

CHAPTER FOUR

Results and Discussion

4.1 Results

To erect a biogas plant at cow farm at assalaya sugar factory with capacity 960 kg/day of dung and 38.4m³/day gas production rate it required:

- 7.362 m³ of cement (220.61 bags = 11.03 ton).
- 18.8 m³ of sand (coarse).
- 11.81 m³ of stone ballast (25mm).
- 536.80 kg of steel (8mm).
- 1.34 kg of binding wire.
- 26058 Numbers of bricks (0.23m × 0.115m × 0.075m).
- 1522 Numbers of tiles.
- 4.74 m³ of sand (fine).
- 47.88 m² of chicken wire mesh.
- 42.47 m of steel rings around the base of the dome.
- 0.45 m of GI pipe for gas outlet.

Quantities of gas consumed for different applications are shown in table 4.1

Table 4.1 Quantities of Gas Consumed for Different Applications

Application	Specification	Quantity of gas consumed (m³/hr)
Cooking	2 burner	0.33

	4 burner 6 burner Per person per day	0.47 0.64 0.24 m ³ /day
Gas lighting mantle lamp	100 candle power	0.13
Duel fuel engine	75-80% replacement of diesel oil per B.H.P	0.50
Electricity	1 KWh	0.21

[1]

4.2 Discussion

The design can be improved by adding a biomass handling unit, and fertilizer collection and distribution unit which contain:-

1. Screw conveyer which receiving dry dung and delivered it to mixing tank.
2. Mixing tank with stirrer and screw pump: tank with stirrer to mix dung with water as per recommended ratio then pumped to inlet chamber.
3. Fertilizer collecting tank with centrifugal pump.