E-ISSN: 2706-8927
P-ISSN: 2706-8919
www.allstudyjournal.com
IJAAS 2020; 2(2): 239-242
Received: 21-02-2020
Accepted: 23-03-2020

Faizmohamad Kakar
Senior Teaching Assistant, Faculty of Science, Herat University, Herat, Afghanistan

Shahnaz Rahmani
Assistant Professor, Faculty of Science, Herat University, Herat, Afghanistan

Ahmadzia Ghanizadeh
Assistant Professor, Faculty of Science, Herat University, Herat, Afghanistan

Nigineh Mohammadi
Laboratory Coworker, Faculty of Science, Herat University, Herat, Afghanistan

Corresponding Author:
Faizmohamad Kakar
Senior Teaching Assistant, Faculty of Science, Herat University, Herat, Afghanistan

Determination of chemical and physical parameters of drinking water in 2nd, 3rd, 5th And 10th districts of Herat province of Afghanistan

Faizmohamad Kakar, Shahnaz Rahmani, Ahmadzia Ghanizadeh and Nigineh Mohammadi

Abstract
Useable drinking water in many part of the world can be achieved from many underground sources that every part of ground has there on special feature. Underground water has less pollution than surface water also has good smell, less foggy and less balance of microbe, than surface water. In many part of the world they are using surface water with different methods of water filtration to prepare the need of their citizen. Afghanistan is one the limited country that its people are using underground water, in Herat province is also the same. Unluckily, there is no any water filtration system, so people use underground water for drinking and laundry, in this research we analyzed four districts of Herat province till to determine the quality of water in them. The samples are experiential section of science faculty of Herat University. The results of this research can be profitable for this organization.

Keywords: Drinking water, quality of drinking water, Mineral of water, physical and chemical factors of water

Introduction
Water is the universal solvent and human survival depends on the use of uncontaminated and cleaned water. The physical, chemical and bacterial characteristics of ground water determine its usefulness for domestic, industrial, municipal and agricultural applications. The quality of water is more important compared to quantity in any water supply planning, especially for drinking purposes.
Herat city is the second largest and important cities in Afghanistan. Providing clean and drinkable water for this city is challenging because of the influenced of population, industrial, agricultural activity, sewage disposal and by water runoff. The purpose of this study is to analyses drinking water of 2th, 3th, 5th and 10th districts of Herat city. Some chemical parameters that analyzed were: pH, F^-, NO_3^-, Ca^{2+}, Mg^{2+} and Hardness (in $CaCO_3$). This research was conducted at Water Analysis laboratories of Herat University, Science faculty. In the end, we investigated the cause of pollution and how to remove the pollution of Herat water.

Material and Methods
In this research many samples of drinking water has received from 2th, 3th, 5th, and 10th districts of Herat city with standard accounting, we had five samples for analyzing for testing bacteriology at first we estril our dish and then we use that. And tested the sample in a moment due to prevent boosting the bacteria or may any error in the process of analyzing and also due to Herat Drinking water exist chlorine. Ten percent of thiosulfate add to our sample.

Methods of Analyzing
Open the tap for two or three minutes, and then by heat the flame of gas than be more than 40 c heat the leave solvents
Separate the tap of sample bottle and prevent paper
Full the bottle by 3 or 4 cm water
Put the tap of the bottle and paper on their place and put on ice

Material and tools

Wide glasses bottle tap or plastic bottle with 100up to 200 Milliliter that before sterilized.

Ice

Sample machine Filtration and titration machine Spectrophotometer and experimental matter with high purity degree.

Result

Result of analyzing chemical and physical of drinking water of 2th, 3th, 5th and 10th areas of Herat city in tables 1, 2 results of physical and chemical parameters of drinking water are shared.

Table 1: Physical parameters of drinking water in the second district of Herat

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Physical Parameters
24.3	5		10-20	^{0}C	**Temperature**
0.5	5	5	≤ 1	NTU	**Turbidity**
1212	5	1500	900	$\mu S/cm$	**Conductance**
672	5	1000	500	mg/lit	**TDS**
Tasteless	5	Popular and unpopular acceptance			**Taste**
was not observed	5	Not to be seen floating			**Oil**
Tasteless	5	Popular and unpopular acceptance			**Odor**
Colourless	5	Colourless			**Color**

Physical and chemical parameters of those areas are analyzed and the result is shared in chart number one. Temperature, taste, oil, smell, and colors are on normal and its Conductance and collection of its solid are in 1212 MS/cm and 672 mg/lit that is more than limitation and less than admissible.

Table 2: Chemical parameter of drinking water in second area of Herat

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Chemical Parameters
7.4	5	6.5-9.0	6.5-8.5		**pH**
0.2	5	1	0.8	mg/lit	**Fluoride**
8.9	5		<50	mg/lit	**Nitrate**
6	5	200	75	mg/lit	**Ca^{2+}**
15	5	150	30	mg/lit	**Mg^{2+}**
52	5	500	150	mg/lit	**Total hardness (according to $CaCO_3$)**

In table 2 the chemicals parameter of drinking water of 2 area of Herat were examined, the tasted parameter are PH, fluoride, nitrate, calcium and Mg and collection of hardness in water (in amount of $CaCO_3$) PH as a given result from analyzing parameter of Herat city, Ca, Mg and collection of hardness in amount of ($CaCO_3$) was in normal an d no any pollution but amount of fluorite in drinking water was 0, 2 mg/lit that this is lack of fluoride in drinking water in Herat city.

In table 3, 4 there is a parameter of physical and chemicals of drinking water in third area.

Table 3: Chemicals parameters of drinking water in third area

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Physical Parameters
19.3	5		10-20	^{0}C	**Temperature**
0.7	5	5	≤ 1	NTU	**Turbidity**
1232	5	1500	900	$\mu S/cm$	**Conductance**
522	5	1000	500	mg/lit	**TDS**
Tasteless	5	Popular and unpopular acceptance			**Taste**
Not to be seen	5	Not to be seen floating			**Oil**
odorless	5	Popular and unpopular acceptance			**Odor**
Colourless	5	Colourless			**Color**

Parameter of physical and chemical of third Area of Herat city was analyzed and the result of that was mention in chart 3. Parameters of temperature, foggy, taste, oil , smell, an color of that were in suitable and its conductance and collection of its in solvent solid are 1232 MS/cm and 522 mg/lit that is more than limitation and less than admissible.

Table 4: Chemical Parameter of drinking water in third area of Herat City

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Chemical Parameters
7.9	5	6.5-9.0	6.5-8.5		**pH**
0.3	5	1	0.8	mg/lit	**Fluoride**
9	5		<50	mg/lit	**Nitrate**
6.2	5	200	75	mg/lit	**Ca^{2+}**
19	5	150	30	mg/lit	**Mg^{2+}**
52	5	500	150	mg/lit	**Total hardness (according to $CaCO_3$)**

In table number 4 chemical parameter of drinking water in third area of Herat city has analyzed. Tested parameters are PH, fluorite,, nitrate, calcium and Mg and collection of hardness in water (in amount of $CaCO_3$) PH as a given result from analyzing parameter of Herat city, Ca, Mg and collection of hardness in amount of $CaCO_3$) was 0.3 mg/ml there was lack of fluorite in drinking water in third area of Herat city.

In chart number 5 and 6 there were physical and chemicals parameters of drinking water in Herat city.

Table 5: Physical parameters of drinking water in the fifth district of Herat city

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Physical Parameters
20.3	5		10-20	^{0}C	**Temperature**
0.8	5	5	≤ 1	NTU	**Turbidity**
1342	5	1500	900	$\mu S/cm$	**Conductance**
692	5	1000	500	mg/lit	**TDS**
Tasteless	5	Popular and unpopular acceptance			**Taste**
Not to be seen	5	Not to be seen floating			**Oil**
Odorless	5	Popular and unpopular acceptance			**Odor**
Colourless	5	Colourless			**Color**

Physical and chemicals parameter of drinking water in Herat city was analyzed, that the given result is in the chart number 5. Parameters likes temperature, foggy, smell, oil, and its color was suitable and its conductivity and collected of solvent solid are 1342 ms/cm and 692mg/lit that is more than limitation and less than admissible

Table 6: Chemical parameters of drinking water in the fifth district of Herat city

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Chemical Parameters
7.7	5	6.5-9.0	6.5-8.5		PH
0.2	5	1	0.8	mg/lit	Fluoride
8.4	5		<50	mg/lit	Nitrate
6	5	200	75	mg/lit	Ca2+
15	5	150	30	mg/lit	Mg2+
59	5	500	150	mg/lit	Total hardness (according to $CaCO_3$)

In chart number 6 chemical parameter of drinking water in third area of Herat city has analyzed. Tested parameters are PH, fluoride,, nitrate, calcium and Mg and collection of hardness in water (in amount of $CaCO_3$) pH as a given result from analyzing parameter of Herat city, Ca, Mg and collection of hardness in amount of ($CaCaO_3$) was 0.2 mg/ml there was lack of fluoride in drinking water in fifth area of Herat city.

In 7, 8 tables there are a parameter of physical and chemicals of drinking water in tenth area of Herat city.

Table 7: There is physical and chemicals parameter of drinking water in Herat city

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Physical Parameters
20	5		10-20	^{0}C	**Temperature**
0.5	5	5	≤ 1	NTU	**Turbidity**
1442	5	1500	900	$\mu S/cm$	**Conductance**
673	5	1000	500	mg/lit	**TDS**
Tasteless	5	Popular and unpopular acceptance			**Taste**
Not to be seen	5	Not to be seen floating			**Oil**
Odourless	5	Popular and unpopular acceptance			**Odor**
Colourless	5	Colourless			**Color**

Parameter of physical and chemical of third Area of Herat city was analyzed and the result of that was mention in chart 7. Parameters of temperature, foggy, taste, oil , smell, an color of that were in suitable and its conductance and collection of its in solvent solid are 1442 MS/cm and 673 mg/lit that is more than limitation and less than admissible.

Table 8: Chemical parameter of drinking water in third area of Herat city has analyzed

Result	Number of Samples	Maximum Contaminant Level	Admissible Limit	Unit	Chemical Parameters
7.3	5	6.5-9.0	6.5-8.5		**PH**
0.1	5	1	0.8	mg/lit	**Fluoride**
9.7	5		<50	mg/lit	**Nitrate**
10	5	200	75	mg/lit	**Ca^{2+}**
11	5	150	30	mg/lit	**Mg^{2+}**
50	5	500	150	mg/lit	**Total hardness (according to $CaCO_3$)**

In table number 8 chemical parameter of drinking water in third area of Herat city has analyzed. Tested parameters are PH, fluoride, nitrate, calcium and Mg and collection of hardness in water (in amount of $CaCaO_3$) PH as a given result from analyzing parameter of tenth area of Herat city, amount of Ca, Mg and collection of hardness in amount of

($CaCaO_3$) was suitable and there was no any pollution, but amount of fluorite in drinking water of Herat city was 0.1 mg/ml there was lack of fluoride in drinking water in tenth area of Herat city.

Discussion In this research drinking water of second, third, fifth and tenth of Herat city were analyzed. Physical parameters that are tested are like: temperature, foggy, conductivity, TDS, taste, oil, smell, and its color, and the factors that are uses for definite of its qualities are PH, amount of {254nm} SAK fluorite, Nitrate Ca, Mg and hardness as ($CaCO_3$) and samples that are given from every area there was five samples. As a given result from analyzing of samples of drinking water of second, third, fifth and tenth of Herat city were seamed. The amount of its foggy PH, NO_3, Ca, and its mg, and its hardness were in normal and samples were without smell, taste and color and there was no any oil. Amount of EC for every area show the density on the salt in these samples, but in admissible amount. In addition amount of fluorite is less than its suitable and lack of fluorite in all four area of Herat city was seamed. As the given research drinking water in all four area of Herat city are use able.

Result

Aim of this research was analyzing and definite quality of drinking waters in 4, 2, 3, and 10 areas of Herat city. For doing better this research physical and chemicals parameters of samples drinking water was analyzed. The given result of chemical and physical parameters such as foggy TDS,PH,no3 and hardness can be definite the quality of water, but one thing that is critical in drinking water f Herat city is being copious of nitrate in it that is shows among germ in water. One more thing the people of those areas are components about that, but not seamed was bad smell and bad color of drinking water, that may due to broken of some tubes in some area of regions. Due to the people also mentioned that this is not always. And also lack of fluoride among all the areas was seamed. That this cause also can effect on our teeth, generally all the water of area are drinkable and there is no any problem among these.

Suggestion

Ministry of irrigation and water and also other organization must take care about this and take care tubes that establish the water line. Prohibiting from digging of sewage walls and prevent from pollution of underground water that are used for drinking Establish of water filtration in every providence of Afghanistan for secure drinking water.

References

1. Blais JF, Tyagi RD, Aucleir JC. Bioleaching of metals and sewage sludge: Effect of temperature, Water Resource. 1993.
2. Skoog DA, Holler FJ, Nieman TA. Principles of Instrumental Analysis Sunders College Publishing Fifth Edition. 2009.
3. FAO. Physical and Chemical methods of Soil and Water analysis. Soil Bull. No. 10. Food and Agriculture Organization, Rome, Italy. 1970.
4. Federal Institute for Geosciences and Natural Resources. Hydrogeology of the Kabul Basin. Part II: Groundwater Geochemistry and Microbiology. Hannover, Germany: Federal Institute for Geosciences and Natural Resources (BGR). 2004.
5. Danish Committee for Aid to Afghan Refugees (DACAAR). Groundwater natural resources and quality concern in Kabul Basin. Kabul: DACAAR. 2009.
6. Government of India & Government of Netherland. Standard Analytical Procedures for Water Analysis, New Delhi. 1999.
7. Kori. Guide manual: Water and Waste Water Analysis, New Delhi. 2005.
8. Saffi Hassan. Ground Water Resources at Risk in Afghanistan. 2007.
9. Saffi Hassan. DACAAR, UNHCR public drinking water points analysed water quality data evaluation in Afghanistan. 2013.
10. Nathan. Afghanistan water contains overview Analysis. 1992.
11. Nicholas Alipv. UNICEF handbook of water quality, New York. 2008.
12. World Health Organization. Guidelines for drinking-water quality. Fourth edition. Geneva. 2011.