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Experience

IN DETAIL

Environmental Sanitation of St. Mary's Hospital Lacor



HORIZONT
3000

AUSTRIAN ORGANISATION
FOR DEVELOPMENT COOPERATION

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List of Abbreviations

BBM	Beschaffungsbetrieb der MIVA (Procurement agency of MIVA Austria)
TBL	Technisches Büro Lechner (Consultancy firm for Ecosan Systems)
UEDCL	Uganda Electricity Distribution Company Ltd

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1. General Information

The Lacor Hospital (St. Mary's Hospital Lacor) is the largest referral private non-profit catholic based institution in Uganda whose mission is to guarantee affordable medical services in particular to the neediest people. It was founded in 1959 by the Comboni Missionaries for the Gulu Catholic Diocese. After 1961 it was managed and developed by Dr. Piero Corti (an Italian pediatrician) and Dr. Lucille Teasdale Corti (a Canadian surgeon) up until their deaths: Lucille in 1996 of professionally acquired AIDS and Piero in 2003.



Char 1 Localization of the Experience

It is owned by the Registered Trustees of Gulu Diocese (Archdiocese of Gulu). Lacor Hospital is registered with the National Board for Non-Governmental Organizations and is accredited to Uganda Catholic Medical Bureau (UCMB). Lacor Hospital activities are in line with Uganda Ministry of Health (Ministry of Health, Republic of Uganda) policies of health care provision. The integration of Lacor Hospital into the Uganda national health system has been in line with national health reform, which was implemented from 1996/1997. The Hospital is located in Gulu Municipality, about 6 km west of Gulu town along the Highway to Sudan. It has been built on land owned by Gulu Catholic Archdiocese. The Christian doctrine of dedication and providing care to the sick is the strong pillar on which Lacor Hospital's identity and performance rests. Most of the patients served are among the poorest of the poor, who live well below the poverty line.

From a small 30-bed Hospital 55 years ago, Lacor Hospital is now a complex with a 482 bed capacity and 3 Peripheral Health Centers - each with 24 beds (Opit, Amuru and Pabbo), a Nurse Training School, a Laboratory Training School, Gulu University teaching site for medical school and other training programmes. Currently, the Hospital accommodates every

day on average 600 inpatients plus their attendants and receives on average 600 outpatients. There are about 1,000 employees combined with their family members living within the Hospital.

Gulu municipality has 152,276 inhabitants, while the total population of Gulu district is 443,733 and that of Amuru district is 190,516 and Nwoya 128,094. Gulu Government Hospital, about 6 km from Lacor, has 335 beds and is the regional referral hospital. There are other small private clinics and drug shops for commercial purposes in Gulu town and the suburbs. The approach of Lacor Hospital is to complement the government's efforts in health service provision.

In this document the Hospital wants to present their experience on **Environmental Sanitation**, which has been made in the period from 2002 to 2005, but the fruits of the experience are ongoing. It is important to share the experience, because all type of organization needs a reliable water and power supply with good waste management systems. The maintenance of technical equipment is a must and capacities have to be built to manage available systems.

2. Context of the Experience

This experience started during the war and covers a period when there was a very difficult social and economic environment. Insecurity has devastated the economy of northern Uganda since 1986 leaving the population in dire need, suffering and despair. Even the staff had to live in the Hospital compound with their families in order to be safe. Under the pressure of external events (war and epidemics) the number of patients in Lacor Hospital was more than 17.000 admitted patients and 140.000 outpatients a year. Between 1996 and 2006, between 3,000 to 10,000 "night commuters", mostly children and women fleeing the rebel attacks in the surrounding villages, would find refuge every night in the Hospital compound. This caused an over-utilization of the hospital facilities, water, electricity, and management of waste.

The waste water treatment in use was a pond system comprising of 4 lagoons with a total oxygenation surface of 8000 square meters. The system was put under test during the Ebola

epidemic in the hospital due to the exceptionally high use of bleach (October 2000 – February 2001).

Because of this same epidemic, the safe **management of contaminated material** and the appropriate **disposal of solid waste** had become a problem to be solved immediately too. The installation of a new laundry system solved the first problem. As for the solid waste, a medical waste incinerator was also constructed. But the implementation of a structured waste management system was still a challenge.

In the power sector, the Hospital had big challenges, because during the frequent and prolonged interruptions of power-supply by the national grid UEDCL (hydro-power), the hospitals power production relied exclusively on generators. Due to the poor electrical network, which was been built step by step during the growth of the hospital, there were a lack of water and power, risks of electrocution and fire, damages to unprotected equipment by the high fluctuations of voltage of the power supplied by the national grid, pollution while using the generators, under-utilization of clean sources of power, and eventually increasing and unsustainable costs.

The water supply relied mainly on drilled boreholes managed by the hospital, since the town water network didn't have capacity and reliability to supply the hospital, the water was pumped to an old metal tank which was leaking and insufficient for the growing consumption of the hospital.

Technical support services relied on locally assembled technicians (mostly trained on the job) under the guidance of a Comboni missionary Brother, since it was difficult to solicit workforce externally. The technical department had to do all works and repair all equipment with limited resources.

Summing up, the initial challenges can be listed as follows:

- Electrical and fire hazards due to inadequate distribution system of power
- Risk of a major disaster due to lack of an adequate fire-fighting system
- Hygienic risks due to insufficient water

- supply to entire sections of the Hospital
- Hygienic risks and pollution related to improper management of waste
- Disruption of services due to interruptions in the power and water supply
- Frequent damages to Hospital equipments due to voltage fluctuations
- Waste of water and power due to leaks in the distribution systems and to the lack of ways to control consumption
- High use of non-renewable sources of energy (generators) with negative environmental impact, mainly due to the erratic power supply by the national grid (hydroelectric power)
- High costs of power and water (electricity bills, generators and water pumping units)
- Lack of properly trained personnel (mainly electricians and plumbers) in the Hospital maintenance unit

All modern health institutions should have a good technical infrastructure to international standards. The practice was developed because of this inevitable need and through discussions with experts in the field from Europe (Austria/Italy) and the Hospita itself.

As to gender aspects, the Hospital employs mostly female nurses and cleaners, who stand higher risk of infection when there is poor sanitation. Furthermore, the hospital's mission is to serve the most vulnerable, highest among them are pregnant mothers and children. Additionally, the hospital manages all sickness including HIV/AIDS.

3. Main Characteristics of the Experience

Volunteer engineers from Italy carried out a first appraisal of the power distribution system in 1998. They identified a high-risk area in the old laundry and immediate corrective actions were taken. All electrical installations after that date complied with the standards suggested by these experts. Fire extinguishers were also put in place in designated points of the Hospital and a small fire squad was established.

At the occasion of the installation of the new Laundry System funded by Austrian organizations, an engineer from BBM (BBM)

carried out a preliminary assessment of the problems and needs of the water and power distribution systems in the Hospital. The hospital administration also identified the problems at hand seeking for technical guidance from experts. Planning meetings were held in Uganda and Austria to find a solution in the most manageable way. The implementation of the practice involved experts from Austria, Italy, and Uganda.

The main objectives of the experience were:

- To increase the protection of people and of Hospital's equipment/ infrastructures against electrical accidents and fire
- To improve the quality of the Hospital's services, the hygienic standard and the protection of staffs against professional hazards by providing regular and sufficient (24 hours) power and water supply without increasing their total consumption, rather by eliminating dispersions, wastage and uncontrolled use
- To reduce the Hospital's dependence on polluting generators
- To reduce the hygienic risks and the ecological impact of unstructured management and disposal of solid waste
- To increase the Hospital's capacity of properly maintaining and managing the power and water systems
- To create ecological awareness among Hospital staffs and users

To fulfil these objectives, the following measures were taken:

The power distribution system was upgraded in order to avoid hazards, dispersion of power and excessive voltage fluctuations. This involved physical installation works. A power distribution house, a generator house and a technical workshop have been constructed and trainings for technical staff conducted to ensure proper maintenance of the system and to establish a technical documentation.

To ensure 24 hours power supply for emergency services and adequate light in the wards without increasing the dependence on generators, alternative sources of energy and energy saving devices have been installed and consumption monitored. Apart from the physical

technical works also an awareness campaign on energy saving was done to staff and users of the system.

The water storage capacity, the rainwater collection and **the water distribution system** were improved in order to avoid dispersion and monitor water usage. Additionally, users' points were provided with water saving devices and staff and general public were educated on water saving.

Additionally, a water-based fire-fighting system was installed and a training conducted including the already existing fire team.

Finally, a structured **solid waste management system** was implemented with differentiate collection and disposal procedures

After a preliminary survey, there were series of planning meetings in which the mode of implementation, technical details of the components to use and general set up of the systems were discussed. A team of experts in the electrical field came from Austria and had intensive work at the hospital. During that time many local technicians were trained on the job concerning modern technology, ways of work and handling of proper tools. Specified training was also carried out to selected people who excelled in the systems managements. The systems were handed over with properly designed operations and maintenance guidelines to help in its management. Since then the hospital also evaluates itself its power consumption and water usage annually.

4. Stakeholders and Partners – Roles and Responsibilities

The general beneficiaries are the people coming to the hospital to receive health services, plus the staff working and residing in the hospital,

Parties, Institutions and Groups of People involved in the implementation of the experience were:

- Austrian Development Cooperation: Funding agency
- DKA Austria: Co-funding agency
- HORIZONT3000: Monitoring agency
- BBM MIVA Austria: Project management, execution and coordination

- Technisches Büro Lechner (TBL): execution of water aspects
- Lacor Hospital: Local logistics, local labour, and beneficiary

The general approach was to combine external and local expertise for carrying out the project and a strong component of training and transferral of know-how was considered. The execution of the practice involved many areas, with different expertise.

- The general project implementation was overseen by HORIZONT3000 Regional Office in Kampala.
- Preliminary survey, technical planning, procurement of technical items, international transports, supervision of the implementation, procurement or preparation of documents for environmental sensitisation, and project co-ordination was done by BBM Austria.
- The water supply system was planned, managed and executed by TBL including the installation of 7 units of solar hot water.
- Labour for constructions and general works was realized by Lacor Hospital utilising its own technical staff and temporary workers.
- Local logistics and communications, as well as the selection of candidates for training and sensitisation actions were organised and carried out by Lacor Hospital.

5. Resources

Besides financial resources, more than 10 technical experts from Austria in the fields of water and electricity, a Hospital Technical Department for professional work and many casual labourers for a period of 24 months were needed.

6. Impact of the Experience/ Practice

The environmental sanitation within the hospital has greatly improved: good and clean water supply, quality and reliable electricity management, experienced technical staff, good management of utilities which unarguably has reduced risk of re-infection around the hospital. The project in general raised the standard of service delivery of the hospital.

New buildings were constructed: the electrical distribution room, generator house and technical workshop. With these infrastructures, the hospital increased its efficiency and the security of the electrical systems, and organized shelters for work.

The Electrical system has been upgraded: the total overhaul of the electrical system involved connecting a new transformer, new distributors with protections and voltage controls, laying of underground cables within the hospital and installing new UPS system with a dedicated generator for critical areas supply. All these measures improved the power quality of the hospital: no more power outages in critical areas, no machines breakdown due to power surges, no more fire outbreak encountered unlike in the past when there were fires due to bad electrical wiring/system.

The water system improved substantially: New twin galvanized water tanks of total capacity 150,000 litres was constructed optimizing the water sources of the hospital. A new distribution system, quality materials and water meters provided efficient water supply to the hospital, manageable and easy to control. The lack of water became history.

Solar hot water systems were installed providing hot water to the maternity ward, operation theatre, nutrition ward and the laundry. This provided the much needed hot water for the departments and also saved energy which would have been used by electricity.

Safety issues were improved: proper quality systems installed with protective gears meant the hospital was working in a safer environment, the institution of a fire fighting systems also made it possible for the hospital to be ready to combat fires.

Technical capacity building was realized: the construction of the technical workshop helped consolidate and qualify the works of the technical department. The training of technicians has greatly helped the hospital, especially in the fields of electricity. The hospital being a team leader in the regions has for many years been assisting neighboring

hospitals and partners of HORIZONT3000 with technical knowhow and support in combating problems.

During the execution of the project itself, there were many casual labourers from the neighborhood of the hospital, many local building materials like bricks, sand, gravels etc, were bought from the neighborhood of the hospital. This helped in raising the economic status of the populace. Additionally, Gender equality and awareness was a good observation during the project, as women were employed equally with men in the various activities, like trench excavations, cable laying, backfilling etc

Furthermore the practice has in-built elements of financial sustainability:

- Protection of people from electrical accidents and consequently of the Hospital from financial liability;
- Protection of Hospital assets and equipment from fire and voltage fluctuations;
- No disruption of Hospital activities due to the lack of water and power supply and more efficient and therefore economical running of its operation;
- No leaks of water and power due to power and water saving appliances and fittings;
- Use of solar water heaters and availability of trained staff for preventive maintenance;
- Monitoring of the consumption of water and power as well as sensitisation on water and power saving

Summing up, the effects of the results are:

- Better service to the patients, of which 80 % are women and children
- Reduced professional hazards for the staff, they live better and work better
- Containment of costs, no wastage
- Lower environmental impact, no waste disposed off in the environment
- More sense of energy saving brought to the staff working in the hospital

7. Lessons Learned and Recommendations

The **Involvement of all stakeholders** is paramount. A practice works best when the beneficiaries are informed and involved in the

planning and execution taking account of social-cultural differences even within the same idea.

The **commitment by the various parties** involved in the implementation is necessary, and a strong support from the management of the hospital is important to the success of the project.

On-site training is a must. For a technical project, all technical people must know what is happening!

For all newly introduced technology, they have to take **collective decisions**. It is not good for the donors to impose a technology on the beneficiaries without explanation. This affects the sustainability of the job done.

Follow up phase has to be planned to monitor how partners cope up with this technology

8. Challenges

Main challenges encountered during the project implementation were:

- Delays in transportation of equipment because of the civil war and the road network
- Delay of the Uganda Electricity Distribution Company LTD in diverting the high voltage line that passed over the construction site and to provide the high voltage meters the Hospital had paid for
- Natural conditions, the peak of the implementation time was when there was much rain. This limited outdoor works and collection of some local materials.
- The technology was higher and needed adaptations for the ordinary technicians
- Many spares are not easily available in the local market.
- There were some disagreements on some technical details especially in the water sector.

Some of the challenges were faced by timely procurement of items from abroad to avoid extra delays, by engaging the head office of the electrical company for speedy actions, by concentrating on indoor works during rains and by the continuous training of technicians.

9. Sustainability

For the practice to be institutionally, socially, economically and environmentally sustainable, the following elements should be considered:

- The technology utilized, especially for the electrical systems, is an advanced one. Although the maintenance team was trained, there is still continuous training of the hospital's technical staff and consultations with the external experts whenever possible.
- Continuous sensitization of the hospital employees and users of the systems is going on. Good practices for saving water, electricity and waste handling should be a routine.
- Operations and Maintenance charts should be followed regularly and monitored.
- Policies for avoiding wastage by the hospital employees should be considered, like fees for excess electricity use.
- Establishing links with suppliers for procurement of genuine spares is a continuous activity.
- The Hospital itself should provide funds for the operation and maintenance of the installed systems.
- Continuous awareness campaign to the hospital staff and the general patients and attendants who visits the hospital are necessary to avoid wastages and losses.
- Other sources of renewable energy should be explored, notably the photovoltaic solar systems.

10. Experience Sharing/ Up-scaling

Success from the Lacor project has been duplicated in smaller scales to other HORIZONT3000 projects. St Francis Naggalama Hospital, Mukono; St Joseph's Hospital, Kitgum; and Holy Family Nyapea Hospital, Zombo; among others, have already implemented similar practices.

The technical department of Lacor Hospital, especially the service team leader whose capacity was built during the project is often consulted and assists in solving technical problems in other institutions.

Continuous upgrade with advancement in technology is always in process. Now over ten years after the project completion, a general review is being made and some components require change. As a recommendation, we should take into account to use more renewable energy source especially solar energy which is abundant these days.

Described experience could serve as a reference for most of the hospitals in the region with the same setting, such as Kalongo Hospital, Aber Hospital, Angal Hospital and Lwala Hospital. Generally all major hospitals and big institutions require such systems.

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