council for Nile Water, headed by the Prime Minister himself. The results of the discussions and the different policy options are then reported, ideally, to the President to take the final decision on such policies.

However, there are no real data concerning the involvement of the Ministry of Foreign Affairs in formulating the Egypt’s Water Policy, or the involvement of MWRI in the formulating the foreign policy.
Cooperation with the Nile Basin involves the same coordination route in the negotiations (discussed in Fig. 7), however, involving MoPIC as a coordinator and facilitator for the different cooperation activities carried out by MWRI and MoFA, in addition to the other ministries involved in the process (Fig. 7). It was reflected also in the Wikileaks Cable documents from the US Embassy to Cairo, December 2009 that reveals that the Egyptian government believes that the Nile Basin countries did not take their investment package seriously and refused the package. Although the Egyptian government said that the refusal of the package was a political decision in order for internal reasons in those countries, it reflects that Egypt did not play a strong role as an investor and a neighboring country.
The large platform for discussion between all the agencies and ministries involved is at the Supreme Council for Nile Water, which is under the Prime Minister and discusses include the Transboundary water management, water pollution and water policies. Such coordination has been intensified after the signing of the CFA by 5 Nile riparian states.

Figure 7: Provision of the Nile Basin Policy coordination between Egypt’s main players for the Bilateral Cooperation with the Nile Basin countries

Egypt has the capacities and the institutions, however the internal coordination and exchange of information between the different institutes was and still is a major hurdle being a black box. The fragmentation in the policies and efforts in national security matters is very critical. Egypt’s Foreign Policy towards Africa is very weak and ignored Egypt’s “historical obligation towards Africa”, that was set during Nasser’s era, where Egypt played the role of the “big sister” country. Egypt’s new water policies have
to recognize scenarios of lower water flow to Egypt. The post 25th of January revolution, Egypt has realized the importance of enhancing the relations with Africa, especially after the 6th signature to the CFA by Burundi. Different strategies and plans are discussed to enhance the bilateral and regional cooperation in the form of more assistance and development projects of mutual interest.

In order to map what the Egyptian government and investors can present as a package of development and cooperation, it is important to study the economical development indicators and the main development projects (in terms of budget) in the Nile Basin countries. This will help us in pointing out how should the Egyptian investments, financial and technical support should be channeled, towards what kind of projects.
Chapter IV - Water-related development in the Nile Basin

Introduction

Transboundary shared water resources are increasingly described as potential catalysts of international cooperation, as they create inter-dependencies and offer benefits that can be tapped by jointly exploiting comparative advantages in different riparian states (Sadoff and Grey 2005). Whittington, Wu and Sadoff explained in their paper on economic development opportunities in the Nile Basin the different economic benefits for six scenarios of cooperation between the Nile Basin countries (Whittington, 2005). It is estimated that $7-$11 Billion is the expected economic benefits from water usage in irrigation and hydropower generation, within the concept of the “economic value of water”.

In relation to the previously mentioned four economic pressures, highlighted by Whittington, six scenarios were discussed, based on the Nile Economic Optimization Model were put on the table, depending on the level of cooperation. The six scenarios were: (1) status quo (limited cooperation); (2) partial utilization of the Blue Nile Basin for hydropower electricity generation; (3) full utilization of the Blue Nile Basin for hydropower electricity generation; (4) utilizing wetlands in Sudan; (5) White River Basin for hydropower; and (6) Full cooperation, which includes all the previously mentioned five scenarios (Whittington2005). The aim of this chapter is to describe the socioeconomic changes in the Nile Basin countries, during the period of 2000-2007, in terms of agriculture, irrigation, hydropower electricity generation and urbanization. In addition, it includes a illustration of the major three water-related development projects in each country and the investments that the Nile Basin countries are willing to put for such projects.

The results of the description of such trends would highlight the main priorities of these countries, on the ground, which would act as a window of opportunity for bilateral and regional cooperation. According the World Bank classification, 8 countries (Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Rwanda, Tanzania and Uganda) are Low Income Countries, while Egypt and Sudan are considered Low Medium Countries. This reflects that the countries sharing the Nile Basin are facing a great
economic challenge in order to achieve their national development goals. Because water is an important driver for development, water database (FAO and World Bank) is used here to describe the trends of agricultural development, energy generation and urbanization in the Nile Basin Countries.

This chapter consists of two main parts to explain the relationship between water withdrawal and agricultural development, hydropower electricity generation and urbanization in the Nile Basin.

**Empirical studies for the relation between water withdrawal and economic development factors in the Nile Basin countries:**

From the Empirical studies on the Nile Basin countries would study the impact of the agriculture needs, hydropower generation and urbanization on the total annual freshwater withdrawals in the Nile Basin countries. In theory, water demand (reflected in the annual water withdrawals) would increase with the need for economic development and urbanization.

\[
F (\text{Total Annual Freshwater withdrawals (bcm)}) = \text{Agricultural needs, urbanization, GDP and Human Development}
\]

The annual freshwater withdrawal reflects the increase in the demand for water for the different activities every year. The data available from the World Bank database, FAO’s AQUASTAT shows data collected for different years, not for every year. UNEP-GEO calculates the data available as an average for water use in 5 years interval. Therefore, in my analysis, I will use the UNEP-GEO data as reference for average interval of years 2003-2007. This was considered a limiting because it does not show the change in the annual water withdrawal, which should be increasing, with the increase in uses and needs for economic growth in the Nile Basin countries.

The Agricultural development includes the percentage of Agricultural land and the percentage of the irrigated land. The increase in irrigated land marks the increase in the withdrawal of freshwater needed for growing crops on permanent and arable lands (also known as the cropland). The dataset were collected from the World Bank World Development Indicators for 2010. In order to utilize the dataset, I used the irrigated area
as a percentage of the total cropland (per Sq Km) per country. Data available were available for the period of 2000-2003, which was considered a limitation, because ideally the calculations did not include the information from 2004-2007.

Hydropower electricity generation marks the building of dams on the river flow. If the dams are for hydropower purposes only, then building hydropower dams on the rivers will not affect the freshwater withdrawals. However, multipurpose dams would allow using the water for irrigation and other different activities, which would reduce the amount of water available. Here, I used the amount of electricity produced by hydropower as Giga-watt per hour. The data set was not complete due to the lack of information from Burundi and Uganda, which was a limiting factor in having a complete dataset for the regression.

Urbanization is earmarked with the increase of the urban population every year. Increasing the urban population requires providing better water services with an acceptable range of quality. Urbanization would increase the withdrawal of the water. The data used from the World Bank 2010 indicators.

Gross Domestic Product is refers to the market value of all final goods and services produced within a country in a given period. GDP is an indicator for the standard of living ad productivity. Data were collected from the World Bank database for 2010.

Human Development Index is a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living. The data were collected for years 2000-2007 from the UNDP database. Eritrea was the only country that did not have an HDI.

Several factors were not taken into consideration due to the lack of data available, such as the following: (1) Industrialized activities in the Nile Basin countries; (2) Impact of climate change on agriculture and water availability; (3) water pricing in urban areas; and (4) Water productivity in the different activities that are related to water, such as agriculture and industry. Such factors would have added more variables to the equation for a more accurate regression. Another limitation was the lack of data concerning some of the Nile Basin countries.
The datasets collected were used to run a linear correlation between independent variables (Irrigated land in Km²; urban population in millions; and HDI) and the dependent variable of the water withdrawal (y) (Wooldridge et al, 2009).

**Correlation:**

<table>
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<th>Irrigation land</th>
<th>Urbanization</th>
<th>HDI</th>
<th>Annual freshwater withdrawals, total (billion cubic meters)</th>
<th>GDP</th>
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<td>.741**</td>
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<tr>
<td></td>
<td>Sig. (2-tailed)</td>
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<td></td>
<td>N</td>
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<td>40</td>
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<tr>
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<td>1</td>
<td>.558**</td>
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<td>.000</td>
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<td></td>
<td>N</td>
<td>40</td>
<td>80</td>
<td>72</td>
<td>80</td>
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<tr>
<td>HDI</td>
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<td>.558**</td>
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<td>N</td>
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<tr>
<td>Annual freshwater</td>
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<td>.736**</td>
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<td>withdrawals, total</td>
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<td>(billion cubic</td>
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<td>meters)</td>
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<td>40</td>
<td>80</td>
<td>72</td>
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</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).**

Pearson correlation shows that irrigation land, urbanization, GDP and HDI are correlated with the annual water withdrawal. Correlation between the annual water withdrawal and the irrigation land is (N=40; p=1; c=0.418), which means that it is highly correlated in a positive manner. The second factor that is highly correlated with the water is the GDP (N=40; p=0.901; c=0.418). Urbanization (N=40; p=0.836; c=0.418) was ranked third in the correlation, while HDI (N=36; p=0.736; c=0.449) was ranked fourth,
in terms of correlation. All the correlations are in the positive direction and are considered highly correlated.

The significance level (or p-value) is the probability of obtaining results as extreme as the one observed. If the significance level is very small (less than 0.05) then the correlation is significant and the two variables are linearly related. All the variables (dependent and independent) show a high degree of significance as well.

The empirical study shows that the Nile Basin countries require water for the different fields of development, especially for irrigation and urbanization. GDP also is correlated with the water withdrawal, because an increase in GDP means more productive activities in different fields such as, agriculture and industry. HDI, which reflects the human development in terms of income, education and health, also reflects the economic status and human capacities in the Nile Basin countries. All the variables show that increasing water withdrawal is considered a sign of possible economic development, especially in terms of agriculture and urbanization. The following section will reflect this in more descriptive manner, especially that another factor, which is hydropower power generation (it is considered insignificant to water withdrawal; however it is an important factor for economic development in the Nile Basin countries). I will be using the same independent variables, as they are highly correlated to the water demand (water withdrawal)
Descriptive Statistics of the Nile Basin countries

I. Gross Domestic Product and its growth rate:

This graph (Fig 8) shows the large economical gap between Egypt and the rest of the countries in terms of GDP at Market price (WB Database, 2010). However, the GDP annual growth%, during 2008, shows that the growth rate in Ethiopia (11%) and Rwanda (11%) is much faster than that of Egypt (7%) and Sudan (8%).

The high annual growth of GDP (Fig 9, annex 1) in the upstream countries, with the increasing GDP during 2000-2008 shows that there is a progress in the economic development. For example, Ethiopia’s sustainable development and poverty reduction
support program’s main building block is the agricultural development led industrialization (ADLI).

II. **Agriculture development**

(a) **Agricultural Land area**

Comparing the percentage of land used for agriculture, Egypt has the lowest percentage (3.6%), because most of the agricultural activities present around the Nile River. Meanwhile, Burundi has a higher percentage of agriculture land (87%). However, this is not an indicator about the level of agriculture development, and the utilization of water. Agricultural land is the total of the permanent cropland, permanent pastures and the arable land.

| Agricultural land (% of land area), World Bank, 2010 |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                | 2000           | 2001           | 2002           | 2003           | 2004           | 2005           | 2006           | 2007           |
| Burundi        | 88.40          | 89.84          | 91.16          | 90.73          | 89.76          | 89.02          | 89.17          | 89.37          |
| Egypt          | 3.31           | 3.35           | 3.44           | 3.42           | 3.49           | 3.54           | 3.55           | 3.55           |
| Eritrea        | 74.55          | 74.57          | 74.57          | 74.92          | 74.26          | 74.48          | 74.77          | 74.67          |
| Ethiopia       | 30.66          | 31.41          | 30.60          | 31.61          | 33.10          | 33.69          | 34.22          | 35.08          |
| Kenya          | 46.86          | 47.16          | 47.12          | 47.22          | 47.43          | 47.44          | 47.53          | 47.44          |
| Rwanda         | 67.69          | 70.90          | 74.99          | 76.41          | 76.21          | 76.21          | 76.00          | 78.03          |
| Sudan          | 56.20          | 56.26          | 56.32          | 56.97          | 56.96          | 57.59          | 57.53          | 57.56          |
| Tanzania       | 38.38          | 38.50          | 38.72          | 39.20          | 39.23          | 39.23          | 39.23          | 38.61          |
| Uganda         | 62.26          | 62.47          | 62.47          | 63.23          | 63.99          | 64.50          | 64.50          | 65.00          |
| DR Congo       | 10.06          | 10.06          | 10.06          | 10.06          | 10.06          | 10.06          | 9.99           | 9.99           |

Table 2: Agricultural land (% of land area) in the Nile Basin countries (2000-2007)

The trend of annual growth rate of agricultural land, (Fig. 10, annex 1) shows that Ethiopia has the highest trend, followed by Uganda. All other Nile Basin countries, including Rwanda, Egypt and Sudan have a decreasing annual growth of agricultural land. Adding new land to the agricultural area in some countries like Egypt means most of the time carrying out extensive reclamation projects in the desert land, these projects are high in cost and consume extensive quantities of water.

(b) **Irrigated land and Future Investments for Irrigation**

Table (3) shows that there is difference between the Nile Basin countries in terms of potential irrigated area (FAO 1997)
<table>
<thead>
<tr>
<th>Countries</th>
<th>Irrigation potential (ha)</th>
<th>Area already under irrigation (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>80 000</td>
<td>0 (not much data were available)</td>
</tr>
<tr>
<td>Egypt</td>
<td>4 420 000</td>
<td>3 078 000</td>
</tr>
<tr>
<td>Eritrea</td>
<td>150 000</td>
<td>15 124</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2 220 000</td>
<td>23 160</td>
</tr>
<tr>
<td>Kenya</td>
<td>180 000</td>
<td>6 000</td>
</tr>
<tr>
<td>Rwanda</td>
<td>150 000</td>
<td>2 000</td>
</tr>
<tr>
<td>Sudan</td>
<td>2 750 000</td>
<td>1 935 200</td>
</tr>
<tr>
<td>Tanzania</td>
<td>30 000</td>
<td>10 000</td>
</tr>
<tr>
<td>Uganda</td>
<td>202 000</td>
<td>9 120</td>
</tr>
<tr>
<td>DR Congo</td>
<td>10 000</td>
<td>0 (not much data were available)</td>
</tr>
<tr>
<td>Sum of countries</td>
<td>10 192 000</td>
<td>5 078 604</td>
</tr>
</tbody>
</table>

Table 3: Irrigation Potential in the Nile Basin (FAO, 1997)

Table (4) shows that Ethiopia and Rwanda only 2.5% and 1.6% respectively of its cropped land are irrigated, while this percentage reach about 10% in Sudan and more than 95% in Egypt. Data also indicates that most of the Nile Basin countries dependent mainly on the rain-fed agricultural system.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>1.59</td>
<td>1.57</td>
<td>1.55</td>
<td>1.55</td>
</tr>
<tr>
<td>Egypt</td>
<td>100</td>
<td>100</td>
<td>99.94</td>
<td>100</td>
</tr>
<tr>
<td>Eritrea</td>
<td>3.73</td>
<td>3.72</td>
<td>3.72</td>
<td>3.50</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2.71</td>
<td>2.53</td>
<td>2.73</td>
<td>2.46</td>
</tr>
<tr>
<td>Kenya</td>
<td>1.58</td>
<td>1.57</td>
<td>1.63</td>
<td>1.85</td>
</tr>
<tr>
<td>Rwanda</td>
<td>0.78</td>
<td>0.71</td>
<td>0.65</td>
<td>0.61</td>
</tr>
<tr>
<td>Sudan</td>
<td>11.39</td>
<td>11.30</td>
<td>11.19</td>
<td>10.24</td>
</tr>
<tr>
<td>Tanzania</td>
<td>1.60</td>
<td>1.70</td>
<td>1.80</td>
<td>1.78</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
<td>0.12</td>
</tr>
<tr>
<td>DR Congo</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
</tr>
</tbody>
</table>


With increasing population and need for food security in the Nile Basin countries, more investment are targeting irrigated systems. Table (5) illustrate investments for water-related development projects in the Nile Basin countries (FAO, 2008), showing difference in Investment for water-related development projects.
<table>
<thead>
<tr>
<th>Country</th>
<th>Short Scale Water Control ($Million)</th>
<th>Scale Water Control ($Million)</th>
<th>Rehabilitation of Irrigation ($Million)</th>
<th>Large hydraulic Scale project ($Million)</th>
<th>Total ($Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>92</td>
<td>135</td>
<td>60</td>
<td></td>
<td>287</td>
</tr>
<tr>
<td>Egypt</td>
<td>69</td>
<td>2000</td>
<td>4636</td>
<td></td>
<td>6705</td>
</tr>
<tr>
<td>Eritrea</td>
<td>120</td>
<td>10</td>
<td>60</td>
<td></td>
<td>190</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>1262</td>
<td>132</td>
<td>619</td>
<td></td>
<td>2013</td>
</tr>
<tr>
<td>Kenya</td>
<td>357</td>
<td>101</td>
<td>230</td>
<td></td>
<td>687</td>
</tr>
<tr>
<td>Rwanda</td>
<td>85</td>
<td>6</td>
<td>6</td>
<td></td>
<td>98</td>
</tr>
<tr>
<td>Sudan</td>
<td>1278</td>
<td>2750</td>
<td>1000</td>
<td></td>
<td>5028</td>
</tr>
<tr>
<td>Tanzania</td>
<td>354.85</td>
<td>350.88</td>
<td>376.64</td>
<td></td>
<td>1082.37</td>
</tr>
<tr>
<td>Uganda</td>
<td>284</td>
<td>168</td>
<td>3950</td>
<td></td>
<td>4403</td>
</tr>
<tr>
<td>DR Congo</td>
<td>236</td>
<td>21</td>
<td>26</td>
<td></td>
<td>282</td>
</tr>
</tbody>
</table>

Table 5: Investments for Water-related Development Projects in the Nile Basin countries (FAO, 2008)

It shows that Egypt is going to invest around $6.7 Billion for irrigation projects on the Nile River in the future (timeline has not been specified), however, the figures show that Sudan (North and South Sudan), Uganda, Ethiopia and Tanzania are planning ahead for developing the irrigation schemes and techniques (more information in the annexes).

Data collected for the agricultural development from the World Bank database for 2010 shows the recent developments in the Nile Basin countries during the period of 2000-2007, rate of annual increase in agricultural land, and the investments marked for the development of better irrigation schemes. Data reflects the national strategies set by the Nile Basin governments for further development, showing great potential for agricultural development in the riparian states. During the period of 2000-2007, the average of the Nile Basin countries agricultural contribution to the GDP was 33% of the GDP, second to the contribution of services, as a percentage of the GDP (average of 45.7%).

### III. Hydropower:

Hydropower is a source of renewable energy which is generated via building dams and using the geographical differences between highlands and lowlands, giving the potential for water to flow downwards and generating electricity. Hydropower is considered a major source of production of electricity in the Nile Basin countries,
especially Egypt, Ethiopia, DR Congo, Tanzania and Kenya. Not all the sites in the Basin are suitable for hydropower generation. Number of studies have to be conducted before establishing such huge projects, including feasibility studies, dam construction, environmental impact assessment (EIA), and impact on the livelihood of the local communities, numbers of studies were conducted concerning the economical development of hydropower generation in the Nile Basin countries and a number of feasibility studies were conducted within the framework of the Nile Basin Initiative for maximizing the use of the potentials on a regional level between the Nile Basin countries.

Figure 9: Electricity production by Hydropower (% of total electricity production) in the Nile Basin countries (2000-2006)

Figure (9) shows that Ethiopia and DR Congo are almost 100% depending on the Hydropower for generating electricity, while Eritrea did not install any facilities for generating electricity using hydropower. In Tanzania and Kenya, there was a decrease in the electricity produced by hydropower, while Egypt does not depend mainly on the hydropower for producing electricity, where it is more depending on the natural gas for this purpose. A study showed that there is a wide gap between the installed hydropower generation and the potential hydropower generation, especially in Ethiopia, Sudan, Tanzania and Uganda (Mason, 2001). The main results of this study are shown in Table (6). The use of the hydropower electricity would secure the energy required for industry and better access of electricity in the urban regions and support the rural development.
### Potential hydroelectric power Generation (Mason, 2001)

<table>
<thead>
<tr>
<th>Country</th>
<th>Installed Hydropower (MW)</th>
<th>Potential Hydropower (MW)</th>
<th>% of the Installed hydropower from the potential hydropower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>41</td>
<td>161</td>
<td>25.47%</td>
</tr>
<tr>
<td>DR Congo</td>
<td>23.1</td>
<td>2600</td>
<td>0.89%</td>
</tr>
<tr>
<td>Egypt</td>
<td>2,845</td>
<td>2983</td>
<td>95.37%</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>410</td>
<td>30,000</td>
<td>1.37%</td>
</tr>
<tr>
<td>Kenya</td>
<td>2</td>
<td>357</td>
<td>0.56%</td>
</tr>
<tr>
<td>Rwanda</td>
<td>34</td>
<td>155</td>
<td>21.94%</td>
</tr>
<tr>
<td>Sudan</td>
<td>238</td>
<td>1618</td>
<td>14.71%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>337</td>
<td>4837</td>
<td>6.97%</td>
</tr>
<tr>
<td>Uganda</td>
<td>180</td>
<td>5000</td>
<td>3.60%</td>
</tr>
</tbody>
</table>

Table 6: Potential Hydroelectric Power generation in the Nile Basin countries (Mason, 2001)

The abovementioned table shows very high potentials for hydropower, especially in Ethiopia, D.R. Congo and Tanzania, in general. With the increasing demand for development, energy becomes a necessity, especially in developing countries such as the Nile Basin riparian countries. Therefore, building dams on the rivers are considered a necessity for irrigation, providing water supply needed for urbanization and settlement and producing hydroelectricity for industrialization and enhancing the different sources of income for the countries. Table (7) shows dams in the Nile Basin countries and their use (FAO, 2010).

### Dams on the Nile Basin – AQUASTAT 2010

<table>
<thead>
<tr>
<th>Name of dam</th>
<th>Country</th>
<th>Irrigation</th>
<th>Water supply</th>
<th>Flood control</th>
<th>Hydroelectricity</th>
<th>Navigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assiut barrage</td>
<td>Egypt</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Esna barrage</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>High Aswan dam</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nag-Hamady barrage</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Aswan dam</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abarda</td>
<td>Eritrea</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alwerro</td>
<td>Ethiopia</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finchaa</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ellegirini</td>
<td>Kenya</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jebel Aulia (Jabal Awliya)</td>
<td>Sudan</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khashm El Gibra</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7: Dams already built within the Nile Basin (AQUASTAT 2010)

<table>
<thead>
<tr>
<th>Dam</th>
<th>Egypt</th>
<th>Sudan</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roseires</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sennar</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Bujagali</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Owen Falls</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Table (7) also shows that majority of the dams are in Egypt, with 5 dams and Sudan with 4 dams. For Egypt, two dams were built for providing the hydropower needed, which represents around 10-14% of the total electricity generated in the country. In Sudan, there are 4 dams; all of them were built for the irrigation and hydropower in the south east of Sudan.

To conclude, hydropower is considered one of the means for development of the Nile Basin countries. Hydropower would give the opportunity for the countries to use the generated electricity for industries, mining, rural development and urbanization. It could also act as a source of income for the country, especially when it comes to exporting the electricity produced to the neighboring Nile Basin countries, through regional interconnections. With the increase in the population, the demand for electricity would increase as well.

IV. **Population growth and Urbanization:**

The total population of the Nile Basin countries (Fig 12, annex 1) reached more than 400 Million people in the year 2010 (World Bank database, 2010), where Egypt and Ethiopia had almost 160 Million people in total. However, the growth rate of the population showed different patterns, where Uganda had the highest level of population growth of more than 3%. Rwanda had a drop in the growth rate of the population, especially in the urban population growth rate. Egypt had the lowest growth rate of the population in all the Nile Basin countries.

In the Nile Basin countries, where the majority of the population lives in rural areas, the rate of population growth in the urban areas is increasing, compared to those in the rural areas.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>4.18</td>
<td>4.86</td>
<td>5.21</td>
<td>5.45</td>
<td>5.55</td>
<td>5.53</td>
<td>6.12</td>
<td>6.05</td>
</tr>
<tr>
<td>Egypt</td>
<td>1.80</td>
<td>1.90</td>
<td>1.91</td>
<td>1.91</td>
<td>1.90</td>
<td>1.88</td>
<td>1.95</td>
<td>1.93</td>
</tr>
<tr>
<td>Eritrea</td>
<td>4.90</td>
<td>5.66</td>
<td>5.90</td>
<td>5.95</td>
<td>5.77</td>
<td>5.46</td>
<td>5.71</td>
<td>5.39</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>4.02</td>
<td>4.25</td>
<td>4.19</td>
<td>4.15</td>
<td>4.12</td>
<td>4.10</td>
<td>4.45</td>
<td>4.41</td>
</tr>
<tr>
<td>Kenya</td>
<td>3.32</td>
<td>3.61</td>
<td>3.60</td>
<td>3.59</td>
<td>3.59</td>
<td>3.59</td>
<td>4.07</td>
<td>4.06</td>
</tr>
<tr>
<td>Rwanda</td>
<td>14.99</td>
<td>9.55</td>
<td>7.68</td>
<td>6.43</td>
<td>6.05</td>
<td>6.26</td>
<td>3.98</td>
<td>4.18</td>
</tr>
<tr>
<td>Sudan</td>
<td>4.99</td>
<td>4.73</td>
<td>4.56</td>
<td>4.44</td>
<td>4.41</td>
<td>4.42</td>
<td>4.30</td>
<td>4.31</td>
</tr>
<tr>
<td>Tanzania</td>
<td>4.17</td>
<td>4.28</td>
<td>4.29</td>
<td>4.30</td>
<td>4.32</td>
<td>4.34</td>
<td>4.61</td>
<td>4.62</td>
</tr>
<tr>
<td>Uganda</td>
<td>3.76</td>
<td>3.81</td>
<td>3.85</td>
<td>3.88</td>
<td>3.90</td>
<td>3.90</td>
<td>4.54</td>
<td>4.53</td>
</tr>
<tr>
<td>DR Congo</td>
<td>3.49</td>
<td>4.35</td>
<td>4.52</td>
<td>4.60</td>
<td>4.56</td>
<td>4.43</td>
<td>4.79</td>
<td>4.67</td>
</tr>
</tbody>
</table>


Although the average of growth rate of urban population shows a decrease from 2000 to 2007 (4.9% in 2000 to 4.4% in 2007), analyzing the country-by-country data shows difference between countries. The urbanization rate was the highest in Rwanda in 2000, where it reached around 15% and then dropped to 10% the year after. Ethiopia maintained an increasing urban population rate from 2000 to 2007. Egypt maintained almost a constant rate of urban population growth of around 1.9% from 2001 to 2007, which is the lowest in the Nile Basin countries (Table 8).


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>1.25</td>
<td>1.74</td>
<td>2.17</td>
<td>2.49</td>
<td>2.66</td>
<td>2.71</td>
<td>2.68</td>
<td>2.70</td>
</tr>
<tr>
<td>Egypt</td>
<td>1.96</td>
<td>1.90</td>
<td>1.91</td>
<td>1.91</td>
<td>1.90</td>
<td>1.88</td>
<td>1.79</td>
<td>1.77</td>
</tr>
<tr>
<td>Eritrea</td>
<td>3.25</td>
<td>3.49</td>
<td>3.76</td>
<td>3.84</td>
<td>3.69</td>
<td>3.40</td>
<td>2.92</td>
<td>2.64</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2.44</td>
<td>2.37</td>
<td>2.34</td>
<td>2.32</td>
<td>2.31</td>
<td>2.31</td>
<td>2.24</td>
<td>2.24</td>
</tr>
<tr>
<td>Kenya</td>
<td>2.43</td>
<td>2.35</td>
<td>2.35</td>
<td>2.35</td>
<td>2.36</td>
<td>2.37</td>
<td>2.25</td>
<td>2.26</td>
</tr>
<tr>
<td>Rwanda</td>
<td>5.42</td>
<td>3.47</td>
<td>1.84</td>
<td>0.83</td>
<td>0.65</td>
<td>1.04</td>
<td>2.05</td>
<td>2.28</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.80</td>
<td>0.68</td>
<td>0.55</td>
<td>0.47</td>
<td>0.47</td>
<td>0.51</td>
<td>0.67</td>
<td>0.70</td>
</tr>
<tr>
<td>Tanzania</td>
<td>2.08</td>
<td>2.10</td>
<td>2.13</td>
<td>2.17</td>
<td>2.22</td>
<td>2.26</td>
<td>2.22</td>
<td>2.26</td>
</tr>
<tr>
<td>Uganda</td>
<td>3.01</td>
<td>3.06</td>
<td>3.11</td>
<td>3.14</td>
<td>3.16</td>
<td>3.17</td>
<td>3.08</td>
<td>3.09</td>
</tr>
<tr>
<td>DR Congo</td>
<td>2.15</td>
<td>2.16</td>
<td>2.35</td>
<td>2.45</td>
<td>2.42</td>
<td>2.31</td>
<td>1.96</td>
<td>1.87</td>
</tr>
</tbody>
</table>

Table 9: % Rural Population Growth rate in the Nile Basin 2000-2007

Rural population growth rate in the Nile Basin countries (Table 9) shows an average decrease in the growth rate in the time interval of 2000-2007 (2.48% in 2000 decrease to 2.18% in 2007). Egypt had the lowest growth rate of rural population in the Nile Basin.
countries. Population growth between urban and rural areas includes migration from the rural areas to urban areas and vice versa. In our case here, the people migrate from the rural areas to the urban areas. This is reflected in the changes in the composition of the population, shown in figure 13 (annex 1).

Another indicator for urbanization would be the percentage of population with access to improved water resources. From the graph below, it is obvious that Egypt has the highest percentage of population with access to water; meanwhile, Ethiopia is having almost one third Egypt’s values. It shows that the Ethiopian population is suffering from lack of access to improved water resources, which is considered one of the indicators for the MDGs. As for the rest of the Nile Basin countries, there is a major room for improvement. There was no information about Kenya (Fig 14).

![Percentage of population with access to improved water sources in the Nile Basin countries (2000-2005)](image)

Figure 10: % of population with access to improved water sources in the Nile Basin countries (2000-2005). World Bank, 2010

Looking deeply into these data, it is obvious that the urban population has better access to water than the rural areas. The population in the rural areas in Kenya are suffering from very low access to improved water sources. Egypt has achieved a 100% of access to improved water sources in urban areas, while Ethiopia achieved around 88%.
Comparing the rural areas in the two countries, it is obvious that Ethiopia was only able to provide access to improved water sources to 18% of the population, versus 96% in Egypt.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>89</td>
<td>70</td>
<td>85</td>
<td>71</td>
</tr>
<tr>
<td>Egypt</td>
<td>99</td>
<td>93</td>
<td>100</td>
<td>96</td>
</tr>
<tr>
<td>Eritrea</td>
<td>70</td>
<td>50</td>
<td>74</td>
<td>57</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>88</td>
<td>18</td>
<td>95</td>
<td>24</td>
</tr>
<tr>
<td>Kenya</td>
<td>52</td>
<td>1.58</td>
<td>56</td>
<td>-</td>
</tr>
<tr>
<td>Rwanda</td>
<td>85</td>
<td>64</td>
<td>80</td>
<td>63</td>
</tr>
<tr>
<td>Sudan</td>
<td>73</td>
<td>55</td>
<td>53</td>
<td>68</td>
</tr>
<tr>
<td>Tanzania</td>
<td>86</td>
<td>45</td>
<td>82</td>
<td>45</td>
</tr>
<tr>
<td>Uganda</td>
<td>85</td>
<td>53</td>
<td>89</td>
<td>60</td>
</tr>
<tr>
<td>DR Congo</td>
<td>85</td>
<td>27</td>
<td>82</td>
<td>28</td>
</tr>
</tbody>
</table>


V. Human Development

An overall measurement of the population and urbanization would be the human development and unemployment rates. Human development is a very important and critical factor for the economic development in the Nile Basin countries. According to the UNDP, human development index (HDI) emphasizes that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI can also be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with such different human development outcomes. There are four indicators that form the HDI: Life expectancy at birth; Mean years of schooling; Expected years of schooling; and Gross National Income (GNI) per capita.

According to the HDI for 2010, in figure (15), Egypt (still takes the lead compared to Kenya, Ethiopia, Sudan, Uganda, D.R. Congo and Burundi. Information concerning Eritrea and Tanzania were not available. According to the UNDP, HDI gives
an overall picture of Human Development in terms of education, health and economic growth. Table (11) and Figure (15) shows the differences between the Nile Basin countries. It is clear that Egypt, Kenya and Uganda have the highest HDI in 2010; however, Rwanda and Ethiopia made progress in the annual increase of the HDI in the last 10 years.

<table>
<thead>
<tr>
<th>Country</th>
<th>World Rank</th>
<th>2010 HDI (scale of 0.1 to 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>90</td>
<td>0.659</td>
</tr>
<tr>
<td>Kenya</td>
<td>106</td>
<td>0.504</td>
</tr>
<tr>
<td>Uganda</td>
<td>112</td>
<td>0.482</td>
</tr>
<tr>
<td>Sudan</td>
<td>114</td>
<td>0.475</td>
</tr>
<tr>
<td>Rwanda</td>
<td>120</td>
<td>0.456</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>124</td>
<td>0.412</td>
</tr>
<tr>
<td>Burundi</td>
<td>132</td>
<td>0.345</td>
</tr>
<tr>
<td>D.R. Congo</td>
<td>134</td>
<td>0.305</td>
</tr>
</tbody>
</table>

Table 11: Human Development Index in the Nile Basin countries - Ranking and 2010 HDI (UNDP, 2011)

Figure 11: UNDP HDI progress in the Nile Basin countries (2000-2010). UNDP, 2011

There were a number of missing data concerning the unemployment in some of the Nile Basin countries. According to the World Development Indicators for 2010,
Egypt’s unemployment percentage from the total labor force was 10.6% (2006), while in Ethiopia it has reached 17% (2006). However, in Tanzania, the total unemployment was only 4% (2006) and Uganda was 3.2% (2002).

To conclude, the population in the Nile Basin countries is quite high, especially in Ethiopia and Egypt, however the growth rate of the population has been decreasing for those countries. The annual growth rate of the urban population is almost double the figures in the rural areas, which is due to migration and resettlement in the urban areas. The urbanization process is taking place rapidly in the Nile Basin countries. Urbanization process requires improved access to water and sanitation, use of water in construction facilities, providing access to potable water in the rural areas, in order to support their development. Rural development would reduce the rate of migration from rural to urban areas. The economic development and HDI shows that the Nile Basin countries are giving more attention to the Human capacities, such as education, health and economy. Although the rate of growth is considered very low compared to the rest of the world and the MDGs indicators, it is still making some progress. To put more focus on the main development indicators in the Nile Basin countries, in the light of the water usage in those countries.

An important factor that would play a role in affecting the water-related economic development in the Nile Basin is climate change and its uncertainties. Different models have been created in order to predict the possible climatic scenarios that would take place, such as the movement of the rain belt from the Nile plateau, increasing evaporation rate from the water in the Nile Basin, changes in the agricultural patterns as well. Conway (2005) argues that there are no certain predictions of the possible impact of climate change on the Nile flow, due to the variations of the predictions of rainfall patterns in the Basin, between two extremes; increasing rainfall patterns in some areas in the Basin and decrease in the rainfall patterns in other areas in the Basin. Future projections for the climate are based on the emission scenario and the General Circulation Model (GCM) employed, and regional predictions tend to span a range of possible scenarios.
**Water-related Development Projects**

The following table reflects on the different types of projects and their budgets. The projects in this table were taken from the FAO AQUASTAT database for water-related project portfolios. The major three development projects, in terms of budget, in each of the Nile Basin countries are listed for comparison.

<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Status</th>
<th>Budget / Funding partners</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>Egypt-Private Sector and Agriculture Development</td>
<td>Recently implemented (1999-2005)</td>
<td>$600 Million World Bank as a Development Partner</td>
<td>Agriculture</td>
</tr>
<tr>
<td></td>
<td>Agriculture Modernization Project</td>
<td>Recently implemented (1994-2001)</td>
<td>$268.8 Million World Bank as a Development Partner</td>
<td>Agriculture</td>
</tr>
<tr>
<td></td>
<td>Irrigation Improvement Project</td>
<td>On-going project</td>
<td>$182.3 Million World Bank, German Bank for Construction and Development (KfW) and Netherlands as Development Partner</td>
<td>Water Resources and Irrigation</td>
</tr>
<tr>
<td>Burundi</td>
<td>Recovery and Rural Areas Development Programme (PRDMR)</td>
<td>Ongoing project (1999-2009)</td>
<td>€34.2 Million International Fund for Agriculture and Development (IFAD); OPEC Fund for International Development; Government of Burundi; World Food Programme</td>
<td>Multipurpose Development Programme</td>
</tr>
<tr>
<td></td>
<td>Transitional Programme of Post Conflict Reconstruction (PTRPC)</td>
<td>Ongoing project</td>
<td>€32.7 Million International Fund for Agriculture and Development (IFAD); OPEC Fund for International Development; Government of Burundi</td>
<td>Multipurpose Development Programme</td>
</tr>
<tr>
<td></td>
<td>Agriculture Rehabilitation &amp; Sustainable Land Management Supplement Project</td>
<td>Ongoing project</td>
<td>World Bank; Global Environment Facility (GEF)</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Rwanda</td>
<td>National Rice Production Programme</td>
<td>Ongoing project (2006-2016)</td>
<td>€610.86 Million Government of Rwanda is still looking for partners</td>
<td>Agriculture</td>
</tr>
<tr>
<td></td>
<td>Rusumo Falls (Burundi, Rwanda, Tanzania)</td>
<td>Ongoing project (2009-2011)</td>
<td>€114 Million</td>
<td>Hydropower</td>
</tr>
<tr>
<td></td>
<td>Nyabarongo hydropower, provinces South/ East</td>
<td>Ongoing project (2008-2011)</td>
<td>€100 Million Export and Import Bank of India</td>
<td>Hydropower</td>
</tr>
<tr>
<td>Eritre</td>
<td>Program to increase food production for under privileged farmers</td>
<td>Ongoing projects</td>
<td>$30 Million Government of Japan</td>
<td>Agriculture</td>
</tr>
</tbody>
</table>

2 In 2008, high level conference on “Water for Agriculture and Energy in Africa: the challenges of Climate Change” took place in Seirt, Libya, where the African countries discussed their status of the major Water-related Development Projects.
<table>
<thead>
<tr>
<th>Country</th>
<th>Project Name</th>
<th>Type</th>
<th>Description</th>
<th>Cost</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>Zula Plains Integrated Development Project</td>
<td>Pipeline projects</td>
<td>FAO-NEPAD</td>
<td>$54.23 Million</td>
<td>Multipurpose Development Programme</td>
</tr>
<tr>
<td></td>
<td>Integrated Rural Development Project</td>
<td>Pipeline</td>
<td>European Union</td>
<td>€70 Million</td>
<td>Multipurpose Development Programme</td>
</tr>
<tr>
<td></td>
<td>Gibe III Hydropower</td>
<td>Ongoing project</td>
<td>(deadline 2013)</td>
<td>$2119 Million</td>
<td>Hydropower</td>
</tr>
<tr>
<td></td>
<td>Mendaya Hydropower</td>
<td>Pipeline project</td>
<td>(2012-2017)</td>
<td>$2637 Million</td>
<td>Hydropower</td>
</tr>
<tr>
<td></td>
<td>Gibe IV Hydropower</td>
<td>Pipeline project</td>
<td>(2009-2014)</td>
<td>$2214 Million</td>
<td>Hydropower</td>
</tr>
<tr>
<td></td>
<td>Water and Sanitation Service Improvement Project</td>
<td>Ongoing project</td>
<td>(2007-2013)</td>
<td>$150 Million</td>
<td>Water Resources and Irrigation</td>
</tr>
<tr>
<td></td>
<td>Arid Lands Resources Management Project</td>
<td>Ongoing project</td>
<td>(2003-2010)</td>
<td>$120 Million</td>
<td>Agriculture</td>
</tr>
<tr>
<td></td>
<td>Western Kenya Community Driven Development and Flood Mitigation Project</td>
<td>Ongoing project</td>
<td>(2007-2015)</td>
<td>$86 Million</td>
<td>Multipurpose Development Programme</td>
</tr>
<tr>
<td>Kenya</td>
<td>Merowe Dam project</td>
<td>Ongoing project</td>
<td>(2004-2008)</td>
<td>$1966 Million</td>
<td>(Multipurpose for hydropower generation)</td>
</tr>
<tr>
<td></td>
<td>Three Dam building Projects in Southern Sudan – Wau, Juba and Tori</td>
<td>Pipeline project</td>
<td>(after 2015)</td>
<td>$600 Million</td>
<td>Hydropower and Irrigation</td>
</tr>
<tr>
<td>Sudan</td>
<td>Kajabar Dam project (3rd Cataract)</td>
<td>Pipeline project</td>
<td>(after 2015)</td>
<td>$1500 Million</td>
<td>Hydropower and Irrigation</td>
</tr>
<tr>
<td></td>
<td>Bujagali Hydropower Project</td>
<td>Ongoing project</td>
<td>(2007-2011)</td>
<td>$800 Million</td>
<td>Hydropower</td>
</tr>
</tbody>
</table>
Table 12: Sample of the major three projects (based on the budget) in the Nile Basin countries. 3 projects per country were selected randomly

From the above mentioned table, it is clear that every country have its own national priorities, when it comes to water-related development projects. For example, Ethiopia, DR Congo and Uganda are focusing on hydropower development, while Egypt is focusing on irrigation and Tanzania is focusing on Agriculture and food security. It is clear that the development partners (also known as the donor countries) and other international organizations are very active in funding most of these programmes, such as the IFAD. However, most of these countries benefit from long term loans from the World Bank. Table (12) shows that the focus is on Hydropower projects forms almost 33% of the sample, while agriculture comes next with around 23% of the sample. Multipurpose development programme (especially in rural areas) follows with around 17%. Table (13)
shows the majority of the projects in the sample are ongoing (63%), while the majority of the pipeline projects goes to the hydropower projects and hydropower-Irrigation programmes (78%).

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total</th>
<th>Recently Implemented</th>
<th>Ongoing</th>
<th>Pipeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Energy Sector</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Hydropower</td>
<td>10</td>
<td>-</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Hydropower and Irrigation</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Multipurpose Development Programme</td>
<td>5</td>
<td>-</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Water Resources and Irrigation</td>
<td>3</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
<td><strong>2</strong></td>
<td><strong>19</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

Table 13: Analysis to the major Water-related Development projects selected in the sample collected in Table 11

Egypt, being considered the most economically developed country in the region, should play a role in supporting the development of the Nile Basin countries in terms of agricultural development, hydropower and urbanization. According to the websites of the Egyptian Embassies in the Nile Basin countries, Egyptian investors are investing in some of the upstream countries. For example, in 2010, Egypt’s total investments in Ethiopia reached $1 Billion the fields of livestock, agriculture and electricity cables and other sectors (Egyptian Embassy in Ethiopia, 2011). Comparing this figure to Saudi Arabia’s $3 Billion and India’s $2.34 Billion investments in Ethiopia (Aiga Forum, 2010), Egypt is still not investing strategically in Ethiopia. In Eritrea, Egypt’s economic cooperation includes digging wells, investments in the fields of pharmaceutical industry, mining, fishing and health care (Egyptian Embassy in Eritrea, 2011). Egypt cooperates with Uganda involves the private sector participation, especially the Citadel Company, which is the lead investor for renovating the railways between Kenya and Uganda with investments of $150 Million (Egyptian Embassy in Uganda, 2011). Relations with Kenya involved in trade, where the volume of bilateral trade has reached around $378 Million in 2008 (Egyptian Embassy in Kenya, 2011).
Egypt, after the signature of the new Cooperative Framework Agreement by 6 riparian states, is trying to adopt a new approach towards the Nile Basin countries, where investments and business is one of the arms that Egypt is planning to relay on for the coming years. This section reflected the different economic indicators of the Nile Basin countries that large economic gap between the downstream and upstream countries. The development projects listed in the sample also shows that the main sector that the upstream countries are focusing on is the hydropower electricity generation, which is considered an important tool for industrialization, urbanization and economic development. In addition to the economic factors, the impact of climate change would also play a major role in changing the amount of rain falling on the Nile Basin and the water flow.
Chapter V. Policy recommendations towards the Nile Basin countries

I. Political context for Egypt

Egypt should change its hydropolitics towards the Nile Basin countries, especially Ethiopia

From Egypt’s point of view, hydropolitics in the Nile Basin is about the disputes with Ethiopia, the source of 85% of the Nile River flow to Egypt. The 1929 agreement assures that no construction works on the Nile River, which would obstruct the flow of water to Egypt and Sudan, to be conducted without the approval of the downstream countries. Ethiopia’s economic development is depending on building dams, especially the Blue Nile River for the aim of generating electricity and other development programmes. As an effort to maximize the mutual benefit and regional cooperation between the Nile Basin countries, projects for regional power interconnection were set, in order to allow trade of electricity generated by hydropower. These projects were funded under the Nile Basin Initiative. Ethiopia, Sudan and Egypt are on the Eastern Nile Subsidiary Action Programme (ENSAP). The idea behind the Nile Basin Initiative and the new CFA is to coordinate and discuss the development projects that would use the Nile River, in order to assess the impact of these projects on the neighboring countries and encourage regional approach for such projects. Urbanization is also one of the issues that are should be included in the transboundary water management, because beside the water intake for improving the water services for the population, the pollution resulting from urbanization would affect the quality of the water shared between the countries. The Nile water pollution in Egypt does not have any impact on the other Nile Basin countries, as the water flows north, towards the Mediterranean Sea. Pollution would be a critical issue for water flowing from Ethiopian and Equatorial Nile Plateaus.

The total amount of rain that falls in the Nile Basin is around 1600 bcm, where only 84 bcm runs through the different rapids and rivers to form the Nile River. Including the green water (the water that falls on ground and does not run into the rivers) together with the blue water (the water that is running into rivers), for the maximum utilization of the water. This has to be introduced to the CFA for the negotiations.
Challenges to Egypt’s domestic and foreign policies and coordination between different actors have to be met.

Egypt has a system for the flow of information, coordination and hierarchy for policy makers and decision takers. Multilateral committees for discussion between the main players in the Nile Basin; however, Egypt has three main challenges, when it comes to its approach in the Nile Basin. First, as we have discussed earlier, Egypt’s National Water Resources Plan did not set a scenario for the possible decrease of the water flow to Egypt due to: the development projects in the riparian states for hydropower, irrigation or urbanization; and climate change impact on the Nile flow. Egypt’s Strategy for 2050 is more realistic and has set different scenarios of any possible changes on the ground, such as increasing population and impact of climate change on the Nile flow and the coast, as in sea level rise. However, Egypt’s Water Strategy for 2050 is said to be, according to some experts, irrelevant due to lack of coordination with other development plans from the different Ministries that were directly involved in the formulation of the 2017. The second main problem is the rigidity in Egypt’s position, where the main policy is to maintain Egypt’s historical rights of the 55 Billion cm³ and acknowledging the previous agreements. In the view of different experts, defining water security would be much more in favor of Egypt and all the Nile Basin countries than the rigid historical rights, because the increase in the population and the increase of the water demand versus water supply require much more water than Egypt’s historical rights. However, some other experts believe that term of water security is very ambiguous and not well defined. The third challenge is the black box, where the policies are formulated and the roles of the different players are still not clear, due to matters of national security.

Consequently; (i) there is not an integrated policy, which would coordinate and guide the different policies that are related to the Nile Basin and Nile water in general, such as Foreign Policy, Transboundary water policy and International Cooperation Policy and Agriculture policy; and (ii) there is not an institutional setup that would include officials on the horizontal line of all the ministries involved in the Nile water issues, with
the role of coordinating on the level of senior and junior officials and unify Egypt’s position.

What I am proposing here is an idea, with three simultaneous steps, for a better approach and understanding of the need for integrating domestic and foreign policies for a better coordination and impact.

First step is to create a Governmental agency, with a permanent and clear structure, which would coordinate the different policies that are Nile water-related. The Supreme Committee for Nile Water acts as a Ministerial Council for discussing all the aspects of the Nile water; however, there is a need for clear coordination between the senior officials and other categories of the civil servants and researchers in the different ministries as well. The proposed Ministry of State, or Agency would include representatives from the different ministries and agencies involved, in order to coordinate the different activities related to Nile water policy internally, and approaches of cooperation with the Nile Basin countries. The idea of the agency will be mobilizing the resources already dedicated for that matter from the different ministries and direct them towards one institution.

The next step would be an integrated policy towards the Nile Basin countries, which would involve the main three actors in the Nile Basin (MWRI, MFA and MoPIC). Such a policy would be a result of coordinating the different policies of the involved ministries, based on knowledge and information exchange with the other Nile Basin countries, to overcome any overlap between the policies within Egypt and with other Nile Basin countries.

Following this step, a broad spectrum development policy should be adopted, for an effective use of Egyptian taxpayers’ money for assisting the Nile Basin countries, encourage investments and exchange between Egypt and the neighboring countries, with a holistic approach. Such a development policy would be called “Nile Basin Neighborhood Policy” would coordinate the different activities with the Nile Basin countries, within a bilateral and regional cooperation. The programmes and assistance would be provided through the different funding instruments of the Egyptian government, such as Egypt’s Technical Fund for Cooperation with Africa. In addition, it would include clear framework for investment to encourage Egyptian investors to establish
enterprises in the Nile Basin countries. Such investment projects would be in the fields of electricity, irrigation and other themes of mutual interest. The Egyptian government would support the investors via providing studies on the investment environment, economic activities and benefits of investing in the Nile Basin countries. Such a neighborhood policy is a result of coordination between foreign policy and international cooperation policy. An important component would be extending education towards the Nile Basin countries via opening new branches of the major Egyptian public universities the Nile Basin countries and provide scholarships for young researchers and students from the Nile Basin neighborhood in order to study in Cairo and integrate into the Egyptian society.

Mandate:
1. This agency would act as an advisory board for the Prime Minister, in order to provide a unified Egyptian position concerning the collaboration with Nile Basin Countries. It would also provide a wider scope on enhancing the collaboration with the Nile Basin Countries.

Objectives:
1. Collecting data and conducting studies on the Nile Basin from all the Nile Basin countries and the Ministries involved in the Nile Basin. This includes Meteorological data, Agriculture, Climate Change, Socioeconomic Studies and .
2. Formulating a national policy towards the Nile Basin, including water policy, foreign policy and international Cooperation Policy.
3. Providing Policy advice to the Prime Minister, concerning the Nile Basin cooperation and other domestic policies that might have a conflict with the Nile Basin Cooperation .

Staff: The staff would be leased from the different Ministries and Agencies involved, and operate under the supervision of the Prime Minister Cabinet directly.

Funding:
Budget of this agency would be cut off from the budget of Ministries involved, in terms of salaries of the leased staff from the different Ministries and agencies involved. In addition, the budget would come also from the Cabinet of Ministries budget, until it becomes feasible to require a budget from the Ministry of finance.

Stakeholders:
- All the Ministries and agencies involved in the Supreme Committee for Nile Water.
- Civil society.
- Private Sector

Figure 12: Idea for establishing an Egyptian Agency for the Nile Water
II. Economical and technical contexts

Economic development indicators of the Nile Basin countries should be taken into consideration by the Egyptian government

Egypt is considered the leading economy in the region, in terms of GDP, HDI and urbanization. In the past few years (2000-2007), the Nile Basin countries showed a higher rate in growth, in terms of agricultural land, hydropower and urbanization. Egypt is relying on irrigation system for agriculture, which maintains agricultural production, with stable water availability. Meanwhile, most of the downstream countries use the rain-fed agriculture.

The main purpose of highlighting the different pillars of water-related economic development is to show that the downstream countries do not fully cooperate with the upstream countries on bilateral level. There were no indications that Egypt, as being the strongest economy in the Basin, is helping the other Nile Basin countries in their own major development projects or programmes. The upstream countries main focus for development are on hydropower, agricultural, rural development and urbanization, while the downstream countries focus more the need for water for enough agricultural production for the increasing population. Due to the transboundary nature of the Nile Basin, the development projects on the river are the main reason for possible conflict of interest. One clear example is the conflict between Egypt and Ethiopia, when it comes to building dams on the Blue Nile River.

Egypt’s mutual cooperation should be upgraded

Cooperation between the Nile Basin countries is obligatory for sharing the benefits of the Nile Basin and exchanging experiences in all the fields. Egypt, through its “Technical Fund for Cooperation with Africa” provides the opportunity for expertise and students exchange and technical assistance on irrigation. However, the budget for the Technical Fund is very small, especially that it is providing assistance in 43 countries, even when compared to budget of the MWRI set for Cooperation. Egypt does not have a legal framework for encouraging investments in the Nile Basin countries. According to UNCATD, Egypt does not have bilateral Investment treaties with the Upstream countries (only four agreements where signed with Ethiopia, DR Congo, Tanzania and Uganda; however it has not entered into force). There is a large room for investment of the
Egyptian businessmen in the Nile Basin countries. Such Bilateral Investment Treaties promotes and protects the investments in each of those countries.

The lack of a legal framework that would protect the investments discourages the investors to risk and invest in new markets. Egypt, after the signature of the CFA by 6 riparian states, is trying to adopt a new approach towards the Nile Basin countries, where investments and business is one of the arms that Egypt is planning to relay on for the coming few years. Therefore, it was very clear that Egypt has started changing its approach towards the Nile Basin countries, not only for opening new markets and encouraging investments, but also policies and players were reshuffled by Mubarak’s regime. Transboundary Water management is subject to a subjective relation between the domestic policies and foreign policy and the relations between the Egyptian actors in the Nile Basin. However, with a current unclear economic situation of Egypt could be considered a challenge towards a true partnership and cooperation with the Nile Basin countries.

Therefore, the most critical problem with Egypt’s approaches towards the Nile Basin countries, is that the development with the riparian states is only taken into consideration within the framework of the Nile Basin Initiative, Bilateral cooperation, Egypt’s Technical Fund for Cooperation with Africa, only, where there is no clear programme for encouraging the Egyptian private sector to invest in the Nile Basin countries. The fact that Egypt does not have a functioning Bilateral Investment Treaty with the Nile Basin countries reflects that the Egyptian Government does not consider the Nile Basin countries as a real window for investments. The lack of a clear framework to encourage investments in the Nile Basin has reduced the chances for enhancing the economic relations with the neighboring countries. The fact that Egypt does not have an effective bilateral investment treaty discourages the investors from both sides to invest.

What is clear from the set of the large projects in the Nile Basin countries are more towards building infrastructure. This requires public-private partnerships, especially in the developing countries. Such partnerships require a legal framework that would protect the right of the investors and secure their money. Packages to encourage Egyptian investors would be facilitated loans and providing studies about the potential activities and themes of cooperation with the Nile Basin countries. Although the post 25 January
revolution Egyptian Government is working on opening the window for investment for Egyptian investors, Egypt’s current economic situation might hinder any facilitation from the Egyptian Government to the Egyptian investors. The first sign of this change started in the different visits by Egyptian officials in the Mubarak’s government, in order to persuade the Nile Basin countries to not go forward with ratifying the CFA. After the 25 January Revolution, the first visit of the Prime Minister outside Egypt was to Sudan and South Sudan, as his first business visit since being appointed by the Supreme Council of Armed Forces. The outcome of the visit was enhancing the cooperation in different fields, including water resources management, agriculture and mining.

Egypt should consider the “virtual water” concept, which would lead to investing in livestock and agriculture in Sudan and Ethiopia. Sudan and Ethiopia’s fertile land will not require a lot of fertilizers to increase the yield of the crops, so it will be cheaper to grow crops outside Egypt.

One new initiative that could be critical, is creating a Nile Basin Development Bank (as the African Development Bank), which would provide long term loans for infrastructure projects. The Nile Basin countries would buy shares in this bank, with limited access to funding for the donor countries, in order to support the idea of ownership of the bank to the Nile Basin countries. This idea is still under discussion in the Egyptian government.

Post revolution People’s Delegation Initiative would accelerate the process of finding a solution that would ensure full cooperation and benefit for all the Basin countries. The fact that it is not institutional gives it the legitimacy of representing the public people, not the government. Such initiative is considered, what is known as “People’s Diplomacy”. Academic exchange would deepen the cultural relations between Egypt and the Nile Basin countries, which has to be intensified. Suggestions such as opening branches of Egyptian public universities would play a strong role in spreading Egyptian knowledge, know-how and culture as well.

Assuming the democratization of Egypt will be a successful process, the possibility of sharing the process and spreading the ideas of democracy and freedom to the Nile Basin countries. Democracy and equity are important pillars for a strong economic development and the idea of sharing the democracy experience with the Nile
Basin countries would help in seeding for the ideas of good governance. Good governance would also promote a better governance of natural resources on the long run. This would be important when it comes to transboundary water governance for the Nile Basin resources.

Figure 13: Provisional Egypt's approach towards the Nile Basin countries
Summary and Conclusion:

Water resources, as any natural resources, are non-renewable resources that are affected by supply and demand of the population. With a continuously increasing population, climate change impact and inefficient water management systems, many countries in the world will face water scarcity.

The problem rises to be more critical in the transboundary river systems, where the water is shared by different countries. The Nile Basin, shared by ten countries faces different challenges, such as: the mistrust and inequitable water sharing between the countries; Egypt’s hydro-hegemony over upstream countries, especially Ethiopia; lack of strong bilateral relations between the downstream countries (especially Egypt) and the upstream countries (especially Ethiopia); and the lack of a strongly institutionalized regional body to set the water governance guidelines for the Nile Basin countries.

Different projects, such as HYDROMET and TECCHONILE evolved to the Nile Basin Initiative, in a process of evolution reflecting the willingness of the Nile Basin to cooperate. The new Cooperative Framework Agreement, signed by 6 countries and 4 countries refused to sign it shows that there are still points of difference between the countries, especially concerning Egypt’s and Sudan’s historical rights in the water and prior notification and approval on any large development project that would have an impact on the water flow. The downstream countries’ action is, primarily, for economic development.

All the figures and numbers shows that the downstream countries, considered within the poorest countries in the world, are progressing in terms of Human Development and GDP, however, the main source of income, which is agriculture (for most of them) is still underdeveloped. Agriculture is based on rain-fed cultivation, which is subject to variability every season; therefore, irrigation cultivation would secure a known amount of water for a known yield production. Hydropower electricity generation has very high potentials in the Nile Basin, especially in Ethiopia, which only exploits 3% of its potential. The hydropower electricity generation would secure enough power for industrialization, urbanization and rural development, with renewable energy that is non-
polluting to the environment. Therefore, water-related development projects are considered crucial for the development of the upstream countries, which is considered the mean reason for signing the new CFA.

On the other side, Egypt, which is 97% on the Nile river has detached itself from being a strong partner for the neighboring countries, by its hydro- hegemony over Ethiopia, especially during the period of 2009/2010, concerning Egypt’s historical rights in the Nile River, secured by the 1929 and 1959 Nile Water agreements during the colonial era. Although Egypt provides assistance to the Nile Basin countries, through Egypt’s Technical Fund for Cooperation with Africa, Egyptian investments were not targeting the neighboring countries.

The main Egyptian actors, when it comes to the Nile Basin, are the Ministry of Water Resources and Irrigation and the Ministry of Foreign Affairs. The two ministries have different policies; however it proves that domestic policies, such as water policy, have some influence on the foreign policy and its directions. After the signature of the new CFA, the Ministry of Planning and International Cooperation became officially involved in the process, trying to deliver cooperation packages with the Nile Basin countries. The main policy coordination is done through Ministerial/Senior officials committee, between the two main ministries, while the larger coordination picture takes place within the Supreme Committee for Nile water.

Understanding the coordination and the players in the scene facilitated my work in understanding what would be Egypt’s different approaches towards the Nile Basin countries. After the signature, Egypt is going to have a series of approaches; Domestically, Egypt’s water strategy for 2050 has taken into consideration the possible scenario of decreased water intake; encouraging the Egyptian investors to invest in the Nile Basin countries; encouraging the civil society, as well as religious presence of Al-Azhar and the Egyptian Coptic Church for amplifying their cultural contribution to the Nile Basin societies. On the International level, the Ministry of Planning and International Cooperation would sponsor collaboration on bilateral level; Ministry of Water Resources and Irrigation would continue the collaboration through the Nile Basin Initiative; Ministry of Foreign Affairs would continue providing assistance through its
Fund and continue negotiation the legal terms of the new Cooperative Framework Agreement. The change in coordination was not affected by the 25th January 2011 (as it is considered a matter of national security), however, possible changes in the foreign policy can be anticipated to change toward re-integrating Egypt to Africa. Non-Institutional initiatives, such as the Egypt’s People’s Delegation, would act as a new People’s diplomacy to break the ice between Egypt and the rest of the Nile Basin countries.

For Transboundary water management, there is no other mean than cooperation in the fields of water harvesting, education and investments for better and sustainable use of water for all the countries involved, as a step towards possible economic integration between the neighboring countries.
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Annex 1: Figures

Figure 14: GDP (at market price) annual growth rate (%) in the Nile Basin countries (2000-2007)
Figure 15: Annual growth rate (%) of Agricultural Land in the Nile Basin countries (2000-2007)
Figure 16: Population and % Annual population growth rate in the Nile Basin countries (2000-2008)
Figure 17: % of population in Urban and rural areas in the Nile Basin countries (2000-2007). World Bank, 2010
Annex 2 – Semi-Structure Interview questions

Interview Questions

List of Questions for the Government Agencies:

1. What is your role in your organization?
2. What are the main activities of your organization?
3. What are the main water-related activities for your organization?
4. Does your organization have a role in formulating policies related to the Nile water? If so, what kinds of policies are formulated?
5. To what extent are your agency’s policies take into consideration the transboundary issues concerning the Nile water?
6. What are the other International organizations that you are interacting with, when it comes to the Nile basin countries?
7. What is the level of coordination between your organization and other organizations in Egypt?
8. Are there any kind of relations between your organization and its counterpart in the Nile basin countries?
9. (A) In your view, what was the cause behind the Nile basin countries signing the agreement without Egypt and Sudan?
   (B) In your view, what could be the main development projects in the Nile basin countries that would have driven them to reach such position?
10. Now, with Egypt getting into restructuring the regional cooperation with the Nile basin countries, what would be the role of your organization?
List of Questions for the International Organizations:

1. What is your role in your organization?

2. What are the main activities of your organization?

3. What are the main water-related activities for your organization?

4. Does your organization have a role in formulating policies related to the Nile water? If so, what kinds of policies are formulated?

5. What are the other International organizations that you are interacting with, when it comes to the Nile basin countries?

6. What is the level of coordination between your organization and other International organizations?

7. To what extent are your agency’s policies take into consideration the transboundary issues concerning the Nile water?

8. Are there any kind of relations between your organization and its respective organizations in the Nile basin countries?

9. (A) In your view, what was the cause behind the Nile basin countries signing the agreement without Egypt and Sudan?

   (B) In your view, what could be the main development projects in the Nile basin countries that would have driven them to reach such position?

10. Now, with Egypt getting into restructuring the regional cooperation with the Nile basin countries, what would be the role of your organization?
11. What do you think of the Egyptian restructuring of the regional cooperation and what do you think would be the response of the Nile Basin countries to the new Egyptian approach?

12. In case your organization has decided to support Egypt’s approach for cooperation, what would be response of your stakeholders?

13. From your own point of view, do you think the stakeholders or member states would like to cooperate, in any possible Egyptian approach for cooperation with the Nile basin Countries, on bilateral or multilateral basis? And why?

**List of Questions for the other organizations involved:**

1. What is your role in your organization?

2. What are the main activities of your organization?

3. What are the main water-related activities for your organization?

4. Does your organization have a role in formulating policies related to the Nile water? If so, what kinds of policies are formulated?

5. To what extent are your agency’s policies take into consideration the transboundary issues concerning the Nile water?

6. What are the other International organizations that you are interacting with, when it comes to the Nile basin countries?

7. What is the level of coordination between your organization and other organizations in Egypt?

8. Are there any kind of relations between your organization and its counterpart in the Nile basin countries?
9. **(A)** In your view, what was the cause behind the Nile basin countries signing the agreement without Egypt and Sudan?

**(B)** In your view, what could be the main development projects in the Nile basin countries that would have driven them to reach such position?

10. Now, with Egypt getting into restructuring the regional cooperation with the Nile basin countries, what would be the role of your organization?