Years of Drought: A Report on the Effects of Drought on the Syrian Peninsula

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1. Introduction

Years of drought have affected the eastern and northeastern regions of Syria, comprised of the governorates of al-Raqqa, Deir al-Zor and al-Hasaka, which are also known as the Syrian "peninsula" or "*jazira*". The peninsula region has the largest tracts of arable lands in Syria, and is considered the (agricultural) backbone of the country.

Agriculture is considered one of the most important sectors in Syria. Other than trade and agro-industry, the Syrian economy is highly dependent on agricultural production. However, the current drought has led to a significant reduction in agricultural production in this area and consequently a decline in the national economy.

One of the major consequences of the drought is that it has driven the majority of the population from this area towards the interior governorates in Syria. These mass migrations have concentrated within the larger Syrian cities, and mainly Damascus followed by Aleppo, Homs and Latakia, where people have gone in search of a livelihood and shelter. In addition to creating demographic changes in several areas in Syria, this internal migration has also produced many humanitarian, social and health problems.

2. General overview on water resources and the agricultural industry in Syria

The Syrian Arab Republic is situated in southwest Asia, on the eastern coast of the Mediterranean Sea. The country covers an area of 185.18 km^2 and has a wealth of rivers, at least when compared to the rest of the other Arab countries. This abundance of water resources can be ascribed to the size and diversity of the natural topography of the area.

The Euphrates River is considered the most important river in Syria. Its course runs through the northern region from Turkey towards the eastern region and the Syrian peninsula, passing through the governorates of al-Raqqa and Deir al-Zor into Iraq. The Syrian state depends primarily on this river for generating electricity and investing in the area known as the Euphrates River agricultural basin. The largest dam in the area, the Euphrates Dam, was also built on this river, forming the Lake Assad reservoir in its wake.

In addition to the Euphrates River, which is considered the longest river in Syria, are the Orontes River (*Nahr al-Assi*), the Barada River, the Yarmouk River, the Khabur River, the Balikh River, the Northern Great River (*Nahr el-Kabir al-Shamali*), the Awaj River, the Southern Great River (*Nahr el-Kabir al-Janoubi*), the Afrin River, the Sajur River, the al-Sin River, the Banias River, the Arous River, the Quweiq River and the Tigris River, which flows through 50 kilometers of Syrian territory, amongst other rivers.

There are also numerous lakes in Syria, the most important and largest of which is Lake Assad on the Euphrates River in the al-Raqqa governorate. Other lakes in Syria include the Qutaina Lake on the Orontes River, the Muzairab Lake, the Baath Lake and the April 17 Lake on the Afrin River, the October 6 Lake on the Northern Great River, the Khatouniya Lake, the Masada Lake, the Blouran Lake, the Seven Lakes in Latakia, the Taiba Dam in Dara'a, the Zarzar Lake and the Rustan Lake, amongst others.

Historically, its abundance of rivers, bodies of water and vast, fertile lands have made Syria the region's best agricultural producer, with agriculture contributing to 25% of the GDP and agro-industry contributing to 10.5% of GDP. Agriculture is of great importance in Syria and is considered one of the principal driving forces of the Syrian economy. It has become a means for securing the food needs of the nation as

well as an efficient way of maintaining foreign reserves. The agro-industry in Syria is also a prime counterpart to achieving domestic food security and contributes to 3% of GDP, or approximately 6% of GDP when one considers the value-added adjuncts of this industry.

The most important crops yielded from the Syrian agricultural sector include grains, cereals and legumes, fibers, consumable oil products, vegetables, fruits, sugar, medicinal herbs and aromatic plants, as well as cotton and tobacco. In terms of livestock production, the most important Syrian export is sheep. From 2004 to 2006, sheep exports contributed to almost 18.5% of Syrian agricultural exports, followed by cotton at 14.4%, wheat at 10.5%, olive oil at 5.2%, tomatoes at 3.5%, cumin at 2.8% and lentils at 2.1%.

3. The Syrian peninsula

Historical and geographical background

The Syrian peninsula is comprised of three Syrian governorates, al-Raqqa, Deir al-Zor and particularly al-Hasaka, which was actually called the Peninsula governorate before its name was changed to al-Hasaka. Therefore, what is referred to as the "peninsula" in this report refers to the al-Hasaka governorate only.

The al-Hasaka governorate is situated in the northern most part of Syria, bordered by Turkey in the north and partially in the northeast. On its eastern side, the governorate is bordered by Iraq, with the Deir al-Zor governorate bordering it in the south. The Deir al-Zor and al-Raqqa governorates border it in the west. The governorate looks exactly like a semi-triangle, with its base in the north and two almost equal sides stretching down from the base to meet at one point in the south.

The peninsula was part of the Turkish state until 1920, when the borders were first delineated between Syria and Turkey. When the Syrian state was established in 1922, both the districts of al-Hasaka and Ras al-Ain were annexed to Syria and turned into one qada'a (district, caza) with its center at al-Hasaka. At first, it was part of the mutasarrifiyya (sub-governorate) of Deir al-Zor. In 1923, another qada'a was formed in the village of Bayandour, which became the qada'a of Kamishili in 1925. And, in 1928, the borders were redefined between Syria and Turkey, and the northeastern part, called *Munqar al-Batta* (the Duck's Bill), was annexed to Syria. In this area, a third qada'a was established called Ain Dewar; and, the peninsula became a mutasarrifiyya (sub-governorate) in 1930. In 1944, it became a governorate on its own, independent of Deir al-Zor.

The governorate covers an area of 2,333,359 km^2 and is the second largest governorate in Syria, with a population of 1,445,000 (out of a total population of 22,331,000 in Syria, according to a 2008 census). What is important to note here is that the population of the peninsula, documented in this report, is as according to official records, which do not take into account persons "without a nationality". Those "without a nationality" are estimated to account for more than a quarter of a million people[1], all of whom are Kurds stripped of their Syrian nationalities based on an irregular census conducted in 1962.

The peninsula is considered one of the most important Syrian governorates, as it is the principal producer of black and white gold (oil and cotton, respectively), wheat, barely and lentils in addition to dozens of other agricultural crops.

[1] There are no official statistics for the numbers of persons stripped of their Syrian nationality; and, the numbers mentioned in this report are estimates of the numbers of persons stripped of Syrian nationality in the al-Hasaka governorate alone, and were provided by local Kurdish sources.

Vast tracts of agricultural land and a richly diverse range of livestock

The mass of arable lands in the peninsula totals 1,393,180 hectares, of which 1,286,857 are actually invested in and 44,700 hectares are irrigated lands. Non-arable lands in this area amount to 87,843 hectares. The peninsula also enjoys excellent terrain for grazing and raising livestock such as sheep, goats, cows and chicken.

The governorates of al-Hasaka, al-Raqqa and Deir al-Zor contribute largely to the country's livestock production with 36.7% of the country's livestock production generated in this region. The production rate of livestock and agricultural products from this region includes wool at 34.3%, milk at 20.5%, cotton at 69%, wheat at 70%, and sugar beet at 33% of the country's GDP. Meanwhile, all the petroleum and petroleum production in the country is found in these three governorates.

The peninsula region is characterized by a continental Mediterranean climate, with a higher concentration of rain and cold in the winter months and dry, hot weather in the summer season. The average rainfall in the peninsula region ranges between 250 and 500 mm, depending on the area.

These governorates have been topographically divided into several agricultural basins based on rainfall averages. The superior agricultural basin has a rainfall average that reaches 500 mm per year; the first agricultural basin has a rainfall average of 350 mm per year; the second agricultural basin has a rainfall average of between 250 and 350 mm per year; the third agricultural basin has an average rainfall of over 200 mm per year; and the fourth agricultural basin has an average rainfall which is below 200 mm per year.

Two major rivers pass through this region, the Tigris River (1,800 million m^3) and the Khabur River (1,527 million m^3). However, the Khabur River has almost completely dried up due to natural factors and the thousands of wells Turkey has drilled, which have affected water levels in the springs of Ras al-Ain – the main water sources feeding the Khabur. There are other rivers in the area, such as the Jaghjagh River, but they are of lesser importance. According to statistics gathered in 1999-2000, there are 19,006 artesian wells in the region. Overall, the water resources in this region amount to 4.28 million m^3, of which only 1.49 million m^3 are actually exploited.

4. The drought and its causes

The retention and depletion of precipitation over the past five years have dealt a fatal blow to the agricultural sector in Syria. The scarcity and low levels of rainfall that have caused the drought have led to a shrinkage in the areas of arable lands available for cultivation as well as a rise in the levels of desertification in many areas in Syria. As a result, there has been a significant reduction in agricultural production, and consequently, a decline in the national economy so dependent on this sector. Indeed, Syria is characteristically known for the breadth of its arable lands, fertile plains, riverbanks and mountains, all of which contribute to its great agricultural diversity.

However, at the same time that the wells and rivers are drying up due to increased demand for water in the cities, the availability of water for irrigation is decreasing day by day. Meanwhile, the United Nations Food and Agricultural Organization (FAO) has warned against the country's dependency on groundwater and the inefficient irrigation systems used by Syria's agricultural sector. It has also warned against the slow pace that Syria has taken in upgrading and modernizing irrigation projects which could lead to the

kind of results that the government would like to have.

In the view of local environmental specialists, the periods between cycles of drought in Syria have become shorter than they were in the past. In other words, drought is striking Syria in more successive periods than previously experienced. The chairman of the board of the Syrian Environment Association (SEA), Engineer Samir al-Safadi, says, "Drought has become part of climate change. In the past, the cycle of drought affected Syria every 55 years. It then shrunk to every 27 years and then decreased to every 13 years. Now, it is occurring every 7 or 8 years."

5. The impact and effects of the drought

Syria imports wheat to meet the needs of the local market

Despite all the advantages gained by Syria's vast tracts of arable lands, and according to a report published by the official *Baath* newspaper in June of 2010, the General Establishment for Cereal Processing and Trade (GECPT) does not expect Syria's wheat production to exceed more than 2.4 million tons this year. In its report, the newspaper quoted the GECPT as saying, "We will have to import wheat for a third successive year in order to meet the needs of the local market". The report claimed that, according to the findings of the organization's annual conference, Syria would have to purchase and market 3.6 million tons of cereals and grains, of which 3.2 million tons would be used to meet nutritional needs and 400,000 tons would be used for seeding.

However, official statements regarding the current wheat production in Syria have been conflicting. The Syrian Minister of Agriculture, Adel Safar, told the *Baath* newspaper last April that wheat production amounted to 4 million tons – a number which would be sufficient in meeting annual, local consumption needs that usually fluctuate between 3.6 and 4 million tons. In the meantime, local experts doubt that wheat production will be any greater this year than in previous years in light of the drought and agricultural pestilence, where rust disease has had an extensive impact on wheat production. At the same time, the director of the GECPT, Suleiman al-Nasser, claimed that, "Estimates for the agricultural harvest in 2010, based on numbers presented by committees of stakeholders formed to study random samples, and in light of the estimates presented by the Ministry of Agriculture and Agrarian Reform on 29/4/2010 regarding cereal and grain production in the governorates, indicate that the production of wheat in the agricultural season of 2010 should be 3,325,488 tons."

According to the official *Baath* newspaper, the Syrian government would have to, once again, import wheat for a third successive year after a harvest that was less than anticipated due to the continuing drought. The newspaper also said that the state, which has a monopoly on the wheat market and which provides substantial subsidies for wheat production, expects to collect 2.4 million tons of wheat from small farmers this year compared to 2.8 million tons in 2009. While these figures do not represent the entire sum of wheat production in Syria – where large quantities of wheat are smuggled or hoarded by producers – they do point to a definite drop in production, and is the strongest indicator yet that the harvest this year was as weak, if not weaker, than it has been in past years.

The *Baath* newspaper report also stated that Syrian ports on the Mediterranean Sea took delivery of 1.2 million tons of wheat imports in 2009; and, they expected to receive another 25,000 tons. The newspaper said, "The situation requires a re-assessment, particularly as spokespersons for the Ministry of Agriculture and Agrarian Reform

claim that our production of irrigated wheat is enough to meet our needs." The newspaper added, "The numbers show a clear decline in production in the governorates which are the primary wheat producers in the country."

The report said that 861,000 tons of wheat were delivered to the government's marketing department in the al-Hasaka governorate this year, or half of that which is usually received because of the weak crop yields due to the drought. Official numbers on the quantity of wheat produced last year was 3.6 million tons compared to 2.1 million tons in 2008 and 4.1 million in 2007.

Wheat Rust

This year, the lack of rain was not the only factor causing the significant drop in wheat production in the Peninsula governorates. Agricultural pestilences such as wheat rust also played a large role in this reduced yield. Wheat rust is a fungal disease that comes in different strains which affect different crops and crop parts such as wheat, barley and rye stems, leaves and grains. It has caused devastating epidemics in North America, Mexico and South America.

Over 50 international agricultural experts, particularly those specialized in wheat, all agreed that the epidemic Syrian crops were exposed to this season was the worst in the country's history. Syrian wheat was affected by no less than seven strains of wheat rust, with the most devastating strain, yellow rust, affecting the eastern region. At the same time, the central region suffered from frost; and the second, third and fourth agricultural basins suffered from significantly reduced rainfall. Dara'a was affected to a lesser extent, and the governorates of Deir al-Zor and Damascus were not affected at all.

Rising temperatures and the lack of precipitation so early in the season also led to a yellowing of the vast majority of barley crops, which were already suffering from powdery mildew disease. Thereafter, the soil produced a form of rust fungus that attacked almost all of Syria's cultivated lands and wreaked havoc on crops. In al-Hasaka alone, the areas affected were estimated at 190,000 hectares of a total area of 688,200 hectares of cultivated wheat (253,200 hectares of irrigated wheat and 435,000 hectares of non-irrigated/rain-fed wheat).

The extent of the damage suffered varied according to cultivated area. For example, in the second, third and fourth agricultural basins, crops were completely wiped out by the drought and rust disease. In other areas, it is estimated that up to 70% of cultivated areas were also damaged.

According to a special committee formed by the Ministry of Agriculture, these extensive crop damages were attributed to the climate change that has affected crops during different vegetative growth stages. For example, plants reached a budding stage much earlier than in previous years. These conditions were exacerbated by erratic and successive downpours accompanied by nebulous, dusty weather, moderate temperatures and relatively high humidity – combined with the latter is that crops planted this year were of the varieties particularly prone to the aforementioned pestilences.

The committee also mentioned that of the major causes for the prevalent crop damage in Syria was the increase in the average number of seeds planted per cultivated unit, which resulted in high plant densities. Also mentioned was the overuse of nitrogen fertilizer by farmers and heavy irrigation methods, which played a role in further increasing plant vegetative growth. Worth noting is that crop damage was confined mostly to soft wheat fields, and primarily in the Cham 6 and Cham 8 wheat varieties, with rust rarely observed in hard wheat fields.

Damages to livestock

Limited and erratic rainfall not only led to a significant drop in agricultural production but in livestock production as well. The entire herds of more than 59,000 livestock owners and 50-60% of the herds of 47,000 livestock owners were lost. Consequently, the Syrian government took the initiative to distribute fodder to livestock owners and breeders, on the basis that they would pay for the fodder in the next year. The government also vaccinated livestock and distributed veterinary medicines to livestock owners and breeders free of cost.

Also affecting livestock was the fact that the drought spread to the local barley crop, where, according to economists, the harvest dropped by nearly 90%. These losses reflected negatively on the livestock sector, whose dependency on barley is approximately 60%. This situation has bankrupted many small ranchers, a crisis which has prompted the National Agricultural Policy Center to work on finding alternative means to providing fodder to livestock, such as substituting barely with hay that is fortified with nutrients.

The areas cultivated with barley in the al-Hasaka governorate included 392,700 hectares of land, of which 29,200 hectares were planted with irrigated barley and 363,500 hectares were planted with non-irrigated/rain-fed barley. The yellowing of the great majority of these barley crops, already suffering from powdery mildew disease and the fungal rust which attacked almost all of Syria's arable lands, led to large tracts of lands cultivated with barley to be completely wiped out.

Social problems

According to the United Nations, 60% of Syria's land and 1.3 million persons (of a total population of 22 million) have been negatively affected by climate change and desertification, caused by human exploitation, lack of irrigation and reduced rainfall. Also, according to the International Committee of the Red Cross and the United Nations, more than 800,000 persons have completely lost their main source of income and livelihood.

In the meantime, there are no exact figures for the numbers of persons forced to migrate due to the drought conditions in the country. Estimates from the Ministry of Agriculture and Agrarian Reform show that 40-60,000 families migrated to other areas in Syria in July of 2010, with thirty-five thousand families migrating from the al-Hasaka governorate alone. However, in light of the continued internal migration, which is taking place at all times of the year, the real figures are likely to be much more than what is stated in the official numbers.

Agriculture is the most important sector in al-Hasaka's local economy and the most important source of income for the vast majority of al-Hasaka's population. Seasonal harvests are a continuous source of economic stimulation for the local market and provide good seasonal job opportunities. However, with the continuous drought, many of the local population have been forced to migrate.

The numbers presented at a conferences held by the local branches of the Baath party in Kamishili show that approximately 200,000 persons have left their villages for Damascus and its outskirts, Dara'a, Homs, Latakia and Tartous, as well as other governorates in search of work. This is notwithstanding those who have left Syria altogether for neighboring countries offering more work opportunities. Other estimates indicate that 30,000 families have left the Kamishili area alone, and 50,000 people have left the al-Shadadi area. There are no numbers available for those who have migrated from the Janoub al-Rad area, whose villages have become virtual ghost towns after being emptied of their populations and their schools have been

closed. Indeed, all that remains of Janoub al-Rad are the guards who have been hired by the local population to watch over the possessions they have left behind.

Wheat and barley shortages have also contributed to inflated food prices in Syria, with price indexes showing that the price of bread and cereals have increased by approximately 27% since January 2008. A report submitted by the Joint United Nations Commission in Syria reveals that these price increases exceed household incomes and basic purchasing power, especially in the areas most affected by the drought.

These internal migrations have led to other social problems for many of the families who have left behind cohesive communities to which they once felt they belonged. Local residents say the average crime rate has escalated in many of the areas where drought migrants have settled and where poverty abounds. And, the Joint United Nations Commission's July 2009 report shows that more and more children are being sent to work instead of school.

UNICEF Representative in Syria, Sherazade Boualia, says, "The drought has caused an increase in the drop-out rates in schools". She adds that, "What is important is to ensure that the opportunity for children to attend schools is not lost. We are trying to provide support to people so that their children are not forced to leave school in order to find work; and we try to ensure that those who are forced to move are registered in new schools."

Due to the high rate of subsistence farming, many families have not only lost their only source of income but also the ability to feed themselves. According to the FAO representative in Syria, Abdullah Bin Yahya al-Tahir, "Many farmers suffered total losses; and they have suffered greatly because the absence of a harvest means an absence of income. On addition to that, they now need to buy food and seeds, the prices of which have all risen due to the failed harvests."

The United Nations call for donations

The United Nations has made a call for US $20 million in donations from the international community in order to assist the tens of thousands of Syrian families affected by the drought in Syria this year. The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) said that the report by the Joint United Nations Commission in Syria shows that the impact of this drought, which was the worst that Syria has experienced in over four decades, are much larger and much worse than initially anticipated. The UN Commission report concluded that the incomes of Syrian families, particularly those in areas affected by the drought, have dropped significantly while the price of foodstuffs have greatly increased.

In light of these circumstances, many Syrians are eating less, selling their possessions or have been forced to migrate. Diseases caused by malnutrition are increasing, especially amongst children under the age of five and amongst pregnant women. Furthermore, the United Nations has shown great concerns about the fact that there are significant shortages of safe drinking water in the northeastern region of Syria.

6. The Syrian Government's response to the crisis

A region with a Kurdish majority

In the view of many experts, the response of the Syrian government to this crisis has been modest and slow due to the Kurdish majority in the area, especially as the Kurds have shown an opposition to the regime based on their demands for their political and civic rights, which are practically non-existent. And, although the majority of crude

oil, natural gas and sulfur is found in this area, its industrial base sorely lacks investment. Indeed, very few factories exist in this area and commercial trade represents a very small proportion of al-Hasaka's productivity, with the exception of trade in foodstuffs and livestock.

According to the annual statistics report published by the Syrian Central Bureau of Statistics on January 17, 2008, the number of the unemployed in the al-Hasaka governorate, with its Kurdish majority, exceeds 86,000 persons. Moreover, according to Kurdish-Syrian parties, the number of those unemployed in this governorate (which has an overall population of 1.5 million) has exceeded 50%, a number which gives reason to suspect that the official figures are not realistic or are inaccurate altogether according to Kurdish politicians.

Recommendations by the government

Despite the devastating extent of the humanitarian crisis the Syrian peninsula is experiencing, the Syrian government's response has not been adequate. Indeed, the government has been extensively criticized by the official press and authority figures in the government. In fact, the government has offered little more than official statements and recommendations, many of which have never been implemented or followed through.

However, recently, and with the aim of addressing the grim situation suffered by these families – who have been harmed by the drought in some areas in al-Hasaka, and who have been forced to relocate to other governorates in search of employment – and with the goal of encouraging them to return and resettle in their original places of residence, the cabinet has adopted the decisions and recommendations made by the nation's leadership with regard to supporting and assisting those families harmed by the current crisis. Included in this proposal is a plan to provide food subsidies to these families, according to the results of a mapping survey conducted by the Syrian Ministry of Agriculture and Agrarian Reform, the Ministry of Social Affairs, the Ministry of Labor and the State Planning Commission. The latter is in addition to providing water to parched villages via transport tankers; addressing the situation of illegal water wells in crisis areas; speeding up the modernization and upgrading of outdated irrigation systems; ensuring that the water and maintenance needs of local schools in the area are met; and, finally, providing medical care to badly affected villages and communities by way of mobile clinics.

Projected statistics and numbers

The figures presented by the Syrian Central Bureau of Statistics, based on the first phase of a random sample survey conducted on the strategic agricultural crops of wheat, barley and lentils for 2010, showed that the total sum of lands planted with wheat in Syria in the agricultural season of 2009-2010 was close to 1.6 million hectares, of which 1,050,000 hectares were planted with soft wheat and 550,000 hectares were planted with hard wheat (of which 271,000 hectares were irrigated and the remainder were non-irrigated/rain-fed).

Al-Hasaka came first in wheat-planting for the current season, with over 652,000 hectares of wheat planted; followed by Aleppo with 329,000 hectares; al-Raqqa, 190,000; Hama, 97,000; Deir al-Zor, 84,000; Idlib, 73,000; Dara'a, 73,000; Homs, 38,000; Alfan and Sweida, 26,000; Tartous, 13,000; al-Quneitra, 9,000; Damascus, 8,800; and Latakia, 3,000.

The areas planted with barley included 2 million hectares of land, with over 95% of these fields planted with non-irrigated/rain-fed barley and the remainder irrigated. Areas planted with barley by the private sector amounted to 1.6 million hectares

while the remainder was planted by cooperatives.

Aleppo came first in barley planting for the current season, with over 862,000 hectares of barley planted; followed by al-Hasaka with 448,000 hectares of barley planted; al-Raqqa, 335,000; Alfan and Hama, 143,000; Idlib, 61,000; Homs, 53,000; Deir al-Zor, 43,000; Dara'a, 21,000; Sweida, 15,000; Damascus, 9,000; al-Quneitra and Tartous, 1,000; and Latakia, 300.

The areas planted with lentils exceeded 131,000 hectares, the majority of which was non-irrigated/rain-fed. The areas with lentils planted by cooperatives included 60,000 hectares with the remainder being planted by the private sector. Aleppo came first in lentil planting for the current season, with over 53,000 hectares of lentils planted (all of which were non-irrigated/rain-fed); followed by al-Hasaka with 42,000 hectares of lentils planted; Idlib, 25,000; Hama, 6,650; Dara'a 1,072; Sweida, 760; Homs, 347; al-Raqqa, 144; Damascus, 131; Tartous, 78; and Latakia, 42.

7. National solutions

Drawing water from the Tigris to the Khabur

The importance of the Tigris-Khabur Irrigation Project is related to the decreasing levels of water in the springs that feed into the Khabur River (in the center of Ras al-Ain in northern Syria). These low levels have led to a complete halt in the free-flow of water from these springs to the Khabur.

The water situation in the Khabur basin has reflected negatively on both public and private irrigation projects that depend on the Khabur River and its springs. Indeed, many of the government projects that depend on this river have come to a standstill and agricultural plans, which depend on the government's irrigation network, have become subject to the erratic water supplies that keep changing from year to year. All of this is in addition to the problem of decreasing levels in the groundwater, due to the high levels of water being pumped to thousands of irrigation wells dug in this basin.

In light of this harsh reality, the Tigris-Khabur Irrigation Project has become a strategic solution to the water shortages and irrigation crises in the Khabur area. And, it is viewed as an effective means to putting a halt to the erosion and decreasing water levels of the groundwater in the Khabur basin.

The project intends to use Tigris waters to support the Khabur basin and to link the Tigris Irrigation Project with the Khabur Irrigation Project by feeding the Khabur with approximately 500 million cubic meters of water from the Tigris annually. Director of Water Resources in al-Hasaka, Engineer Samir Moura, considers drawing water from the Tigris to the Khabur one of the most important projects slated for the future. It would ensure that the water requirements for irrigating vast tracts of fertile lands and for carrying out major agricultural projects in the Upper Peninsula would be met.

The project would have an overall cost of 100 billion Syrian Pounds, but it is of great importance and has a strategic advantage on both the tactical and economic levels. It would not only contribute to reducing unemployment by providing thousands of new job opportunities in the governorate, but would also increase the area mass of irrigated lands, increase the production of strategic crops and improve the social conditions and living standards of residents in the area. Consequently, it would also help alleviate the problem of labor migration from the governorate by ensuring social and economic security for its residents, while increasing investment opportunities and new opportunities for tourism and agricultural projects in the area.

The project to draw water from the Tigris to the Khabur, by exploiting Syria's share in the waters of the Tigris, will meet several strategic goals: to ensure safe drinking water for the cities and villages that lie within the geographical scope of the project; to revive the Jaghjagh River and reduce its current pollution levels; to irrigate 120,000 hectares of new agricultural land; to support 60,000 hectares of government-irrigated lands in the Khabur basin; to ensure a significant part of national food security is met; and finally, to halt the erosion and overdrawing of groundwater resources for irrigation purposes.

The justification for endorsing the Tigris-Khabur Irrigation Project is to maximize the use of natural river water resources to irrigate almost 150,000 hectares of land, which would enrich agricultural highlands that extend from the city of Ras al-Ain to al-Soor in the Deir al-Zor governorate. The Tigris-Khabur Irrigation Project would cover three major areas: The first area would extend from the springs of Ras al-Ain to the joint dam (the Friendship Dam) in al-Hasaka; the second area would extend from the joint dam (the Friendship Dam) in al-Hasaka to the Basel Dam in South Hasaka, and; the third would extend from the Basil Dam in South Hasaka to al-Soor in the Deir al-Zor governorate.

The director of Water Resources claims that approximately 50% of the project had been executed by the end of last May. The works that were completed included: reviewing the previous study; reevaluating the general plan; updating all the project data and technical indicators; preparing work plans for monitoring and evaluating the final design stage for all the various components of the project; preparing agricultural, hydro-geological and hydrological plans; water balance operations; reviewing previous studies; conducting field studies and surveys on the Ain Dewar channel, the al-Malikiya pumping station, the Krachuq tunnel, various outlets, waterways and other proposed sites and facilities; following up on the implementation of operations related to electrical power supply, energy and controls; economic feasibility and environmental impact studies, and; finalizing the implementation of various monitoring, topographical, geo-engineering, geo-physical, laboratory and field operations.

Of the major facilities designed for the new Tigris-Khabur Irrigation Project include the pumping station at Ain Dewar on the Tigris River, located at Ain Dewar on the Syrian-Turkish border. According to the project's study, this station will discharge water at a rate of 10/100 m^3/second and is located in front of the Ain Dewar sedimentation basin and channel. The channel is 20.5 kilometers in length, with a water discharge rate of 100 m^3/second. The channel also has no irrigation fields to prevent water drainage from flowing towards Iraqi territory.

Other major facilities include the al-Malikiya pumping station, which will discharge water from the Ain Dewar channel to the al-Malikiya Dam at a rate of 10/100 m^3/sec, and from the al-Malikiya Dam towards Wadi al-Safan and the Krachuq tunnel. The Krachuq channel will transport water from the al-Malikiya Dam reservoir to the tunnel outlet into the Rmeileh channel. The water from the Rmeileh channel will then flow into the Bab al-Hadid and Jweideh Dams, which then subdivides into two main water channels which transport water to the Khabur River.

There are also plans in place to upgrade the main channel, according to an updated study and according to the amounts of water being transported to the Khabur Irrigation Project. Finally, a channel will be built to support the Khabur Irrigation Project. The parameters of the principal channel will also be adjusted according to the updated study so that areas that direct water flow towards Iraqi territory are canceled out and new areas for water flow are created.

The project will also include conversion stations and transport lines that are capable of securing the required electrical power supplies to all the project's facilities. A command center with electronic control over the various components of the project will also safeguard against technical malfunctions and protect project facilities. The electronic command center will also help improve working conditions and efficiency in light of the extensive size of the project and the vast geographic distances that exist between its core components.

Engineer Moura clarified that the steps taken to execute this project thus far have included implementing the terms of the Syrian-Iraqi-Turkish agreement. For these purposes, the General Company for Hydraulic Studies in Homs has been contracted to study the upgraded general plan for the Tigris-Khabur Irrigation Project, with the objective of irrigating 150,000 hectares of land. The company has also been contracted to devise a technical plan for the water outlet and pumping station at Ain Dewar.

The company began its work at the end of July of last year and the project's study has been finalized and organized into three main phases. The first phase will include reviewing the previous Bulgarian study; reassessing the general plan for the irrigation and drainage networks; updating the technical indicators and other key components of the project, based on new data gathered and based on the terms of the Syrian-Iraqi-(Turkish) agreement, and; finally, drawing water from the Tigris River. The second phase will include the execution of several operations based on the outcomes of the first phase, and based on the technical indicators developed for various project components in the first phase; conducting further field studies on the project's main installations and facilities, and; developing a technical plan for the irrigation channels, pumping stations and power facilities, amongst other works. The third phase will include putting in place operational plans for the project's channels, irrigation and drainage networks as well as the technical design for the secondary pumping stations.

8. Humanitarian and international assistance

Previously, the British *Financial Times* newspaper published that, despite recent moves by the United States and the Kingdom of Saudi Arabia to engage with Syria, the international community has not yet provided the financial assistance required for the emergency aid to Syria because of tensions between Syria and many Western countries and certain Arab countries concerning several regional issues. In the meantime, Mustafa Shabib from the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) in Damascus has confirmed that the drought is slowly turning into a catastrophe because, for political reasons, donors are not facilitating the remittance of the financial aid needed for humanitarian operations required in Syria. In the same vein, Dr. Nabi Rashid Mohammed, Syria's Deputy Minister of Agriculture, said to the British newspaper, "We would like the greatest number of stakeholders to engage in this problem because the Syrian government is doing all that it can. But, the problem is greater than our capacity to deal with it".

In the meantime, the United Nations World Food Program recently announced that they have begun distributing food rations to 190,000 people in eastern Syria, but that there are more than 110,000 other persons suffering from the drought in this area who are in need of emergency food assistance. They also stated that the lack of international financial aid has crippled the organization's ability to distribute rice, oil,

flour, chickpeas and salt rations to all those in need.

Syria has signed an emergency project document for an urgent response by United Nations agencies to limit the impact of the drought on the northeastern parts of Syria. The project has a budget which exceeds US $22 million, allocated for the International Planning Commission and the World Food Program. In one of its reports, the *Thawra* newspaper stated that the objectives of this emergency project was to ensure that all food needs are met in a fair manner amongst all its intended beneficiaries; to help stave off local responses to the drought that reflect negatively on the population, who have resorted to selling off their livestock and material possessions, or who have found themselves forced to migrate to the outskirts of urban centers or neighboring countries; to build capacities of stakeholders involved in the emergency response effort, and; to respond to the food security crisis by building capacities and skills in finding alternatives and solutions to dealing with drought conditions.

The emergency project includes providing food rations to 300,000 widows, divorcees with families and small-scale ranchers and farmers in the fourth and fifth agricultural basins in the northeastern provinces. It has also determined the scale of the food basket required to meet the needs of 75% of the project's intended beneficiaries. Altogether, the project will distribute 30,157 tons of basic and additional food allowances within an implementation period of eight months, which was supposed to end on July 31, 2010.

9. Recommendations

Experts see that the drought crisis is much greater than the capacities of a country like Syria to respond. Furthermore, Syria's tense relations with countries capable of providing aid in a time of humanitarian crisis have also reflected negatively on the ability to contain the crisis. The situation of corruption in the country has also had a negative effect on the crisis, with aid being wasted or lost by government officials.

Kurdish political parties are of the opinion that the area could benefit from economic resources other than agriculture, such as tourism and industry. And, Syrian opposition parties and organizations criticize the regime of neglecting the peninsula region, which is full of archaeological sites as diverse as Hamoqar, considered by archaeologists to be one of the oldest cities in the world, as well as Tel Halaf, Tel Burak, Tel Shaghir Bazar, in addition to one of the world's most famous archaeological ruins, Tel Mozan (Orkic).

Local authorities claim that they have made all the facts concerning the humanitarian situation clear to the Baath Party's leadership. They also claim that food aid baskets are of little use when one considers the rampant corruption, with aid either going to waste or being stolen. And, in a meeting conducted with ministers who recently visited al-Hasaka, local authorities requested emergency solutions to the region's problems; a request which, as of yet, has not received any positive response.

The Syrian government should make a serious stand when it comes to the drought crisis in the peninsula region. For, a crisis can generate many more crises, such as internal migrations that can change the demographics of any given area or the illegal immigration of young people to foreign countries in search of a livelihood.

The Syrian government should take action to contain the crisis by initiating alternative projects and creating job opportunities in the region. It should also play its part in negotiating with Turkey to regain access to waters retained by Turkish dams built in areas adjacent to the Syrian border. Such action could revive rivers such as the

Khabur and the Jaghjagh, amongst others, which have dried up due to natural causes and the Turkish projects erected on the other side of the Syrian border.

In the meanwhile, the international community should increase its humanitarian assistance to those harmed by the drought. And, the various United Nations agencies should declare the peninsula region in Syria a “disaster area” so that it can benefit from funds and aid to cover the damage caused by years of drought. It is also the duty of international bodies to monitor the implementation of aid so that this aid can be safeguarded against theft and waste, by setting up permanent monitoring committees in all the areas of intervention in the emergency assistance program. The United Nations should also work on encouraging the European Union and other Western nations to implement developmental and economic projects in the Syrian peninsula, where the region enjoys excellent natural resources, land areas and population densities.

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