

## Rehabilitation of alternative water supply systems in a fast growing town: the example of Kigali where urban people and detainees share the results of an unusual partnership.

Dr. P.G. Nemprini, M. Serafino, P.Y. Monnard and R.G. Conti

### Introduction

Since the tragic events in 1994, the population of the town of Kigali has increased dramatically, up to more than 350'000 people. 90% of the city's water supply, comes from the WTP of Kimisagara (20'000 m<sup>3</sup>/day) which can hardly cope with the increasing water demand. There was a permanent shortage in several neighborhoods. Among others, the two suburbs of Gikondo and Remera were suffering from lack of water and their population was increasing rapidly. In these two suburbs the authorities have located two new detention centres to accommodate the increasing number of offenders, for whom the authorities are responsible, as in any other prison around the world.

ICRC has been involved in the maintenance of decent minimum detention conditions as from the beginning of the war, helping the new government to fulfill his tasks. Throughout the years, ICRC engineers assisted the Rwandan authorities by constructing and upgrading water supply and sanitation facilities, such as septic tanks, latrines and water storage reservoirs, drainages, improving the water and sanitation situation in most of the prisons, among other activities in this field, mainly directed

to the improvement of the rural and urban water supplies[1].

If access to clean water and adequate sanitation facilities play a vital role in preventing health problems in any context, in overcrowded prisons their continuous provision is of paramount importance to prevent epidemic outbreaks and illnesses caused by inadequate hygiene.

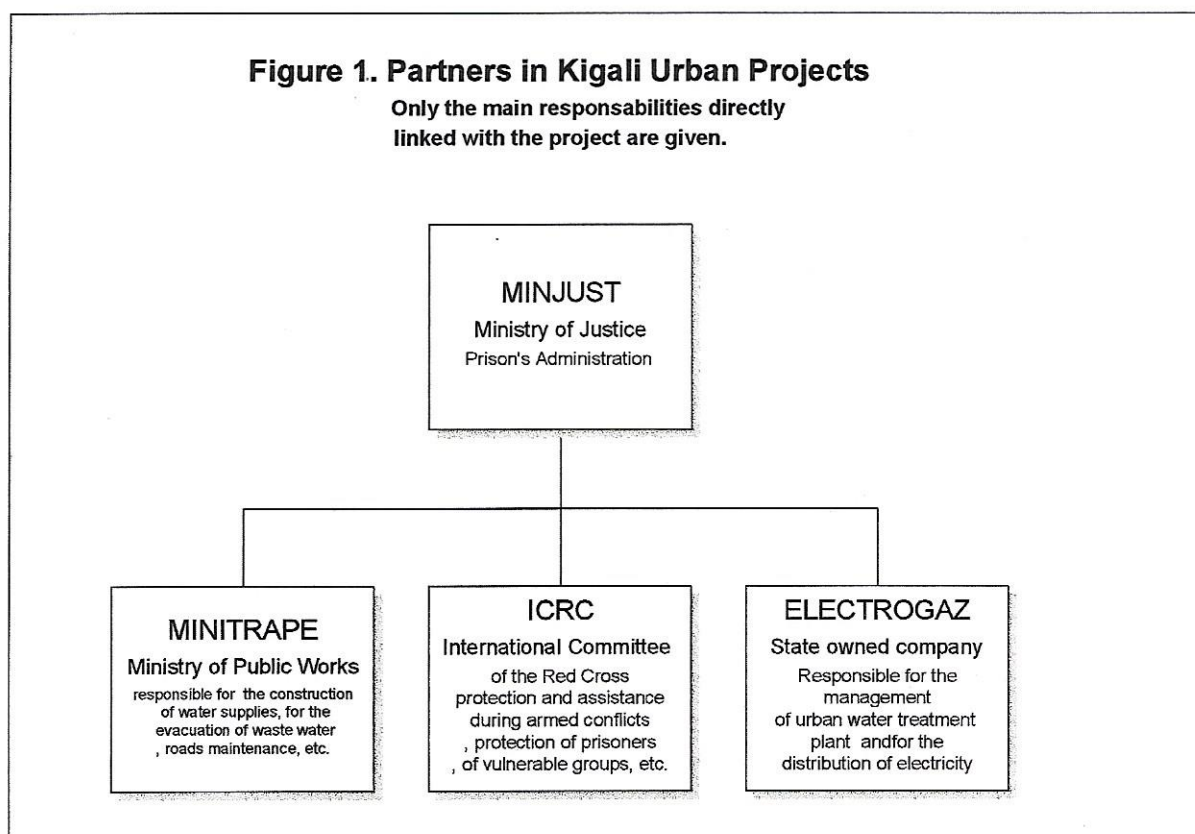
Unfortunately, the location of the detention centres is mainly dictated by the availability of space, by security constraints and for many other reasons the choices are rather limited.

Two suburbs were chosen: Gikondo and Remera, as being suitable to locate 2 new detention centres, capable to host about 5000 inmates each, but the already poor water supplies of the two suburbs were not capable to cope with this new demand. Moreover the inhabitants would hardly accept a better service for those who are considered as "genocidaires", even if most of them are still waiting for trial and some may not be guilty.

To cope with this challenge the ICRC engineering department had to implement an unusual form of

**Figure 1. Partners in Kigali Urban Projects**

Only the main responsibilities directly linked with the project are given.



partnership with the ministry responsible for the prisons (MINIJUST) but also with those in charge of the production and distribution of the water, turning to alternative water supplies, the main water treatment plant being unable to increase its production and therefore to meet the increased needs.

## Partnership

For prisons matters the ICRC deals in general with the Ministry of Justice who allows the ICRC's delegates and engineers to interact with the prison's administration for any activity to be carried out inside the premises. In the particular case of Kigali the working relationships had to be extended to other partners, namely to ELECTROGAZ, the parastatal company responsible for the management of the urban water supplies and with MINITRAPE, the ministry of the public works, responsible for the construction of new water schemes in urban and in rural areas. Several minor sources and existing pumping stations were selected throughout the city, considered to be able to fulfill the needs of the above mentioned communities.

Mid 1995 an agreement was signed between the main partners to rehabilitate three water pumping stations and to increase the yields of the springs supplying their underground tanks, allowing for an increased

pumping rate and for a better coverage of the suburbs of Remera and Gikondo, where the two new prisons were to be opened. The relative responsibilities of the partners involved in the project are outlined in figure 1 where their respective mandates are also given.

It is interesting to note that ELECTROGAZ has also the right to implement projects in partnership with International Organisations, despite the fact that MINITRAPE is in principle responsible for any new project. In this case the agreement was signed between ELECTROGAZ and the ICRC, the role of MINITRAPE was mainly limited to the normal exchange of information on the progress of the work, but was essential if one bears in mind that MINITRAPE will then be responsible for the general maintenance within the prisons.

The locations of the two suburbs and of the two prisons are indicated schematically in figure 2, where also the main distribution lines of the Rwampara/Mburabuturo/Gikondo project can be visualized.

## Projects description

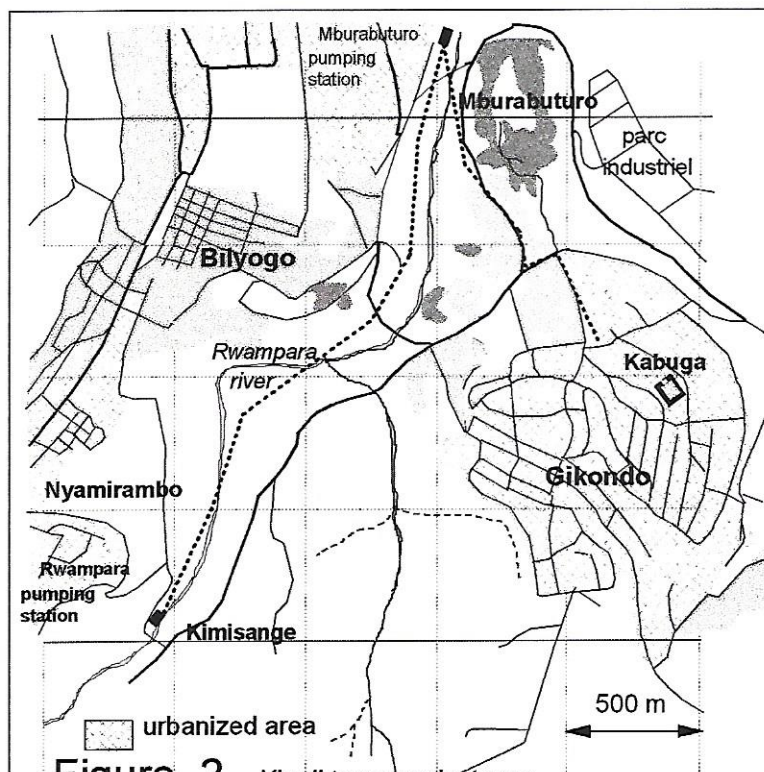
### Gikondo suburb and Kabuga detention centre

The new prison of Kabuga is located in the middle of the suburb of Gikondo, where spontaneous

settlements have increased the population up to about 30'000 inhabitants. The prison itself, foreseen for 5000 inmates is now accomodating about 8000 prisoners. It is supplied only during the night by the Mburabuturo pumping station to avoid shortages in the Gikondo and in Kicukuru areas, the last suburb being also supplied by the Kimisagara WTP. A 45 m<sup>3</sup> corrugated iron buffer storage tank is coping with the needs of the inmates, but has to be filled up twice a day to guarantee about 10 l/p/day, assumed to be the minimum amount to maintain the required hygiene conditions.

### Mburabuturo pumping station.

There was a need to increase the yield at the Mburabuturo pumping station (PS), as low as 35 m<sup>3</sup>/h, since the last rehabilitation carried out in 1980, in order to put in activity the foreseen second pump. The construction of a new drainage system, together with a new collection well, increased the



yield to about 60 m<sup>3</sup>/h, allowing for the installation of a 35 m<sup>3</sup>/h centrifugal pump (head = 196 m), covering the needs of both the prison and the inhabitants of Gikondo, at least for the time being.

In case of need the Mburabuturo PS is connected to the Rwampara PS from which the water can be supplied by gravity. The improvement is evident and can be seen in the last figure, where the respective amounts from the network supply ex- Kimisagara and from the Mburabuturo pumping station are shown.

A mean total amount of about 100 m<sup>3</sup>/day are now supplied (February) from which about 2/3 are from the rehabilitated pumping station and from the joint ICRC/ELECTROGAZ project. These amounts cover the present needs for the inmates up to 12.5 l/p/d but represent only 30 % of the daily pumped amounts supplied to the population of the suburb, which was previously without water.

### Rwampara pumping station.

For the a/m reasons a similar work was carried out at the Rwampara PS, located uphill, in order to supply not only the needed amounts at the Mburabuturo station, but also to maintain and eventually increase the amounts needed for the suburbs supplied by this station, namely Nyamirambo (20-25 m<sup>3</sup>/h), Mont Rebero/ Kamisange (10 m<sup>3</sup>/h) and Parc Industriel (20-25 m<sup>3</sup>/h), for a total normal requirement of 60 m<sup>3</sup>/h. A similar work than the one described for Mburabuturo has been achieved and the yields were increased from 27 m<sup>3</sup>/h at the

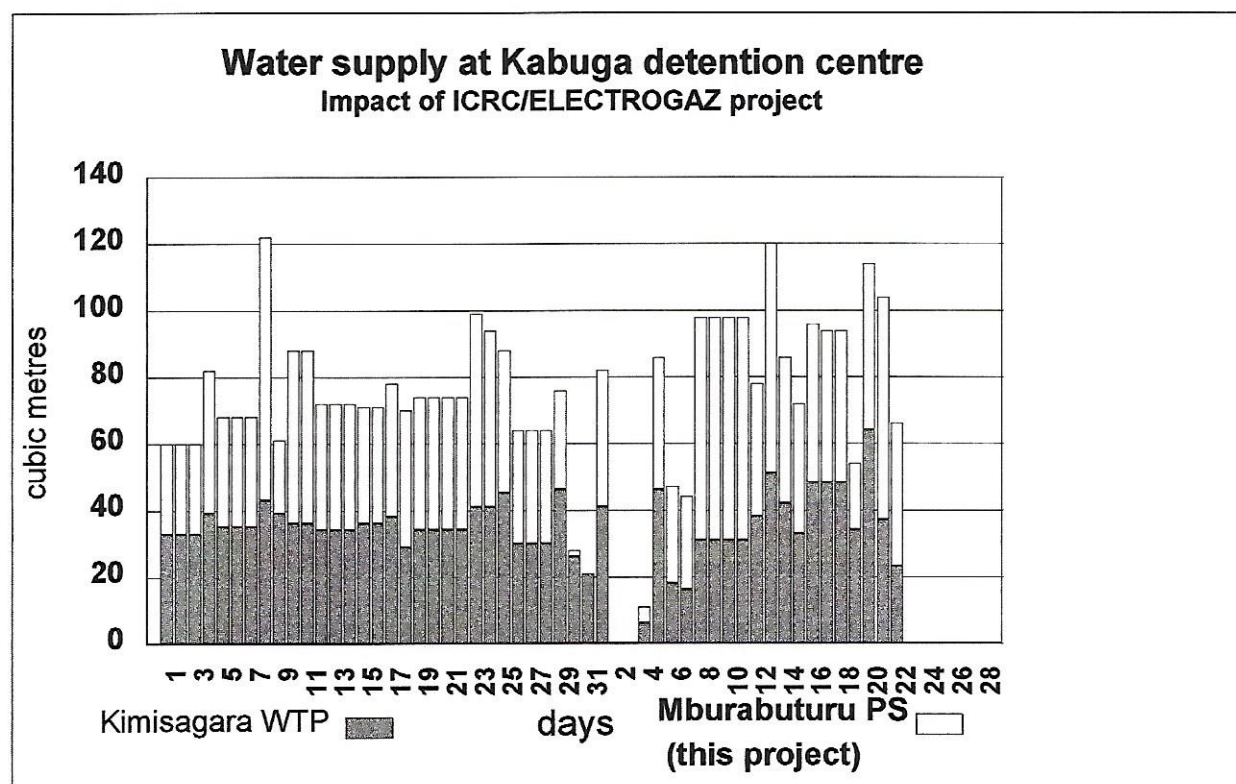
beginning of the work to about 60 m<sup>3</sup>/h, thus meeting the capacities of the pumping station and the requirements of the different suburbs.

### Kinyinya pumping station and ONATRACOM detention centre.

This spring was supplying the suburb of Kimironhgo by gravity and through the Kinyinya pumping station part of the Remera suburb (stadium), poorly covered by the Kimisagara network. When the authorities decided to open a detention centre at the ONATRACOM old bus station, the main concern of ICRC's engineers was to find a solution to supply it with sufficient water, bearing in mind that 4000 inmates would be accommodated there.

Three new spring catchments had to be built to increase the yield from 5 to 10 m<sup>3</sup>/h, enabling to supply 3 water kiosks located along the line as well as the pumping station. If needed, a further development of the yields is foreseen with the installation of low lift solar pumps in several collection wells, to be dug beside the collection chambers supplying the pipeline.

The station was equipped with a new pump (20 m<sup>3</sup>/h, 100 m TMH) and a new line (1800 m, 63 mm dia) was laid to supply directly the detention centre, where a 75 m<sup>3</sup> reservoir has been erected. This reservoir will be filled up during the night hours, thus leaving the available daily flow to the inhabitants of Kimirohongho.



## Discussion

Prison's versus urban population's needs.

Prisons are enclosed premises and do require, among other needs, a reliable water supply as well as a decent waste water evacuation system. Failures to do so are immediately repercutated on the prisoner's health and epidemics may result in high death tolls. Most of the african prisons, built during colonial times, are in precarious conditions and generally overcrowded. Initially located at the edge of the cities they have slowly been surrounded by new suburbs due to the increasing demand of land linked with the cities's population explosion. The improvement of their water supply is hindered by crippled budgets and is generally neglected in favour of the demand of the surrounding suburbs, highly populated and also poorly supplied[2]

In Kigali and in Rwanda in general, this competition was reaching a potential explosive situation, where new prisons had to be built to release the congestion of the existing overcrowded one's, located in suburbs where people were beginning to resettle and where also the demand was rising as more people were returning. It would have been politically uncorrect to supply exclusively the inmates without adressing the problems of the surrounding population.

To release the tension and the understandable resentment between the two communities the ICRC engineers had to identify alternative water sources, which improvement would ease the situation.

End of March 1997 the results are satisfactory as outlined in Table I. The yields of the different alternative sources have been increased to a total amount close to 1500 m3/day, pushing the proportion of the alternative sources from 7.5% to 15 % of the total quantities available for the city's inhabitants. In the specific case of Gikondo about 14'000 people do now receive water (18l/p/day) while the 8000 inmates of the Kabuga detention centre are entitled to 12 l/p/d. Even if the exact census of the population is not precisely known, the last figures being from 1971, the situation of the inhabitants has improved.

Similar figures can be quoted for the other suburbs where detetnion centres have been opened.

The situation is far from being solved and remains precarious, but the tankering of water to Kabuga has stopped since December 1996.

**Table I**

Yields at the different alternative sources before and after the project

|             | before 97 | now  |
|-------------|-----------|------|
|             | m3/h      | m3/h |
| Mburabuturo | 35        | 60   |
| Rwampara    | 27        | 60   |
| Kinyinya    | 5.5       | 11   |
| Kizanye     | 10        | 10   |

## Conclusions

In this specific context ICRC had to change its traditional inside approach and enlarge its activities to tackle the global problem of the water supply of a city. This implies agreements with new partners and liabilities which were not usual in other assistance programmes in favour of detainees.

By increasing the water coverage of the population surrounding these premises it was possible to cut costly tankering programmes while improving the water supply of the inmates and made it sustainable, thus decreasing the tensions between the two communities. This was also possible because since a few years ICRC has decided to embark in long lasting programmes to ensure a smooth transition from the emergency to the recovery phase to finally hand-over the responsibilities for both the communities to the respective specific partners.

## References

- [1] P.G. Nembrini, Water supply in Rwanda, from war to sustainability, WEDC Conference Kampala, 1995.
- [2] The World Bank. Habitat II, Istambul 1996

---

Dr. P.G. Nembrini, Public Health Engineer,  
International Committee of the Red Cross, Nairobi.

M.Serafino, Engineer, Italian Red Cross, Roma

P. Y. Monnard, Engineer, International Committee  
of the Red Cross, Kigali, Rwanda.

R. G. Conti, Head, Water and sanitation department,  
International Committee of the Red Cross, Geneva..

---