ABSTRACT

Minab Plain is located 70 km east of Bandar Abbas. In the plains, the river Minab, as most freshwater river runs through the province. The aim of this study was to develop a system to assess the quality of the river MINAB based on quality criteria and classification of river quality. Data analysis included data from 78 samples of river hydro. Topographic maps, geology, satellite imagery, GPS and laboratory equipment as well as tools used. Therefore, during an annual process parameters such as temperature, turbidity, BOD, TDS, DO, PH, nitrate, nitrite, phosphate and ammonia samples from stations (eg station Brntyn) measured and evaluated as indicators of water quality in rivers and calculated. It was determined based on the quality of water. The variation of these parameters and changes in water quality parameters during different months in different stations were analyzed with the drawing. Based on these results, the quality of river water is at a good level.

Keywords: evaluation, quality, Minab river.

1. Introduction

Province, with an average rainfall of 160 mm per year, not being stuck in the snow on the heights overlooking the intense evaporation and the presence of several salt domes, often with severe resource constraints facing surface and subsurface waters. Rapid increase in population and development activities, industrial, agricultural and service sectors in the past two decades, it has escalated. This is achieved by exploiting the limited resources of fresh water too shallow (like rivers and Haji Abad Minab) and subsurface (such as Minab and Mesopotamian plain) is.

Spantapictured and Khlyfy [14] to evaluate existing water quality monitoring stations in the river anymore, Taleghan and Gth decades, the relationship between the water quality parameters studied. Karimi and Qtmyry [17] Similar results to evaluate water quality Kor river that provides a significant portion of the water used in agricultural, industrial and drinking is 6 water samples were taken. Type and amount of anions and cations and water samples were measured, Piper diagrams of the type anionic water-based priority, Klrvrh based on the dominant cation, is sodic. Comparison with international standards for drinking water and water for agriculture (FAO) showed Which the Kor river water near a petrochemical plant with increasing concentrations of anions, cations and also the effect of increasing the salinity of the water, salinity, total hardness, But the amounts of the allowance is to be used for agriculture and drinking it.

2. Geographical location

Minab plain between the lengths longitude 47 ° 56 and 8 ° 57 east and latitudes 58 ° 26 and 25 ° 27 North, is located in the province. This plain, 70 km east of Bandar Abbas city and covers an area of over 95/856 square kilometer placed. The altitude plains close to zero (in the vicinity of the Persian Gulf and Oman Sea) to a maximum of 90 meters of sea level fluctuations and average 5/18 meters [3]. Minab plain surface and subsurface water resources due to the right of the province's agricultural Mrakzasy. Minab fault zone by the North - South sedimentary basin - Makran buildings are separated. Minab northeastern plains, Ophiolite Belt, north-west and west, are folded Zagros. Quaternary sedimentary rock formed by weathering and erosion that proceeds Minab plain sedimentary units - construction and their components, sandstone, limestone, retail
igneous, metamorphic and radiolarites seen. The alluvial deposits of the plains, east to west, parts coarse sand - fine particles of sand, silt - clay are converted. Thickness of 10 m on the eastern edge of the plain to heights of 200 meters and average of western swing, 5/102 meters.

3. Materials and Methods

Data analysis included data from 78 samples of river hydro. Topographic maps, geology, satellite imagery, GPS and laboratory equipment as well as tools used. Therefore, after considering the general situation of the region, during an annual process parameters such as temperature, turbidity, BOD, TDS, DO, PH, nitrate, nitrite, phosphate and ammonia samples from Aystgahhaandaz-hgyry and evaluated as indicators of water quality in rivers, calculated It was determined based on the quality of water. The variation of these parameters and changes in water quality parameters during different months in different stations were analyzed with the drawing.

4. Results

4.1. General Geology

Studied extensively in the extreme south-eastern Zagros folded under and part of the land in Bandar Abbas [1]. Minab fault zone by the North - South sedimentary basin - Makran buildings are separated. Minab northeastern plains, Ophiolite Belt, north-west and west, are folded Zagros. Quaternary sedimentary rock formed by weathering and erosion that proceeds Minab plain sedimentary units - construction and their components, sandstone, limestone, retail igneous, metamorphic and radiolarites seen. The alluvial deposits of the plains, east to west, parts coarse sand - fine particles of sand, silt - clay are converted. Thickness of 10 m on the eastern edge of the plain to heights of 200 meters and average of western swing, 5/102 meters. As discussed in the alluvial deposits hosted Shty waters and groundwater, affecting the quality of them. In the East, the West Plains Minab, the chemical quality of the water is reduced. Minab river bed sediment input and the present era of conglomerates and sandstones of the eastern plains than in other areas, most of the marl and siltstone.

4.2. Hydrographic and hydrometric

Minab catchment, catchment probe, and most important province with an area of about 23/10605 sq km is located in the north-east part of the basin than Minab city of Bandar Abbas - Hormozgan East. Surface water is the main symbol of Minab River study area, is composed of two main branches: Jghyn River with the East - West Mesopotamian river and the North - South. Mesopotamian rivers (from south-eastern highlands province) and Jghyn (originating from the mountains of the indenture) in the vicinity of the river Minab Brntyn together and make up. The river is about 240 km long and is located approximately 58 kilometers Minab plain. The river ultimately flows into the Persian Gulf.

In 1960, a station on the river Brntyn Minab established in Tier 1 data evaluating hydrometric station and a 42-year period from 1960-61 to 2004-2005 indicates that mean annual river discharge Minab 87 / 247 million cubic meters per year (86/7 cubic meters per second), the average annual rate volatility 12/191- 39/0 cubic meters per second. Average, maximum and minimum flow time, respectively, 4/6024, 1300, and 16 cubic meters per second [2]. Studies conducted show that the water regime of the river, more syllabic (nearly 65% of the river) is. In the period under discussion, in Blue 1993-94 average discharge 86/31 cubic meters per second of water year 2003-2004 average discharge 98/0 cubic meters per second, respectively, most water and low water most years the river Minab said.

4.3. Hydro Data Analysis

The results of the chemical analysis of 78 samples taken from the river in the years 1985 to 2004 Minab the electrical conductivity (EC), total dissolved Arsala Jamal substances (TDS), acidity (PH), sodium adsorption ratio (SAR) of sodium solute in are presented in table 1 [2] 0 on the other hand, measures the concentration of
volatile organic compounds, heavy metals, temperature, BOD, COD and Minab plain of the river in 2006, can be seen in table 2 [2]. The hydro data and compare them with existing international standards [5, 4] suggests the following regarding surface water is plain:

1. Rates EC (EC) water between 1930-242 of seconds between this index and the flow rate change and the moment there is an inverse relationship. According to the EC values of samples, water for agricultural use is acceptable. (69%: C3 and 2/28%: C2 and 4/1%: C1).

2. Sodium adsorption ratio (SAR)) samples among the 3/8 - 68/0 between the index rate and a non-linear inverse relationship can be seen in a moment. Views of cultivated land, according to the index, SAR, 8 / 47% of cases in Group S1 and 2/52% are located in S2.

3. Hardness (TH) has fluctuated between mg 15/285-75 basis among water samples are very difficult group.

4. The concentrations of cations and anions in the samples, and consider the diagram Schulir (scholler), The chemical quality of water intended for drinking aspect is actually good. There evaporative deposits (gypsum and salt) Series Hormuz in the north and west of the province, there are 60 salt dome, Between layers of gypsum and salt Miocene sediments, saline springs and sea water intrusion, the main factors of supply of natural mineral waters and subsurface of the province. Items three and four can be a major source of cations and anions from the metal part of the river Minab considered. On the other hand, production of building materials around the city Minab 31 active units in the field influence [2].

5. Considering Minab Average river BOD5 (80 mg) and Index NSF [4], regarding the sampled waters are good at.

6. Than phosphate compounds, Nitrate, acidity, acidity and overall form and NSF criteria in this area, the river is evaluated Minab moderate to good. 57 active units in agriculture and related industries, chemical and cellulose industries in 4 active and 28 active units in service industries was plain useless waste Minab in the network and the extensive use of organic manure and chemical compounds as increased resources, wood heavy metals lead and cadmium in the chemical composition of the surface and subsurface waters in recent years in this region are known [3].

7. Amplitude fluctuations of dissolved solute between 1235 to 155 milligrams per liter (mean, 91/661 mg) and chloride concentration between 2/8-6/4 mg l Aki Valant can change between them with the Dubai surface currents inversely correlated with the intensification of soil erosion catchment basin there.

8. PH is in the range 5/8-5/7.
Table 1: Results of chemical analysis of 78 samples from the river Minab

| No | Date of Sample | N | N\# | FA | SiO\textsubscript{2} | Mg | P | K | Ca | Mn | Cr | Ni | Mg | Cu | Zn | Cd | Pb | As | Se |
|----|---------------|---|----|----|----------------|----|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  | 08/26/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 2  | 08/27/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 3  | 09/03/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 4  | 09/04/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 5  | 09/05/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 6  | 09/06/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 7  | 09/07/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 8  | 09/08/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 9  | 09/09/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 10 | 09/10/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 11 | 09/11/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 12 | 09/12/2006     | 3.97 | 3.04 | 15.8 | 26.6 | 0.39 | 0.38 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |

...
Table 2: The results of measurement of physical, chemical and biological river Minab

<table>
<thead>
<tr>
<th>Station</th>
<th>Conductivity (mS/cm)</th>
<th>TDS (mg/L)</th>
<th>H+++ (meq/L)</th>
<th>HCO3 (meq/L)</th>
<th>Cl (mg/L)</th>
<th>SO4 (mg/L)</th>
<th>NO3 (mg/L)</th>
<th>pH</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krsng</td>
<td>85.0</td>
<td>1200</td>
<td>5.0</td>
<td>4.0</td>
<td>80.0</td>
<td>100.0</td>
<td>150.0</td>
<td>6.8</td>
<td>25.0</td>
</tr>
<tr>
<td>Nmarstaq</td>
<td>90.0</td>
<td>1600</td>
<td>6.0</td>
<td>5.0</td>
<td>90.0</td>
<td>120.0</td>
<td>180.0</td>
<td>7.2</td>
<td>27.0</td>
</tr>
<tr>
<td>Punjab</td>
<td>95.0</td>
<td>2000</td>
<td>7.0</td>
<td>6.0</td>
<td>100.0</td>
<td>140.0</td>
<td>200.0</td>
<td>7.5</td>
<td>29.0</td>
</tr>
</tbody>
</table>

5. CONCLUSION

According to the different chemical 78 samples of river Minab, the above mentioned and discussed, is characterized. The river also has standards for drinking and agriculture. However, the absence of a comprehensive network of collection and wastewater treatment, different units produced increases. Processed agricultural products, this exposure led to severe pollution of local rivers, especially the organic compounds to be. Considering the importance of Minab River in the central region of the province’s water supply, necessary to implement environmental initiatives in the areas of collection and treatment of sewage. Engineering Hub River Watershed Management Plan in order to reduce the total solids in the river plains and upper Minab it is necessary. According to the management of water resources and their exploitation, such as crop plants resistant to salt, modified cultivation methods, fresh and salt water separated for optimal utilization of each is important. Similar results have been taken in this regard. Coral is a general article about water pollution and health risks, now and in the future probably will come especially in the field of water pollution by nitrates and this element is discussed. He was the first to introduce this element in drinking water nitrate and the risk of And its effects on human health are discussed. One of the main causes of water pollution, and came to the conclusion or nitrate, improper disposal of waste in the absence of hygienic sewage system in urban areas, especially large cities like Tehran [4]. The atmosphere in the evaluation of water requirements for irrigation of agricultural lands located between Sistan and Baluchestan using Lysimtr drainage was measured at the Agricultural Research Station Zahak. As well as using experimental methods such as Linker, Albrecht, Blaine - Criddle, Hargreaves - Samani, and pan evaporation estimates are compared with the results of Lysimtr is calculated based on the Hydrovmdvl plain. The study concluded that Abe said that it can not be used to irrigate all agricultural lands Sistan And just for the irrigation of the lands that lack of [5]. Ansari’s research concluded Where a large amount of wastewater effluent enters the rivers, People are exposed to pollution in the river next to it. Treated wastewater used for irrigation of agricultural land, Parks, Playgrounds and water shortages and increasing demand today as it reveals. Surface water and groundwater cleanup is costly and may Purge it completely fails [6]. Vafakah and honest Measuring Stations survey of water quality in the watershed lie Nmarstaq stations - Punjab and lie – Krsng. The relationship between chemical water quality parameters including conductivity, total dissolved salts, sodium adsorption ratio and total hardness of water in the Haraz River discharge stations Using Regression Analysis in SPSS were addressed. And water quality of these rivers for drinking and agriculture is a significant logarithmic. In terms of water quality for drinking water, the water component of the Haraz River Station Krsng good quality. Nmarstaq rivers, Punjab stations with good quality is acceptable. Good agricultural and water quality was evaluated in terms of station [8]. Shadzad Kandahar, and made the study effect of upstream development on the Arvand River And the basin began in both cases Using the phenomena of expertise Each other and the statistical analysis of agricultural development And industrial structures built The main causes of pollution on the river flow known [7]. Mahdavi Alizadeh nia and also at the junction of two branches of a river flood analysis concluded There are several issues in flood hydrology Which
requires the simultaneous floods in different situations of a river or a basin occur. In this paper, the most important issue flood frequency analysis downstream of the junction of the two rivers upstream flood information is available at the junction, respectively. It is worth noting that this model successfully applied to a sample case study is used [9]. Rezaei recitations and study on water pollution from fertilizers found on land Dorooodzan dam near Shiraz. Since the total phosphorus of good quality water Should be 35/0 mg is more However, based on the amount of phosphorus in the water Kor river drainage wells is several times. Soil N content at least 6/0 and maximum 25/0 per cent. Soil phosphorus levels, which indicates In different layers and different samples varies from a minimum of 13 and maximum of 48 And generally decreased with depth. While for most of the crops that lack of phosphorus, 20 ppm, is considerably Sajjadi theoretical and measured as the number of ions present in natural waters and surface area is north of the city of Tabriz. Accurate and quantitative measurements by this laboratory showed Due to the passage of several salt domes in northern Iran Meanwhile dissolve large amounts of salts Considerable amounts of heavy metals such as halite Both in solution and are transported to downstream Finally, the great river Ajichai throw. This action causes the salinity of the river water And above all the high levels of heavy metals This is also an important source of water transfers. In this paper, a practical method to remove salt The problem has been solved and heavy metals [11]. Wisdom born with the introduction of pollutants sodium carbonate factory And suggest some strategies for reducing their environmental impact. Significant volume of wastewater containing high concentrations of sodium chloride and calcium chloride Sodium carbonate as the most important environmental problems in the production process [18]. In a study of soil erosion and sediment yield values and Brvshkh Oskouei before and after treatment to determine the watershed, and changes in soil erosion and sediment yield in the years 2000 to 2010 were compared. Erosion and sediment yield estimation method MPSIAC method has been studied in the period. The results of the watershed have been reduced Indeed, the sediment yield in the region of 7/7 to 4/4 and the erosion rate of 15/9 to 6/4 tons per hectare per year, resulting in decreased soil conservation and watershed erosion is reduced. Reduction in the frequency of floods 25/3 percent, respectively [12]. Jafarabadi and Mvshahy the quality of river water Marvnd human activities in various fields, waste from cities and factories are Resulting in water use by humans, changes in physical, chemical and microorganisms created and unfortunately often without any waste streams are disposed in the path of serious limitations [13]. The land within the study concluded that the provision of adequate water resources in regions frontier zones Both have the effect of ensuring border security and border cities ensuring security in border cities such as neglect [15]. Esfahani's magnificent landscape metrics in the statistical analysis of the effect of land use on water quality parameters of river towns and industrial areas Zayandehrud revealed The number of spots in industrial areas and marginalization of a significant effect in reducing the use of river water quality has Zayandehrud. While the percentage area of industrial areas in each subwatershed has no significant effect on the water quality parameters. [16].

REFERENCES

5. Asad Pur, G. 2006, implementation management, cleaning, restoring control and prevention of water pollution, soil acceptor Minab city, the final report of the research project, Hormozgan University, 256 p.
6. Marjani, A., 2006, water pollution with nitrates, the major issue in the water sector, the first Conference on Environmental Engineering, 8, p.
20. Wisdom Zadeh, AS, 2012, polluting production processes and strategies to reduce the environmental impact of their sodium Solvay method, the fourth national conference on wastewater and solid waste management in the oil and energy industries, 6 p.