



Ministry of Science & Technology
Government of India

Project Proposal On

""Investigations on effective utilization of natural filter media and green nanoparticles coupled with solar energy in grey water treatment system""

Submitted to

Division :Water Technologies Cell

Programme or Scheme : DST Water Technology Call for Proposals 2023

Submitted by

Project Investigator:

Dr. Rashmi H R

K S SCHOOL OF ENGINEERING AND MANAGEMENT-bangalore

Part 1 : General Information

General Information:

Name of the Institute/University/Organisation submitting the Project Proposal :

K S SCHOOL OF ENGINEERING
AND MANAGEMENT

State Karnataka

Principal Investigator Name: Dr. Rashmi H R

Category: General

Type of the Institute : Academic Institutions (Private)

Project Title : "Investigations on effective utilization of natural filter media and green nanoparticles coupled with solar energy in grey water treatment system"

Division : Water Technologies Cell

Programme Or Scheme : DST Water Technology Call for Proposals 2023

Thematic Area : Waste Water Recycling and Management for Industrial, Domestic and Community based Solution

Stream : Technology Development

Academic Area : Civil Engineering,

Application Area : Energy, Waste Processing, Water,

Government National Initiative : Swachh Bhart,

Type of Proposal : Proposal Against Call

Project Duration : 3 Years

Proposal Submit Date : 30/09/2023

Project Keywords : Greywater treatment, Nano particles, filtration, filter media, solar energy.-

Project Summary :

Objectives-

- 1.To study the filtration efficiency using low cost natural filter media Sea shell, coconut shell, Charcoal.
- 2.To investigate the suitability of green nanoparticles Phyllanthus acidus, Tamarindus, Azadischata indica.
- 3.To investigate the effective use of solar energy using adjustable solar panel.
- 4.To determine the efficiency of rural greywater treatment process.
- 5.To estimate the cost of the greywater treatment unit process.

Methodology-

- The grey water sample will be collected and physical and chemical characteristics pH, Electrical conductivity, turbidity, Total solid, phosphorous, nitrogen, ammonia, heavy metals of grey water will be studied.
 - Every unit operation will be made of acrylic sheet.
 - Initially the grey water is stored in oil and grease tank in which aeration is also provided and the effluent of oil and grease tank is passed to the sedimentation tank attached with a rectangular mixer in which moringa oilier is used as a coagulant.
 - The supernatant of sedimentation tank is passed through the filter media in a filtration tank. The filter media used in filter media are sea shell, coconut shell, charcoal. The influent are passed through filter media is collected in under drainage system.
 - The effluent is stored in a tank, The rounded glass surfaces are coated with green synthesized nano particles in which the green synthesized nano particles Phyllanthus acidus, Tamarindus, Azadischata indica are used for the softening of water.
 - The softened water is then passed to the glass container in which adjustable solar panel collects the energy and transfer to the container and the condensed water ie disinfected water is collected at the other end and stored in storage tank.
 - Finally the water in the storage tank is checked for the physical and chemical parameters and compared with the portable water standards.
 - All the physical and chemical characteristics are checked at the end of every unit operation system.
- Hypothesis- This method of treatment can be regarded as the most efficient, capable of addressing a wide range of contaminants, environmentally friendly and economic feasibility for rural greywater treatment and reuses.
- ### Possible outcomes-
- The grey water is treated to the standard portable values.
 - Reduction in freshwater consumption
 - Scale-up the process/technology
 - Green nanoparticles coupled with solar energy were an better option for the treatment of grey water.
 - Create proven solution/test case scenarios for policy makers
 - Encourage reality builders and developers to adopt the solutions

Part 2: Particulars of Investigators

Principal Investigator:

1. Name:	Dr. Rashmi H R
Gender:	Female
Date of Birth:	14/04/1987
Designation :	Associate professor
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