

A Major Project Report

on

**DESIGN OF TRADITIONAL MULTI-STAGE
WATER FILTER FOR RURAL COMMUNITIES**

Submitted in the

**Partial Fulfilment of the Requirement for Award of Degree of
Bachelor of Technology in Civil Engineering**

By

AYUSH BANCHHOR (20102014)

GOURAV PATRA (20102021)

KISLAY YADAV (20102024)

NIKHIL MILIND GACCHE (20102034)

Under the Guidance of

Dr Ashish Kumar Parashar

Assistant Professor



DEPARTMENT OF CIVIL ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDHYALAYA

(A Central University Established by the Central University Act 2009 No. 25 of 2009)

2023-24



DEPARTMENT OF CIVIL ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDHYALAYA

(A Central University Established by the Central University Act 2009 No. 25 of 2009)

CERTIFICATE

This is to Certify that the Major project report entitled “**Design of Traditional Multi-Stage Water Filter for Rural Communities**” submitted by **AYUSH BANCHHOR, GOURAV PATRA, KISLAY YADAV** and **NIKHIL MILIND GACCHE**, B. Tech VIII Semester, in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya Bilaspur is accorded to the student's own work, carried out by them in the Department of Civil Engineering during the session 2023-24 under my supervision and guidance.

Dr. Ashish Kumar Parashar
Guide

Examiners

Dr. Ashish Kumar Parashar

HOD

Department of Civil Engineering
Guru Ghasidas Vishwavidyalaya
Bilaspur (C.G.)

ABSTRACT

Bilaspur District is located in the central-eastern part of Chhattisgarh, India, with a predominantly rural population. Living in rural areas or off-grid locations often presents unique challenges when it comes to accessing clean and safe water. Unfortunately, natural water sources such as wells, springs, or rainwater collection systems can be susceptible to contamination from various sources. Contaminants may include sediment, bacteria, viruses, chemicals, and other impurities that can pose health risks when consumed or used for daily activities. However, with the right knowledge and resources, it is possible to implement effective water filtration systems that ensure the availability of clean water for various purposes.

Traditional water filtration methods have been employed by rural communities in Bilaspur District for generations to purify water for all domestic purposes. These methods utilize locally available materials such as river stones, gravel, sand, charcoal, and alum, combined with indigenous knowledge and traditional techniques, to achieve effective filtration. By leveraging natural filtration processes and cultural practices, these methods have proven effective in removing contaminants and improving water quality for all domestic purposes.

The objective of project is to design a multi stage water filtration technique which is cost effective and deploys Indian traditional methods for purification of water. The filter was designed with a flow rate of 269 litres per hour per square metre. Samples were collected from ponds located in Lokhandi, Guru Ghasidas Vishwavidyalaya and Mohtarai. Research was conducted by evaluating the physical, chemical and biological qualities of water samples. Some of the physical, chemical and biological parameters analysed included pH, turbidity, dissolved solids, suspended solids, hardness, and biological oxygen demand. Drastic reduction of 98.16% and 80.42% in turbidity and biological oxygen demand, respectively, was observed after filtering water samples.

Keywords: pH, Total Dissolved Solids (TSS), Total Suspended Solids (TSS), Turbidity, Hardness, Biological Oxygen Demand (BOD), Filter Chamber, Nelumbo Nucifera, Coconut Shell Activated Carbon (CSAC).