

**Application Number : EOI-S- 67**

**Category :** Sanitation related

**Title :** Evapotranspiration toilet

**Current Stage of the Technology :** Technology Commercialized/ Implemented

**Estimated Capital Cost,If Quoted (In Rs):** 10639.00

**Waste Management :** Both Solid and Liquid Waste Management

**Cost Per Unit : A.(In Rs)**10639.00

**B. i. Capacity (Minimum) 0 Cost (In Rs)**0.00

**ii. Capacity (Maximum) 0 Cost (In Rs)**0.00

**Patent filed :** No

**Patent Application Number :** --

**Patent granted :** No

**Patent Number :** --

**Provide Video Link :** --

**Key Word :** --

**Summary of the Product :** The Evapotranspiration toilet is an on-site sanitation system for the chemical and biological treatment and reuse of household blackwater, developed and popularized over the last two to three decades by permaculture practitioners in different countries, especially the U.S. and Brazil. It is a natural, zero discharge system, digesting, absorbing, and releasing all of the human excreta.

**Design Capacity :** The substructure measures 9 feet long by 2.5 feet wide by 5 feet deep with a volume of 112.5 cubic feet or 3.18 m<sup>3</sup>. Currently, a small family of five uses this sized model. Moving forward and standardizing this model, the literature recommends a substructure sized at 2m<sup>2</sup> per person.

**Treatment Protocol :** It is a natural, zero discharge system. The substructure does not require maintenance or contact with human excreta. The evapotranspiration toilet has an impermeable, underground substructure filled with layers of materials, decreasing in size with each rising, successive layer. Together the substructure layers use anaerobic digestion, capillary action, evaporation, and transpiration processes to filter, release and absorb the waste matter. Firstly, there is the mostly anaerobic digestion of human excreta where a tank that receives very little oxygen digests most of the pathogens. Anaerobic digestion converts a portion of the human excreta into biogas, exiting out the back-stand pipe. The digested materials are then filtered through a system of porous rocks naturally colonized by bacteria that complement the digestion, further mineralizing and filtering through the successive layers: small stones, sand, soil. The sand and soil layers are the substratum for the root zone system. The top layer is deposited fertile soil with high-water plants suited to transpiration. The digested matter travels up and out the substructure through capillary action. The nutrients leave the system by incorporating into the

plants' biomass through mineralization and absorption by the plants' roots, while evapotranspiration removes the liquid, either transpiring through the plants or evaporating at the surface from the soil.

**Post Treatment handling Protocol :** It is a natural, zero discharge system. The substructure does not require maintenance or contact with human excreta.

**Operations and Maintenance Cost and Protocol :** It is a natural, zero discharge system. The substructure does not require maintenance or contact with human excreta. The use and maintenance of this system is standard. The superstructure includes a porcelain squatting platform, set into a brick and concrete base, that requires periodic cleaning. No intervention or maintenance is required for the substructure other than to water and protect the plants at the initial stage.

**Certification of Product : --**

**Ease of Operations and Management :** The use and maintenance of this system is standard. The superstructure includes a porcelain squatting platform, set into a brick and concrete base, that requires periodic cleaning. No intervention or maintenance is required for the substructure other than to water and protect the plants at the initial stage.

**Interference with Ecosystem :** It is a natural, zero discharge system.

**Test Trailed : Whether Test Trailed/Implemented :** The FICCI Research and Analysis center collected samples and all determined parameters tested within the permissible limits. Coliform and E.coli were not detected in the water hand pumps neighboring the toilets. The toilet basin soil samples, and bananas, all tested absent for E.coli, Salmonella and S. aureus. All the coliform tests were within a safe range. The moisture tests inside and outside the basin were of comparable values, indicating it is adequately regulating moisture.

**Competitors : --**

**About Innovator and Contributors :** Ms. Vanduzer-Snow studied at Lafayette College, New York University and is currently a doctoral student at Rutgers University. She co-authored a multi-volume set on United States' foreign policy during the cold war years. Her works have appeared in G24 Papers, Finance and Development and Indian Express. She specializes in Political Economy, Global Governance and Comparative Politics.

**Contributors :**

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