CHAPTER II

INHERENT CORRELATION BETWEEN EGYPT AND THE NILE RIVER IN EXERCISING STATE'S INTEREST

This chapter described about the Nile River; the history of the Nile, Nile River tributaries and High Aswan Dam built by Egypt on the Nile. Egypt water resources and utilization which contained the water supply and water demand in Egypt and its water policies. Other than that was Egypt legal framework in maintaining its influence over Nile River.

A. The Nile River

The name of Nile is presumably from the Greek word of Neilos (Latin: Nilus), which probably originated from the Semitic root *nahal*, meaning a valley or a river valley and hence, by an extension of the meaning, a river (Lewis, 2012). Nile River is considered to be the longest river in the world, more or less around 6,853 kilometres from its upstream in the mountains of Burundi into the Mediterranean Sea, the river passes through 11 countries: Tanzania, Uganda, Eritrea, Rwanda, Burundi, the Democratic Republic of Congo, Kenya, Ethiopia, Egypt, Sudan and South Sudan. The Nile is constituted by three tributaries; Blue Nile, White Nile and Atbara. The White Nile starts at its upstream in Burundi passes through Lake Victoria, flows into Juba in southern Sudan. The Blue Nile which originates at Lake Tana in Ethiopia then meets up with the White Nile in the near of the capital city of Khartoum. Lastly, the flow of Atbara whose source is in the Ethiopian highlands is joined with the main flow (the White and Blue

Nile) from the north of Khartoum. The flows goes northward through the Lake Nasser, coming in to Cairo and into the Mediterranean Sea (Pedersen, 2016).

1. The History of the Nile and Its Inherent with Egypt

According to the Ancient History Encyclopaedia, Nile and its Delta were worshiped as a god by the ancient Egyptian and many gods and goddesses are associated in the Nile. The bringer of water and fertility was not the river but its inundation called as god “Hapi”, seen as the image of abundance but he was not considered as a major god. “Isis”, the goddess of the Nile and the Giver of Life, was believed to have taught the people how to farm and work the land. The water god “Khnum”, who ruled over all forms of water even the lakes and rivers in the underworld, was believed to be in charge of the amount of silt that flooded the river banks every year (Mark, 2009).

One of the uniqueness of the ancient Egyptian is the bond between the Nile and the Egyptian people. Egyptians were the first people to believe in life after death. They got the understanding through the phenomena of the fall and rise of the Nile water. The fall and rise of the flood waters meant that the “death” of the land would be followed each year by the “rebirth” of the crops. Thus, rebirth was seen as a natural sequence to death. Like the sun which “died” when it sank on the western horizon and was “reborn” in the eastern sky on the following morning, humans would also rise and live again (Federal Research Division Library of Congress, 1991) . Based on the myth of ancient Egypt, the Nile for the

ancient Egyptian considered as the source of all life in Egypt and an integral part of the lives of the gods.

The modern history of the Nile conflict began in the colonial times of British in the 20th century. British were realizing that the Nile River was important for their colonies. At that time the natural force of the Nile River created a natural dam from plants and soil which made all ships passage blocked. In 1898, British began to free the blockage that blocked the ship passage. In 1904, right after the blockages had been removed to clear a path through the vast swamp in South Sudan well known as the Sudd, British began their move to improve the flow of the Nile by making a massive alternative drainage plans (Federal Research Division Library of Congress, 1991).

However, British does not control the Ethiopian portions of the Nile, from which are more than 80% of the Nile's water came (Lewis, 2012) . Due to that reason the British had to sign an agreement with Ethiopian in 1902. The agreement was needed to assure them that the Nile would not be interfered with. Beside the agreement, British had to put a pressure on the Italians and French so that they would not interfere in the matter of dominance in the Nile Basin. It worked well on Italian but little less with the French. But, the most troublesome for the British was the Egyptian. The development plan of British on the Nile became a disputed matter between the two governments. In the end it leads the British to be the sponsor of the 1929 agreement between them which were about the regulation on the flow of the Nile and the distribution of its use (Owiro, 2004).

In the era after World War II, British government commissioned a complete hydrological study to be made of the Nile Basin as a whole. However, due to some political problems, the study was not able to include Ethiopian portion but the rest of the valley was included. It took 50 years for the study to be completed and the study was released in 1958 as the report on the Nile Valley Plan. The study suggested various ways to increase the amount of water which reached Egypt such as the Construction of Jonglei canal which its function was to divert the flow of the Nile in southern Sudan to avoid the enormous evaporation losses that occurred there (Lewis, 2012). Nonetheless, the Nile Valley Plan treated the entire Nile Basin as a single unity which was considered as unacceptable to the newly independent African states.

Beside the Nile Valley Plan, Egypt also had a major plan construction which was High Aswan Dam. High Aswan Dam would significantly improve the flow of the Nile in their territories, its function was to control the yearly floods of the Nile and to harvest the hydroelectric power of the river. However it brought an effect on the lands of northern Sudan that the whole sections of northern Sudan would be inundated by what was to be Lake Nasser. Other than that was the severe environmental concern that the dam would change life on the banks of the Nile.

In dealing with those problems, the two nations signed an agreement on the “full utilization of the Nile waters” in 1959. By this agreement, Sudan got a change of yearly distribution of Nile water from 4 billion cubic meters – in the 1929 agreement – to 18.5 billion cubic meters. Other than that, Sudan was

allowed to undertake series of Nile development project which were Rosieres Dam and the Jonglei Canal. As an exchange Egypt would be allowed to build the High Aswan Dam which would regulate the flow of the river into Egypt and provide water during droughts. The agreement also formed a joint committee which would be in charge of supervising and directing all development projects which affected the flow of the river. It also meant that Egypt and Sudan should be involved in any claims from the other riparian countries. Because as downstream countries that relies on water from the Nile, it is important to be involved in any claim that happened on the Nile to ensure the water flow coming to their countries are not affected by it.

2. Nile River Tributaries

As what have been mentioned in the previous explanation, the Nile constituted with three tributaries; the White Nile, the Blue Nile, and the Atbara. Each tributary have a different characteristic or different amount of water supplies to Egypt.

The first one is White Nile, which the flow begins at Lake Victoria in Uganda. The White Nile supplies more or less about 28 percent of the Nile waters in Egypt (Stanley & Clemente, 2017). On its way from Lake Victoria to Juba in Southern Sudan, the altitudes of the White Nile's channel drops more than 600 meters. In its way from Juba to Khartoum, Sudan capital which around 1,600 kilometre, the river only falls down about 75 meters (Federal Democratic Republic of Ethiopia Ministry of Foreign Affairs, n.d). In the area of Southern and

Central Sudan, the White Nile traversed a wide, flat plain covered with swamp vegetation and slows almost to stagnation.

Secondly, The Blue Nile, which originates at Lake Tana in Ethiopia, provides an average of 58 percent of the Nile's waters in Egypt (Federal Democratic Republic of Ethiopia Ministry of Foreign Affairs, n.d). Blue Nile has a steeper gradient and flows more promptly than the White Nile. In contrast with the White Nile, the Blue Nile transmit a considerable amount of sediment; for several kilometres north of Khartoum, water closer to the eastern bank of the river is visibly muddy and comes from the Blue Nile, while the water closer to the western bank is clearer and comes from the White Nile (Federal Research Division Library of Congress, 1991).

Lastly, according to Federal Research Division Library of Congress (1991), the much shorter is Atbara River, which also originally originates from the Ethiopia territory. Atbara flow joins with the main Nile just in the north of Khartoum and it is contributes about 14 percent of the Nile's waters in Egypt. During the low-water season, which runs from January to June, the Atbara dwindles to a number of pools. But in late summer, when heavy rains fall on the Ethiopian plateau, the Atbara contribution to the Nile flow increase into 22 percent.

Meanwhile, the Blue Nile also has a similar pattern. In the low-water season, Blue Nile contributes 17 percent of the Nile waters and during the high-water season it will contributes 68 percent of the Nile waters. In contrast with the

White Nile which will only provides around 10 percent of the Nile water during the high-water season. However, it will contribute more than 80 percent of the Nile water during the low-water season (Federal Research Division Library of Congress, 1991). Furthermore, before the presence of the Aswan High Dam was completed in 1971, the White Nile watered the Egyptian stretch of the river throughout the year, while the Blue Nile, carrying seasonal rain from Ethiopia, caused the Nile to overflow its banks and deposit a layer of fertile mud over adjacent fields. The great flood of the main Nile usually happened in Egypt during August, September, and October, but it sometimes began as early as June at Aswan and often did not completely wane until January.

3. High Aswan Dam in Egypt

As what has been explained in the previous section that before the presence of the High Aswan High Dam, the flow of the Nile was fickle and unsteady. The great floods caused a destructive effect to the lands with the loss of life and property. In order to avoid those disasters and to acquire control from the available water supply, the High Aswan Dam was constructed by Egypt. (Shumays, 1962) Argued, that The High Aswan Dam was a productive and protective work by Egyptian government. The objectives of the High Aswan Dam were to maintain full control of the Nile flow at Aswan in the far south of Egypt, to expand cultivation and to produce hydro-electric power necessary for industrialization and development.

The High Aswan Dam located at Aswan, 500 miles south of Cairo. It took 10 years to build the dam and was completed in 1970 under the President Nasser administration. The Dam was created as a giant reservoir about 300 miles long and 10 miles wide, which called as Lake Nasser as an honour to the President Nasser who passed away in 1971 (History.com Staff, 2010). The Dam is approximately 3600 meters and pyramidal in shape, 980 meters wide at the base and 40 meters at the top, 111 meters high above the Nile floor and 196 meters above sea level, which now has put an end to the destructive flood of the Nile (Strzepek, Yohe, & Mark, 2006).

High Aswan Dam has brought significant benefits to the Egyptian. High Aswan itself has made the towns and villages up to today have a reliable water supply and the Nile no longer floods which made people and villages are safer. Meanwhile, in the electricity sector, the electric produced by the Hydropower generation from the dam provides sufficient power for industries and village in Egypt. It is also said that the Aswan Dam contributes to more than half of the total power supply in Egypt. The High Aswan Dam also make the river is kept steady so it can be use all year. Other than that, the Dam makes more land can be irrigated and more food can be produced (Scudder, 2003).

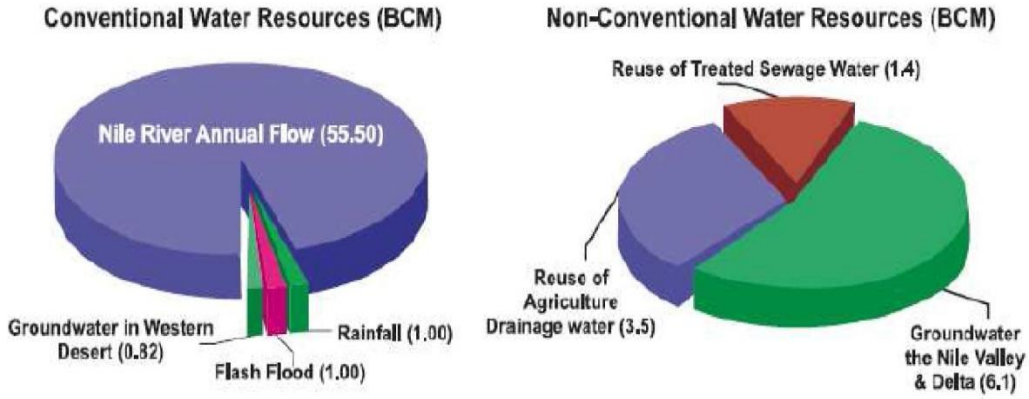
Furthermore, the High Aswan Dam itself is a long term storage policy of Egypt to secure their annual water quota from the Nile. As what has been mentioned before that in building the High Aswan Dam Egypt needed to sign an agreement with Sudan which was called as the 1959 agreement. By doing so,

Egypt annual water quota from the mean annual 48 Billion Cubic Meters (BCM) into 55.5 BCM and Sudan quota was secured from the beginning mean annual 4.5 BCM into 18.5 BCM (Abu-Zeid & El-Shibini, 1997). The construction of High Aswan Dam and 1959 agreement has managed to satisfy both Egypt and Sudan in term of irrigation for the land under cultivation and plans for the future land expansion. The High Aswan Dam also managed to safeguard the water supply for Egypt during the drought season in ten consecutive years starting in 1978, because the dam managed to supply water to Egypt during the drought season and compensated the deficit in the Nile flow.

B. Egypt Water Resource and Utilization

It is said that water is a key driver for sustainable growth and poverty alleviation as an input to almost all production, such as agriculture, industry, energy, transport and etc. As of today, for Egypt, water resources development and its management remain at the heart of the struggle for growth and sustainable development in their country. Egypt water resources consist of two types water resources; Conventional and Non-Conventional, as can be seen in the Figure 1. Those two water resources are the supplies to fulfil the needs of Egyptian in various sectors.

Figure 1: Egypt Water Resources



Source: (Gaafar & Abdin, 2009).

1. Water Supply – Conventional and Non Conventional

The conventional water resources in Egypt are limited to the Nile River, ground water in the Delta, Western deserts and Sinai, rainfall and flash floods. Each resource has its limitations on use. These limitations relate to quantity, quality, location, time, and cost development.

As illustrated in the Figure 1, according to the 1959 agreement with Sudan, the average annual quota that Egypt got from the Nile River as stated in the agreement was 55.5 BCM (Abu-Zeid & El-Shibini, 1997). This amount of annual quota was guaranteed by the High Aswan Dam.

From the other conventional resource, groundwater provided 0.82 BCM per year as it shown in the Figure 1. The groundwater is located at the Western Desert, the Nubian sandstone aquifer, which extends below the vast area of the New Valley Governorates and the region east of Owaynat. Apparently, in the

recent data, the groundwater has been estimated providing the water to be 2.0 BCM per year (Ministry of Water Resources and Irrigation of Egypt, 2014).

Another 1.0 BCM per year is utilized from rainfall along the coastal area and flash floods occurring within short-period heavy storms in the Red Sea and Southern Sinai that are directly used to meet part of the water requirements or used to recharge the shallow groundwater aquifers. However, according to the newest data from the Ministry of Water Resource and Irrigation of Egypt (2014), the water provided by the rainfall estimated to be 1.3 BCM per year. In fact, rainfall occurs only in the winter season in the form of scattered showers. Therefore, it cannot be considered a dependable source of water due to high spatial and temporal variability.

The data from Ministry of Water Resource and Irrigation of Egypt (2014), explained that desalination of seawater in Egypt has been given low priority as water resources because the cost of treatment is high compared with other sources. Desalination actually practiced in the Red Sea coastal area to supply tourist villages and resorts with adequate domestic water supply where the economic value of the water is high enough to cover the treatment cost. And the non-conventional resources include the renewable groundwater aquifer underlying the Nile valley and delta, the reuse of agricultural drainage water, and the reuse of treated sewage water. The amount of the groundwater in the Nile valley & delta is estimated at 6.1 BCM per year, the reuse of agriculture drainage water is about

3.5 BCM per year and the reuse of treated sewage water is about 1.4 BCM per year.

This limited quantity of water has to fulfil the Egyptian water requirements. So far, agriculture is the largest consumer of water which the data showed about 85% (Gaafar & Abdin, 2009). Other than that the availability of Egypt water resources also has to meet the needs of the growing population as well. Also development of industry will consume more water which will affect the Egyptian water balance.

2. Water Demands

Water demands in Egypt are continuously increasing due to the growing population and the increasing of living standards as well as the governmental policy to encourage industrialization. Currently, water demand for the agricultural sector is the largest consumer of the total water demand in Egypt.

Annually, agriculture sector which depends on Nile water consumes more than 85% of Egypt share of Nile water which makes the largest component in the Egypt national water use is the agricultural sector (Ministry of Water Resources and Irrigation of Egypt, 2002). Despite the fact that the country had to lose part of its fertile land to urbanization, this has been balanced by the expansion of agricultural areas. Expansion of agricultural areas is being executed horizontally and vertically through crop intensification by cultivating the land more than once a year. In 1990 cultivated lands were 6.92 Million Feddans (MF) – an Egyptian unit land of area equal to 1.038 acres (Sizes, Inc, 2016) – with cropped area of

about 12.43 MF. Meanwhile, in 2005, the cultivated areas and cropped lands were 9.2 MF and 17.50 respectively (Ministry of Water Resources and Irrigation of Egypt, 2014). Moreover, irrigated agriculture in Egypt is almost entirely dependent on Nile water – although there are minor contributions from groundwater. At present, the average consumption of water for agriculture is about 58 BCM per year (Karajeh, et al., 2011).

In fact, Egypt agriculture sector is a key sector in the Egyptian economy. According to the data from IFAD (2014), Egypt agriculture sector provided livelihoods for 55 percent of the population and directly employing about 30 percent of the labour force. The data from IFAD (2014), also showed the contribution of agricultural sector to Egypt GDP accounted for about 13 percent and 20 percent of total exports and foreign exchange earnings.

Furthermore, the municipal water demands accommodate the water supply for major urban and rural villages in Egypt. Portion of the water supply comes from the Nile, either through canals or direct intakes on the river. Moreover, the other portion comes from groundwater resources. According to the data from Ministry of Water Resource and Irrigation of Egypt (2014), the estimated water demands in 2013 were 10 BCM, in which approximately 70% of rural population and 97% urban population of Egypt depend on piped water supply. Meanwhile, the sanitary facilities are less developed in Egypt which approximately 6% of rural and 50% of urban population are connected to a sewerage system – a system and infrastructure of collecting, treating and disposal of sewage

(Engineeringarticles.org, 2015). Municipal water production are diverted from two sources, surface water which supplies about 83% of total municipal water demand and groundwater, which supplies about 17% of total demands (Ministry of Water Resources and Irrigation of Egypt, 2014).

Other than that, the development of the quality and productivity of the industrial sector are vital for the economic, social progress and growing rates in Egypt. During the year of 2013, (Ministry of Water Resources and Irrigation of Egypt, 2014) data showed that the water demand for the Industrial sector was 2.50 BCM per year. Furthermore, small portion of the water which only 0.7 BCM is consumed through evaporation during the industrial processes while most of the consumed water returns to the system in a polluted form.

To sum it up, currently, the available water resources used by Egypt are 55.5 BCM per year, and 1.3 BCM per year effective rainfall on the northern strip of the Delta, non-renewable groundwater for western desert and Sinai. Meanwhile, the demands of water needed for different sectors are estimated about 79.5 BCM per year. The difference between the needs and availability of water is about 20 BCM per year. However, this difference is overcome by recycling. The overall efficiency of the Nile system in Egypt is about 75%.

As we can see from the data above, it shown that Egypt demand of water is quite high, and the availability of water still do not reach the demand. Furthermore, the Nile is the most contributor of Egypt water about supplies 55 BCM per year, so it makes Egypt almost totally dependent on Nile water supplies.

Other than that, according to the recent research, by the year 2020, the water demand of Egypt will most likely increase by 20% (15 BCM per year). Therefore, Egypt could not lose its quantities of water supplies from the Nile because in each year the water demand in Egypt is increasing. The reduced supply of water from the Nile would be detrimental to Egypt survival.

3. Egypt Water Policies

There are two kinds of Egypt water policy, the first one is the Water Development Policy which is an action affecting the increase of quantities of water available for distribution and use; and the second is Water Allocation Policy that is defined as action affecting the distribution of given quantities of water among different uses and users (Abdin & Gafaar, Egyptian Water Policies towards Increasing Its Value, 2009).

According to the fact, there are several policies have been made by Egypt to manage the water resources. Here are the lists of the policies have been made by Egypt from 1975 till 2005 (Abdin & Afify, 2011);

1. Water Policy for the year 1975
2. Water Policy for the year 1980
3. The Egyptian Water Master Plan, 1982
4. Water Policy for the year 1986
5. Water Policy for the year 1990
6. Water Security Project,1993
7. Water Policy for the year 1999

8. The National Water Resources Policy (NWRP 2005)

Those policies lead to the creation of many important projects for Egypt Water resources management such as:

1. The construction of new barrages at Isna, Nag-Hammadi and Assiut along the course of the Nile with the purpose of expanding its cultivated area and to increase the cropping intensity.
2. The Aswan Dam and its rehabilitation, and the construction of Gabal Awlia Dam in Sudan which increases water storage capacity to enable the country to convert more than half a million Feddans (a Feddans is 0.42 hectare) in the Upper Egypt from basin to perennial irrigation.
3. Financing the rehabilitation of the Owen Falls Dam in Uganda to make use of the additional quantities of water to increase the cultivated area.

Furthermore, the Minister of Water Resources and Irrigation (MWRI) is the ministry responsible for managing all water resources aspects of the Arab Republic of Egypt including the Nile. The MWRI is the one who published the Egypt National Water Resources Plan. Moreover, the latest Egypt water policies (1997-2017) are emerged from the National Water Resource Plan project. The main objectives of the policy itself are to improve the utilization efficiency, water productivity, and protection of water resources in Egypt. The new water policy considers both water quality and water availability to achieve a match in both water supply and demand (National Water Resources Plan, 2005).

The NWRP describes how Egypt will use its water resources in a sustainable and responsible way from a socio-economic and environmental point

of view. With the rapid growth of population and new land development for agriculture, there is a threat of more pollution. There is a need therefore to (i) reduce water use (demand management), (ii) optimize the supply (supply management), and (iii) abate water pollution (pollution control). The drafted plan also comprises of an investment plan, completed in March 2004. The plan addresses all water related activities and considers both the technical, managerial and institutional interventions. Important decisions on allocation of resources and priority setting of interventions are indicated.

The Egyptian Water Policy strives toward enhancing water quality that is threatened by the steady increase in population and the continuing expansion of urbanized and industrialized area. Moreover, significant quantities of municipal and industrial wastes are presently discharged into the Nile River system, canals and drains without proper treatment and cause chemical and biological pollution.

As a result, the Egyptian government has been increasingly concerned about the protection of the Nile and other water bodies. Laws and legislation has been made to assure the sustainability of water resources development and use, suitability of water quality for each specific use and the control of water pollution. The most important of these laws are Law 48/1982, relating to the protection of the Nile and other waterways from various sources of pollution, and Law 4/1994 on protection of the environment.

A number of policy measures and considerations that affect overall water use efficiency, water allocation, and its effect on quality can be stated as follows (Ministry of Water Resoures and Irrigation of Egypt, 2005):

1. Improvement of irrigation efficiencies and drainage conditions in prioritized areas (i.e. areas overlying or adjacent to salt sinks, and where reuse of drainage water is not recommended).
2. Gradually introduce modern irrigation techniques to replace traditional irrigation methods.
3. Prioritization of drainage water reuse in areas where; drainage water would otherwise low to sink, the least harm is done to other downstream users, and Groundwater is least vulnerable to pollution.
4. Local reuse of drainage water in the upstream stretches will result in less accumulation of salt and pollutant concentration at the downstream ends.
5. Reuse of drainage water policy should be reviewed, considering the application of intermediate reuse at appropriate locations.
6. Water allocation should be de-centralized based on equal opportunities for farmers within the same region, and be based on a set annual amount per Feddans.
7. Improvement of the infrastructures for proper water distribution, and installation of upstream discharge regulators and control structures at key points of the irrigation system.
8. Promoting the use of non-conventional salt tolerant crops and fish farming.

9. Separating return lows of low quality water from fresh water, and forcing municipal and industrial users to treat effluent before discharging into the drainage system.

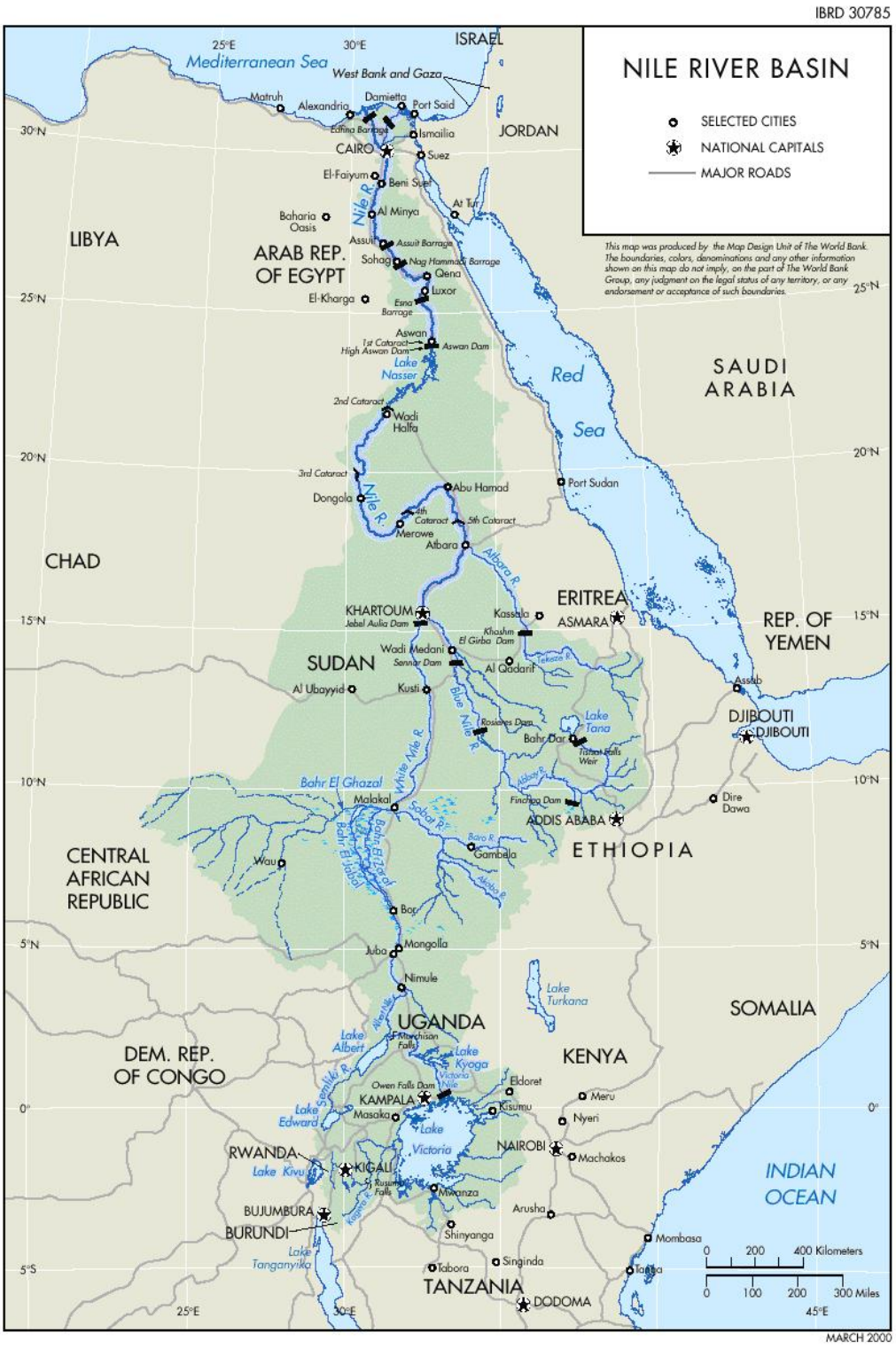
C. Egypt Legal Framework in Maintaining its Influence over Nile River

Since a very long time ago, the Nile River has been serving as the main water resources for almost all of the Africans countries. As what have been discussed in the previous chapter, Egypt is more dependent on the Nile than other riparian countries, which enjoys heavy rainfall and able to access to the sources of the Nile. In fact, the foreign policies of Egypt have centred on the objective of securing the continuous consumption of Nile waters. This reality has made the issue of sharing of Nile waters intolerable phenomenon and compelled Egypt to secure its influence over Nile. There are two agreements; 1929 and 1959, that have been the main legal basis for Egypt in an attempt to perpetuate its influence over Nile and to ensure the supplies of water from the Nile to Egypt.

The 1929 treaty signed between Egypt and Sudan which gave Egypt the right to 48 BCM of water per year (Wolf & Newton, 2007). From the 1929 treaty, Sudan received rights to 4 BCM of water. Three decades later, Egypt and Sudan – newly independent, signed the 1959 Nile water agreement. The 1959 was more comprehensive than the former by providing legal framework for complete control over the waters. Sudan given the right to utilize the waters amounted to 18.5 BCM, and Egypt which allowed building the High Aswan Dam got 55.5 BCM (Abu-Zeid & El-Shibini, 1997).

Furthermore, in an effort to reach a common understanding and develop mutually beneficial framework, the Nile Basin Initiative was launched in 1999 by all riparian countries: Egypt, Sudan, Ethiopia, Kenya, Uganda, Rwanda, Tanzania, Burundi and Congo, as well as Eritrea as an observer. Nearly all of the downstream countries have signed a May 2010 Cooperative Framework Agreement (CFA), which seeks to replace previous colonial era treaties. However, Egypt at that time oppose it and claim it infringes upon their historical rights which also can be refereed that Egypt declared that they would never give up their current share of the Nile water (Abebe, 2014). Egypt even suggested that the wording of CFA on the Article 14, from "*not to significantly affect the water security of any other state*" into "*not adversely affect the water security and current uses and rights of any other Nile basin state"* (Tawfik, 2015). Egypt also defends that instead of such sudden changes, the main target should be on cultivating the NBI. Assuming that was done, a trust fund, that supported by all the countries and institutions involved, it could be use to utilised for developing a various project on the Nile that would benefit all the riparian countries. Egypt also suggested that the CFA will destroy the levels of cooperation that has been forged since the NBI started (Nunzio, 2013). At the end, In June 2010, Egypt decided to halt their participation in the NBI and its joint projects.

Figure 2: Map of Nile River Basin



Source: (Map Design Unit of the World Bank, 2000).