VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI -590018

Project Report on

"PEDAL POWERED WATER PURIFICATION BY REVERSE OSMOSIS"

(Sponsored by Karnataka State Council for Science and Technology)

Submitted in the partial fulfillment of the project work prescribed by the Visvesvaraya Technological University for the award of

BACHELOR OF ENGINEERING

In

MECHANICAL ENGINEERING

Under the Guidance Of

Mr. RAJU JADAR M.Tech

Project Associates:

ABHISHEK SAJJAN	**2SR11ME004**
DEVEGOUDA PATIL	**2SR11ME029**
GANESH D ALADAKATTI	**2SR11ME033**
PUNEET M GAONKAR	**2SR11ME076**

2014-2015

SRI TARALABALU JAGADGURU INSTITUTE OF TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

RANEBENNUR-581 115

ABSTRACT

Pure water is very much essential to survive but now a days this water is getting contaminated due to Industrialization which leads to many water-related diseases, our project pedal powered water purification by RO method meets the needs of people without requiring any electrical energy. RO is a physical process that uses the osmosis phenomenon, that is, the osmotic pressure difference between the salt water and the pure water to remove the salts from water. RO is a pressure-driven membrane process where a feed stream flows under pressure through a semi permeable membrane, separating two aqueous streams, one rich in salt and other poor in salt. Water will pass through the membrane, when the applied pressure is higher than the osmotic pressure, while salt is retained. As a result, a low salt concentration permeate stream is obtained and a concentrated brine remains at the feed side. A typical RO system consists of four major subsystems: pretreatment system, high-pressure pump, membrane module, and post treatment system. Using a high-pressure pump, the pretreated feed water is forced to flow across the membrane surface. In operation by pedaling the cycle man power is converted into mechanical energy which is further converted into hydraulic energy in RO pump. RO pump is attached to rear wheel of bicycle which runs due to friction. RO pump pumps the water to SEDIMENT FILTER which removes various foreign bodies such as bits of rust, sand silt and dirt .Then the water passes through CARBON FILTER which removes chlorine and other organic chemicals. The water from pre filters enters into RO membrane, which removes bacteria, pyrogens, pesticides, asbestos etc .The impurities are flown into drain and the pure water is collected. Simple tests are carried out to check purity of water. This technology has advantage of a membrane based process where concentration and separation is achieved without a change of state and without use of chemicals or thermal energy, thus making the process energy efficient and ideally suited for recovery applications.