



ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ - ಬೆಳಗಾವಿ
VISVESVARAYA TECHNOLOGICAL UNIVERSITY - Belgaum



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DEPARTMENT OF CIVIL ENGINEERING

PROJECT REPORT ON

**“BIOSAND HOUSEHOLD WATER FILTER FOR RURAL
AREAS”**

BACHELOR OF ENGINEERING DEGREE

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2011-2012

ABSTRACT

The demand for water is rapidly increasing at a rate three times faster than the world's population growth. Alarming statistics, such as 1.2 billion people in the world are lacking a safe water supply, have been highlighted at this year's 3rd World Water Forum to confront some of the issues that attribute to the current global water crisis. This Forum and many more in the past and future have consistently emphasized the need for local communities, governments, and non government organizations to build on sustainable development and technologies to improve water supply and sanitation needs in developing countries.

There are many options of treatment of water available in Indian Urban areas, however, treatment of water for human consumption in many rural areas of India is still a widespread problem.

A slow sand filter contains biological activity and is therefore often referred to as a bio-sand filter. As micro-organisms such as bacteria, viruses and parasites travel through the sand, they collide with and adsorb onto sand particles. The organisms and particles collect in the greatest density in the top layers of the sand, gradually forming a biological zone. The biological zone is not really a distinct and cohesive layer, but rather a dense population that gradually develops within the top layer of the sand. The population of micro-organisms is part of an active food chain that consumes pathogens (disease-causing organisms) as they are trapped in and on the sand surface. The uppermost 1-3cm of this biological zone is sometimes referred to as '*schmutzdecke*' or 'filter cake'. This is defined as a layer of particles deposited on top of the filter bed or biological growth on top of the filter bed. Slow sand filters are usually cleaned by scraping of the bio-film and/or the top sand layer.

The purpose of this study is to investigate the effectiveness and the performance of the Bio Sand filter in the rural areas of Bijapur Taluk. Recent studies show that there are 20,000 household size concrete Biosand Filters (BSF) in over 30 developing countries. The bio-sand filters are based on a method that has been used for over 200 years. It requires locally available materials such as gravel and sand with minimum maintenance lasting several years.