(Challenges) Expected

Saturation services in Leh face many challenges which create technical and operational risks for Blue Water Company,

1. Long and cold winters: Developing aptly terms in water is challenging as the seasonal freezes and hardens. Biological cycles may be halted for the season, and the freeze can also be quite lethal to the tanks. Proactively is affected when major ice conditions are scheduled to be observed.

2. Tourist season during summers: Seepage tanks can be flooded only at night due to high traffic of tourists at hotels and on the streets. However, nights during the summer season can also be quite cold, which thaws the seepage. Proactively is affected when major ice conditions are scheduled to be observed.

3. Low pump power: Seepage pumps lose power at high altitudes, and they are not effective at high altitudes. From over 300 feet, fuel consumption goes up, which affects business economics. And many seepage tanks cannot be drained. The company is experiencing with suction pumps in such cases.

4. Narrow streets and gradients: Many roads in Leh are low small for trucks, and gradients make it difficult for the truck to reach the seepage tank. New products are being developed for such locations (see table).

5. Resistance to scheduled cleaning and political risks: Any change in the Municipal corporation’s determination to have seepage tanks observed regularly can dramatically impact revenues. While this is not a risk in the near term, there can be pressure in the future.

6. Performance of the treatment plant: While the plant is designed to keep high altitudes and cold temperatures, careful monitoring is still required, especially in year 1. To understand the performance and ensure compliance with regulations and standards.

(Potential and Flexibility to Improve)

The system allows for incremental improvements, if needed, to further improve performance,

1. Greenhouse to improve treatment quality: The ROUs can be converted into greenhouses to improve treatment quality, especially during colder winters.

2. Capacity increase: Building more PSUs of 500 to 1000 can increase the capacity of the treatment tank—within 4 weeks. Extra space has been retained for such expansion in the future.

3. Mobile Gutter: BORDA is developing a smart, mobile device that can reach and clean seepage tanks that are too far from the road or are difficult for trucks to access. This is particularly important in Indian cities, and the device can help eliminate the mess that remains prevalent in big cities as only people can go in and clean such tanks.

IMPLEMENTING PARTNERS AND SUPPORTERS

BORDA e.V., Am Dach 4 E, 33586 Bremen, Germany, +49 (0) 261 525 80, info@borda.de

BORDA South Asia: Kaul House, #9/47, Koramangala, Nagal Bangalore 560034, Rishi, neera@borda-eas.org

At an altitude of 12,000 feet, Leh town in Ladakh, North India, with a population of about 40,000 is one of the highest cities in the world and has amongst the highest climatic climate temperature of 30°C low air pressure and very little rain or snow.

Roads to Ladakh remain closed for 6 months of the year, making access difficult. Increasingly, small weather patterns caused by global warming are affecting water supplies, leading to floods and agricultural production, thereby disturbing the safety and self sufficiency of the region.

Due to its geographic location, Ladakh’s traditional way of life is vulnerable to climate and season changes. But modern habits and an influx of tourists over the past 10 years (1,000,000 expected in 2015) are causing havoc on the ecology, plastics waste, traffic jams, floods, massive amounts of construction materials destroying the fragile ecosystem and polluting natural resources.

About 60% of water is drawn from the pure underground water tanks and even consumed without filtering. But as a result to become increasingly popular, they discharge sewage into underground seepage tanks and pits, which leach toxic overflow into the soil, which is contaminating the underground water. Week of yellow and smelly water being drawn down through wells have been reported.

A sewer system is under construction and in 12 years, may cover only 50% of the city. The city does not have any other ground water contamination would have disastrous effects on public health and tourism. Many Indian cities, including those have seen cholera or typhus outbreaks due to similar pollution of water sources. Besides, over 50% of the population will continue to use seepage tanks and wells.

Due to the situation, the Ladakh Autonomous Hill Development Council (LAHDC) visited Dornakal (near Bangalore) in February 2017 to understand Faissal Sludge Management (FSM) and realized that it was critical to protect the environment and water supply in Leh. In May 2017, BORDA wants to use concepts to FSM system for the city that can complement the sewerage system. This is the future that the FSM system was commissioned and operations started.
A Familiar Problem

Despite its importance, sanitation is often neglected. Lack of proper sanitation leads to poor health and hygiene, which in turn affects the overall development of a community. The issue is particularly acute in rural and semi-urban areas where access to basic sanitation facilities is limited.

1. How will the municipality manage the FSM project?
   - FSM involves multiple operations including planning and scheduling, cleaning of septic tanks in an efficient manner, safely removing the contents and then ensuring their proper disposal. This can be challenging, but it is crucial for maintaining a healthy living environment.

2. How will the municipality pay for it?
   - With the public funds that have been identified, it takes time to allocate budgets and government lending. Processes and delays can add up, which is why careful planning and implementation are essential.

A Solution—India’s first PPP for FSM

The municipality, in collaboration with a private company, has developed a sustainable model for FSM. This model includes setting up a plant that not only helps in the proper disposal of waste but also generates revenue, making it a profitable venture.

1. Speed and Implementation: In just three months, a working prototype was developed, showcasing the potential of PPP models in implementing such projects. This rapid implementation not only demonstrates the effectiveness of PPP models but also serves as an example for other municipalities.

2. No Cost to Government: There is no financial burden on the government, ensuring that the project remains self-sustaining and financially viable.

3. Accountability and Simplicity: The private sector is responsible for the project, ensuring that it is executed efficiently and effectively. This model allows for better monitoring and faster execution of projects.

4. New Technology: The use of advanced technology in FSM, such as the Bio-Active Sludge process, enables the treatment of waste in a more efficient and sustainable manner. This technology not only reduces the environmental impact but also enhances the overall performance of the system.

5. Respect for Operators: The operators are trained to handle the equipment and processes safely, ensuring the smooth operation of the plant.

6. Re-use of Waste Resources: The plant is designed to upscale the recycling of waste, making it a sustainable and eco-friendly solution.

The Faecal Sludge Treatment Plant (FSTP)

The plant is designed to treat faecal sludge and produce a final product that is safe for reuse. The FSTP system utilizes a combination of advanced technologies to achieve this. The primary modules include the following:

- **Primary Modules**
  - 1. **Planted Floating Bed**
  - 2. **Horizontal Planted Floating Bed**
  - 3. **Planted Floating Filter**
  - 4. **Biological Sludge Treatment**

**Specifications**

- **Construction**
  - Type: Pilot Scale
  - Area: 500 m²

**Primary Modules**

- **1. Planted Floating Bed (15 units)**
  - 500m² of treatment area, including a 50m² primary treatment area.

- **2. Horizontal Planted Floating Bed (2 units)**
  - 1000m² of primary treatment area, including a 200m² primary treatment area.

**Product**

- **Biogas**
  - Up to 5000 m³ of biogas per year.
  - Suitable for various applications such as cooking and electricity generation.

**Biogas Storage**

- **42 m³ Storage Tank**

**System Efficiency**

- **95%**
  - Effective treatment of faecal sludge.

**Quality Check**

- **95%**
  - Ensures high-quality output, meeting international standards.

**Management**

- **Annual Service Agreement**
  - Ensures regular maintenance and efficiency of the system.

**Conclusion**

The implementation of such projects not only addresses the pressing issue of sanitation but also contributes to the overall development of the community. By focusing on sustainable and efficient solutions, we can make significant strides towards improving the living conditions of millions of people.