PROJECT: PIGGERY FARM BIO-GAS TREATMENT

Cebu, Philippines

I. Introduction

The demand to find an alternative fuel source has risen due to environmental concerns that are experienced globally. The discovery of methane gas (CH4) from agricultural manure is essential to livestock farms to help address scarcity in fuel. Methane or biogas produced from anaerobic digestion of agricultural waste is fuel to power generator set to produce electricity. On the other hand, the effluent from the anaerobic digester can be used as organic crop fertilizer. This renewable energy source can also significantly contribute to greenhouse gas reduction as it becomes a sustainable alternative to fossil fuels.

II. Project Details and Problems

Location	Carcar, Cebu
Farm Capacity	2,200 sow level
Anaerobic Lagoon Volume	9,600 m3

The 43-hectare piggery farm has two Caterpillar generators. However, only one generator is running due to poor digestion since the methane gas produced is insufficient. Low digestion rate can also indicate thick solid build-up in the anaerobic system, leading to more frequent desludging. Another problem is the impurities contained by the biogas produced, hydrogen sulfide (H2S). A high level of H2S can cause corrosion to power automobiles, which lead to maintenance cost.

III. Solution

The application of Microbe-Lift IND and SA accelerated the degradation of organic waste solids, which leads to higher methane gas production. The projected increase in CH4 production is 20%-50%, while the sludge or bottom solid is expected to be reduced by as much as 80%. Microbe-lift Technology also contains strains of bacteria that have sulfur-oxidizing capabilities that can reduce H2S concentration.

IV. Results & Technical Data

a. Anaerobic Digester

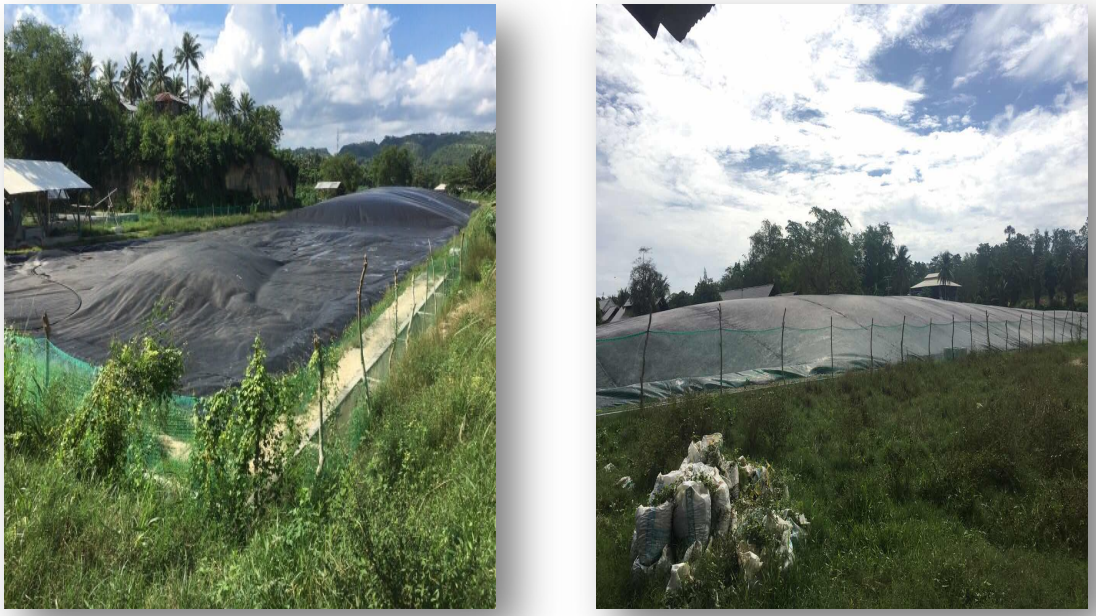

Figure 1. Day 1 vs. Month 2

- After two months of treatment, the second generator was already running for 12 hours per day. After seven months, its average running time is 13.5 hours.
- As of 2018, the average electric bill savings is around PHP240,000.00 (USD 4,800.00) per month.

b. Hydrogen Sulfide Monitoring

3000 PPM

(Day 1)

2000 PPM

(Month 1)

800 PPM

(Month 4)

Figure 2. Hydrogen Sulfide Concentration Levels in Draeger Tubes

- The average hydrogen sulfide reading is 600 PPM as of writing.

c. Laboratory Analysis

Parameter	Before Treatment (mg/L)	Most Recent Laboratory Analysis (mg/l)	DENR Standard for Class C (mg/L)	Remarks
BOD	52.9	18.9	50	PASSED
TSS	260	2	100	PASSED

Though attaining the regulatory standard is not part of the project objectives, the farm manager is extremely satisfied as the digester treatment also addressed their problem with BOD and TSS levels. As per the farm manager, the desludging frequency was also reduced, which also lessens their maintenance cost.

V. Summary

The data above proved that the combination of Microbe-Lift IND and SA is very effective in anaerobic digesters treatment. It did not just increase the methane gas production and reduced the hydrogen sulfide concentration level but also enhanced the biological degradation, which helped attain the effluent standard.