

Impact of Mixed Farming on Nitrate Contamination in Ground Water in Dausa Tehsil

Abstract

Rajasthan is the driest State in India. The state depends on ground water in 91% for both drinking & irrigation. In this research paper on the basis of the report of chemical examination of ground water of the study area Dausa tehsil, it is aimed to reveal the imbalance of nitrate contamination in ground water in Dausa tehsil. It is found that 13 samples out of 24 samples cross the limit of acceptable nitrate contamination according to BIS. The present research work shows the correlation between high nitrate concentration in ground water and agriculture activity and animal waste in Dausa tehsil.

Keywords: Nitrate, Mixed Farming, Fertilizer, Urea, Ammonium Chloride, River Basins.

Introduction

Rajasthan is the driest state in India in which out of 15 basins only two rivers basins are perennial i.e. Chambal & Mahi. Due to the unavailability of surface water, ground water plays an important role not only for drinking water but also for irrigation. Rajasthan has only 1% of country's water resource. The state has extreme geographical & climatic conditions. The state comprises most of wide and inhospitable Thar Desert on 60% of its total area this is why the state depends on ground water is 91% for both drinking and irrigation. Unfortunately, this precious source is facing the problem of salinity, fluoride, high nitrate contamination in most of the districts of Rajasthan.

Study Area

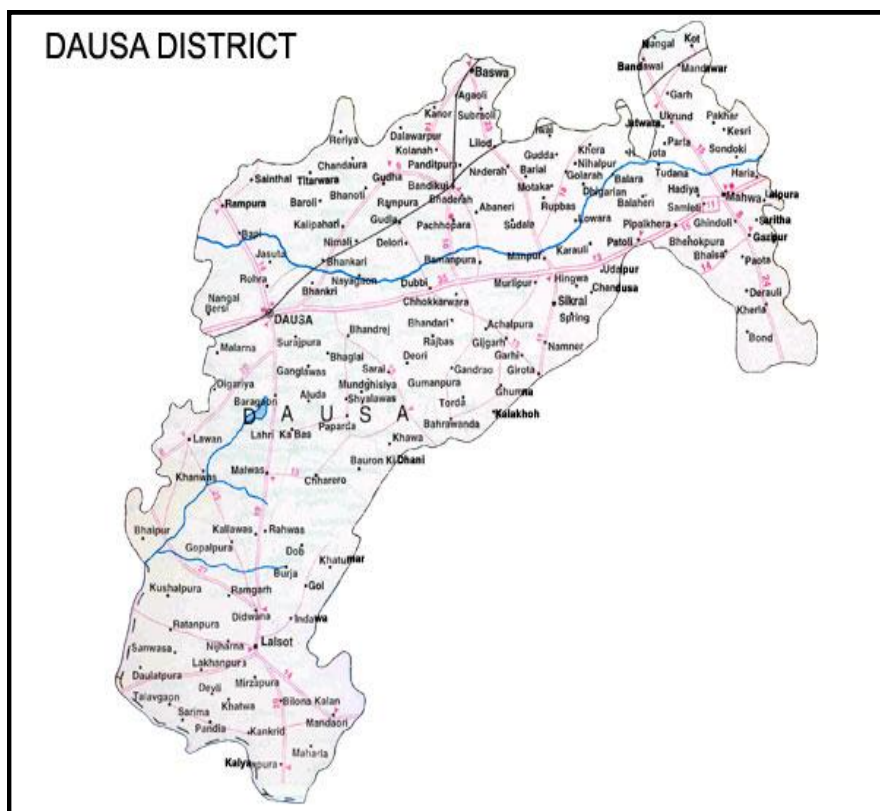
The study area Dausa region is a tehsil of Dausa district in the State of Rajasthan.



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The study area Dausa is situated in the eastern part of the state. It is also known as "Dev Nagari". Dausa is located between 26° 22' N to 27° 14' N and 76° 8'E to 77° 4' E longitude. Dausa district has a population of 1634409 according to census 2011, and area of 3432 square kilometer. Dausa Tehsil is bounded in the north by Baswa tehsil in the east by Mahwa tehsil in the south by Lalsot tehsil and in the west by Bassi tehsil of Jaipur district .

Objectives of the Study

1. The present research work aims to seek the nitrate contamination in ground water in the Dausa region.
2. To reveal the imbalance of NO₃ ions in ground water of the study area.
3. To find out the possible reasons of high nitrate concentration in ground water of the study area

Nitrate in the Study Area

The present research work is based on the report of the chemical examination of water (2017-18) given by the office of the junior chemist public health Engineering Department Laboratory Dausa

Table 1: Distribution of Nitrate In Ground Water Different Villages of Dausa Tehsil

S.No.	Name of Villages	No. of Samples	NO ₃ Concentration (mg/l)	Average NO ₃ Concentration (mg/L)
1	Dhigaria	02	1, 1	1
2	Nangal Govind	02	18,71	44.5
3	Hignotia	02	18,39	28.5
4	Kherla	02	7,1	4
5	Jirota Khurd	02	38,4	21
6	Bhandana	02	2,74	38
7	Sitapura	02	4,1	2.5
8	Chawndera	02	5,17	11
9	Malagwas	02	86,61	73.5
10	Khuri Kalan	02	77,79	78
11	Bapi	02	98,139	118.5
12	Sainthal	02	2,8	5

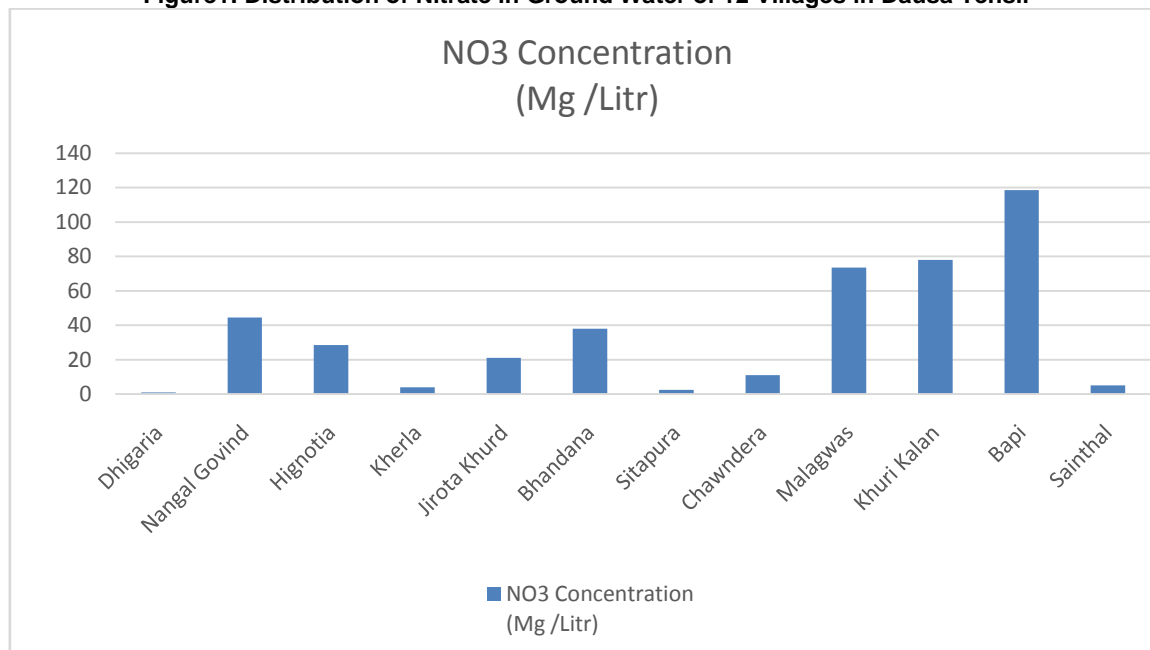
*Report of the chemical examination of water (2017-18) ,

the office of the junior chemist public health Engineering Department Laboratory Dausa

The report was carried out in 12 Villages of Dausa tehsil because the people of this region use ground water for drinking water and also for irrigation.

The ground water samples were collected from hand pumps. Two samples were taken from a village.

Figure1: Distribution of Nitrate in Ground Water of 12 Villages in Dausa Tehsil



Considering the health effects of the chemical constituents, WHO (1998) and Bureau of Indian Standard (BIS 1992) have set guidelines for maximum permissible level in drinking water. In case of NO₃ WHO has set a value of 11.3 mg/l as nitrate where as BIS acceptable Concentration is 10.2 mg/l and maximum permissible concentration is 22.6 mg/l. The above report or table shows that there are 13 samples out of total 24 samples of ground water cross the limit of acceptable NO₃ concentration according to BIS.

Agricultural Scenario

In the Dausa regions there is no industrial development, people mainly practices specially of mixed farming with having two or three cows or buffaloes along with agriculture. In whole Dausa district as there is no river having only some streams of rainy seasons, irrigation is carried out through tubewells. The nitrogen fertilizers commonly used in the study area urea diammonium phosphate and ammonium chloride application of fertilizers including farmyard manure is very high. During the season nitrogen fertilizer is applied three times at the rate of 30-40 kg/hectare.

Conclusion

Through the above data and discussion it can be concluded that the contamination of nitrate in the ground water in Nangal Govind, Hingotia, Jirota Khurd, Bhandana, Chavandera, Malagwas, Khuri Kalan, Bapi could be attributed to animal wastes derived from cows and buffaloes and agricultural activities. A large amount of samples exceeding the

BIS standard of nitrate suggests that extensive monitoring has to be conducted in the study area providing safe drinking water.

Acknowledgement

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References

1. Saxena H.M., *Geography of Rajasthan*, 28th ed. , Rajasthan Hindi Granth Academy, Jaipur
2. *District Statistical Outline (2012-13)*
3. *Chemical Examination Report, Office of Junior Chemist, PHED, laboratory, Dausa*
4. Austen, K.F., Dworetzky, M. and Farr R.S.: *J. Allergy*, 47: 347-348 (1971).
5. Hussain, I. Hussain, J., Sharma, K.C. and Ojha, K.G.: *In: Environmental Scenario of 21st Century*, APH Pub. Hussain et al.
6. WHO: *Fluorine and fluoride. Environmental Health Criteria*, Vol. 36. Geneva (1984).
7. WHO: *Geneva Report*, pp. 37 (1994).
8. WHO: *Guideline for drinking water quality, second edition, vol. 2, Health criteria and other supporting information*, World Health Organization, Geneva (1996).
9. Wislicenus, EL, "Resistenz der Fichte gegen saure Rauchgase bei ruhender und bei tatiger Assimilation," *Tharandt. Forstl. Jahrb.* 48: 152 (1898)