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# Arsenic Contamination in Groundwaters of Village Koudikasa in Rajnandgaon District (Chhattisgarh)

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## Abstract

*Excessive intake of arsenic can lead to health problems. More than 800 water samples collected from hand pumps and dug wells from Chowki block were analyzed for arsenic and some other physico-chemical parameters. Out of the total samples analyzed the highest concentration of 1890 µgAs/L was found in one of the hand pumps at the Koudikasa village. The paper presents results of groundwater samples with special reference to arsenic contamination in village Koudikasa. Short term and long term technological options for providing arsenic free water and recommendations for future course of action have also been delineated in the present paper.*

## Key Words

*Koudikasa Village, arsenic contamination, groundwater*

## Introduction

High concentrations of arsenic in groundwaters of West Bengal, India and Bangladesh have become a major cause of concern in recent years as arsenic has acquired an unparalleled reputation as a poison with arsenic trioxide contributing a convenient agent for homicide. In addition to its publicized role as a poison, arsenic finds its applications in, medicine and dyes. In modern days besides this it is used in pesticides, additives to animal feed, wood preservatives, glasses, semiconducting devices, etc (Webster, 2000). Possibility of arsenic in higher concentrations has never been considered seriously in the past. The ubiquity of arsenic in the environment originates from natural enrichments and is intensified by anthropogenic activities. The most common sources of arsenic in the natural environment are volcanic rocks specially acid volcanic rock, volcanic ash and specifically their weathering products, marine sedimentary rocks, coal, coal ash, petroleum, hydrothermal ore deposits and associated geothermal waters (Korte and Fernando, 1991; Smedley and Kinniburgh, 2002). Arsenic associated with sediment particles can be a major source of arsenic contamination. Major ore minerals of arsenic are

Arsenopyrite (FeAsS), Orpiment (As<sub>2</sub>S<sub>3</sub>), Realgar (AsS) and Lollingite (FeAs<sub>2</sub>). It is often associated with Au, Ag, Cu forming their arsenite. It is found that geochemical mobility of arsenic in nature depends on oxidation state of arsenic and associated element (Masson and Moore 1982). Arsenic is known as the king of poisons and has plagued human being since the days of antiquity. Arsenic is not a physico-chemical constituent of the body. The toxicity of arsenic species differ with their chemical forms and oxidation states (NRC, 1999; Thomas et al., 2001). The arsenic (III) in the body combines with sulphhydryl containing substances and inhibits the activity of many enzymes of the group. Arsenic can give rise to acute and chronic toxicity in the body. It is suggested that the intake of significant amounts of inorganic arsenic can intensify the chances of cancer development, especially skin, lung, liver and lymphatic cancer. Manifestations due to arsenic poisoning on human body are shown in the Figure 1.

The paper presents results of groundwater contamination with special reference to arsenic in Koudikasa village of Chowki block in district Rajnandgaon, Chhattisgarh. Short term and long term

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