CHARACTERIZATION OF RURAL DRINKING WATER SOURCE WITH REMOVAL OF HIGH CHLORIDE THROUGH BIOADSORPTION: A CASE STUDY

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CERTIFICATE

This is to certify that the research work embodied in this dissertation entitled "**CHARACTERIZATION OF RURAL DRINKING WATER SOURCE WITH REMOVAL OF HIGH CHLORIDE THROUGH BIOADSORPTION: A CASE STUDY**" by **LOKESH KUMAR, Roll No. 2K11/ENE/05** in partial fulfillment of the requirement for the award of the degree of Master of Technology in Environmental Engineering, Delhi Technological University (Formerly Delhi College of Engineering), Delhi, is an authentic record. The work is being carried out by me. The work embodied in this major project has not been submitted for the award of any other degree to the best of our knowledge.

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ABSTRACT

The demand of Drinking water in rural India is being fulfilled either by the limited surface sources or by the underground water wells. Contamination levels of these water sources are generally high. To deal with the Quality issue of drinking water in the rural India is very important. In Rural India about 700 million people are residing in about 1.5 million habitations spread over multi different ecological regions. It is very difficult to meet the drinking water needs of such a large population with a good efficiency. Because of the different level of awareness, social and economical development, education, poverty, practices, rituals and water availability add to the complexity of the task. Regardless of an estimated total of Rs. 1,105 billion spent on providing safe drinking water since the First Five Year Plan was launched in 1951, lack of safe and secure drinking water continues to be a major problem and a national economical burden. In rural India, village ponds and groundwater well have been playing very vital role in social, cultural, economical and environmental development of the users. These ponds are the social resources of Indian villages and support the livelihoods of the marginalized community in rural, urban, coastal and tribal areas of India. Due to contaminations of these drinking water sources in villages, around 37.7 million Indians are affected by waterborne diseases annually, 1.5 million children are estimated to die of Diarrhea alone and 73 million working days are lost due to waterborne disease each year. The resulting economic burden is estimated at Rs.36000 million a year. While 'traditional diseases' such as diarrhea continue to take a heavy toll, 66 million Indians are at risk due to excess fluoride and 10 million due to excess arsenic in groundwater. In all, 1, 95,813 habitations in the country are affected by poor water quality. Hardness and Chloride are also deteriorating the water supply lines and structures along with few reported health issues like hypertension and bone disease in rural India. This is an effort to characterize the drinking water quality parameters available in the village ponds and deep wells and suggestion for removal of excess chloride content by bio-adsorbent. A case study of Village & P O Kharak kalan District Bhiwani , Haryana.

Keywords: Contamination, Drinking Water Quality, Rural India, Chloride Bio-adsorption, waterborne disease.

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LIST OF ABBREVIATIONS

DO	Dissolve Oxygen
CPCB	Central Pollution Control Board
BDST	Bed Depth Service Time
SPCB	State Pollution Control Board
UHLA	Ultra- High Lime With Aluminum
CLDH	Calcined Layered Double Hydroxides
TDS	Total Dissolve Solids