

File No. W-11035/8/2010-CRSP(R&D)

Government of India  
Ministry of Drinking Water and Sanitation  
Nirmal Bharat Abhiyan

12<sup>th</sup> floor, Paryavaran Bhawan,  
CGO Complex, Lodhi Road,  
New Delhi-110003  
Dated – 3/06/2014

To,  
Principal Secretaries/Secretaries  
In charge of Rural Sanitation  
All States

Subject:- Circulation of brochures to States in respect of R&D project on Techno- Economic Adaptability of Ecological Sanitation- reg.

Sir,

The Society for Community Organisation and Peoples Education (SCOPE), Tamilnadu has completed a Research project on Techno- Economic Adaptability of Ecological Sanitation and constructed 10 no. of ECOSAN Toilets (5 in dry zone and 5, where the ground water table is high). The study reveals that the safest period for removal of compost from the ECOSAN chamber is 9 months when it becomes free from E.COLI and Salmonella. It also reveals that dry soil (very fine) was most efficient material for quick composed.

Brochures containing details of the project are enclosed herewith (as per list attached) for distribution to districts and block level officers, which may help in construction of such type of toilets.

Yours faithfully,

  
(Sujoy Mojumdar)  
Director

- Copy to:- 1. Director (NIC) – Please host the report and brochure along with letter on the website. One copy of report and brochure is enclosed herewith for hosting, *on R&D section in the website.*  
2. Hindi Section for providing Hindi Version of the letter.

Yours faithfully,

  
(Sujoy Mojumdar)  
Director

Every day the householder used the material assigned to apply over the faeces after defecation. Experiments were conducted to discern the differences in composting materials and its efficiency in recovering nutrients. In the ECOSAN the faecal matter (compost) was removed after eight months and sent for biological study and presence or absence of E.coli and salmonella. Under this study for the first time faecal matter was removed from the compost chamber at the end of six months and there after every month (total 12 months) to find out the efficiency of the different additives.

The above five additives were spread over the faecal matter removed from the compost chamber and the impact of the additives on composting process was studied for a period of six months. Every month biological parameters and presence or absence of E.coli and salmonella were studied. The main aim of the study was to identify the material which performs better than the other in reducing the time period of composting and nutrient recovery.



## Conclusion

The study revealed that the safest period to remove compost from the ECOSAN chamber was nine months when it was free of E.coli and salmonella.



Chamber opened in the presence of P.D. DRDA, Trichy.

It was found that Dry soil (Very fine after sieving) was the most efficient when compared to all the other materials. Dry soil composting showed robust results as microbes were totally absent, the pH level was neutral and the nutrient recovery of NPK was far better when compared to others.

This was not the case with Wood Ash, Lime Powder, Saw dust, and Burnt Paddy Husk as either the microbes were present or pH showed high values, unsuitable for crops, and with weak nutrient recovery. The upshot is that Dry soil is highly suitable for composting.

### Cost

ASH locally available: -10kg: Rs:5/-

Lime powder easily available: 10kg: Rs:80/-

Burnt paddy husk available only in modern rice mill areas: 10kg: Rs:50/-

Saw dust available only in areas with timber saw mills: 10kg: Rs:60/  
Dry sieved soil available in easily

Society for Community Organisation  
and Peoples Education (SCOPE)

P40, Ramalinga Nagar West Extn, 2nd Street,

Woraiyur, Trichy - 620 003

E-mail: scopeagency1986@gmail.com



Ministry of Drinking water

& Sanitation

GOI - New Delhi

Research Project

2012 - 2013

**TECHNO-ECONOMIC  
ADAPTABILITY  
OF ECOLOGICAL  
SANITATION**



Society for Community Organisation  
and Peoples Education (SCOPE)



### Introduction

The World Health Organization defines it as *Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. Inadequate sanitation is a major cause of disease worldwide and improving sanitation is known to have a significant beneficial impact on health of households and communities.*

Improper disposal of human excreta is hazardous.

The three popular forms of toilets, single pit toilet, septic tank and UGD disposal is not fully environmentally friendly. Hence a new model namely ECOSAN UDDT model is being introduced which is more environmentally friendly.

Ecological sanitation goes a step ahead in devising a mechanism to place economic value on human wastes in a scientific manner. *Ecological sanitation is a holistic approach to sanitation and water management.* It follows the principle of managing the human waste on site and not taking it to far off places for treatment as it involves huge cost for infrastructure and maintenance. The nutrient rich Urine and Faeces are collected separately and they are used for farming to increase agricultural productivity. Ecological Sanitation is thus a modern method of managing human excreta, by means of recovering nutrients in both urine and faeces, facilitating sustainable agriculture, preventing contamination of surface and ground water and most importantly conserve water. Thus ECOSAN could be one best model of environmentally to sustainable sanitation.

This model is ideal in all geographical locations. But it

is the best model for high-water table, coastal, flood prone and also water scarce, rocky, desert regions.

### Objectives

- To examine the technological options of materials used in composting and in construction of Eco-san toilets towards identifying a cost effective method.
- Cost of composting with varied alternatives will be estimated along with the analysis of time duration for composting.
- Evaluation of the best option suitable to the needs of the community in terms of economy, social acceptability, hygiene and time span.
- Evolve a methodology to popularize and implement ECOSAN all over the country.

### Villages Selected:

Thennatherayanpatti Village in Pudukkottai District (Dry Zone) and Karuppampatti Village in Trichy District (high water table area) were selected. In each village five ECOSAN Toilets were constructed. Five households were selected in Karuppampatti village for the additive compost material study.



### CONSTRUCTION MATERIAL STUDY:

Hollow blocks were used for construction of ECOSAN toilets since it was quite strong, environment friendly, cost effective and the most popular material used for construction in the area.

Studies revealed that substructure construction should be given top most priority. Super structure could be made with any materials depending on the financial capacity and the aesthetic appeal of the house holder.

### Special Features:

- Knowing the advantages of having an environment friendly sanitary napkin incinerator in their own home Mrs. Rajalakshmi has constructed the incinerator attached to the ECOSAN UDDT.
- Mrs. Jaya constructed a bathroom attached bathroom-cum-UDDT.

### USE OF DIFFERENT COMPOST MATERIALS

The main focus of the study was to find out and understand the use of different compost materials and the duration of composting. Conventionally, wood ash was the only material used in composting process of human waste. Hence it was decided to study five materials for enabling the compost process. They were Wood ash, Dry soil, Lime powder, Saw dust, Burnt paddy husk.