

Climate Change, Water and the Policy-Making Process in the Levant and North Africa; The Syria Case

At a closed workshop held by the Issam Fares Institute for Public Policy and International Affairs in August 2009, leading water experts tackled the issue of climate change with a specific regard to Syria.

The Middle East is considered to be the world's most water-stressed regions where the average temperature over the Mediterranean has increased from 1.5 to 4 degrees Celcius in the last 100 years, and drought events are expected to increase tenfold over the next 100 years. Syria specifically, due to the type of vegetation it holds as well as the types of industries it specialises in, will be directly affected in a negative manner by climate change unless direct action is taken.

Background

Syria is considered an arid to semi arid country. Two thirds of its area is considered arid to very arid. In terms of climate, it consists of very Mediterranean type weather; cool, wet winters, and warm, dry summers. At the same time, the climate in Syria can be unpredictable due to the influences of different air mass circulation.

Syria is considered to be an agricultural country, whereby approximately 45 per cent of the population lives in rural areas. This sector alone makes up 26 per cent of the GDP. Research has shown that any change in precipitation or surface air temperature will have a direct impact on the country.

Water

Syria is divided into seven hydrological basins. The sector which uses the most amount of water is the agricultural sector, which consumes 94 per cent from the Tigris and Khabour basin, and a further 71 per cent from the Barada and Awaj basin. Yet, per capita, Syria's available water resources are at 860 m³/y, which is below the international water poverty standard of 1000 cubic meters, and the situation around the basins is expected to worsen by 2026 due to the growth of demands.

Currently Syria depends largely on five main rivers shared with neighbouring countries; Euphrates, Tigris, Yarmok, Orontes, and Nahr El Kabir Janobi. These make up a total of 75 per cent of its water resources, but yet there is only one official agreement regarding just one of the basins, which is between Lebanon and Syria over the Orontes basin. The problem lies with the impact of climate change; challenges in managing these shared waters will be increased and therefore have the potential to cause conflicts.

Groundwater is also a very important source of water in Syria, and its importance increased considerably during the drought years. The appraisal report from the Syrian North Eastern Region rural development project revealed that in the 2001, the overall water deficit showed a considerable increase in the percentage of used water to available water in the drought years (1999-2001), and that in the year 2001-2002, the deficit was 16 per cent more than the average

of the previous 10 years (1992-2002).

Springs

There are a number of springs located in Syria, the main ones being Figeh, Barada, Sen, and Ras El Ein. The karst spring of Barada constitutes an important source of drinking water for Damascus city, supplying up to 24 per cent to the area. Damascus has considerably improved its drinking water network, and more work is planned for the surrounding countryside, but within the city the quality of groundwater is deteriorating as a result of over-irrigation, over-fertilization, and pollution from domestic and industrial waste.

As a result, several recommendations to protect the springs have been suggested. These include defining a protection zone around the spring in order to preserve the sources from pollution; improved understanding and modelling of changes in climate related to the hydrological cycle at scales relevant to decision making; and the need to down-scale atmospheric models.

Agricultural Sector

Syria's economy has traditionally been dominated by the agricultural sector, which is said to employ around 25-30 per cent of the labour force. Up to 70 per cent of the cropped area is dependent on rainfall, and is therefore considered to be 'rain-fed' agriculture. The main crop in these areas are barley and wheat. The rain-fed area is approximately 5.5million hectares, yet only 1.4 million hectares is under irrigation, according to official statistics from 2004. 60 per cent of the irrigated area is done through private wells, of which 58 per cent are illegal.

Using the drought that occurred in the year 2007-2008 as an example, wheat production decreased by 78.9 per cent in this period, and production was close to zero in the rain-fed areas. The expected increase in temperature and decrease in rainfall from climate change will have a negative impact of crop water requirements, efficiency, availability, and production. A mathematical study showed that if temperature was to increase by a mere one per cent, and precipitation was to decrease by between 4-10 mm, there will be a 10 per cent increase in water use. If no irrigation water is added, there will be a decrease in wheat productivity of 15.6 per cent.

Institutions and Researchers Involved in Climate Change and Related Issues

Secretary of state for environmental affairs – identifies environmental problems; stipulates environmental policies; enhances public awareness; conducts research and scientific studies.

Ministry of irrigation – responsible for managing water resources; creates policies and studies on water; collects data; plans, constructs, operates, and maintains most hydraulic structures.

Ministry of agriculture – responsible for on-farm water management and basic extension and research services to farmers.

General directorate of meteorology – responsibility of climate monitoring through supervising climate stations across the country

Ministry of higher education and scientific research, along with other institutions involved in environmental issues including climate change – minimum and limited research has so far

been conducted, with a large focus currently on raising awareness.

Analysis of Current Status Quo

A new water policy has been adopted by the ministry of irrigation based mainly on water demand management rather than on water supply management, which translates into increasing productivity and reducing unproductive losses.

Furthermore, the current Five Year Plan (2006-2011) places special importance on water security as an essential ingredient of sustainable development. The Plan emphasises on improving the efficiency of irrigated agriculture through rehabilitation and modernization of irrigation systems, as well as the optimal use of surface water resources, improved groundwater management, and the protection of the environment from pollution and sewage. Yet, in order for these initiatives to be implemented properly, there needs to be coordination and interaction with other ministries and government departments.

The government has also launched a national program to promote modern irrigation and assist farmers to convert from inefficient, traditional on-farm irrigation systems to advanced efficient modern systems.

Knowledge management and information are increasingly becoming the key factors for ensuring sustainable management. In Syria, most of the available data regarding water and climate change are either limited in time and space or limited in accuracy due to lack of data quality control. Furthermore, climate data is dispersed amongst the different institutions and government departments, making the information difficult to obtain and convoluted.

Therefore, coordination between the concerned institutions is necessary. For example, recently, an agriculture policy centre was established within the ministry of agriculture with the assistance of the FAO and the Italian government which deals specifically with drought monitoring, but unfortunately its work is still relatively unknown at a national level, and there is only a minimum amount of coordination with other institutions dealing with water issues. It is important that Syria officialises its status with its neighbouring countries regarding the sharing of water from mutual river sources. There is currently a protocol of understanding between Turkey and Syria with reference to the Euphrates but it has not been officially adopted by the Turkish government, and recently a document has been signed between Turkey, Syria, and Iraq regarding the Tigris. With the Yarmouk, there is a tentative agreement, but not official, and for Nahr el Kabir Janobi, there is still nothing on paper. There is also the issue of the Golan Heights, where Israel is currently taking enough to cover 30 per cent of its water needs.

Conclusions and Recommendations

All predictions indicate that climate change will reduce the overall amount of rain by 20 per cent and will increase its variability making it much harder to manage. As a result, Syria and other Eastern Mediterranean countries will suffer from extreme weather conditions, thus limiting water supply and reducing agricultural productivity and food security.

Government policies focusing on water should place an emphasis on demand management rather than supply management. Furthermore, there needs to be concerted regional efforts for cooperation regarding sharing of data, experiences, and capacity building.



There is also an urgent need to create central institutions or task forces at a national level which will be charged with assessing, monitoring, supervising, and developing a climate change preparedness plan.

Finally, investment programs need to be developed in order to build a regional resilience to climate change.