DRDO
BiO Digester
Defence Research Development
Organisation (Ministry of Defence)

2nd Floor, 31/908, Subash Chandra Bose Road,
Ponnurunny. Vyttila-682019. Kerala, India.
Ph: +91 9349236394, +91 6282425681

E : biodigesterkerala@gmail.com
W: fusionhomeskerala.com

Member - Green Building Council of India

DRDO BIODIGESTER TECHNOLOGY

A) Challenges of waste water treatment in India

India is lagging behind other countries with respect to environmental sanitation and it requires newer strategies and targeted inventions with follow-up evaluations. In order to achieve sustainable and less expensive onsite treatment of black water . The Defence Research Development Organisation (DRDO), Ministry of Defence , Govt of India, has developed an anaerobic baffled biodigester , specifically inoculated with an enriched and bio augmented microbial consortium. This ecofriendly biodegradation technology was initially designed for The Armed Forces posted at high altitudes and glaciers. And presently all Indian Railway Coaches,DMRC, KMRL, many other prestigious institutions , relying this technology for waste water treatment.

B) DRDO AMI (Anaerobic microbial inoculums)

The consortium of microbes designed for organic matter degradation was prepared by acclimatization, enrichment and bio augmentation with psychrophilic microbes collected from Antarctica and and low temperature areas. These microbial consortiums break down biodegradable organic matter into methane and carbon dioxide in the absence of Oxygen. According to the developers , the microbial consortium was able to work in varying temperatures , and could resist freezing , thawing and temperature fluctuations. And even detergents toilet cleaners, commercially available in the market.

C) Treatment process of DRDO Biodigesters

DRDO has reported that these biodigesters have the capability to treat faecal waste to the extent more than 95% and inactivate harmful pathogen ,E- coli etc during fermentation, rendering the effluents almost free of them.

2nd Floor, 31/908, Subash Chandra Bose Road,
Ponnurunny. Vyttila-682019. Kerala, India.
Ph: +91 9349236394, +91 6282425681
E : biodigesterkerala@gmail.com
W: fusionhomeskerala.com

The treatment efficiency of the bio digester was assessed in terms of removal of Organics, Biological Oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS) and pathogens (faecal coli forms). The maximum removal rate of COD, BOD and TSS was found to be in the range of 70-75%, 68-80% and 55-75% respectively. Variations were observed between the grab and composite samplings with the respect to the removal efficiency of organics, solids and pathogens. Even though There was no significant difference in the performance of anaerobic biodigesters installed.

D) Method of sampling

Samples of raw water , treated water after biodigester , treated water after post filtration unit and tap water were collected once a month from all the sites,
The samples were transported to the laboratory and stored at a temperature below 4 degree C. The analyses were carried out within 24-48 hr of sample collection.
The samples
were collected , transported and preserved according to standard methods. The collected samples were analysed for various physico chemical and bacteriological parameters (PH, total biological Oxygen demand (BOD), COD, solids and faecal coliforms(FC). All the physico- chemical parameters of the influent and effluent samples were analysed according to standard methods, to maintain quality control, samples were processed in triplicate for waste water analysis, and standards were run at regular intervals. Hydraulic retention time (HRT) was calculated for all the sites.

E) Conclusion

The biodigesters with regular number of users showed higher COD, BOD and TSS removal efficiency in the range of 70-75%,68-80% and 60-80% respectively.. COD and BOD removal was mostly governed by anaerobic microbial activity in which four different groups of microbes (fermentative, syntropic, acetogenic and methanogenic bacteria) degraded organic matter into Co2 and methane through complex chemical pathway. TSS was a visual indicator of suspended organic and inorganic pollutant load and its removal showed the settle ability of solids in the digester. Even though there was large fluctuation in influent concentration, the treated water characteristics did not vary significantly through out the study.

NB: Excerpts from the study of Performance evaluation of anaerobic baffled biodigester for treatment of black water

\

Ligy Philip*, K. Kalaivani, Praveen Rosario, Vamsi Krishna and S. Sr iShalini

Department of Civil Engineering, Indian Institute of Technology Madras, Chennai 600 036, India

CURRENT SCIENCE, VOL. 118, NO. 8, 25 APRIL 2020

DRDO
BIO Digester
Defence Research Development
Organisation (Ministry of Defence)

2nd Floor, 31/908, Subash Chandra Bose Road,
Ponnurunny. Vyttila-682019. Kerala, India.
Ph: +91 9349236394, +91 6282425681

E : biodigesterkerala@gmail.com
W: fusionhomeskerala.com

Member - Green Building
Council of India

Fusion homes™
energy efficient flats-green buildings
Authorised Distributor

DESIGN CONSTRUCTION CONSULTANCY