SOLIDARITÉS INTERNATIONAL

OUR EXPERT ASSESSMENT

DESIGN AND PRODUCTION OF A DRINKING-WATER SUPPLY NETWORK

Especially committed to fighting water related diseases and unsanitary conditions, SOLIDARITES INTERNATIONAL (SI) has been involved in the field of access to drinking water and sanitation for almost 35 years.

The annual number of deaths caused by these diseases has risen to 2.6 million, making it one of the world's leading causes of death; amongst these victims, 1.8 million children, aged less than 15, still succumb...

Today, when more than a billion people are still deprived of access to drinking water and permanently exposed to water-related diseases, the right to drinking water remains a vital concern in developing countries.

In this regard, drinking-water supply networks represent quite a relevant technical solution for supplying water to refugees, as well as to dense populations and areas with high population growth.

In order to further advance technical and socioeconomic diagnoses, SOLIDARITES INTERNATIONAL has led many projects, sometimes lasting years, in partnership with institutions and legitimate operators from the water sector.

Hydraulic components and civil engineering relating to rehabilitation, growth and the construction of infrastructure are inseparable from the accompanying social measures, which involve placing sustainability, with the concerted management of water services and the participation of the community, at the heart of the process.

ANALYSING AND ADAPTING

TO COMPLEX AND VARIED MISSION CIRCUMSTANCES

Repairing, renovating or building a drinking-water network is a relevant technical response when the humanitarian emergency situation requires the re-establishment of the water supply and following the very first emergency measures (tanks, mobile treatment units). When public health risks result from insufficient access to a water supply, safety, economic and political conditions must be met in order to implement a sustainable system. If this is the case, investing in a drinking- water supply network can prove to be a more adaptable, profitable (because it is cheaper in the medium/long term) and sustainable solution, as much in an emergency or post-emergency situation as in a stable environment.

1 | THAILAND

SUPPLYING WATER IN REFUGEE CAMPS

Fleeing Burmese repression, the Karen people have been settled in Thailand for 2 generations. In the Mae La camp, which consists of 45,000 people, SOLIDARITES INTERNATIONAL has improved and extended a drinking-water supply network supplied by the catchment of springs and by pumping river water, and has also set up a treatment plant for latrine sludge. While its management constitutes a real challenge in a restrictive situation, the sanitary risk is well-controlled.

> SI personnel in front of Mae La's drinking-water supply network's pressure pumps

2 | DRC

SUPPLYING DRINKING WATER IN A STABILISED SITUATION

Since 2001, to contain cholera epidemics in the east of the Democratic Republic of the Congo, SOLIDARITES INTERNATIONAL has implemented sustainable solutions adapted to either rural or urban situations. In the two regions of Kivu, situated in the mountains, the small, gravity-fed, drinkingwater supply networks demonstrate the preferred solution. In an urban setting, only more complicated and longer (5-15 year) interventions allow for radical changes to the citydwellers' circumstances. Aside from Beni, SOLIDARITÉS INTERNATIONAL carries out large-scale work in Kalemie.. In partnership with Regideso, our teams renovated the drinking-water supply network. Dating from Belgian colonisation, it actually only partially covered the needs of the 250,000 inhabitants.

> One of the 22 public tap stands constructed in Kalemie in the DRC, equipped with a reservoir of 10m3 and a row of 10 taps

FIXING AND MAINTAINING

THE SUSTAINABILITY GOAL, AT THE OUTSET AND AT THE HEART OF OUR MISSIONS

"Reinforcing local players' capabilities guarantees users the continuity of a drinking water service beyond our phase of humanitarian intervention". While this can be risky due to unstable conditions in the zones where SOLIDARITÉS INTERNATIONAL intervenes, it still constitutes a main objective when implementing drinking-water supply programmes. Autonomy, longevity, and the viability of water services represent a fundamental concern for people's health and are, as such, the foundation of our mission.

1 | THE QUESTIONS TO ASK IN ADVANCE

The first stage in the project cycle is the diagnosis aimed at analysing the pertinence of the intervention. In addition to technical data, it provides information on the institutional, socio-economic and cultural setting, responds to some key questions: What are the priority needs? What provision is required? What is the National Water Policy (quantity and quality norms, price list, etc.?) Which local water market structure should be used? Do the inhabitants want to/are they able to pay for this service? Is there the potential to create or reinforce a maintenance system?

> Point of sale (kiosk) for water. Following a diagnosis in the vast slum Mathare (Kenya), it was decided to not intervene in the drinking-water supply network, in order to avoid smashing the existing water market to pieces, even though it was informal and hardly fair…

2 | CONCERTED WATER MANAGEMENT

Since 2001, SOLIDARITES INTERNATIONAL has renovated and extended the drinking-water supply network in Beni, in the North Kivu province. A vast hydraulic construction grants 240,000 inhabitants access to drinking-water. The governance of the water service has been greatly improved: the communities participated in all phases of the project, the public was consulted for the tariffs and sustainable management of the network was set up, based on close consultation between the projects' partners (Regideso, the town hall, the Management Committee, the Association des Mamans 18 and the Association des Gestionnaires de Bornes fontaines).

> During the inauguration of a tap stand in Beni. The "Comité des Mamans" is an association which ensures the interface between users, private operators and the authorities.

DESIGNING AND IMPLEMENTING

DRINKING-WATER SUPPLY INFRASTRUCTURES, OUR EXPERIENCE

From the first exploratory sketch to the official handover of the built and renovated work, the technical quality of the drinking-water supply infrastructures is based on extensive diagnosis and on professional commitment. In order to design a drinking-water supply network and to choose the appropriate technical solutions, it is necessary, at a minimum, to figure out the needs, identify the exploitable water resources and size the installations, without forgetting to estimate costs (operating, maintenance). Depending on whether it is a matter of a new drinking-water supply network or a complete or partial restoration, the work focuses on all, or part of, 3 main components.

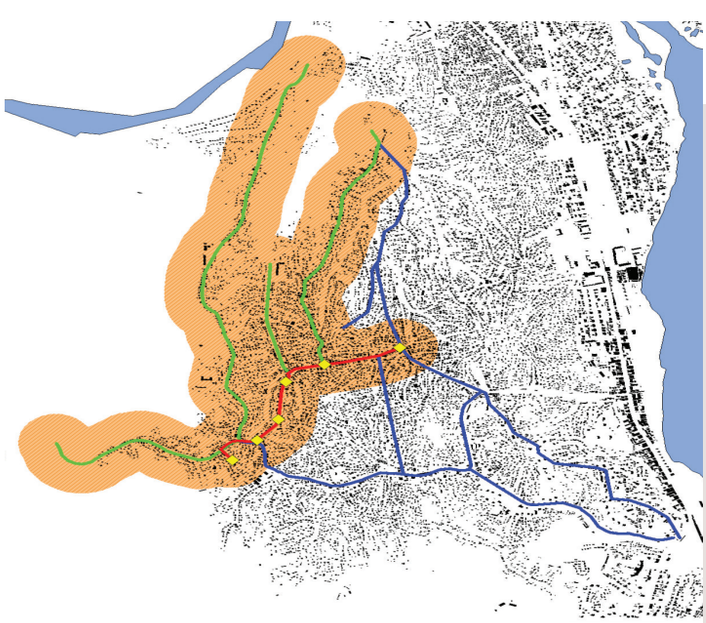
1 | CATCHMENT AND SUPPLY

Where possible, the gravity system is preferred as it is more reliable and relevant: this technique does not require energy. When this choice is not possible, raw water (surface or groundwater) is pumped, routed to the purification unit and then pushed back to the reservoirs and the distribution network.

2 | WATER TREATMENT

Regular analyses must be in compliance with the country's drinking water norms. Unwanted chemical substances must be absent or below the limit. The water must not contain either bacteria or faecal coliforms (0 for 100ml), it must be "transparent" (turbidity < 5 NTU) and present an adequate residual chlorine level (0.5 mg/l) to prevent recontamination during transportation or at home.

> Retrofiltration plant built in Beni, in the DRC, relying on slow sand filtration and making it possible to produce drinking water from contaminated water.



3 | THE DISTRIBUTION NETWORK

In order to guarantee a satisfactory and reliable water supply, a hydraulic study must be performed and a piezometric profile created. Once the type and diameters of the pipes are chosen and the capacity of the reservoirs is calculated, the establishment of a model of the drinking-water supply network on Epanet software makes it possible to calculate the loss of linear loads, the output and the residual pressure at different points of the network. Water will be delivered to homes by private branch pipes equipped with water meters, as well as by the public tap stand.

> Map to visualise the primary pipes (blue) of Kalemie's drinking-water supply network, the section renovated in 2015 (red) and the impact zone (orange zone) and its secondary pipes (green).

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Photos © | Carl de Keyzer, Vianney Prouvost, SOLIDARITÉS INTERNATIONAL
design | ljavelaud | 09•2011
adaptation | solidarités international | 03•2015
impression | le réveil de la marne

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