San Fernando La Union – FSM Case Study

Topic: Faecal Sludge Management – City-wide Programs for Organized Desludging

Location: San Fernando La Union, Philippines

Units to which the case study is related: Organization, Finance, technology, Operation and Maintenance

Video: https://youtu.be/_K78v1XWWcY

Key Words: tariff, septage, citywide, organized desludging

In 2009, the city applied for a grant from the United States Agency for International Development (USAID) and Rotary International (RI) through the USAID/RI Water Alliance program. The Water Alliance agreed to accept the project and USAID provided technical assistance while RI provided financing for the infrastructure.

The City hosted a stakeholders meeting and established a Technical Working Group (TWG) that moved the program forward. The TWG was met every week over a 9-month period and provided:

- Text for a local ordinance that would set the policies, rules and procedures for implementing the septage management program;
- A promotions campaign (figure 1) to increase public awareness and support for the program;
- Support to the RI team charged with selecting the design and technology for the septage treatment plant.

Figure 1. Promotions campaign poster prepared to encourage septic tank desludging.

The program was designed to be phased in over time.

Phase 1.

Immediate goal: To provide rapid implementation of a basic treatment plant that can start accepting loads of sludge as soon as possible. The program for phase 1 included:

- Building a septage treatment plant designed for 30 cubic meters per day. This is about 1/3rd the size of the treatment plant at ultimate buildout.

- Assign a septage tariff to the real property tax that people who want to participate, can pay once per year. The fees were set quite low to encourage participation.
- Those that participate by paying the fee can avail of one desludging every 5 years.
- Those that don't pay the tax can still call for service, but pay a surcharge
- Commercial, institutional and industrial users may also participate based on the following fee schedule:
    - Residential: P600 per year (about $12 US dollars)
    - Commercial: P1,000 per year
    - Malls and institutions: P1,500 per year
    - Industrial: P2,000 per year.

The local ordinance

The local ordinance contains some important provisions:

- Establishes a Wastewater Management Council. The council is a policy recommending and advisory body consisting of 12 voting members. They meet periodically to review issues related to septage and sanitation in San Fernando City. The program requires compliance when:
    - The building is sold;
    - The building is substantially remodeled (value of the remodel greater than 50% of the building value); or
    - The Health Officer or other regulatory officials deem the on-site facility is contributing to an imminent health hazard.
- Use of alternative wastewater systems, such as communal tanks or EcoSan style facilities, where septic systems are deemed inappropriate;
- Greywater and drainage management;
- Rules and regulations for the collection, transportation, treatment and reuse of septage and fecal sludge;
- The fee schedule; and
- Regulatory compliance, enforcement and penalties.

The Treatment System

The treatment system includes:

- Preliminary screening
- Grit chamber
- Anaerobic Baffled Reactor (ABR)
- Upflow Anaerobic Sludge Blanket (UASB) Filter
- Facultative sewage lagoons
- Maturation ponds for disinfection

Screening, grit removal, ABRs and sewage lagoons are common technologies. The treatment plant makes use of a UASB, which is less common. This is a single tank where wastewater is introduced at the bottom of the tank. Sludge under anaerobic conditions form granules that are suspended in the sludge blanket. As the wastewater flows up through this blanket, the suspend solids in the flow are trapped.

Dissolved solids are also removed through anaerobic bacteria. The duel treatment processes of physical filtration and organic matter reduction by the microbes results in about a 70% reduction in biochemical oxygen demand (BOD) and total suspended solids (TSS).

The screens, grit chamber and anaerobic system are designed for up to 90 cubic meters per day, or the anticipated full load anticipated from the city by year 10. The sludge drying beds and lagoon system will require expansion after flows exceed 30 cubic meters per day.

Financing

About 12% of the tax payers are currently participating in the program. As such, the facility is underloaded. Additionally, there have been fewer than anticipated actual desludging events, so the net result is that income has exceeded expenses. in the 3.5 years of operation, the City has saved P19 million pesos, or the equivalent of $440,000 US dollars.

Phase 2

Phase two will include an expansion of the sand drying beds at the treatment facility and letting of contracts to the private sector for scheduled desludging. The schedule will be by zones which will enable some economy of scale while giving maximum flexibility to the homeowners as this voluntary program expands.