The Effects of the Conflict in the Orontes River Basin in Syria

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1. Introduction

The Orontes (Asi) River basin is a key region in the ongoing conflict in Syria and will remain so during the post-conflict transition period. Massive population displacements and widespread destruction are linked to the highly strategic nature of the basin due to the ethnic and sectarian diversity of the population, the borders areas with Lebanon and Turkey, and the access to the coastal areas and the Damascus-Aleppo highway. Furthermore, the region has large water and agricultural resources. Since mid-2013, pro-government forces and opposition forces each control about 40% of the Orontes basin. About half of the remaining 20%, are combat areas in the center and south of the basin. In the areas to the east, control is undefined or shifting from one side to another. These areas with low population density are not a major strategic stake, barring the Salamiyah district and the communication lines in the region. Northern areas extending over the provinces of Idlib and Afrin were the first to escape the control of the regular forces, followed by the regions of Qalamoun, ArRastan and Al Qusayr. The latter was retaken by pro-regime forces in June 2013.To the north, the cities of Idlib and Jisr ash Shughur that were pro-regime enclaves were taken by rebel forces in March and April 2015. The two cities of Al Fu’ah and Kafraya remain under the control of pro-regime forces.

Territorial control and combat zones are related in part to the sectarian distribution of the population. In the middle reach of the Orontes basin, the population is predominantly Alawite to the west of the river and is Sunni to the east; both sides have Christian, Shia, Ismaili, and Circassian enclaves. In the north, the Afrin district population is predominantly Kurdish.

From the standpoint of the pro-regime forces, the location of combat areas can be interpreted as a strategy to partition the country. Indeed, since 2013, the fighting has been concentrated in the center of the river basin where areas are besieged and are subject to heavy bombardment. These correspond to large irrigation schemes along the Orontes River with high economic stakes. This is also the case of the Al Qusayr district and the Al Ghab plain. While the Al Qusayr area is controlled by pro-regime forces, in the Al Ghab area, rebel forces (Jaish Al fateh) have taken the cities of Ariha et Jisr Ash Shughur in May 2015 and control about 50% of the Al Ghab plain.
The offensive led by these forces in the Yabrud district to control the access to the Qalamoun region, aims to ensure territorial continuity between the areas controlled by the regime and the northern Bekaa valley. Further, the Qalamoun is an area of refuge for people expelled from Al Qusayr. Springs, wells and water networks are strategic for territorial control and have been deliberately targeted to interrupt water supply in certain sectors.

2. Population displacements

The conflict has led to a mass exodus from one of the most densely populated regions of the country. Three quarters of the four million inhabitants of the Orontes basin have been displaced during the past three years. Some of these displaced populations have returned to their areas of residence after hostilities ended. Some have been forced to shift, according to the changing locations of clashes or have moved due to the depletion of their resources. In some cases, such as the Al Qusayr district, inhabitants fled to the Qalamoun region. But moving combat zones have led to a second - and sometimes third - exodus, within a few months, with no possibility of returning to their home villages.

The map shows a zoning of the basin based on proportion of displaced people and the main hosting areas. About 1.6 million people from the Orontes basin have been displaced and have found refuge in Syria or in neighboring countries - mainly in Lebanon and Turkey. The most affected areas were emptied of almost all their population on account of fighting or bombing, or because they were expelled from districts declared as military zone to prevent the return of the population. The two main military zones were established in strategic sectors of the Qatinah and Al Qusayr districts, which comprise a large irrigation scheme and located close to the Lebanese border, and to the north of An Nabk.

The main hosting areas under control of opposition forces are located in the north, in the districts of Afrin, Harim, KafirTakharim, Salqin, Ad Dana, Al Atarib, and Dar Ta`izzah, hosting areas are also found in the districts of Ma`arrDibsah and Ahsim, north of Ma`arrat an Nu`man, where refugees mainly come from the Orontes basin, and south in the Assal al Ward district. The latter area is currently threatened by the ongoing offensive of pro-government forces on the city of Yabruk. The two main hosting areas controlled by the regime are the Salamiyah district and the outskirts of the city of Hama. The villages of Akkum and Daminah al Gharbiyah, located on either side of the military zone of Al Qusayr host, displaced populations from neighboring villages whose populations have been expelled.

Displacements have profoundly altered the geographical distribution of the population by draining high density areas located in the center of the basin while greatly increasing the population in the peripheral areas ill-equipped to handle large flows of refugees.

3. Access to drinking water

Prior to the conflict, 95% and 89% of urban and rural households respectively were connected to the public water supply system. This, however, did not prevent from shortages nor assure access to safe water. According to data from the Ministry of water resources, in 2010 the availability of drinking water per capita in most rural areas in the Orontes basin ranged from 50 to 75 liter per day (l/d). The quality of drinking water was poorly reported. Data from the Ministry of Public Health, for the country as a whole, indicate that in 2006, out of 8610 samples 6% were contaminated with coliforms. The rate of contamination was probably higher in the Orontes basin because of the lack of treatment plants and the high level of pollution.
The public water supply system in the Orontes basin comprises about 1500 wells equipped with electric pumps and two main pipe networks supplying the main cities. Groundwater is the main source of drinking water. Wells are used to feed small rural networks generally at the village level - one exception being the Al luji network which supplies 39 villages from one main pumping station. The Homs pipe network is fed by the Ain Altanour and Alsamak springs located on the west bank of the Orontes River close to the Lebanese border. The Hama-Salamiyah pipe network supplies the two cities plus Al Qusayr, Qatinah, ArRastan and to 65 villages along the network. The latter is fed from an intake on the Orontes River close to Umeiry. Water is treated in a purification plant 11 km south of Al Qusayr.

Access to safe drinking water is currently critical in large parts of the Orontes basin which has led to a sharp increase in waterborne diseases. For over 50% of the population living in the basin, safe water supply per capita is less than the 20 l/d defined by the World Health Organization as the short term survival requirement in emergencies. Power cuts and damage to pumping stations are the main causes of drinking water shortages. Public water networks in rural areas are dependent on power supply which is severely affected by the conflict. Areas under the control of pro-regime forces are however generally better served than those under the control of opposition forces.

At the time of writing, the two pipe networks are functional. The Homs pipe network has so far suffered no major damage. The Hama – Salamyah water pipe was damaged on January 26, 2014, north-west of Al Wa’r, and repaired within 3 weeks. However, the supply of besieged villages north of Homs is intentionally cut. Water supply was also interrupted in several neighborhoods of Homs; Bab as Siba, Qarabes, Al Qusur, Al Khalidiyaj, Al Bayadah, Ashereh, Nazhen, Jub al Jandali, Jurat ash Shayyah, and in the old city. In most rural areas where the availability of drinking water per capita is reported to be less than 10 l/d, public networks are out of function as a result of the destruction of pumps, particularly in areas north of Hama, or due to permanent power cuts. In certain areas, water of unknown quality is supplied in limited quantities by mobile tankers, which can cost as much as 50,000/m³. The Qalamoun region is one such case. The reported availability of drinking water does not necessarily reflect the situation of displaced people who have settled in isolated shelters with no connection to the public water network.

4. Agricultural water infrastructures and production

Prior to the conflict, the Orontes basin contributed about 25% of the total agricultural production in Syria. Over 50% of the crop production was grown on around 295,000 hectares of land irrigated from surface and/or groundwater resources. The basin comprises 6 state managed irrigation schemes making up a total of 128,960 hectares (Table 1).

Irrigation from groundwater expanded substantially in the past thirty years in particular in the district of Qusayr and east of the city of Homs. Close to 60% of water withdrawn for irrigation came from groundwater resources.

Crop production in the Orontes basin was reduced by over 70%, due to the sharp decline in irrigated areas. To a lesser extent, production decreased because of the reduction in cultivated areas and in the yields of rain-fed crops. Irrigated areas shrank more than half in the entire basin. The six major irrigation schemes, which used to provide more than half the production of the basin, have been strongly affected by the total or partial interruption of the water-supply. Part of the water infrastructure was destroyed during the fighting by bombing and passage of military vehicles, but the water supply has often been deliberately cut by disconnecting the supply to the channels and by plugging wells. Access to irrigation water is as strategic as the drinking water supply for territorial control.
Supply in the district of Al Qusayr was interrupted in 2011, following the obstruction of springs and cutting the supply of the main channel. Part of the secondary channels was damaged by fighting in 2013. In addition, out of 6,342 agricultural wells, 2,620 were plugged. Half the pumps and motors were looted. In the largest part of the Al Qusayr district, 20,500 hectares of irrigated land have been dried off and are no longer cultivated, since nearly entire populations of 23 cities and villages have been expelled. As many as 5,565 pumping facilities, out of the 11,460 recorded in the area, were destroyed or looted.

The Homs irrigation schemes, was abandoned in 2012. The latter scheme is fed by the Qattinah water reservoir whose main channel was destroyed, upstream of Homs. Almost all secondary channels were heavily damaged by bombing and are no longer usable.

The outskirts of the city of Hama have been relatively untouched by fighting. Damage to water systems is limited. The irrigated area has however dropped by over 60%. The land north of the city in the districts of KafriZayyah, Kurnaz and Qalat al Madiq is irrigated from groundwater and has now dried up due to the lack of fuel and electricity to power the pumps. In addition, 6,500 hectares in the KafriBuhum and Harbinasfah districts, used to be irrigated by the public network. The latter is not damaged, but there is no water supply due to the destruction of the Qattinah main channel. The greatest damage is in the area of Murk - KafriNabudah – Halfaya, where 42% of wells were plugged and 71% of pumps were destroyed or looted.

The decline in irrigated areas in the Acharne and Al Ghab plains can be explained by the fall in the level of the Apamea and Qastun reservoirs, which are currently at the minimum threshold level required to supply irrigation canals. The water volume flowing in the Al Ghab plain network fell from an annual average of over 300 million m$^3$ in 2010-2011 down to 70 million m$^3$ in 2012-2013. In the western part of the Al Ghab plain, which is supplied by springs, most of the land is still irrigated.

The ArRuj area in the province of Idlib is irrigated from groundwater. Pumping stations were damaged and the 15,000 hectares perimeter was completely dried up. About 13,000 hectares of formerly irrigated land are currently used for the production of rain-fed wheat and barley. Almost 2,000 hectares located near a military base are inaccessible. The irrigation network supplying 18,500 hectares located in the Afrin district is almost out of service in 2013. These lands were then used for rain-fed crops. Pumps were restored and most of the irrigation scheme is currently functional.

The main rain-fed cropping areas are located at the periphery of the basin to the east and north in areas relatively untouched by the fighting. Production has

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### Table 1 – Irrigation schemes

<table>
<thead>
<tr>
<th>Irrigation schemes</th>
<th>Area (Hectares)</th>
<th>Main productions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Qusayr</td>
<td>6,800</td>
<td>Apricot trees, apple trees, vegetables</td>
</tr>
<tr>
<td>Homs - Hama</td>
<td>20,190</td>
<td>Wheat, sesame, vegetables</td>
</tr>
<tr>
<td>Al Hulah</td>
<td>2,200</td>
<td>Wheat, potatoes, vegetables</td>
</tr>
<tr>
<td>Al Asharinah &amp; Al Ghab</td>
<td>65,560</td>
<td>Wheat, cotton, sugar beet, groundnuts, vegetables, sesame, potatoes, vegetables</td>
</tr>
<tr>
<td>ArRuj</td>
<td>15,500</td>
<td>Wheat, cotton, sugar beet, sesame, potatoes, vegetables</td>
</tr>
<tr>
<td>Afrin</td>
<td>18,500</td>
<td>Apricot trees, pomegranate, vegetables</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>128,750</strong></td>
<td></td>
</tr>
</tbody>
</table>
declined by 20% to 30% due to the lack of fuel, prices of fertilizers and seeds have drastically increased. Furthermore, farmers are faced with the risk of crop destruction, especially by fire, and of losing access to their fields at harvest time.

Before the conflict, the Orontes basin was one of the prime tree production regions in Syria, with 471'000 hectares of orchards, mainly olive groves. It also accounted for a large part of the livestock production. In early 2014, the state of orchards was assessed in 112 villages in the provinces of Idlib, Homs and Hama. Nearly 15% of 26,000 hectares of orchards have been destroyed. These surfaces were burned accidentally or intentionally or cut for military reasons or for collecting firewood, whose price has tripled over the past three years. Furthermore, 40% of surfaces are no longer accessible, mainly in the districts of Al Qusayr, ArRastan and An Nayrab.

Damage to cattle and sheep were evaluated in the villages of the Orontes basin located in the provinces of Idlib and Homs. Cattle herds were depleted by 90% and 60%, the number of sheep dropped by 60% and 40% respectively in the provinces of Idlib and Homs.

The effects of the conflict on poultry production have been partially assessed in the province of Idlib. The production capacity was reduced by 60% between 2010 and 2013. Out of a total of 206 production units in 2010, 122 were no longer in business in 2013, due to the total or partial destruction of buildings and production equipment and/or because of the lack of food supply.
Figure 1 – The Orontes River basin: Population displacement in Syria, December 2015
Figure 2 – The Orontes River basin: Availability of drinking water in Syria, December 2015

Availability of drinking water

- No access to water
- 10 - 15
- 15 - 25
- 25 - 50
- > 50

Legend:
- Main road
- Secondary road
- Capital of province
- Capital of district
- Other city
- Current Orontes stream bed (natural course)
- Current Orontes stream bed (artificial course)
- Water body
- Watershed boundary
- International boundary

Map credits: 
- Source: Syria Water and Environment Management Project (SWEP)
- Data: National Service for Mapping and Remote Sensing (NSMRS)