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Delivering sustainable water supply in fragile and conflict affected states: experiences from Syria

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GOAL has been carrying out Water, Sanitation and Hygiene (WASH) programming in Syria since 2013. This project is delivering clean water to over 450,000 people by utilising pre-existing water networks that had fallen into disrepair and lacked regular electricity supply for operation. This is delivered by pre-existing Water Unit structures that operate in a similar fashion to a typical water utility. The programme has completed necessary rehabilitation works and now focuses on how cost recovery mechanisms can be established to ensure the longer term sustainability and enable funding to move from O&M to further rehabilitation works. This paper shares a background on rehabilitation works to date, but focuses predominantly on recent cost recovery consultancy work from IMC Worldwide. Key lessons revolve around the ability to complete such complex work under remote work arrangements, developing suitable tariffs with uncertain information and how to best develop customer complaints mechanisms.

Introduction

GOAL began work in Syria in 2012, with WASH programming methodology developed in mid-2013. GOAL programming commenced with cash transfer and distribution programmes, enabling sufficient time to be taken to design WASH programming that addressed unmet needs. In August of 2013 this was judged to be working closely with Water Units to support the rehabilitation, operation and maintenance of water networks that had existed prior to the conflict. Engrained into the project was to develop a system of cost recovery where the costs for operating and maintaining the system are to be recovered by the water consumers.

With support from the UK Department for International Development (DFID) GOAL commenced work in late-2013 on the rehabilitation of water networks. This funding was later complemented with funds from the USAID Office of Foreign Disaster Assistance (OFDA), Norwegian Church Aid (NCA) and the Humanitarian Pool Fund (HPF). GOAL is now working with four Water Units from the areas of Harim, Salqin, Darkosh and Idleb. With the rehabilitation works of Harim and Salqin now largely complete, and water being delivered to over 450,000 people, the project focus is now shifting onto cost recovery and how this can be achieved to both ensure the resilience of target populations to changing circumstances and increase the potential to extend rehabilitation work to more areas.

This paper will briefly outline some methods employed to deliver this project and explore some of the key lessons learnt.

Background context

The background working context can be essentially split into two components, the situation before the conflict started and the situation facing the water consumers prior to the rehabilitation of the water network.

Pre-conflict water supply system

Prior to the conflict households were all connected to a water distribution network. The energy needs of this network were met by national grid electricity supply. Households were charged approximately $0.05 per m3 of water, a cost that was heavily subsidised by central government (GOAL Syria, 2014:a). The vast majority

of households had a water meter that was manufactured within Syria by central government, although once programming commenced it became clear that many of these were damaged beyond use. The Water Units in the local areas would manage the operation and maintenance of water systems, read meters, collect money from households and then send this to the Water Establishment in Idleb city, the centre of the governorate.

Under this system the majority of households enjoyed plentiful, clean water supply at an affordable price. This supply was heavily subsidised by central government which enable tariffs to be set at extremely low levels.

Conflict-affected water supply systems

Prior to GOAL commencing operations to support the Water Units, the number of households served with mains water fell throughout the conflict. GOAL's baseline and endline surveys, conducted in January and December 2014 respectively, for an OFDA/DFID-funded water systems repair project, revealed that households using the water mains supply as their primary water source had fallen from 95% to only 9% over the course of the conflict, with most households resorting to use water tankers as a primary source of water. Water tankers are expensive ($1.5 to $5 per m^3); the second highest expenditure for households, preceded only by food. With the restoration of mains water supply, this expenditure decreased by 42% (GOAL Syria, 2014:b).

Therefore although activities during the current OFDA project have had notable successes in increasing water supply, continued support for operation and maintenance is required. Without support to Water Units, water supply and quality will decrease, likely prompting a reversal in the positive trends seen in Figure 1.

GOAL water supply rehabilitation programme

Through consultations with the existing water units, GOAL used the expert knowledge and experience of the Water Unit personnel, who have worked in the water networks for numerous years. The GOAL team, formed of experienced engineers, then verified the necessary work.

The repairs varied depending on the extent of the damage to the 52 water pumping stations and associated piped network, The major rehabilitation was the installation of 47 generators, 41 water pumps, 8 water storage tanks, 14 fuel storage tanks, numerous pipeline repairs and building constructions, Rehabilitation works covered all aspects of the water distribution network, excluding household connections which were maintained in their pre-conflict state.

In terms of the skills required to implement the works, the Water Units have the expertise to conduct minor repairs that do not require specialised equipment. The GOAL team of engineers provided additional support where required, If there are extensive repairs required, contractors complete the work under the supervision of the GOAL engineering team.

When possible items were procured from Syria. This included all building construction supplies, pipelines, storage tanks, fuel and some electrical equipment including switches, electric meters, relays, circuit breakers, conductors and transformers. Items procured from Turkey included generators, water pumps, electrical cables, control panels, fuel and water analysis machines.

There are obvious security issues when completing work of this nature in Syria, the GOAL security team provided information and advice about the security situations. When it is deemed too dangerous to work, activities will be halted. As water stations can be targeted, in the major towns, GOAL rehabilitation included a back-up station that could be used if the main station was destroyed.
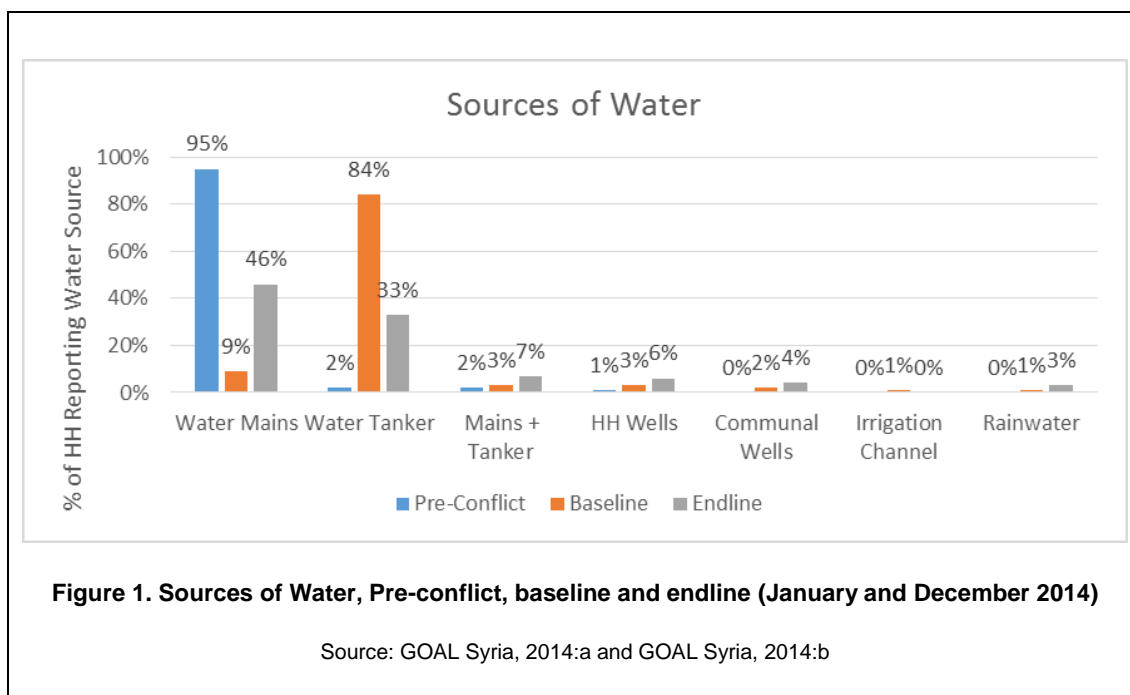
Obviously many issues and difficult decisions were tackled during this project implementation, including:

- Lack of certainty on the population data makes it difficult to determine how much water is needed.
- Armed groups taking over the water stations to use for profiteering and political influence.
- Disagreement between local authorities on the amount of water distributed to towns under their control.
- Interference of local councils with recruitment of people working in the Water Units.
- Local councils demanding to be in charge of the running of the network, despite having limited technical skills.
- Bombs either destroying the stations/network or making it too dangerous to work.

The hardware rehabilitation works have cost approximately GBP2.3 million to complete to date, this serves a total population of 450,000 people.

Water supply systems following GOAL programme

With GOAL's intervention, GOAL was able to reverse the downward trend, and increase the amount of households served by the water mains as their primary water source to 46%, with a 51% reduction in the number of households relying on water tankers (Figure 1 below).

Figure 1. Sources of Water, Pre-conflict, baseline and endline (January and December 2014)

Source: GOAL Syria, 2014:a and GOAL Syria, 2014:b

Complications remain with respect to reaching all households with piped water supply. Those in the distant rural locations are more difficult to reach and likely to increase the overall cost of delivering water supply. Similarly working remotely brings challenges with parts of the network suffering from recurrent breakdowns and system optimisation meaning households become cut off whilst improvements are made. As the current system supplies power via generators there is also a challenge in providing a 24/7 supply due to limited fuel supply.

The quality of the water supply through mains water is much better than the alternative source used by household, trucked water. The water tanker supply is more difficult to control and test quality, whilst that supplied through this project is clean and chlorinated.

Cost recovery mechanisms

Over the past year, through the support of the Harim and Salqin Water Units, GOAL has developed a detailed understanding of the water network's operational and maintenance requirements and associated costs. GOAL is using this information currently to support the Water Units to establish a cost recovery system where the costs of operating and maintaining the water networks are recovered by charging water user fees. This supports GOAL's objective to restore water supply to pre-conflict standards, and to incorporate sustainability into the programme. Currently, the Alfawar (Harim) network provides 116,200 people with 17 litres of water per day with a monthly operation and maintenance cost of $42,394, currently provided by GOAL through the WASH programme. This equates to $0.72 per m3. The Alghafar (Salqin) network currently provides 202,805 people with 34 litres of water per day with a monthly operation and maintenance cost of $72,412. This equates to $0.35 per m3. While this is significantly more than the $0.05 per m3 charged prior to the conflict (enabled through heavy government subsidy of the water service), it is less than the water trucking services that have been introduced since the start of conflict, which charge between $1.5 and $5 per m3 (depending on the season and the location of the village).

The challenges of cost recovery

The cost recovery system is extremely complex, covering 436,984 people across 121 towns/villages. Some of the complexities include:

- Establishing accurate water user charges considering that there are limited water meters;
- Issuing bills and collecting money across such a large geographical area (especially considering security concerns); Also Cash Management concerns from the collection phase to the expenditure phase;
- Continuing conflict often requires further focus on rehabilitation of network components and thus cost recovery strategy implementation is put on hold;
- Continuing fluctuations in fuel costs mean that it is challenging to establish accurate tariff levels;
- Further conflict displaces populations into areas with operational water networks, making it very difficult to establish an accurate customer database; and
- Ensure that the most vulnerable are not left unserved due to being unable to pay their water bills.

To assist with the development of the cost recovery strategy and operational plan, GOAL has contracted a consultant with experience in setting up cost recovery solutions in insecure environments. Preliminary discussions and reports have identified that establishing a robust cost recovery system requires the optimisation of network efficiency; creation of financial management systems; and the capacity building of the water service providers (the Water Units). Over the course of the proposed OFDA Award, with the full findings and recommendations from the consultancy, GOAL will assist the Harim and Salqin Water Units to develop a plan for increasing network efficiency through:
- Establishing asset management plans;
- Network optimisation (including the creation of network models and technical works such as installation of bulk water flow meters at strategic locations); and
- The implementation of standard operating plans to facilitate forecasting budgets and resources.

The creation of the financial management system will include the development of a customer database, setting of water tariffs (based on O&M costs and ability to pay, with free water available for the vulnerable and tiers for public and commercial use), and the introduction of billing and revenue collection systems (developed with consideration for security concerns). The overall purpose of the cost recovery approach is to develop a system that is within the capacity of the Water Unit to adopt over the long term, to support post-conflict recovery. Therefore, engrained into each aspect of the strategy and operational plan will be an element of capacity building for Water Unit personnel. Building on the full findings and recommendations from the cost recovery consultancy, within the Award period, GOAL will aim to recover 50% of the operation and maintenance costs of the Alfawar (Harim) and Alghafar (Salqin) water networks; although, this is dependent on prerequisite conditions being met to ensure adequate security. Within the operationalisation of the cost recovery scheme, GOAL is cognisant of the security threat posed with the collection and storage of large amounts of money and developing a safe mechanism for the collection and management of funds is an integral part of the cost recovery approach. GOAL plans to introduce the cost recovery strategy under a phased approach beginning with a pilot of the cost recovery system in the towns deemed most secure.

Lessons learnt

Key lessons learnt to date from Rehabilitation in FCAS Environment include:
- It is important to verify and re-verify needs, as remote management and the difficult working environment mean that the quality of the information is not always accurate.
- Remain flexible because the fluidity of the situation can lead to the need to change plans quickly.
- Develop robust remote management tools to help with meeting objectives.
- Managing relationships between the mandated water providers and the local authority (local councils) needs to be very clearly defined before implementing the project.

Key lessons learnt to date from Cost Recovery Strategy implementation/development, include:
- The work required to determine an appropriate tariff is particularly demanding, especially if this is intended to include future depreciation costs.
- Heavily subsidised government systems might not be possible to replicate during conflict and so significant awareness-raising campaigns are required to ensure households compare costs to the alternative water trucking systems as oppose to pre-conflict water systems, this awareness campaigning should also highlight the difference in quality.
- Phasing out of fully subsidised water systems requires a significant awareness raising campaign.

- Water Unit capacity building is delivered remotely.
- Remote management techniques are likely to require monitoring and evaluation mechanisms integrated with mobile technology to enable cloud based databases.
- There is a significant opportunity for partnerships with global stakeholders, particularly water utilities who can offer on-going assistance to Water Units including specialised skills. Sutton and East Surrey Water is providing ongoing technical support as part of the consultancy work led by IMC Worldwide.
- Collecting and managing revenue in a conflict zone presents a significant security risk.
- Any proposed approach for cost recovery system should take into consideration some flexibility and extra procedures to cope with the unstable security situation, for example the potential influxes of IDPs from a nearby area. This would probably lead to unpredicted rises of the population. A voucher based system may support such flexibility.
- The approach is divergent from the traditional approach to water supply in a humanitarian context and presents challenges more typical to the development of services for urban water supply in the developed world. It has been necessary to contract in services from these sectors to ensure the development of a cost-recovery system will extend beyond the conflict and donor funding.
- Supporting water service provision through adopting existing municipal services can offer a more cost-effective means of water supply, but relies heavily on security in funding and power generation. This process should be balanced against the pros and cons that comes with attaching water supply with municipal services as it could raise several accountability challenges. By shifting from a beneficiary based response to a consumer based approach, greater self-sufficiency in supply may be achieved, with reduced dependency on long term funding from external sources.
- A consumer based approach for the humanitarian response to water supply, introduces many of the consumer rights that exist for consumers in the developed world. This can place greater emphasis on the need for transparency and accountability by the service provider.

Acknowledgements

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Note/s

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