



Wel-Come Rajasthan Gosewa Sangh

**BIOGAS BOTTLING EXPERIENCE
IN GOSHALAS (Cattle Farms)**

Present by

**Dr. D. S. Bhandar i
Chairman**

Introduction of Institution:-

- Rajasthan Go Sewa Sangh was founded by the followers of Mahatma Gandhi on 14th October 1954, having eight hectare of agriculture land, where goshala, biogas plant, methane separation plant, organic manure production, panchgavya treatment, naturopathy center, production and distribution of herbal medicines and plants are successfully running for the last many years. The Institution presenting itself as a model before the society with uninterrupted dedication and pioneering services of 56 years in this field.



India is traditionally an agriculture base country. 165 million families are depending on agriculture for their livelihood. About 65% population reside in the villages. Agriculture and animal husbandry both are the sources of income to the farmers.

In India. Cattle population is estimated to be 185.18 million (Live stock census 2003) of which 160.50 million are indigenous and 24.68 million are cross bred cows. The total cow dung produced is 1815.80 million kg. per day. Proper management of cow dung and urine would save precious foreign exchange incurred towards import of chemical fertilizer and petroleum. According to national council of applied economic research (N.C.A.E.R.) cattle dung in India has a fuel value equivalent to 35 million ton of coal or 68 million ton of wood. An estimated one third of the dung amounting to some 300 million tones is used as fuel in rural houses, another 340 million tones goes back to soil as fertilizer. F.Y.M. (Farm Yard Manure) is still the most predominant source of organic farming in country.

Introduction – Background :-

The concept of 'sacred cow' is a part of Indian cultural heritage since immemorial. Thousands years ago Indians were the first to understand the importance of cow and its product. The bullocks were used for agriculture operation and transport. Thus they put a ban on the slaughter of the cow and decided to keep unproductive and disable cows are to be maintained in a separate house. Such houses are maintained by different societies, known as Goshala (Cow shelter home)

Rajasthan go sewa sangh was founded by senior and experienced social workers. The main object of the institution was to improve the cow breed as well as to look after the unproductive, disabled and famine affected animals in the State. Rajasthan go sewa sangh is maintaining 4893 livestock at eleven different places in Rajasthan mostly in northern & western part of the state. The head quarter of institution is at Jaipur, where we are maintaining 300 productive animals of good breed. To make cows more productive and use of its product, the institution has taken different activities. Cow dung is used for making high quality manure for agriculture and for organic farming. Biogas plants were constructed long back and biogas was used only for cooking purpose. At present we have three (cow dung) gobar gas plants having 80, 60 and 30 cubic meter respectively and are in working continues.



30 Cubic Meter



80 Cubic Meter

80 Cubic Meter



30 Cubic Meter



60 Cubic Meter



In the year 2006 Prof. Virendra Kumar Vijay from I.I.T. visited our institution and suggested for separation of methane from biogas plant to be used for automobile and power production. The object of such project was for the demonstration purpose and further improvement of the plant by I.I.T. experts. The Govt. of India, Science and Technology Department approved a project for Rajasthan Go Sewa Sangh, Jaipur under the supervision of Prof. Vijay and a sum of Rs. 17 lakhs were sanctioned for this project at Jaipur (Rajasthan).

The detail of the plant was prepared by I.I.T. The plant was divided into two parts. One is separation of methane by water scrubbing at a high pressure. This dissolves CO₂ as well as H₂S in water. The second portion consists of compressor which compressed the methane gas. The compressed enrich biogas is stored in two cylinders having capacity of 12 kg. each.



- **WATER SCRUBBER**
Water Scrubber type (WS) biogas enrichment system as per IIT-Delhi's Technology & Design: Enrichment of raw- biogas through water scrubbing.
- Water & gas scrub against each other in opposite direction at moderate pressure.
- Impurities of H₂S & CO₂ are dissolved in water during the scrubbing process.
- 90% content of CH₄ achieved through water scrubbing balance CO₂.
- Low investment, low power consumption & low maintenance.
- User friendly & ideal for use in Rural areas.
- Available in 400 – 500 m³/per day capacities.
- For use in Cattle Dairy Farms, meat, fertilizer, food processing and hotel industry. Airports, Railway stations, Municipal waste and sewage treatment plant.
- Advantages of purification of raw biogas – high heat value – better engine life (generator OR vehicular) – ready replacement of fossil fuels.

BIO GAS COMPRESSORS

High pressure compressors for bottling:



Specially manufactured compressors suitable for biogas application available.

High pressure compressors upto 300 bar pressure.

Diaphragm compressors for maintaining purity of gas.

Heavy duty Reciprocating type, Vertical and 'V' type, multistage compressors.

Water cooled, non-lubricated low on power consumption.

User friendly, low on maintenance.

Installations throughout India & abroad.

GENERATOR



The plant came to operation in the month of Feb. 2008 and is working without any problem. The maintenance expenditure is minimum. In the year 2008 a three wheeler vehicle with CNG engine was purchased from Delhi and is in use for the last five years. The vehicle has covered 25948k.m. till today. It needs constant maintenance. The vehicle is fitted with 4 kg. bio CNG cylinder which runs 90-100k.m.



During the last five years number of college students, scientists and business man have visited the plant and suggested for commercial use.

With the success of this project. The Ministry of Science and Technology, Govt. of India further suggested for demonstration of biogas enrichment and bottling for rural & automobile application. In the year 2010 they sanctioned five modified version of plant at different places of Rajasthan goshalas. One such automatic plant was established at Jodhpur. The plant came in operation in the month of July 2010. The details are shown in the figure.

At both the places the plants are in operation and running successfully. The plant at Jaipur which was first established as a model for demonstration purpose is running without problem. The cost of running three wheeler and four wheeler has not been calculated at the present rate, However in 2009 the cost of methane production was tentatively calculated as such:-

1st calculation: - On 34 Kg. production per day	=	Rs.
Cost of cow dung 750 Kg. × .50 paisa	$\frac{3}{4}$	375.00
Interest of the cost of plant	$\frac{3}{4}$	789.00
Cost of labour 3 × 150	$\frac{3}{4}$	450.00
Other exp.	$\frac{3}{4}$	100.00
Total :-	$\frac{3}{4}$	1714.00

Cost of 1 kg.	1714/34	$\frac{3}{4}$	Rs.50.50 Per liter
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2nd calculation:-

Manure sold	1714-750	=	964.00
Cost of 1 kg.	960/34	=	28.35

At present the three wheeler is running 30 k.m. per kg.



C.N.G. प्लान्ट

श्री कन्हैया गौशाला, पालरोड, जोधपुर

STATE SCIENCE & TECHNOLOGY PROGRAMME (SSTP), DST, Government of India

Development and Pilot level demonstratin of Biogas Enrichment and Bottling system for Rural & Automobile Applications

Sanction Number and Date ST(RJ)/DP/2K8/625

Date of Equipment Commissioned.

Cost of the Equipment: ₹17.30 Lakhs

Information on AMC, if any: NA



संजय जी लंगरवां टर्नेट रोडवाला

RJ19 CC 1961

CMC



RUNS 37410 K.M



Conclusion :-

Successful use of enriched biogas has opened a new vision for goshalas. Large number of goshalas are having more than one thousand animals in Rajasthan and other states. Further research is needed to make CNG cylinder which can be used for cooking purpose and for other commercial use. More awareness is needed to make use of biogas for commercial use.

Please visit

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Thanks