Water for Resilience and Recovery in Syria

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From the Orontes River Basin to In- and Post-Conflict Challenges

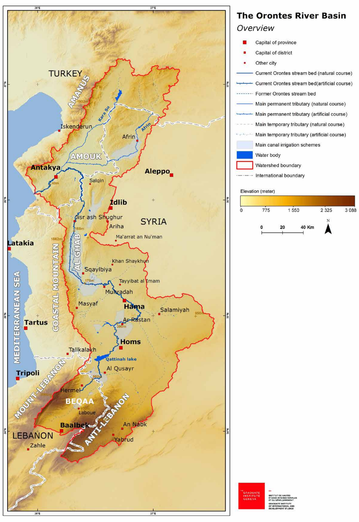
In 2012, one year after the conflict in Syria began, the Graduate Institute launched a research program on water management challenges in the Orontes River Basin. The research was designed from a post-conflict perspective to identify and assess options for concerted water management in the basin. One of the primary objectives of the program was to maintain collaboration with Syrian colleagues from Universities, research centers and government services working in the water sector and provide them with support at a time when international institutions were withdrawing from the country.

Access to water for domestic and agricultural purposes has become an increasingly critical issue over seven years of protracted and intensive conflict. In-conflict challenges became a major concern of the research team. The Orontes Program collects data on water resources, infrastructure, utilization and management, and can be used to design and implement effective rehabilitation projects that support Syrian civil organizations and the Syrian population in their efforts to take charge of the situation.

> Water is a strategic entry point into addressing needs across sectors. Improving access to safe water and restoring water infrastructure contributes to efforts in health, livelihood, food security and shelter.

Water is not only essential to immediate emergency relief, it is also integral to longer term prospects. Water management, water governance and water sharing are important elements in the recovery and reconciliation process. International organizations are aware of the urgent need to restore basic services including water supply. Efforts are thus far constrained by lack of means, but this is not the only limiting factor. In order to succeed, resilience-oriented interventions require a holistic and flexible approach that includes Syrian organizations and local power structures and the private sector. In particular, the inclusion of Syrian organizations is a key component in effective strategies aimed at restoring basic services. Yet, to date, the support given to these organizations by International organizations is entirely insufficient.

In 2015 Geo Expertise launched a new program designed to address this problem. In collaboration with a network of Syrian engineers and technicians, and with the support of the Graduate Institute, the program aims to strengthen Syrian organizations their capacities to design and manage water projects and provide expertise and mediation in the rehabilitation and management of water supply infrastructure.



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The Orontes River Basin

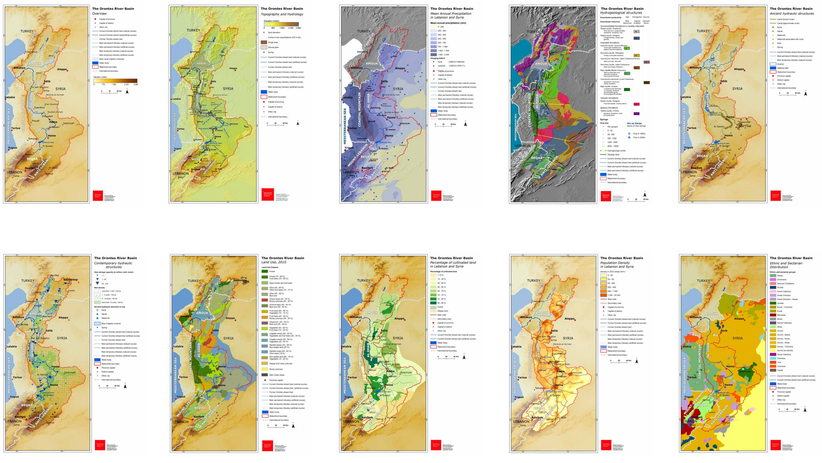
The Orontes River Basin is a key region in the ongoing conflict and will remain so in the post-conflict transition period. The strategic nature of the basin is the result of the ethno-sectarian diversity of the population, the border areas with Lebanon and Turkey, the access to the coastal area, the presence of the Damascus – Aleppo highway and large water and agricultural resources.

Prior to the conflict, the basin was home to 24 % of Syria's population. It provided a quarter of the agricultural production and a third of industrial production of the country. The Orontes Basin was one of the first industrialized regions of Syria with the establishment of state plants such as the Homs sugar factory in 1948, and the oil refinery in 1957. Industrialization accelerated in the 1990s with the establishment of private factories, in particular the chemical and pharmaceutical plants.

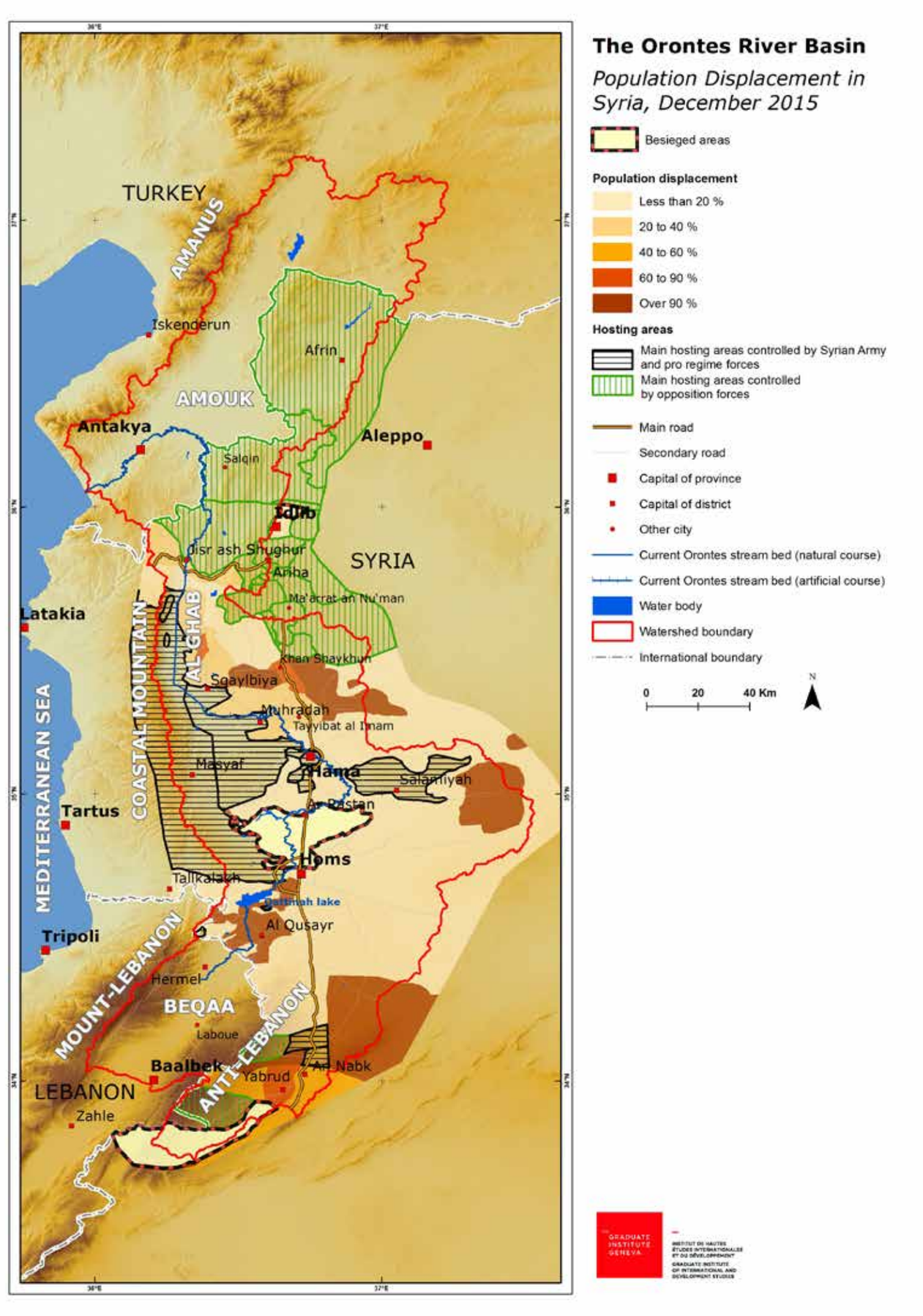
The basin has a long history of water developments. The first, located in the upper reach of the basin, date back at least to the Bronze Age and possibly earlier. Since the 1950s, large-scale irrigation schemes have taken place in the upper and middle reaches of the basin. The Al Ghab irrigation development plan became the first agricultural achievement of the Ba'ath Party after it took power in 1963. Later, up until the second half of the 1970s, farmers cultivating irrigated lands in the Orontes River basin were among the main beneficiaries of the agrarian reform and centralized agricultural policy. However, public investment in the Orontes River Basin drastically reduced in later years following the construction of the Tabqa dam, which signaled the Euphrates valley becoming the national priority for irrigation projects. Nonetheless, water extraction continued to increase in the Orontes River basin as a result of the multiplication of wells over 50% of which are unauthorized.

Even prior to the conflict, water resources and water management were a critical issue in Syria, and over the years the Orontes basin has suffered from severe environmental, economic and social crisis. Clientelism in the application of water regulations and crony capitalism have made water use a source of social and political tensions eroding the rural basis of the Ba'ath Party. The Orontes basin, once a stronghold of the Ba'ath party, became a protest hotspot in 2011.

The objective of the Orontes River basin research program was to identify and document water management options through a detailed assessment of resources, water use, infrastructure and policies. The research characterized and analyzed the hydro physical system and the social economic political system, as well as the complex interaction between the two. The data collected and analysis produced by the research program serve as a basis to address current conflict-related water management challenges and post-conflict perspectives.

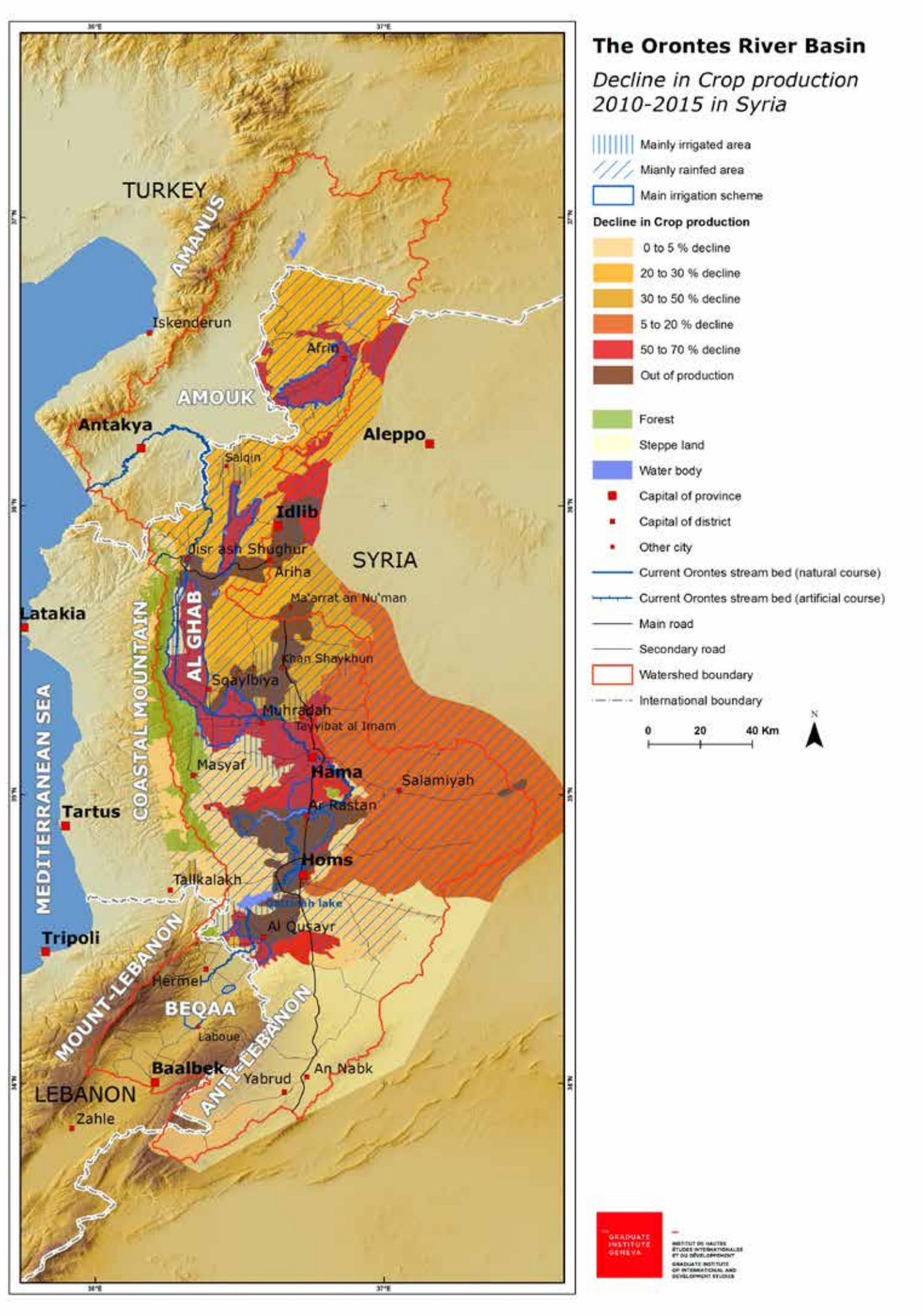


Effects of the Conflict - Access to Water and Population Displacement



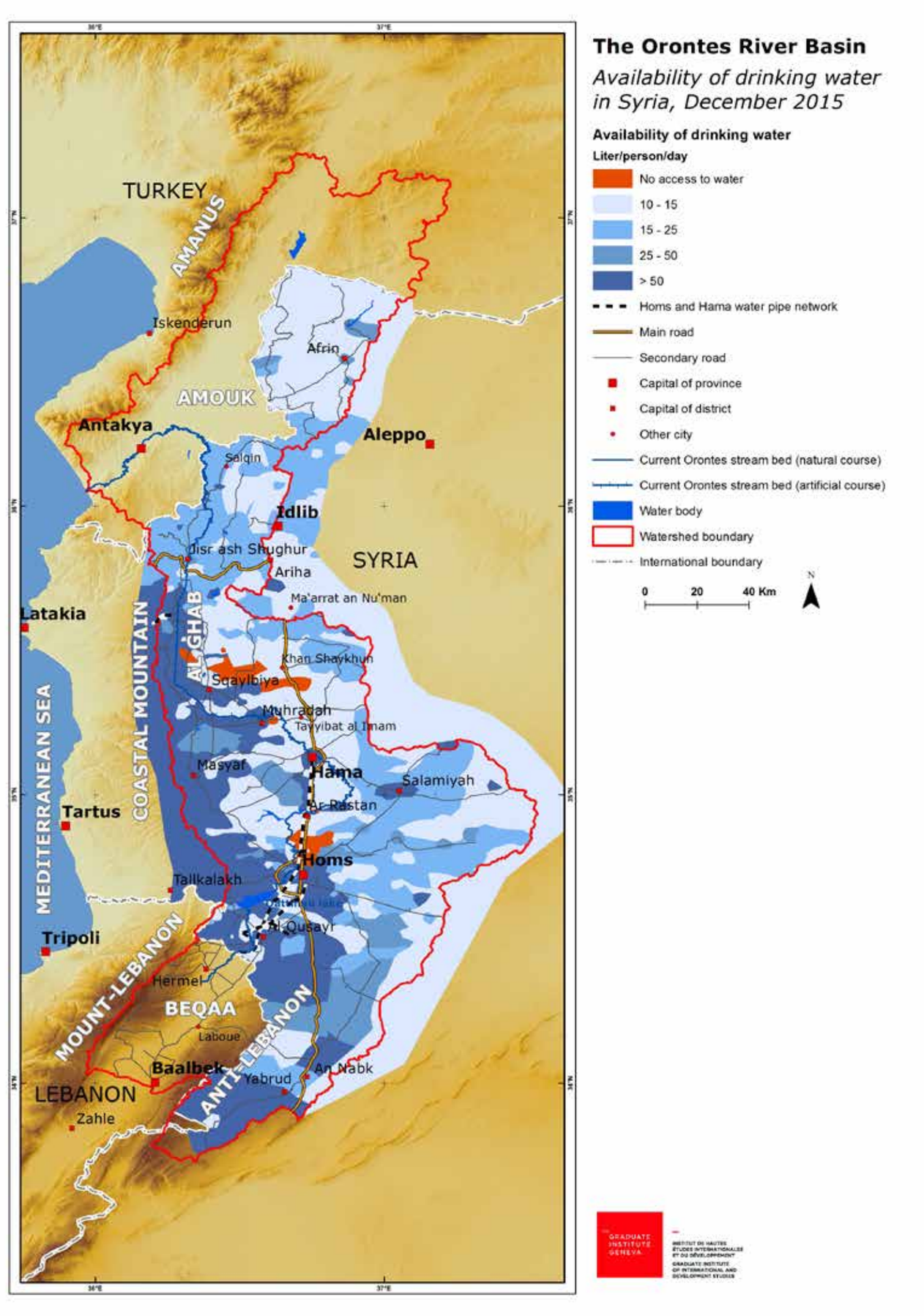
Access to safe drinking water is a fundamental human right, yet in Syria it has become a critical issue. Widespread insecurity and looting, the weaponization of water, the flight of trained personnel, a lack of equipment spares, and energy shortages have all severely degraded the country's water infrastructure. Today, about 70% of the population lacks access to safe drinking water, and the situation is continually worsening.

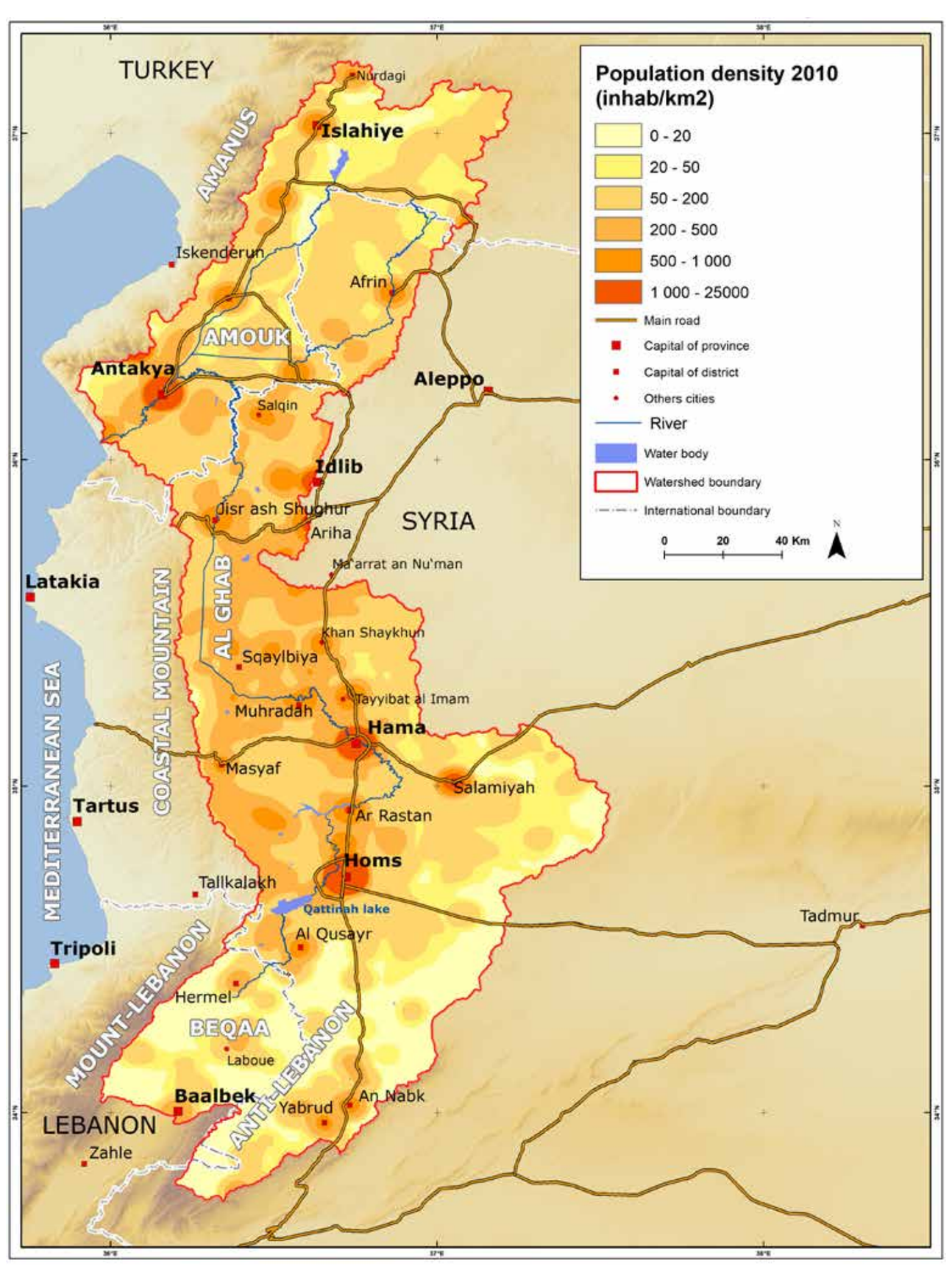
Consequently, Syrians must rely on unsafe water sources and are increasingly vulnerable to contaminated water, waterborne diseases and price gouging. Furthermore, the destruction of irrigation networks and pumping stations has led to a drastic decline in agricultural production.

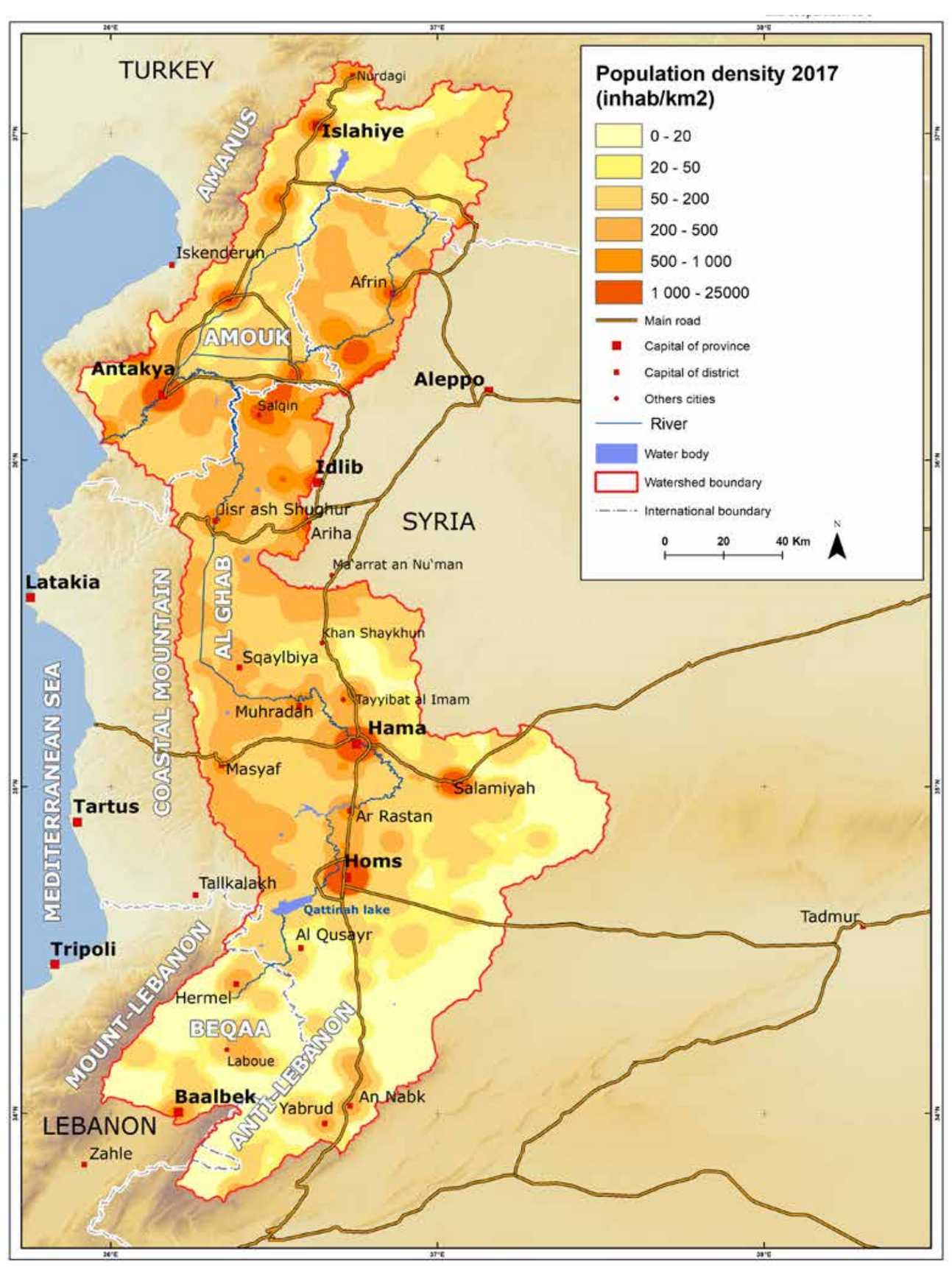


Close to 50% of the four million inhabitants of the Orontes Basin has been displaced during the past six years. The vast majority of them has yet to return to their homes and is mainly being hosted in the northwest of the basin. Other areas hosting significant number of displaced persons are found north of Ma'arrat an Nu'man, where refugees mainly come from the Orontes basin, and south in the Assal al Ward district. The two main hosting areas controlled by the Government of Syria are Salamiyah and the outskirts of the city of Hama. The villages located on either side of the military zone of Al Qusayr, host displaced populations from neighboring villages whose population has been expelled.

The high influx of internally displaced population overstretches water resources in host areas.







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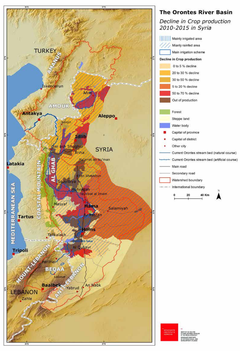

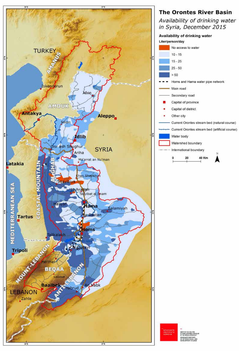

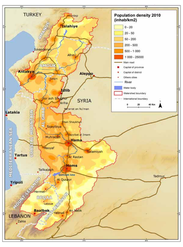

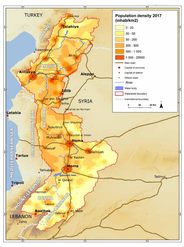

Water-Project Training

The aim of the training program developed by Geo Expertise and the Graduate Institute is to restore the supply of drinking and irrigation water by strengthening the capacities of local organizations. The program offers training in the design and management of water projects, as well as in the operation and maintenance of water supply networks.

Water Project Design and Management

Objectives:

- To provide local organizations and Syrians working for humanitarian organizations with technical expertise to assess needs, water resources and define sustainable solutions to restore water supply for domestic and irrigation purposes.
- To provide support in designing and writing water project proposals to be submitted to funding agencies.

To meet these objectives, Geo Expertise ran six 2-week training sessions on water projects design and management, in Reyhanli, Antakya, Sanliurfa, Gaziantep and Beirut.

Operation and Maintenance of Water Supply Networks

Objective:

- To provide training for local organizations, local councils and Syrians working for humanitarian organizations based on the demand and needs of partner organizations. This consists in providing know-how to local organizations with limited or no technical expertise in varied water-related topics. The training content includes water distribution and cost recovery, water quality control and management, maintenance of supply networks and pumping stations, building and management domestic wastewater infrastructures, conflict resolution and the management water user associations.

Ten 1-week training sessions on operation and maintenance have taken place in Joubas and Ad Dana in Syria.

Dam safety and dam break flood wave calculation

A one week course on dam safety was organized in Reyhanli in February 2016 to address the management of dam failure and flood protection for engineers from northwestern Syria where several medium size dams are at risk of collapsing.

Training sessions in water project design and management, in operation and maintenance of water supply networks and in Dam safety have so far addressed a total of 165 participants and helped establish a large collaborative network.

The program has contributed to the design of 45 projects, among which 15 have been at least partly implemented. This includes the rehabilitation of the Ar Ruj irrigation scheme, which is the first of his kind to have been completed thanks to the support of the Qatar Development Fund.

The reluctance of international organizations to support Syrian local organizations remains a main constraint limiting the implementation of water rehabilitation projects.

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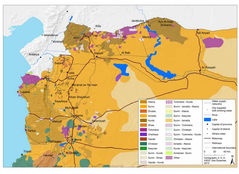
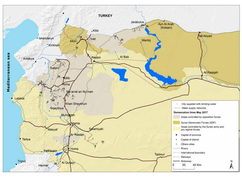
Mediation to Restore Cross-Line and Inter-Ethnic Water Networks

The program has documented 25 shared water supply networks crossing between military demarcation lines and/or ethno-sectarian territorial limits and currently out of function. Prior to the conflict, areas with limited or difficult to access groundwater resources were supplied by pipe networks distributing water from one or several sources to groups of villages and small cities. Previously, these water networks were managed by government services but have, since 2012, stopped operating as a result of the conflict. Shared networks including pumping stations have been damaged to various degrees and lack power and spares.

The rehabilitation of these shared water supply networks require collaboration by the concerned communities, itself something which requires a mediation process. The aim of the program is to develop a mediation strategy by analyzing technical requirements and by identifying stakeholders, interest groups, local power structures, representatives to participate in negotiation committees and mediators accepted by all parties.

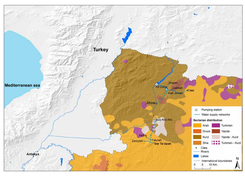


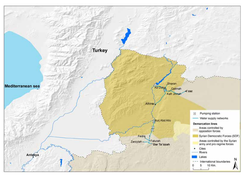


The approach was applied in a pilot project on the provision of drinking water to Afrin, I'zaz and Dar Ta'izah. Water supply has been reduced in Afrin and interrupted in 2012 in I'zaz and 2014 in Dar Ta'izah. In these 2 locations, water is currently provided from wells but in insufficient quantity and at high cost. The networks supplying these two localities cross an ethno-sectarian limit between Kurdish and Arab areas. Water is supplied to Arab localities from sources located in the district of Afrin: the Maydanki reservoir on the Afrin River and the Burj Abd Allo pumping station. The interruption of water supply to Arab localities was not intentional and is due to the damage to pumping stations and distribution networks.

A request was submitted in December 2015 by the I'zaz Local Council to the Geo Expertise team based in Reyhanli, Turkey to setup mediation to restore the water supply from the Maydanki reservoir. The Dar Ta'izah Local Council requested support from the team to support the design of a project proposed by engineers from Dar Ta'izah. Requests from the 2 Local Councils followed a training course on water management conducted by Geo Expertise attended by participants from Afrin and I'zaz districts.

The situation in northwestern Syria is complex. Nonetheless, the set of meetings conducted with all interest groups and local power bodies indicates that, through mediation, agreements can be reached on the restoration and management of water supply networks, providing that key civilian actors are associated in project design and management.





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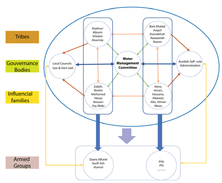

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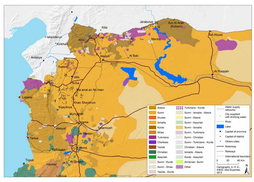

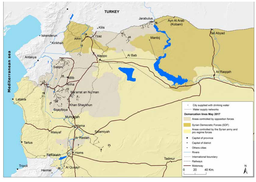

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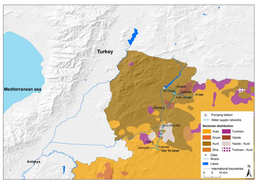

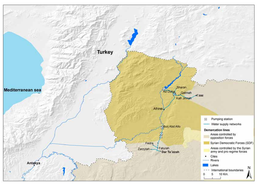

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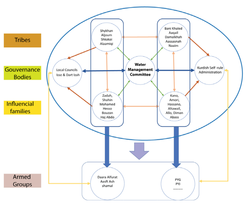

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Rehabilitation and Management of the Ar-Ruj Irrigation Scheme

إعادة تأهيل وإدارة شبكة الري في سهل الروج، ادلب، سوريا

The Al-Ruj plain is located to the west of the city of Idlib and is shared between 65 villages. The area was originally a swamp only a small part of which could be used for crop production after water receded in the summer.

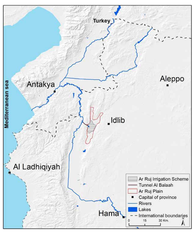
In the 1960s, the swamp was drained and an irrigation network was constructed supplying irrigation to 5,000 hectares of land. The drying up of the springs due to the extensive use of groundwater upstream prompted the drilling of 17 wells to irrigate 2,700 hectares. At the beginning of the 2000s, pressurized irrigation systems were established, relying on the water of Ain el-Zarqa spring stored in the Al-Bala'a reservoir (14.5 Mm3) to irrigate 10,500 hectares for the production of wheat (60%), cotton (25%), beans (10%) and sugar beet (5%). In the summer the cultivated area mainly used for vegetables crops did not exceed 50% of the scheme.

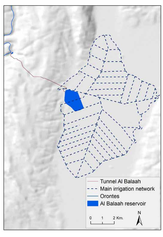
The management of the irrigation network and collection of water fees from farmers was assured by government services. In 2012, irrigation completely stopped due to the extensive damage to the water supply network and pumping stations.

يقع سهل الروج الى الغرب من مدينة إدلب، وتتقاسمه 65 قرية. كان السهل بالأساس مغموراً بالمياه ولا يستفاد إلا من جزء محدود منه في فترة انحسار المياه في فصل الصيف.

وفي الستينيات تم تجفيف المياه الراكدة وأنشئت شبكة للري تغطي مساحة 5000 هكتار من الأراضي الزراعية تُروى من ينابيع عري. لكن جفاف الينابيع فيما بعد دفع المؤسسات المعنية بالمشروع الى حفر 17 بئراً لتأمين الري لمساحة 2700 هكتار. وفي بداية السنوات 2000 تم إنشاء شبكات ري مضغوطة تعتمد على مياه عين الزرقا ونهر العاصي بعد تجميعها في خزان البالعة وذلك لري مساحة 10.500 هكتار. كانت تُزرع 60% قمح كمحصول شتوي. بالاضافة لزراعة المحاصيل الصيفية كالقطن والخضروات. المساحة المروية صيفاً لا تتجاوز 50% من مساحة المشروع.

وكانت المؤسسات الحكومية هي المسؤولة عن إدارة شبكة الري وتحصيل الرسوم من المزارعين. وفي عام 2012 توقف الري بشكل كامل بسبب الاضرار التي لحقت بشبكات الري ومحطات الضخ في المنطقة.





QATAR FUND FOR DEVELOPMENT
صندوق قطر للتنمية
الهلال الأحمر القطري
Qatar Red Crescent
geo expertise

بناءً على طلب المزارعين المستفيدين والمؤسسات المحلية، قامت مؤسسة جيو إكسبرتيز بإنجاز دراسة لإعادة تأهيل سهل الروج وبوشر بالتنفيذ بعد تأمين التمويل اللازم من صندوق قطر للتنمية عن طريق الهلال الأحمر القطري.

ويهدف المشروع إلى إعادة تأهيل 700 هكتار في القسم الجنوبي من شبكة ري سهل الروج وذلك لإنتاج القمح والبقوليات والخضراوات الصيفية.

وتشمل أعمال التأهيل:

- إزالة القنابل العنقودية غير المنفجرة،
- تأهيل أقنية الري الرئيسة المتضررة،
- إصلاح أو تبديل المضخات،
- تأهيل الشبكة الكهربائية،
- تزويد المشروع بمولدتين كهربائيتين.

ولقد قامت جيو إكسبرتيز بإنجاز الاعمال بالتعاون مع ورشات محلية وباشراف الهلال الأحمر القطري.

ومن المتوقع أن يرتفع حجم إنتاج القمح إلى أكثر من 2000 طن والذي سيساهم
في رفع مستوى الامن الغذائي وتحسين سبل العيش في منطقة

At the request of local institutions and farmers, Geo Experiences completed an assessment of the Al Ruj irrigation scheme, designed a rehabilitation plan and implemented the project after securing the required funding from the Qatar development fund through the Qatar Red Crescent.

The project aimed at restoring 700 hectares located in the southeast section of the irrigation scheme for the production of wheat, legumes and summer vegetable crops.

The technical component of the project comprised:

- the removal of unexploded cluster munitions,
- the rehabilitation of damaged primary irrigation canals,
- the repair or replacement of pumps and the installation of two electric generators.

The work was conducted by the Geo Expertise team in collaboration with local workers team, the Qatari Red Crescent assured the administrative monitoring of the project.

The production of wheat will be increased by over 2'000 tons which is an important contribution in terms of food security and livelihoods in an area hosting a large number of internally displaced persons. The number of beneficiaries of the project is estimated at 28,000 persons 55% of which are children.



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The rehabilitation of the canals and equipment was completed in December 2017 and the irrigation network was tested in January and February 2018. Irrigation of the 700 hectares started in March.
To ensure the management of the scheme, a local management system was developed based on the establishment of a water user association. A funding plan was designed including water users and the private sector.

The general assembly of the water user association comprises 49 farmers elected or designated by their village. The number of representative per village is related to the area of the village included in the project. Members of the General Assembly elected 7 members to form the Executive Committee of the irrigation scheme. Members of the Executive Committee elected the president, treasurer and technical manager of the Committee.

The executive committee supervises:
- The operation of the pumping stations
- The application of the irrigation and water allocation plan
- The infrastructure protection and maintenance
- The collection of water fees and the financial management of the project.

لقد تم الانتهاء من أعمال تأهيل وصيانة شبكات الأقنية وكافة مستلزمات ومعدات المشروع في شهر كانون الأول من عام ٢٠١٧، ثم اختبرت شبكة الري في شهري كانون الثاني وشباط من عام ٢٠١٨، وبعد ذلك انطلقت عمليات الري في نهاية شهر آذار من العام نفسه.
ومن أجل تأمين إدارة محلية للمشروع، تم تأسيس جمعية مستخدمي المياه. كما
تم وضع خطة تمويل تشمل مساهمة المستفيدين والقطاع الخاص.

وتتألف الهيئة العامة لجمعية مستخدمي المياه من ٤٩ مزارعاً، تم انتخابهم او
تسميتهم من قبل أهالي القرى التي ينتمون إليها. ويرتبط عدد ممثلي كل قرية بحصتها من أراضي المشروع. وقد انتخبت الهيئة العامة للجمعية مجلس لإدارة المشروع يتكون من سبعة أعضاء. ثم انتخب المجلس من بين أعضائه رئيس الجمعية وأمين الصندوق والمسؤول الفني.

The Ar-Ruj rehabilitation and management project was designed and is implemented by Syrian experts, engineers and technicians in collaboration with local institutions and water users. The project demonstrates the capacity of the population and Syrian organizations to take charge of the situation with the support of international agencies.

تم تصميم وتنفيذ إعادة تأهيل وإدارة مشروع الري في سهل الروج من قبل خبراء ومهندسين وفنين سوريين بالتعاون مع المؤسسات المحلية ومستخدمي المياه.
يبرهن المشروع على قدرة الشعب والمنظمات السورية على الاخذ بزمام الأمور مع دعم الوكالات الدولية.



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