

Analysis of Magnesium contents of Ground water at surrounding areas of Dildar Nagar of U.P, India

Salahuddin

Associate Professor, Department of Mathematics, PDM University, Bahadurgarh, Haryana, India

ABSTRACT: In this paper, we have discussed about the newly collected sample of ground water at surrounding areas of Dildar Nagar village and its experimental analysis in laboratory for Magnesium. Also, we have demonstrated the data graphically and have explained the data using the method called analysis of variance.

KEYWORDS: Analysis of variance, Graphical representation, Magnesium.

I. INTRODUCTION

Magnesium (See [12]), an abundant mineral in the body, is naturally present in many foods, added to other food products, available as a dietary supplement, and present in some medicines (such as antacids and laxatives). Magnesium is a cofactor in more than 300 enzyme systems that regulate diverse biochemical reactions in the body, including protein synthesis, muscle and nerve function, blood glucose control, and blood pressure regulation. Magnesium is required for energy production, oxidative phosphorylation, and glycolysis. It contributes to the structural development of bone and is required for the synthesis of DNA, RNA, and the antioxidant glutathione. Magnesium also plays a role in the active transport of calcium and potassium ions across cell membranes, a process that is important to nerve impulse conduction, muscle contraction, and normal heart rhythm.

Analysis of variance (see [5], pp. 256-258) is very useful technique concerning researches in the fields of economics, biology, education, psychology, sociology, and industry. The ANOVA technique enables us to perform simultaneous test and as such is considered to be an important tool of analysis in the hands of a researcher. Using this technique, one can draw inferences about whether the samples have been drawn from populations having the same mean.

The ANOVA technique is very useful in the context of all those situations where we want to analyze more than two populations such as in comparing the yield of crop from several varieties of seeds, the gasoline mileage of four automobiles, the smoking habits of five groups of university students and so on. In such situation one generally does not want to consider all possible combinations of two populations at a time for that would require a great number of tests before we would be able to arrive at a decision. This would also expend lot of time and money, and even then certain relationships may be left unidentified (particularly the interaction effects).

II. STUDY AREA(SEE[2])

Dildarnagar is a village panchayat located in the Ghazipur district of UttarPradesh state, India. The latitude 25.4328495 and longitude 83.683076 are the geocoordinate of the Dildarnagar. Lucknow is the state capital for Dildarnagar village. It is located around 333.2 kilometers away from Dildarnagar. The other nearest state capital from Dildarnagar is Patna and its distance is 146.7 KM. The other surrounding state capitals are Patna 146.7 KM., Ranchi 284.5 KM., Gangtok 534.6 KM

Location map of the Study area



III. MATERIALS AND METHODS

3.1 Sample Collection:

The ground water samples were collected from different locations to evaluate the physico-chemical contamination. Samples were collected in plastic container to avoid unpredictable changes in characteristic as per standard procedure (APHA, 1998). The results were compared with WHO standard values (2003). The details of sampling locations are illustrated below the Table 1

Table 1: Water sampling locations and sources

CODE	Sampling Station	Source
GW1	Usia	Bore well
GW2	Dildar nagar	Bore well
GW3	Karma	Bore well
GW4	Nirahukapura	Bore well
GW5	Bhadura	Bore well
GW6	Gorsara	Bore well
GW7	Baksara	Bore well
GW8	Sihani	Bore well
GW9	Arangi	Bore well
GW10	Bhaksi	Bore well

3.2 Analysis the data

The experimental analysis of Magnesium of sampling locations are illustrated below the table 2 and graphically represented in fig 1 and the statistical analysis of the data are illustrated in table 3.

Table (2): Monthly variation in Magnesium (mg/l) of ground water at different sampling sites

CODE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GWS1	29.4	22.7	28.0	25.7	28.0	22.3	22.3	29.4	33.9	36.9	34.3	34.7
GWS2	24.5	24.7	27.1	22.2	27.9	25.7	23.0	25.0	30.1	34.3	24.7	20.1
GWS3	59.8	54.3	57.0	48.3	52.7	56.3	63.0	69.0	72.1	78.0	63.0	69.1
GWS4	31.0	21.1	26.0	28.3	23.1	27.0	30.2	33.2	22.7	36.7	29.1	22.7
GWS5	32.3	22.1	34.8	48.7	39.8	38.8	34.1	40.4	57.0	64.2	60.1	48.7
GWS6	29.0	36.4	32.1	23.0	28.7	24.1	28.2	24.1	32.4	38.3	30.4	24.3
GWS7	18.2	18.7	16.3	18.0	20.3	18.0	22.2	25.0	27.8	24.2	26.3	26.2
GWS8	24.4	22.4	27.0	23.3	27.0	24.1	27.0	22.2	28.4	39.0	34.8	26.7
GWS9	25.3	20.3	23.1	18.8	20.2	28.8	32.7	34.2	38.8	27.4	29.0	27.7
GWS10	20.7	18.7	18.6	20.3	25.1	24.3	20.6	24.3	22.3	21.5	18.3	18.2

GW1= Usia, GW2 = Dildar Nagar, GW3 = Karma, GW4 = Nirahukapura, GW5 = Bhadaura, GW6 = Gorsara, GW7 = Baksara, GW8 = Sihani, GW9 = Arangi, GW10 = Bhaksi



Fig 1: Graphical representation of Magnesium

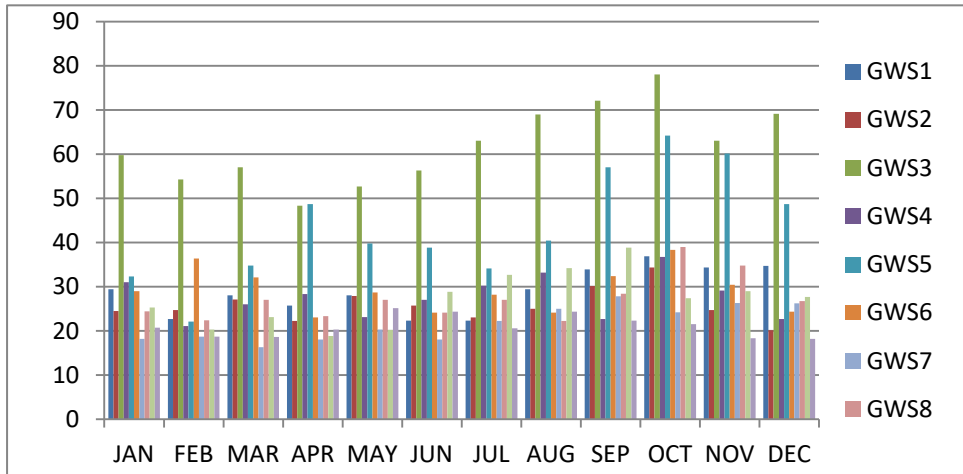


Table 3: Anova: Two-Factor Without Replication

SUMMARY	Count	Sum	Average	Variance
GWS1	12	347.6	28.96667	26.33333
GWS2	12	309.3	25.775	14.08023
GWS3	12	742.6	61.88333	77.73242
GWS4	12	331.1	27.59167	22.60629
GWS5	12	521	43.41667	157.5579
GWS6	12	351	29.25	24.58818
GWS7	12	261.2	21.76667	15.97333
GWS8	12	326.3	27.19167	25.40992
GWS9	12	326.3	27.19167	37.04447
GWS10	12	252.9	21.075	6.125682
JAN	10	294.6	29.46	133.5782
FEB	10	261.4	26.14	123.6316
MAR	10	290	29	127.68
APR	10	276.6	27.66	129.9404
MAY	10	292.8	29.28	98.55511
JUN	10	289.4	28.94	121.3582
JUL	10	303.3	30.33	153.5312
AUG	10	326.8	32.68	195.9684
SEP	10	365.5	36.55	254.5317
OCT	10	400.5	40.05	315.2383
NOV	10	350	35	218.5756
DEC	10	318.4	31.84	246.7093

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Rows	16381.77	9	1820.196	66.94095	4.1E-38	1.975806
Columns	1790.053	11	162.7321	5.984761	2.08E-07	1.886684
Error	2691.916	99	27.19107			
Total	20863.74	119				

IV. RESULTS AND DISCUSSION

The data is statistically analysed using two way analysis of variance and after analysis the result shows that Magnesium of ground water of these areas depends on locations as well as months also.

REFERENCES

- [1]. David A Freedman, *Statistical Models: Theory and Practice*, Cambridge University Press, 2005.
- [2]. Dildarnagar Village , Bhadaura Tehsil , Ghazipur District. (2015, February 20). Retrieved from <http://www.onefivenine.com/india/villages/Ghazipur/Bhadaura/Dildarnagar>.
- [3]. D. R. Cox, *Principles of statistical inference*. Cambridge New York: Cambridge University Press, 2006.
- [4]. Henry Scheffé, *The Analysis of Variance*. New York: Wiley, 1959.
- [5] Kothari, C. R., *Research Methodology*, New Age International (P) Limited, Publishers, New Delhi, 2004.
- [6]. Salahuddin, Analysis of Chloride Content in the Surface of water at different locations of Madhya Pradesh, *International Journal for Pharmaceutical Research Scholars*, 2(4), 107-109,2013.
- [7]. Salahuddin, Physico-chemical analysis of upper lake water in Bhopal region of Madhya Pradesh, India, *Advances in Applied Science Research*, 5(5), 165-169,2014.
- [8] Salahuddin, Husain, Intazar, Analysis of Lower Lake Water in Bhopal Region of Madhya Pradesh, India, *International Journal of Lakes and Rivers*.13(1), 17-25, 2020.
- [9]. Salahuddin and Khola , R. K, Analysis of Chloride Content in the Surface of water using two way Anova, *International Journal for Pharmaceutical Research Scholars* , 2(4), 51-53, 2013.
- [10]. Salahuddin, Khola , R. K, Physico-Chemical Analysis for the Presence of Oxygen Content of Ground Water at Different Locations of Dildar Nagar of U.P, India, *Global Journal of Science Frontier Research (B)*, 14 (6),01-03,2014.
- [11]. Sirajudeen, M. Kadhar Mohidheen and R. Abdul Vahith, Physico-chemical contamination of groundwater in and around Tirunelveli district, Tamil Nadu, *Advances in Applied Science Research*, 5(2),49-54, 2014.
- [12]. Magnesium.(2015, November 07). Retrived from <https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/>