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Assessing Dry Matter Accumulation in Different Parts of Maize Hybrid in Different Amounts of Nitrogen and Amino- acid

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- ✓ *Sewage, Lar River,*
- ✓ *plating, Nitrate,*
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Abstract

Studies have shown that the entrance of industrial, agricultural, hospital, and urban sewage jeopardize water resources. The vertical penetration of sewage into the earth layers can pollute water resources; for example, existing detergents in sewage, up to 1,200 meters, organic and mineral materials, up to four thousand and 500 meters, and oil products up to 3,000 meters, can penetrate in the ground, and in running route, pollute the water resources. Unfortunately, the Lar River is also one of the rivers that encountered with this serious problem, and human activities have had a devastating effect on it. The effective activities on the rivers are diverse, but one of the most destructive activities is industrial activities, especially plating activity, which enters the sewage into the environment, groundwater, and rivers, regardless of environmental, health and safety guidelines. This study was carried out to investigate the effect of industrial workshops on the physical-chemical characteristics of the Lar River water. In this study, northeast plating workshops in Tehran are considered as case study. Five hypotheses were suggested in this study that are measured by the experimental and observation method. Sampling process was done in 5 stations, and three times (morning, noon, and night) per day were checked. The sampling method from the Lar River, the sample volume at equal intervals, or the different sample volume is in consistent with the flow rate in collection time. Laboratory methods investigated nitrate, saltiness, color formation, detergent test, and so on. In addition, Calibration and quality control of samples were done. Finally, the measurement of heavy metals like iron, manganese, and lead were accepted as main indexes for measuring heavy metals as well as completing the measured data with parameters like turbidity, COD, BOD, etc. in several separate levels. Statistical calculations were performed by Spss software version 21. Finally, first hypothesis were rejected, and it was determined that the pollution amount in the Lar river is lower than the national standard rate and EPA. Other four hypotheses were confirmed. In addition, it is proved that the distance and proximity of studied stations to plating industry in Larriver affects the pollution of river. Therefore, the station that is closer to pollution resource, is more pollutant rather than other stations.

1. Introduction

Rivers are small part of running waters that considered as vital parts of hydrologic circle and in every year they transfer 32 to 37 cubic kilometers of water into oceans [1]. Running water are significant resources of water that have an important role in provision of needed water of different activities such as; agriculture, industry, drinking, and electricity generation. Despite this, rivers are more prone to pollution. Global population growth in recent decades and demand growth for food ingredients and also increase of hygiene level lead to decrease of water capitation consumption and forces existing water resources. Unfortunately in our country, from the beginning of using chemical fertilizers and extermination poison and herbal disease into agricultural production, there is not any balance between need and consumption. So, immethodical consumption of chemical material in agriculture increases the intensity of water resources pollution while crossing of cities and countries. [2]. Destroying water resources is destroying development foundations. Water is one of human's biggest challenges that could be beginning of global positive and negative revolution. The vacuum between water provision and demand intensity precipitates crisis.

The necessity of water management is important as development management [3]. Conservation and optimized use of water resources are principles of constant development in every country. Many of water resource

planning in countries is on the basis of potential capacity of surface water resources. Awareness of water resources quantity is one of important need in water resource planning and development and its conservation and control. Planning and administration of development plans and taking decision in water resource management, requires detection and determining of exploitation of water resources and knowing their quantitative and qualitative characteristics [2]. Qualitative characteristics of water are a component that its necessity in planning of water resources management and also health assessment of aquifers domain and creating change in its management is felt [4]. In the unique management of water, preservation of water quality, particularly in regions that have been faced with proportional limitation of water resources, is posed as planning basis. Rivers, apart from natural changes, had many alternations. There are different elements and combinations in waters that effect on physical and chemical quality. Among them, investigating cathodes and anodes could show many features of water and by using them other features of water could be determined. Effective chemical and physical quantities in waters include; the ions of fluorine, chlorine, sodium, sulfate, iron, total harness, soluble solid materials and electrical transduction [5]. Regarding that human factor (agricultural and industrial pollutants) decreases pollutants density of river water, and postulating that natural mechanism such as water chemical and physical features and rivers' self-refinement will have major responsibility in controlling or increasing this density. The first step in determining rivers' water quality, is acquiring awareness of rivers' water quality changes in setting dimensions and also determining major resources and all kinds of water pollutants [6], in other words in order to restrain environmental abuse effects which have been resulted of development upon a river, investigating physiochemical conditions and that rivers pollutants is necessary [7].

Nowadays, a few of rivers are found in Mazandaran province that has not polluted by penetration or sewage deposits. Regarding this, due to high level of underground waters, the risk of penetration of wastages and consequently more water and soil resources will be polluted. In more than 80 rivers in Mazandaran, pollutants penetrate through urbane and domestic sewage. Up to three months ago, these rivers had pure water and were full of aquatics and fishes [3]. [8] did a research entitled the investigating the concentration of mercury, nickel and lead due to tunnel construction activities in Shiraz city. The results showed that the sewage of this factory has polluted with mentioned metals and their rate is higher than global standards.

Heidari et al. [9] based on his study about the effects of building sewages on its surrounding, concluded that the high rate of lead (33.2) and mercury (66.2) are higher than global standards and had negative effects on animals and plants and might poison them. [10] conducted a research about the concentration of mercury, nickel, and lead in activities of tile factory in eighth restrict of Tehran. The results showed that the sewage of this factory was polluted to nickel, lead, mercury, and cadmium.

Golipoor & Ranjbar [11] evaluated the qualitative parameters and concentration of heavy metals in Karhsar river. The study was done in 5 stations along the river. The results indicated that the chemical quality of river water was in an appropriate rate. However, the total average of heavy metals concentration was lower than standard for agricultural and surface waters.

Mohtasabi [12] in an investigation entitled water quality index (WQI) of Karon river is indicator of the effects of soap factory in Khoramshahr town that the rate of COD, BOD, and chloride in output sewages with averages 1300/0 pm, 196/8 ppm, 4024/9 ppm are higher than maximum and authorized rate of standard. The classification of understudy stations based on the index system of water quality showed that first, second, third and factory sewages with average index of annual quality 54/63, 40/29, 45/71, 24/32 achieved to the moderate, bad and very bad range. The results showed that the entry of factory sewage among the stations during the sampling months with confidence level 95% respecting to factors like COD, BOD nitrate, phosphate, and bicarbonate showed a significant difference. In addition, it was determined that the output sewages of factory regarding to the streaming volume and sewage Debi of the factory, have changed the quality of river water. The investigation of changes procedure has showed that factors in second station increased and the third station decreased considerably, which indicates the potential of Karonriver for self-refinery.

Mohammad Fam [13] carried out a study to investigate the effects of runoffs and sewages of refinery buildings on qualitative parameters of Zayanderod river. They found out that the debi of Zayanderod during the February is in the lowest rate and in the February is in the highest rate. The rate of phosphate per phosphor in all stations and during the studied time was variant between 0/049 to 2/7. PH changes in river water at four stations were variant between 7/2 to 8/6 during the sampling. Mirmohammdai et al. [14] measured the concentration of lead in output sewages of Has industry in the united states. The results showed that some of the sewages had lead with higher concentration above 2/88 microgram/g.

Hasheminezhad et al. [15] in a study entitled the investigation of the effects of Industrial sewages on the surrounding environment "concluded that the most of construction workshops discharge 96% of industrial sewages in the absorptive wells, and 4% in the urban sewage network. This causes negative effects on the environment, wildlife, plants and human health.

2. Material and Methods

This research is an experimental research. The kind of descriptive method for research in relationship between variants is correlation, the purpose of it is practical research, and collecting data was through observation. Documentary, library studies, and other countries experiments are used in this study. Related articles and theses were studied in this study. Reference to technical resources and using their experiments and methods were done in this research. In addition, changing process of research conceptions to measured indexes, criteria are used, and the withdrawing of these criteria and analyses are done in studied area. Preserved Lar district is located in 35/54 northern width and 51/33 eastern height and contain Lar plain and river. It is located in the foothills of Damavand that in national partition, the north and northeast of it is in Larijan, Amol town, Mazandaran province and its south and south-west part are located in Lavasanat, Shemiran town, Tehran province. Lar plain from north leads to Nor town mountains, from east and northeast to Damavand mountain, from south-east side to Ira and Polor of Mazandaran province, from south to Afje, Emame, and big Lavasan, from west to Khatoonbargah and Garmabdar (https://www.google.com/maps/34.2731529,50.8). Lar plain was introduced as Lar national park in 1965. This plain has 73500 hectare latitude. Based on enactment of environment maintenance organization in 1972, this plain were monitored as preserved zone and some parts of it was forbidden for hunting and shooting in 1981. Sampling was done from 5 stations and three times (morning, noon, night) per day. The sampling method from the Lar River, the sample volume at equal intervals, or the different sample volume is in consistent with the flow rate in collection time. In both cases, distinct samples were combined to obtain a reagent sampling. Sampling method in consistent with stream, showed real sampling compared to firm volume sampling method in firm time intervals. The volume of collected sampling should be enough for all physical-chemical experiments on sampling. Sampling frequency should be between 8 to 24 hours or even more.

Table 1. Characteristics of sampling station placed in Lar River

Station number	Station name	Geographical longitude and latitude	Upper contamination resources
S1	Kolaroy	35065548 and 511782	Upper villages
S2	Region exist sewages	3512519 and 515637	Public building sewages and watering unites
S3	kani	3516925 and 511177	Upper villages
S4	Arab Okhli	3519010 and 514801	Upper villages
S5	Sar Kala	3519298 and 514965	Public building sewages and platin unites

First, the normality of data will be analyzed in heavy metals concentration in water at analysis section. Then, one-way-Anova test will be used to compare the concentration of various materials in different times. In addition, the Regression test will be used to determine correlation between river water materials, sewages and environmental factors. Excel software, version 2010 is used to design necessary charts.

3. Results and discussion

Samples were tested twice for each station (July and August) and three times during a day (morning, noon, night). Table 2 and 3 are presented the average rate of sampling for each station and the experiment method.

Table 2. Assessed physical parameters in terms of test method in August of 2018

Date:97/ 06/19		Number of sampling report: 1			Weather condition: sunny	
row	Date of sampling	Station name	Hack			
			TEMP	PH	Do	EC
1	97/05/ 19	D1	20, 5	7, 12	8, 38	191, 2
2	97/ 05/ 19	D2	20, 9	7, 07	7, 97	178, 5
3	97/ 05/ 19	D3	21, 6	7, 12	7, 54	203
4	97/ 05/ 19	D4	21, 9	7, 23	7, 68	266
5	97/ 05/ 19	D5	22, 5	7, 23	5, 94	268
Evaluation device		Digital thermometer device		PH meter	Do meter	BOD meter
Standard method		2550		-H 4500	4500	52210
Detection preciseness		0, 1^{O}C		0,01	0, 01 Ppm	Ppm 0,01

Table 3. Assessed physical parameters in terms of test method in September of 2018

Date:97/ 06/19		Number of sampling report: 1		Weather condition: sunny		
row	Date of sampling	Station name	Hack			
			TEMP	PH	Do	EC
1	97/06/ 18	D1	19, 6	7, 16	8, 42	191, 6
2	97/ 06/ 18	D2	20	7, 11	8, 01	178, 9
3	97/ 06/ 18	D3	25, 5	7, 16	7, 58	207
4	97/ 06/ 18	D4	21	7, 27	6, 70	270
5	97/ 06/ 18	D5	21, 5	7, 27	5, 98	272
Evaluation device		Digital thermometer device		PH meter	Do meter	BOD meter
Standard method		2550		-H 4500	4500	52210
Detection preciseness		0, 1^{O}C		0,01	0, 01 Ppm	Ppm 0,01

Table 4 is presented the measuring average for two months regarding to physical parametrs.

Table 4. Average of Assessed physical parameters in terms of test method in August and September of 2018

Date:97/ 06/19		Number of sampling report: 1		Weather condition: sunny		
row	Date of sampling	Station name	Hack			
			TEMP	PH	Do	EC
1	August and September of 2018	D1	20, 5	7, 14	8, 40	191, 4
2	August and September of 2018	D2	20, 45	7, 09	7, 99	178, 7
3	August and September of 2018	D3	21, 05	7, 14	7, 56	205
4	August and September of 2018	D4	21, 45	7, 25	6, 70	2768
5	August and September of 2018	D5	22	7, 25	5, 96	270
Evaluation device		Digital thermometer device		PH meter	Do meter	BOD meter
Standard method		2550		-H 4500	4500	52210
Detection preciseness		0, 1^{O}C		0,01	0, 01 Ppm	Ppm 0,01

Based on tables 5 and 6, it can be seen that the rate of pollution to various materials on August is more than July. Table 5 is presented the standard methods for sampling and doing work progression.

Table 5. Sampling standard methods and doing work progression

row	parameter	Sampling environment	Sampling method	Sampling sequence
1	Degree of heat	water	1060 standard method	Once in each station
2	PH	water	1060 standard method	Once in each station
3	Soluble Oxygen	water	1060 standard method	Once in each station
4	BioChemical oxygen	water	1060 standard method	Once in each station
5	Organic Phosphate	water	1060 standard method	Once in each station
6	Nitrate	water	1060 standard method	Once in each station

Table 5 presented the obtained results from investigation of chemical-physical parameters in Larriver and their changes in different stations. Average and compared results of data indicated that phosphate, nitrite, nitrate,

ammoniac factors in various stations and nitrite, nitrate, ammoniac, temperature, PH, total solids of soluble, and electrical conductivity factors in different times of sampling had significant differences (p>0/05). Electrical conductivity changes toward solid soluble was studied to realize the correlation between two parameters and the results, showed 100% correlation between two parameters.

Table 6. Hourly comparison (average ± deviation) of soluble solid material (mg/l) in different station

Station hour	08: 45	10: 00	10:45	11:30	12: 15	13:30
	Average ± *deviation*	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation
1	0/0873±0/00737a	0/0773±0/00659a	0/1773±0/00638b	0/1073±0/00629b	0/1473±0/00623b	0/1673±0/00619b
2	0/0773±0/00737 a	0/0973±0/00659 b	0/1673±0/00638 b	0/0473±0/00629 b	0/1073±0/00623b	0/1573±0/00619 b
3	0/0673±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0773±0/00629 a	0/0973±0/00623b	0/0973±0/00619b
4	0/0873±0/00737 a	0/0673±0/00659 a	0/1173±0/00638b	0/0173±0/00629 a	0/0373±0/00623b	0/0619±0/00619 b
5	0/0873±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0273±0/00629 a	0/0673±0/00623b	0/0573±0/00619 b

Same letters show insignificance and different letters show significance. (p>0/05)

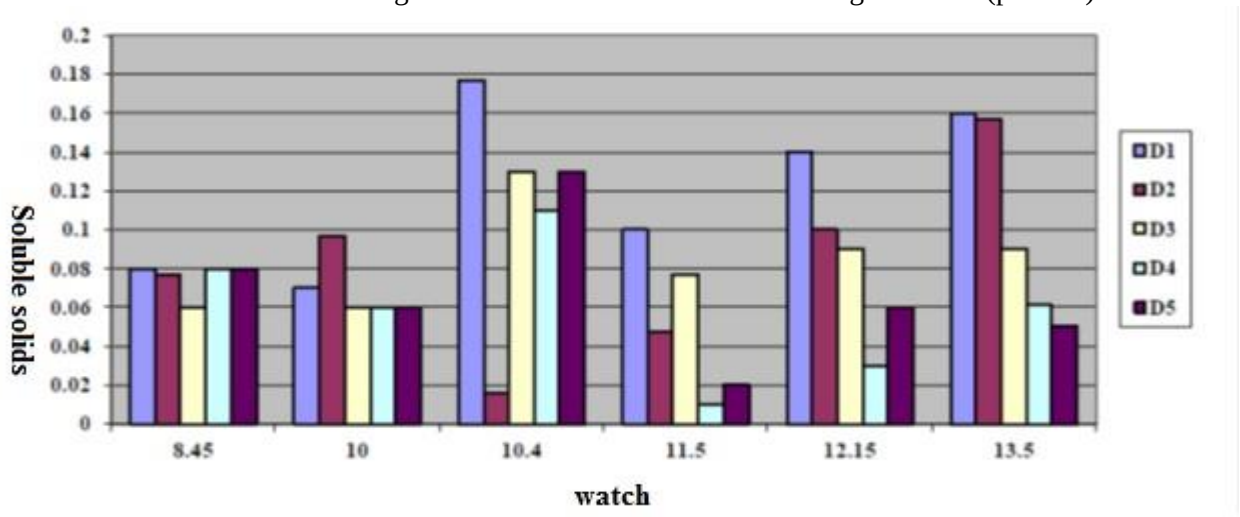

Figure1. Solid soluble changes at different stations and times during the sampling

Table 7. Hourly comparison (average ± deviation) of Nitrate (mg/l) in different station

Station hour	08: 45	10: 00	10:45	11:30	12: 15	13:30
	Average ± *deviation*	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation
1	0/0873±0/00737a	0/0773±0/00659a	0/1773±0/00638b	0/1073±0/00629b	0/1473±0/00623b	0/1673±0/00619b
2	0/0773±0/00737 a	0/0973±0/00659 b	0/1673±0/00638 b	0/0473±0/00629 b	0/1073±0/00623b	0/1573±0/00619 b
3	0/0673±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0773±0/00629 a	0/0973±0/00623b	0/0973±0/00619b
4	0/0873±0/00737 a	0/0673±0/00659 a	0/1173±0/00638b	0/0173±0/00629 a	0/0373±0/00623b	0/0619±0/00619 b
5	0/0873±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0273±0/00629 a	0/0673±0/00623b	0/0573±0/00619 b

Same letters show insignificance and different letters show significance. (p>0/05)

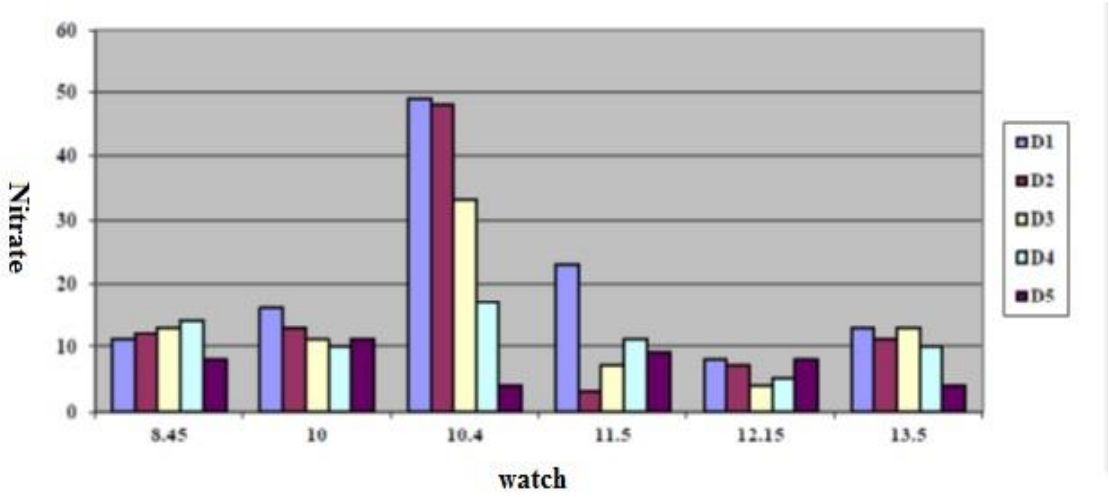

Figure 2.nitrate changes at different stations and times during the sampling

Table 8. Hourly comparison (average ± deviation) of soluble oxygen (mg/l) in different station

Station hour	08: 45	10: 00	10:45	11:30	12: 15	13:30
	Average $\pm$ *deviation*	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation
1	0/0873±0/00737a	0/0773±0/00659a	0/1773±0/00638b	0/1073±0/00629b	0/1473±0/00623b	0/1673±0/00619b
2	0/0773±0/00737 a	0/0973±0/00659 b	0/1673±0/00638 b	0/0473±0/00629 b	0/1073±0/00623b	0/1573±0/00619 b
3	0/0673±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0773±0/00629 a	0/0973±0/00623b	0/0973±0/00619b
4	0/0873±0/00737 a	0/0673±0/00659 a	0/1173±0/00638b	0/0173±0/00629 a	0/0373±0/00623b	0/0619±0/00619 b
5	0/0873±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0273±0/00629 a	0/0673±0/00623b	0/0573±0/00619 b

Same letters show insignificance and different letters show significance. (p>0/05)

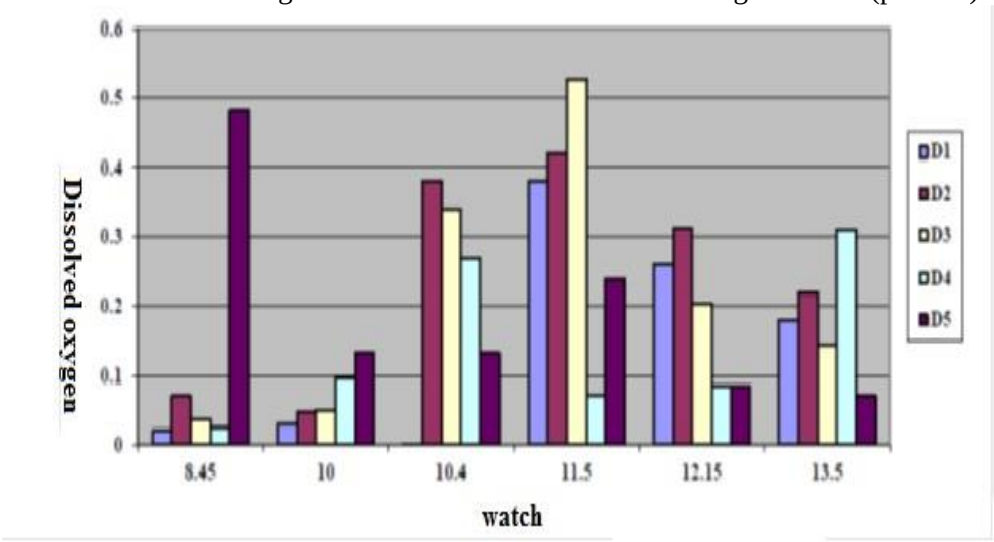

Figure 3.soluble oxygen changes at different stations and times during the sampling

Table 9. Hourly comparison (average ± deviation) of electrical guidance (mg/l) in different station

Station hour	08: 45	10: 00	10:45	11:30	12: 15	13:30
	Average $\pm$ *deviation*	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation
1	0/0873±0/00737a	0/0773±0/00659a	0/1773±0/00638b	0/1073±0/00629b	)/1473±0/00623b	0/1673±0/00619b

2	0/0773±0/00737 a	0/0973±0/00659 b	0/1673±0/00638 b	0/0473±0/00629 b	)/1073±0/00623b	)/1573±0/00619 b
3	0/0673±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0773±0/00629 a	)/0973±0/00623b	0/0973±0/00619b
4	0/0873±0/00737 a	0/0673±0/00659 a	0/1173±0/00638b	0/0173±0/00629 a	)/0373±0/00623b	)/0619±0/00619 b
5	0/0873±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0273±0/00629 a	)/0673±0/00623b	)/0573±0/00619 b

Same letters show insignificance and different letters show significance. (p>0/05)

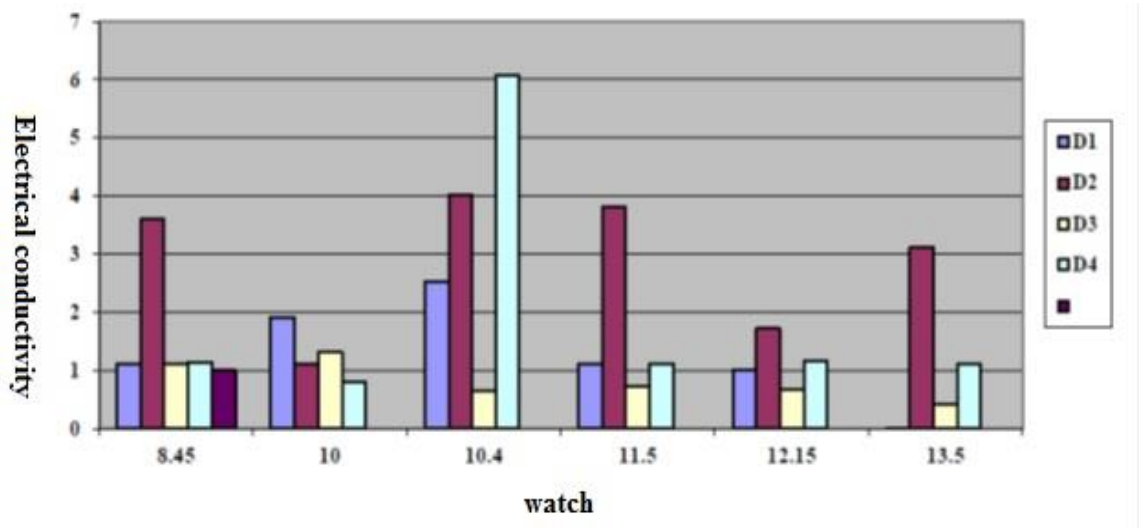

Figure 3.electrical conductivity changes at different stations and times during the sampling

Table 10..Hourly comparison (average ± deviation) of PH (mg/l) in different station

Station hour	08: 45	10: 00	10:45	11:30	12: 15	13:30
	Average ± *deviation*	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation	Average ± deviation
1	0/0873±0/00737a	0/0773±0/00659a	0/1773±0/00638b	0/1073±0/00629b	0/1473±0/00623b	0/1673±0/00619b
2	0/0773±0/00737 a	0/0973±0/00659 b	0/1673±0/00638 b	0/0473±0/00629 b	0/1073±0/00623b	0/1573±0/00619 b
3	0/0673±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0773±0/00629 a	0/0973±0/00623b	0/0973±0/00619b
4	0/0873±0/00737 a	0/0673±0/00659 a	0/1173±0/00638b	0/0173±0/00629 a	0/0373±0/00623b	0/0619±0/00619 b
5	0/0873±0/00737 a	0/0673±0/00659 a	0/1373±0/00638b	0/0273±0/00629 a	0/0673±0/00623b	0/0573±0/00619 b

Same letters show insignificance and different letters show significance. (p>0/05)

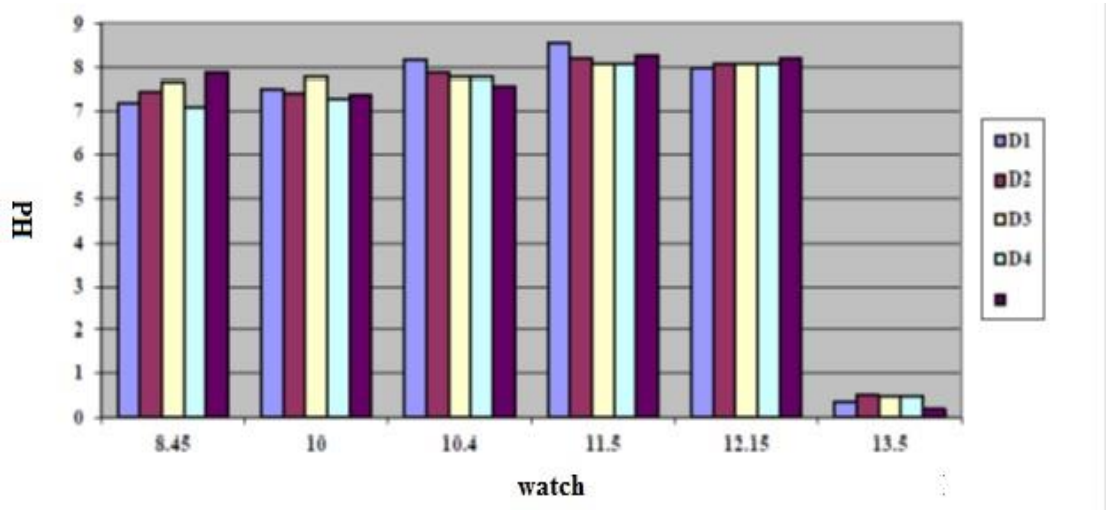

Figure 4. pH changes at different stations and times during the sampling

In table 11, public criteria for water quality are used as standard measurement that were prepared by environment maintenance organization.

Table11. Water standard quantitative of Countries River, environmental organization

parameter	Permitted maximum	unite
PH	6, 5-9	
Total soluble solids	750	Mg/l
Soluble oxygen	At least 5	Mg/l
Oxygen	5	Mg/l
Ammoniac	0.02	Mg/l
Nitrate	45	Mg/l

In this part, charts of measured factors and their changes are presented:
A: temperature changes

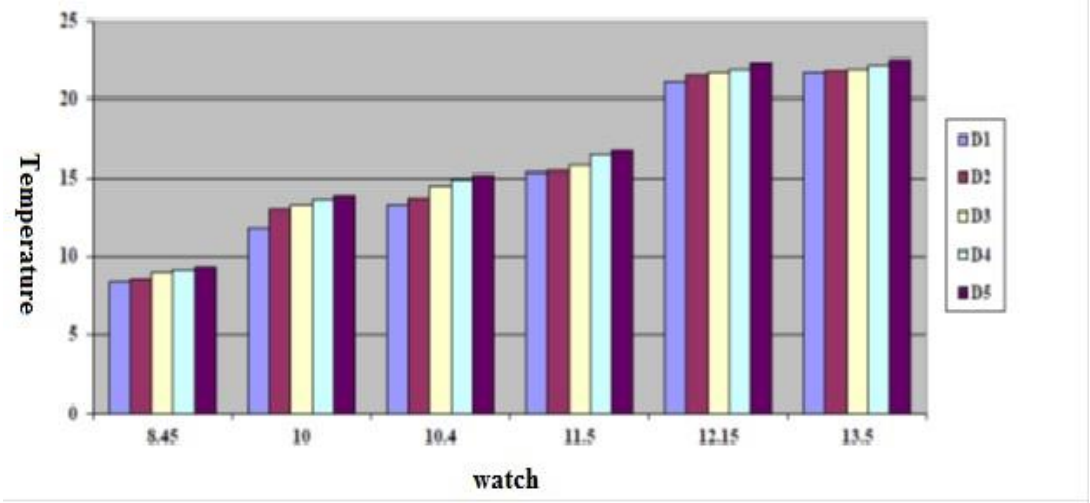

Figure 5.temperature (centigrade) changes at different stations and times during the sampling

Based on chart 1, water temperature changes was decreased at different times during the six various times in a day and at 13:30 is reached to the maximum rate for each station and at fifth station (D5), in all times , its rate is more than other areas.

B: PH changes

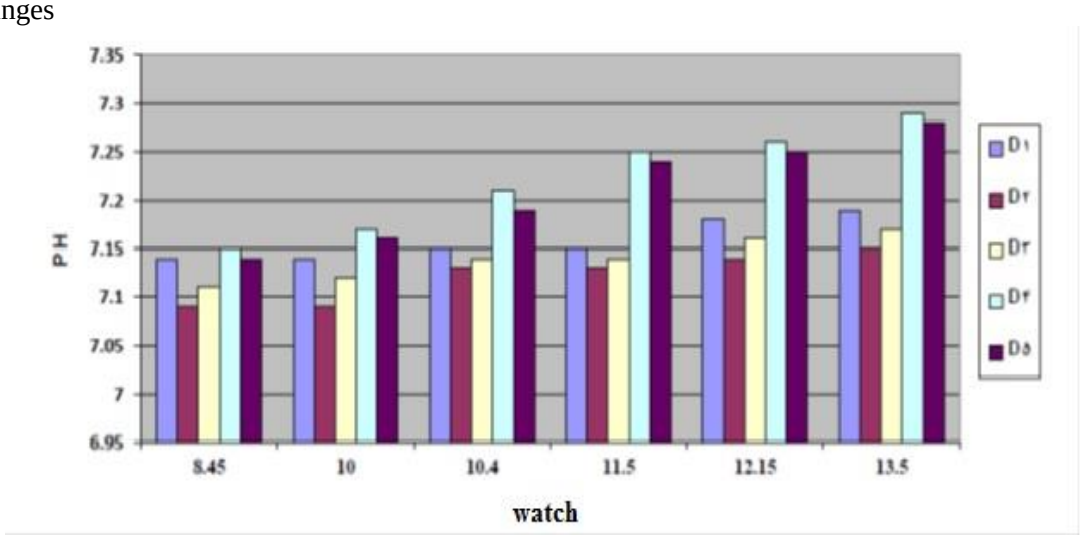

Figure 6.pH changes at different stations and times during the sampling

Based on chart 6, PH changes of water during the six times of a day, indicates that this procedure increase from D1 station to D5 station except fourth station that its amount at different times is equal to fifth station. Just at 10:40 and 12:15 the amount of PH at fifth station is more than fourth station. In interval time between 8:45 to 13:30, the amount of PH increases.

C: DO changes

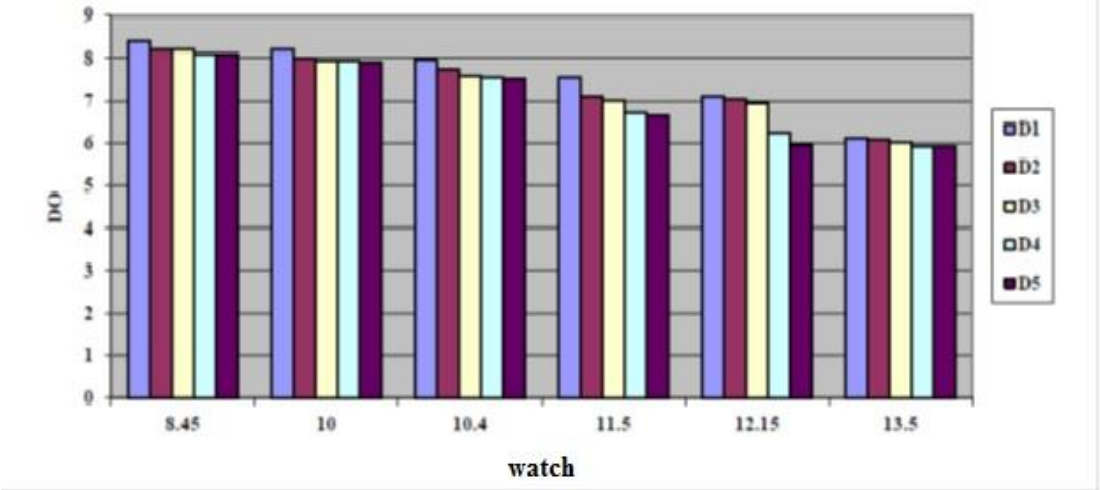

Figure 7.DO changes at different stations and times during the sampling

Based on chart 7, DO changes procedure is like PH changes. The rate of DO decrease in the noon and the reduction continues with definite slope from first station to fifth station. The maximum rate for DO is at 8:45 in first station and the minimum rate is at 12:15 in fifth station.

D: electrical conductivity changes

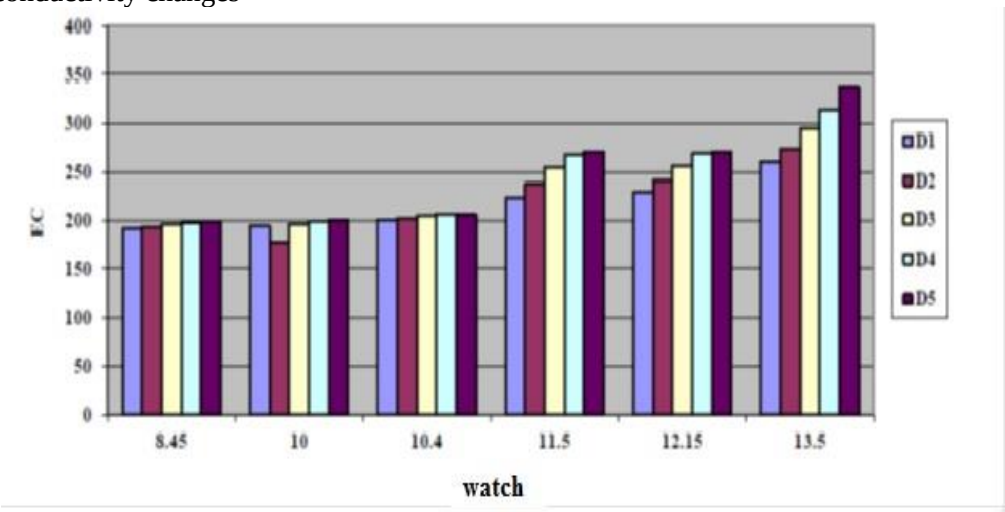

Figure 8. EC changes at different stations and times during the sampling

Based on chart 8, the EC rate increases in the noon from first station to fifth station and this increase has fewer slope during 8:45 to 10:40 and more slope during 10:40 to 13:30. The lowest rate of EC is at 10:00 and in second station, but the highest rate is at 13:30 in fifth station.

According to the table 12, it can be concluded that:

1.There was negative correlation (reverse relation) between soluble oxygen and electrical conductivity. The reason is:

Soluble material in water (metals) and oxygen form cathode and anode electrodes. Metals act as anode and turn into hydroxide fro and hydroxide frack and then metal oxide. This event reduces the movements of ions. The concentration of impurity increase in moving from first station to fifth station, which are considered as outskirts of town and ions effects negatively in each other and electrical conductivity of solvent decrease. In same condition, the speed of water corrosion increase, and consequently water electrical conductivity decrease.

2. There was negative correlation (reverse relation) between soluble oxygen and PH. The reason is:

Moving to downstream of the river (from D1 to D5), increase ionization potential of water and PH and consequently soluble oxygen in water decrease. Therefore, a negative correlation (reverse relation) exists between soluble oxygen and PH.

3. There was negative correlation (reverse relation) between soluble oxygen and nitrate. The reason is:

Moving to downstream and by increasing the severity of pollution, nitrate rate increases. Soluble oxygen in river settles under the effect of factors like solvate capacity of oxygen in water, minor pressure of oxygen in air, temperature and purity degree of water. The nitrate increase replaces with oxygen molecules in water. Therefore, nitrate increases and soluble oxygen decreases. So there are reverse relation between them.

4. There was negative correlation (reverse relation) between soluble oxygen and temperature. The reason is:

High temperature decreases the soluble oxygen rate in water. It is clear that a hot drink loses its gases compared to a cold drink. If we put water on oven, air bubbles before boiling water reveals in surface of water and soluble gases disappear.

Table 12. Pearson correlation between investigated parameter in different 6 hours in all stations

Soluble solid material	PH	Soluble oxygen	Electrical guidance	Darkness	temperature		
0, 091	-0, 868	0, 529	0, 507	-0, 320	1	Pearson correlation	temperature
0, 249	0, 449	0, 000	0, 000	0, 006		Meaning	
72	72	72	72	72	72	N	
-0, 105	0, 290	0, 457	0, 434	1	-0, 320 **	Pearson correlation	Darkness
0, 380	0, 013	0, 000	0, 000		0,006	Meaning	
72	72	72	72	72	72	N	
0, 109	-0,492	0, 947	1	-0, 434	0,507 **	Pearson correlation	Electrical guidance
0, 168	0,000	0,000		0, 000	0,00	Meaning	
72	72	72	72	72	72	N	
0,232	-0, 533		0, 947	-0,457 **	0,529 **	Pearson correlation	Soluble oxygen
0,05	0, 000	0, 000	0, 000	0, 000	0,000	meaning	
72	72	72	72	72	72	N	
- 0. 192	1	-0, 533	-0, 492	0, 290 *	-0,868**	Pearson correlation	PH
0, 210	0, 107		0, 000	0, 013	0, 000	Meaning	
72	72	72	72	72	72	N	
0, 598	-0, 0149	0, 322	0, 164	-0, 085	0, 138	Pearson correlation	Soluble solid material
0, 000	0, 210	0, 06	0, 168	0, 480	O, 248	Meaning	
72	72	72	72	72	72	N	

** Correlation is significant at the 0, 01 level (2- tailed).

* Correlation is significant at the 0, 05 level (2- tailed).

During the day (about 8:45 to 1:30 time interval), weather is warmer and water temperature increases. Due to reverse correlation between solubility of oxygen and water temperature increases the thermal pollution in water. Urban areas play an important role in thermal pollution. When it rains, the abundant water distributes in earth surface and during the sunshine they getting warmer. Similarly, this process happens in rivers and streams, especially in Flagstone Rivers or streams, which transmit heat to water. High temperature of water decreases soluble oxygen rate in water. Therefore, there is reverse relation between soluble oxygen and temperature. It means that high temperature decreases the rate of soluble oxygen.

5. There was positive correlation (direct relation) between electrical conductivity and PH. The reason is:

Electrical conductivity indicates the presence of ions in water. So, more rate of ions, increase the PH rate. In this research by moving from first station to fifth station, PH increases. It means that ions in water increase and these ions conduct electricity flow. Negative ions move toward positive electrode and positive ions move toward negative electrode. The electrical conductivity of purified water is so low and it increases by growing the concentration of ions. Also, the presence of hydroxide ions in alkaline samples are caused errors and increase the conductivity capacity considerably.

6. there was positive correlation (direct relation) between electrical conductivity and nitrate. The reason is:

Nitrogen is an ion with negative load (anion) that combines with positive load ions (cation) and change into nitrate potassium or nitrate sodium. Nitrate is recognized as the most soluble anions. The presence of nitrate in water increases the electrical conductivity of water and decreases the electrical resistance. Therefore, it is clear that the nitrate rate increases in moving from fifth station toward first station. Nitrate increase, decreases the electrical resistance due to high rate of anions and consequently increase the electrical conductivity of water and stable positive correlation between two factors.

7. there was positive correlation (direct relation) between electrical conductivity and temperature. The reason is:

An increase of temperature by passing the time (8:45 to 13:30), provide necessary energy for releasing the electrons and this event increases the electrical conductivity that overcomes on reduction of conductivity due to more movements of atoms and eventually, electrical conductivity increases because of high temperature. Therefore, the specific resistance of it reduces and the electrical conductivity of water increases. So, there are positive correlation between two factors.

8. there was positive correlation (direct relation) between PH and nitrate. The reason is:

Nitrates reacts to acids and alkaline and changes PH rate. Moving to downstream of river (D1 to D6), due to the high rate of pollution, ionization capacity, and PH rate increase. High rate of PH, reduces the soluble oxygen of water and consequently molecule oxygen replacement procedure increases and then nitrate increases. Therefore, there are positive correlation between nitrate and PH increase.

9. There was positive correlation (direct relation) between PH and temperature. The reason is:

Temperature increases by passing the time during the day (8:45 to 13:30). Water of the river is neutral material. Because in purified water due to self-ionization of water, the concentration of hydronium ions H30+ and hydroxide OH- ions are equal. In 25-Celsius degree, the concentrations of mentioned ions are equal and considered in this rate: 10-7 mole/L:

$H2O(1)+H2O(1) \rightleftharpoons H3O+(aq)+OH-(aq)$

$[H+]=[OH-]=10-7$ mol/L

So for purified water at 25 Celsius degree, the firm rate of ionization for water Kw is defines as below:

$Kw=[H3O+][OH-]=10-14$ mol2/L2

Self-ionization of water is a heat sink reaction. Therefore, an increase in temperature rate, increases the rate of self-ionazation and the concentration of Hironimu and hydroxide ions will be higher than 10-7. In this case, the firm rate of water ionazation will be bigger than 10-14 and consequently increase PH.

Software calculation of different parameters average and standard deviation

Pearson correlation coefficients between studied parameters in six different times at all stations are mentioned below:

Table 13. Average and deviation of different parameters

N	Std. deviation	Mean	
6	5, 20163	17, 3333	weather
6	15, 14434	13, 0550	Darkness
6	114, 47019	459, 8333	EC
6	112, 12909	361, 1250	TDS
6	1, 34008	7, 9958	DO
6	29, 63424	19, 3383	BOD
6	43, 18799	28, 3917	COD
6	0, 04602	0, 0792	TP
6	0, 59311	2, 3017	TN

An increasing procedure of rivers pollution and poison-creation by public sewages are vanished wildlife, and changed running rivers to quagmire. In addition, factors like unpenetrated covering of parks and gardens might cause flood, but doesn't destroy the river life and can decrease the pollution of rivers and create self-refinery.

Obtained results from data analysis

Testing hypotheses and adaptation with review of literature

Testing first hypotheses: Pollutant parameters rate in Larriver is higher than authorized rate.
Based on Table 14, qualitative standards for rivers water are presented by environment maintenance organization. Also, the amount of present compound at 6 stations was expressed distinctly. Based on obtained results of this research and standards, these results are presented:

Table 14. Comparison of polluted parameters in Lar River with existing standards

Parameter name	Obtained average of study	National standard	EPA	result
Sulphate	728/ 38 mg/l	400	250	Over than national allowance and EPA
chlorine	83/23 mg/l	400	250	Lower than national allowance and EPA
calcium	156/ 38 mg/l	250	*	Lower than national allowance
Manganese	3/08 mg/l	50	*	Lower than national allowance and EPA
Nitrate	07/ 12	50	10	Lower than national allowance and EPA
PH	0/48 mg/l	9	8/5	Lower than national allowance and EPA
fluoride	0.115 mg/l	1.7	2	Lower than national allowance and EPA
Iron	400 mg/l	1. 3	0/ 3	Lower than national allowance
Soluble oxygen	577/7mg/l	450	*	Lower than national allowance and EPA
Soluble solid material	1155/5 mg/l	1500	500	Lower than national allowance and EPA
Electrical guidance	16/ 95 mg/l	1500	*	Lower than national allowance

As shown in Table 14, the pollutant parameters rate at Lar river, except sulphate, are lower that national and EPA standard. Therefore, this hypothesis is rejected because the river has self-refinery capacity.
Compared to review of literature, the results of this study run contrary to other mentioned researches in review of literature section such as researches of Khanipour et al. (2015), Razawi (2014), Panahande et al. (2014) etc. . but this study has correlation with the research of Zeineddini et al. (2014) entitled "evaluation of qualitative parameters and the concentration of heavy metals in korhsar river" . Their study was carried out at five stations along the river. The results showed that the chemical quality of the river water was optimal. However, total average of heavy metals concentration is lower than standard rate for agricultural and surface water.
Testing second hypothesis: There are significant differences between the numbers of pollutants in various seasons.
Based on the presented results of Tables, the rate of pollution to various materials on August was more than July. Table 15 is provided a summary of three previous Tables:

Table 15. Comparison of pollution difference in different months

Parameter name	Average of increase of September in relation to August	result
Sulphate	0, 4	Increase in August
chlorine	0,3	Increase in August
Calcium	0,3	Increase in August
Manganese	0, 3	Increase in August
nitrate	0,3	Increase in August
PH	0,3	Increase in August
Fluoride	0,3	Increase in August
Iron	0,3	Increase in August
Soluble oxygen	0,4	Increase in August
Soluble solid material	0,4	Increase in August
Electrical guidance	0,3	Increase in August

As shown in table 15, the rate of pollutant parameters in Larriver , between 0.3 and 0.4, in August was more than July and consequently the second hypothesis was confirmed.

Testing third hypothesis: There are significant correlations between diurnal changes and the amount of pollutants.

Based on the presented results in charts 1 to 3, showed the rate of pollutants in the morning until 2 p.m. got increased and after 2 p.m. decreased again. The highest rate of pollutants was shown at 13:30. By the way, the reduction of pollutants was not as low as morning rate decrease. The reduction is a few and and this process continued until night and mid-night and in the morning, the rate of pollution at all stations reached to the minimum rate. But the rate and reduction slope was not clear, because the sampling was not done at mid-night.

The results had correlation with Hadipourdara et al. (2004) research. They carried out a research entitled "the use of hospital refinery sewages for irrigating plants". In this experiment, refinery system is an active mire process with continues feeding. Based on the surveys, the average sewage debi of Yazd shohadaykargar hospital is about 250 m^3 every day that during a week there are not any important fluctuation. Based on the measured parameters, the quality of refinery sewages compared to Iran environment maintenance organization for re-use for irrigating plants, except MPN, has correlation with all parameters. However, during the day, it is showed a few differences in the pollutants rate that this rate was more than other times in hot hours that it is due to more evaporation of water and pollutant parameters in water.

Testing fourth hypothesis: The rate of heavy metals like nickel, chrome, lead, aluminum etc. is higher than authorized amount in the sewages of plating industry.

As observed in table, the amount of polluted parameters in weaker water of plating, is estimated more that national and internationals standards. But, these quantities in rivers lower that defined national and EPA standard pollution totally approves the power of self-refinement of rivers.

This finding corresponds with the findings of Havasara and et al (2015) and Gilherm (2015) and (2015), Havasara and et al (2015) had article named "investigation the density of heavy metals such as existing mercury, lead, and chromium in carwashes' weakest water in German". The results demonstrated that the weakest water of this manufactory is polluted to nickel, chrome, and lead and their quantities are 1/57, 4/ 67 and 1/34 mg/g, respectively, the amount of them is upper than global standards. Furthermore, Gorterz (2015), had a study which named investigation of existing heavy metal density in weakest water in Malaysia. The outcomes show that this weakest water of these workshops is polluted to nickel and lead and their quantity are 1/57, and 1/34 mg/g, respectively and their amount is upper than global standard. Also, Hilherm and et al (2016) had a study amout pollution of mercury, lead and nickel in weakest waters of wash cars and concreting. The result showed that the weakest waters of this manufactory is polluted to mercury, lead, and nickel and their quantities are 1/57, 4/67 and 1/34 mg/g, respectively, and their quantity is more than global standards.

Testing fifth hypothesis: The distance and proximity of plating industry to the studied stations in Lar river effects on the river pollution.

According to shown cases, in diagrams of 1 - 4 to 3-4 whenever we get far from pollution resource, the amount of pollution will be low and closer sections to pollution resources are more polluted than other sections, by getting far from resource, by sedimentation of articles and self-rThis finding corresponds with Kesh (2013). He studied on investigation the effects of producing chemical fertilizer companies on o surrounding rivers. The results showed that all agricultural pollutions such as pest killers Po_4^{-3}, No_3^{-1}, and $Cuso_4$ in used water for watering, was over than upper parts waters and lower than lower parts, while the other anodes and cathodes except organic materials had achieved their highest amount in lower partsefinement of rivers leads to decrease of pollution.

Table 16. Comparison of polluted parameters in wastage of assessed workshops

Parameter name	Obtained Average of study	National standard	EPA	results
Aluminum	728/38 mg/l	400	250	Over national allowance and EPA
lead	583/51 mg/l	400	250	Over national allowance and EPA
Nickel	356/ 52 mg/l	250	*	Over national allowance and EPA
Manganese	67/ 91 m/l	50	*	Over national allowance and EPA
Nitrate	63/ 93 mg/l	50	10	Over national allowance and EPA
Fluoride	3/ 44 mg/l	1/7	2	Over national allowance and EPA
Chromium	0/ 415 mg/l	0/3	0/3	Over national allowance and EPA

Conclusion

Regarding region geographical characteristics, its mountain and up country climate and its vicinity with Tehran, every year seasonal migrations are done in this region. Most often, seasonal migration to rest and fun and using of region climate in summer and also to harvest and to utilize of their farms, they migrate to countries. In addition of inhabitants and seasonal population many of Tehran citizens with aim of see sighting and amusement in summer and using of skiing facilities of Shemshak and DarbandSar and Dizin, particularly in holidays they go to the region. People persons in riverside particularly in holidays also causes wasted material enter to the rivers. Inhabitant population centers in water closet domain based on enumeration in 2005 and also informal demography of 2010 which is listed in table 15. Mostly, country wastage in Jajrood riverside has leaded into absorbing cesspool the due to high level of submerrian water totally is related to river water and inter it. The concentration of population in riversides and high level of riverbed in these regions causes discharged sewages after crossing of a subterranean path lead to a river. Direct discharge of domestic and urbane waterways and sewage pipes in riversides in dwelling regions is seen. Conducted actions to installment of Sepyink Tank for new buildings due to inaccessibility to discharged tanks due to region's uneven condition and mountain on discharge of septics it is not possible the pollution of river is resulted from direct and indirect discharge of sewage of population centers. So, there is not the possibility of detecting pollution time of river and in every moment and every place the possibility of occurrence of pollution is exist.

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