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# A New Technology for Green Energy

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Availability of sufficient energy, food, and waste disposal facilities are highly essential for the development of the community. In addition to these, sanitation is also one of the most important factors for having a healthy life style. Due to various reasons most of the peoples living in the villages, coastal areas and slum areas have no sufficient sanitation facilities.

When slums were formed in the banks of water bodies, it is the usual practice that the discharges from the toilets are directly connected to the water bodies. This will lead to severe water pollution including the spreading of water related diseases. It is high time to undertake corrective measures to overcome this situation. Otherwise the precious drinking water sources including ground water will be contaminated and the availability of drinking water will become a big problem.

Due to thick population in urban areas, the drainage lines are overloaded and the related issues are frequent and common. The existing drainage facilities are not quite sufficient to meet the requirement compared to the growth in the population. Pre treatment of excreta before passing to the public sewage system is also one of the best options to mitigate this issue to a considerable extent.

The scientific disposal of human excreta is a major problem. Many remarkable achievements to improve the sanitation have already been taken by government bodies as well as by many national and international Organizations. A good number of public toilet complexes and individual toilets have been constructed with automatic / electronic system. But almost all the toilet complexes are having traditional septic tanks only. Such septic tanks may be those constructed at the site or pre fabricated ones. An exhaust pipe is seen connected with all septic tanks to release the gas generated inside the septic tanks. The gas

generated from the septic tanks will be mixed with the atmosphere due to this arrangement.

As per scientific studies it is understood that human excreta discharged by an adult person is capable of producing 29 – 30 litres of Biogas every day. It is estimated that the excreta of an average family having 5 members will produce about 54 Cum of Biogas per year. This is equivalent approximately to 27 kg of LPG. In other words, if we can capture this biogas with the help of an anaerobic digester, it will be helpful for the conservation of LPG in urban areas and fire wood in rural areas.

Biogas is a good source of Green Energy which can be used to meet all the requirements of energy needs. Due to unscientific design and construction of septic tanks, facilities are not sufficient enough for capturing the biogas from the septic tanks.

If we allow to release the biogas from septic tanks to the atmosphere, it will cause severe environmental pollution problems because of the presence of the Methane, which is the major content in the biogas.

The excreta of 35 peoples will be producing about 1000 liters of biogas (1 cum) every day. The main content in the Bio Gas is methane, which is 22 times more dangerous than Co<sub>2</sub>. The biogas produced in one year from the excreta of 35 peoples will be equivalent to the pollution caused by 3.5 metric tons of Co<sub>2</sub>. From this we can imagine the quantity of methane being emitted in a country like India, having a total population of around 120 crores of peoples.

Considering the potential of capturing of methane in the form of Biogas, It is high time for developing a compact device to capture methane from human excreta. Many schemes are available in the form of toilet linked biogas projects, to capture the bio gas from human excreta. Due to various



reasons, all these schemes are not picking-up in accordance with the potential available. One of the main reasons attributable for this is that the level of the out let pipe line from the toilets to the existing septic tank is very deep in the ground. So the procedure of connecting the existing toilet to the bio gas plants is not quite easy and practicable. So many people are not willing to construct toilet linked bio gas plants. Lack of awareness of the peoples is also one of the factors for the non cooperation of the peoples in this regard.

### **Anaerobic Septic Tank**

Based on incessant and continues research for years, we developed a new generation of anaerobic septic tank, which is suitable to link existing toilets and the newly constructed ones. The patent registration work of this anaerobic digester had already been completed.

This anaerobic septic tank is working under biomethanation process. Through the microbial action inside the anaerobic digester the solid content in the excreta will be converted in to biogas. It is a compact device made of Fiber glass Reinforced Plastic (FRP). Installation time is also very less compared with other systems. The Bio gas produced from the anaerobic septic tank can be collected in an external balloon, or the gas collector of a floating dome gas model bio gas plant.

For a 5 member family, a 1000 litre anaerobic septic tank will be sufficient. This volume takes in to consideration of the water discharged from the toilet. The strength of the body of the anaerobic septic tank is designed to withstand the ground pressure. To create anaerobic condition, a water seal is provided in the top cover of the digester. This cover is designed with a special lock system to simplify the installation, activation, operation and maintenance of the device. During the operation of anaerobic septic tank, it is advisable to use mild toilet cleaners instead of strong chemicals and acids to clean the toilets. The continuous use of strong chemicals to clean the toilets will destroy the presence of microbes in the septic tank. This will reduce the efficiency of the system. The expected life span of an anaerobic septic tank will be more than 15 years.

Different capacities of prefabricated anaerobic septic tanks are available to meet the requirements of all categories of individuals, families and housings communities etc. The bio gas generated can be used for cooking, lighting and for the generation of electricity for institutional and community applications.

Introduction of anaerobic septic tanks will completely be of environmental friendly system. It will also help to generate green energy without any recurring expenses.

The Swach Bharath Mission of the Prime Minister of India envisages better sanitation for all the peoples in the country within a few years. Under this programme the construction of toilet is one of the important aspects. Along with the toilets septic tanks or drainage system are the unavoidable part. If anaerobic septic tanks can be included along with the toilet construction it will help to improve the sanitation and also help to produce biogas at the same time.

In consideration of the atmospheric pollution, and the increase in demand for energy, an initiative has to be taken on the part of Government to provide necessary support to the public, to construct anaerobic septic tanks, along with all existing and new toilets.

Those who are interested to undertake commercial production of this Anaerobic Septic Tank can consult BIOTECH, a Kerala based R&D organization and consultant of renewable energy. BIOTECH is providing all technical support to introduce anaerobic septic tanks to all categories of the public in the community.



Dr. A. Sajidas

Dr. A. SAJIDAS is recipient of several national and international awards including WINNER OF GREEN OSCAR ( INTERNATIONAL ASHDEN AWARD-2007) FOR GENERATION OF ENERGY THROUGH DECENTRALIZED WASTE TREATMENT From UK, Presented by Al Gore, American Vice President ( Former ) in the presence of Prince of Wales - Prince Charles.

He holds a Masters Degree (MA) in Sociology and Doctorate in Solid Waste Management and has experience of more than 29 Years in designing and execution of various models of Waste to Electricity Biogas plants, other Renewable energy projects, Waste management projects and Energy conservation activities. He has in his credit 22 Important Inventions relating to the development

of various green energy projects. Presently working as the Managing Director, BIOTECH, Trivandrum and an International Consultant-Biogas in the Ministry of Agriculture, Republic of Yemen under the project funded by the World Bank and Government of Japan.

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