

A brief overview on current environmental issues in Iran

Abdolghaffar Ebadi ^{1*}, Mohsen Toughani ², Azadeh Najafi ³, Mahboubeh Babae ⁴

¹ Department of Agriculture, Jouybar Branch, Islamic Azad University, Jouybar, Iran

² Department of Fishery, Babol Branch, Islamic Azad University, Babol, Iran

³ Department of Architecture, Payame Noor University, Mazandaran (PNU), Sari, Iran

⁴ Department of Law, Jouybar Branch, Islamic Azad University, Jouybar, Iran



Highlights

- Environmental problems make human beings vulnerable to natural disasters.
- The current global and Iranian environmental situation greatly needs urgent considerations.
- Community awareness can help to create a more friendly environment for survival.

Graphical Abstract



Article Info

Receive Date: 20 November 2019

Revise Date: 10 January 2020

Accept Date: 10 February 2020

Available online: 15 February 2020

Keywords:

Environmental awareness

Environmental issues

Crisis

Global warning

Iran

Abstract

The environment of Iran is constantly changing in recent years and this issue cannot be ignored. Of the critical environmental crisis should refer to global warming, overcrowding, decreasing natural resources, garbage disposal, ozone layer destruction, deforestation, rainfalls, water pollution, public health issues, and genetic engineering. Men around the Iran are experiencing new and challenging environmental problems daily. Some of these problems are likely to affect the health of the ecosystem, but somehow they change the recent landscapes. The planet is on the verge of a massive environmental crisis. Environmental problems in Iran also make human beings vulnerable to natural disasters occurs currently and in the future, as well. So due to the growing problems of the environment in Iran, this is an emergency situation. Therefore, the current environmental situation greatly needs urgent considerations and many factors to be addressed. By increasing community awareness and concern about issues, it can help to create a more friendly environment conscious for survival.



 10.22034/CAJESTI.2020.01.08

* Corresponding author. Dr_ebadi2000@yahoo.com (A.G. Ebadi)

E-ISSN: 2717-0519

P-ISSN: 2717-4034

1. Introduction

The environment is constantly changing, and this issue cannot be ignored. So, the current environmental situation greatly needs urgent considerations. Due to the severe invasion of natural disasters, heat and cold periods, various weather patterns, and many more reasons, Earth inhabitants need to be aware of the various environmental problems (Salehi et al., 2018).

Also, Global warming is now an irregular reality about the present living. Earth Planet is hotter than ever, and the inhabitants are at the center of the crisis. On this basis, Environmental problems make human beings vulnerable to natural disasters occur currently and in the future. Some of these problems are likely to affect the health of the ecosystem, but somehow they change the recent landscapes. So, due to the growing issues of the environment, this is an emergency. In case of ignoring these difficulties, then life ends up in disaster and doomed to destruction.

The critical environmental issues should refer to Global warming, which is now an irregular reality about the present living. Earth Planet is hotter than ever, and the inhabitants are at the center of the crisis. However, the status is not the sole environment issue that should be concerned (Farahani and Bayazidi, 2018).

1.1. Major environmental difficulties in Iran

1.1.1. Pollution

To compensate for air pollution, water and soil may need millions of years to reconstruct. Exhausting gases from industrial and vehicles are always in the first ranking. Heavy metals, nitrates, and plastics are toxic and cause pollution, mostly in Iran. Water pollution occurs due to oil leakage, acidic rain, and urban canals and streams. Air pollution (Table 1) is caused by variable gases and poisons emitted by industries and factories and combined with fossil fuels (Yousefi et al., 2018). Soil contamination is also essential due to industrial pollutants that deprive the soil of nutrients (Table 2).

Table 1. Air Pollution Mortality in Iran (2012).

Type of disease	%
Heart disease	63
Chronic Obstructive Pulmonary Disease	2
Stroke	28
Acute respiratory failure	2
Lung cancer	5

Table 2. The number of unhealthy days in Tehran between 2012-2020.

Year	Days
2012	164
2013	90
2014	98
2015	75
2016	72
2017	49
2018	61
2019	42
2020	55

1.1.2. Global warming

Ecological changes, like global warming, are attributed to human activities that lead to greenhouse gas emissions. Global warming increases the temperature of the oceans and the Earth's surface, and as a result, the higher polar ices melt and increase the sea (Ebadi and Hisoriev, 2018). Besides, abnormal patterns of the environment also cause power foods, heavy snowfall, and Desertification (Figs. 1 & 2).

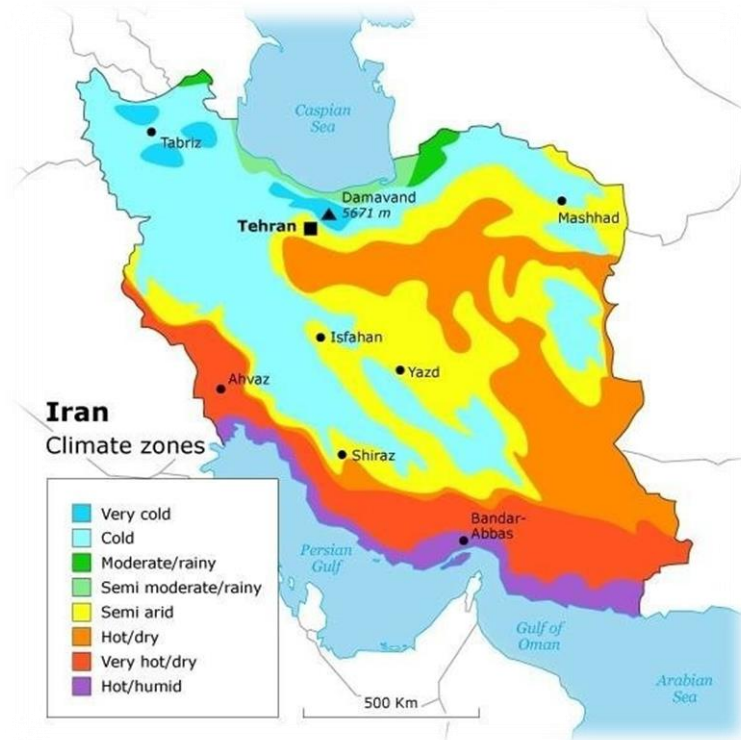


Fig. 1. Climatic map of Iran (Yousefi et al., 2019).

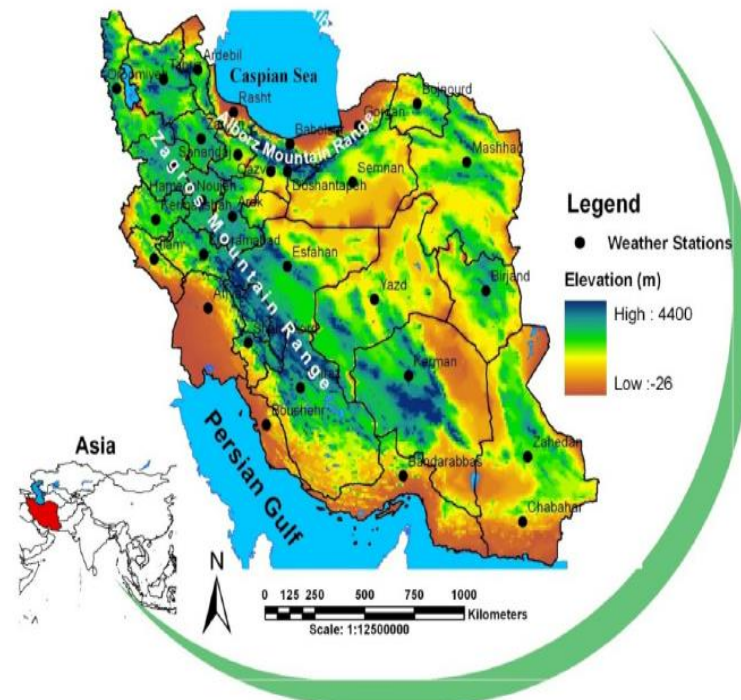


Fig. 2. The overall Topography map of Iran (Yousefi et al., 2019).

1.1.3. Overcrowding

The population of Iran and the world are on a steady rise, which leads to a lack of natural resources such as food and shelter. Currently, the shortage of natural resources is not developed, and developing countries are creating tension. In concentrated agriculture, chemical fertilizers, pesticides, and insecticides to produce more nutrients damage the environment. On this basis, Overcrowding is the main currently environmental issue in Iran (Tavakol et al., 2017).

1.1.4. Decreasing of natural resources

Decreasing of natural resources is of great concern to life in Iran. Consumption of fossil fuels stimulates greenhouse gas emissions and, as a result, global warming. Men worldwide are trying to adopt renewable resources into solar, wind, biogases, and Geothermal energies (Ebadi and Hisoriev, 2018). Cost of infrastructure and maintenance of these resources decreased by the recent years (Fig. 3).

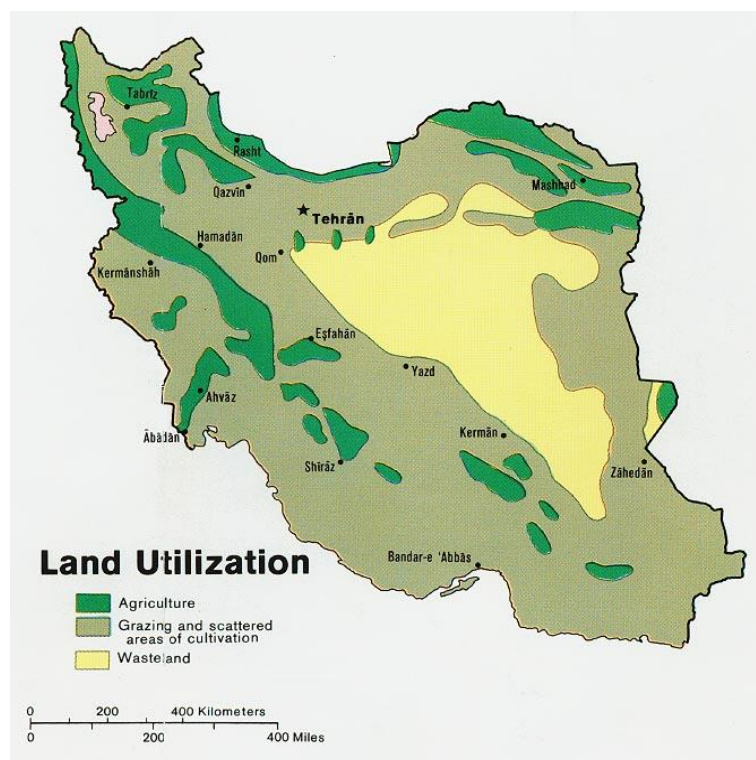


Fig. 3. The Land Utilization map of Iran.

1.1.5. Garbage disposal

Excessive consumption of resources and plastic productions generates a global waste crisis. Developing countries are usually known for excessive wastes and exporting them in oceans and less developed countries (Mohammadiha et al., 2018). Nuclear waste disposal has many health risks that developed recently in Iran based on nuclear activities. Also, plastic, fast-food, packaging, and worthless electronic devices threat human health (Table 3).

Table 3. Components of municipal waste in Iran.

Kind of Waste	%
Biodegradable waste	79.5
Paper and cardboard	9.38
Plastic	2.5
Wood	2.5
Glass and pottery	3.33
Textiles	1.43

1.1.6. Deforestation

The forests are of essential resources for the natural cleaning of carbon dioxide and produce fresh oxygen. The forests cover most northern parts of Iran and currently about 30% of the earth. They also regulate temperature and rain. However, in recent times, for instance, in Panama, as the increase in population, shelter, food, and clothes were in shortage in forests (Ebadi et al., 2019). Deforestation means removing green cover for commercial, industrial, and residential purposes (Figs. 4 & 5).

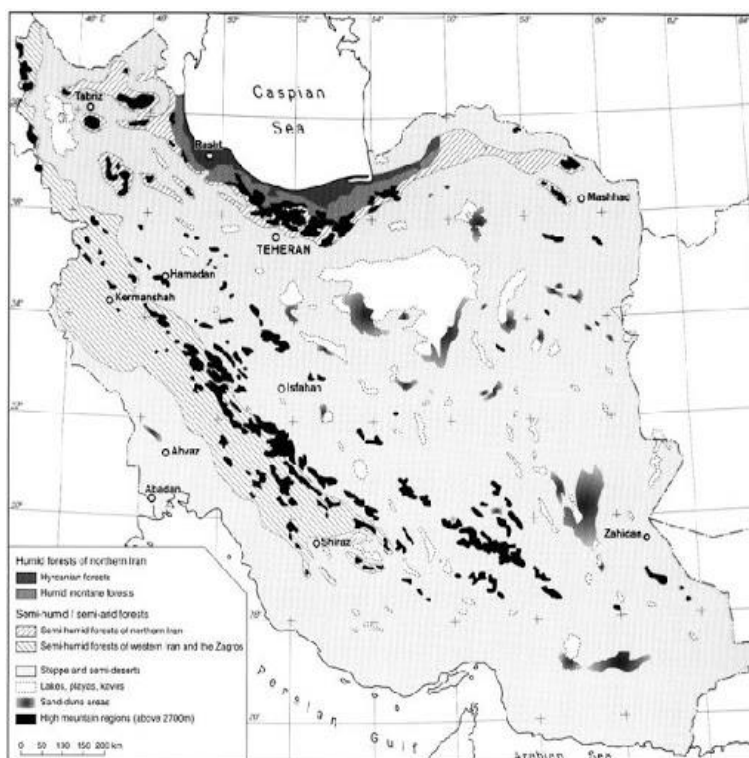


Fig. 4. The Forest distribution map of Iran (Ebadi et al., 2019).

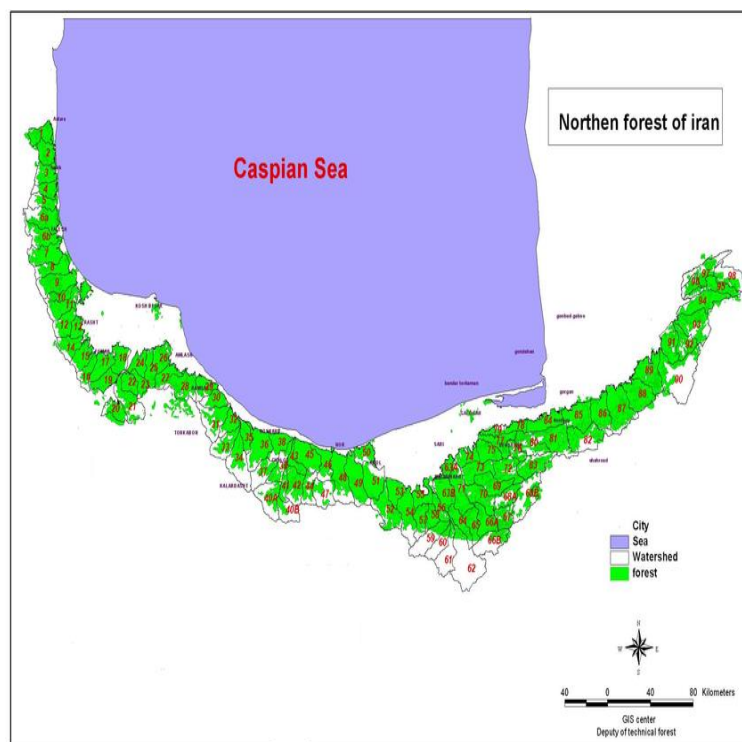


Fig. 5. The Hyrcanian Forests coverage of Iran (Ebadi et al., 2019).

1.1.7. Acidifying the oceans

Excessive Production of CO₂ affects directly on Acidifying the Oceans. Humans produce 25% of CO₂. During the recent 250 years, this amount increased and may reach 150% until 2100 and had a primary effect on Hodgson and Plankton, which is similar to that of Anbarpocia, which in Iran resulted in technical activities by many factories (Ebadi and Hisoriev, 2019).

1.1.8. Ozon layer destruction

An invisible protective Layer is a layer of metal that protects the earth's surface towards harmful radiation. The chloroform bromide contamination in chlorofluorocarbons (CFC's) affects principal layers of Ozone. Reaching the top of the atmosphere, they create a hole in the Ozone. The giant hole was recognized on top of the South Pole. CFCs are widely abandoned in many industries and services. Because the ozone layer emits harmful UV radiation and diffuses to the earth surface, it is of great value. One of the most important environmental issues now is the Ozone layer destruction (Mohammadiha et al., 2018).

1.1.9. Rainfalls

Rainfalls can occur due to special contamination of the atmosphere. Burning fossil fuels or the eruption of volcanoes or plants that release carbon dioxide and nitrogen oxides into the atmosphere also leads to Rainfalls. Acid rain is a known environmental problem that could adversely affect animals, aquatic species, and human beings. The shortage of rainfalls caused the main environmental issues in Iran (Yousefi et al., 2019).

1.1.10. Water pollution

Pure Drinking water is poorly rare. The water is now a considerable economic and political item, so the human population struggles to achieve the water resources. One of the recommended alternatives is the use of the sweetening process. Industrial progress Enhanced contamination increasingly in sea, river, and oceans is a potentially great threat to human health. Algae biomass production techniques are nowadays used in special ponds for wastewater treatment (Figs. 6 & 7).



Fig. 6. The Schematic map of Agricultural pollution for water sources of Iran.

1.1.10.1. Overview of algae wastewater treatment

Algae play a very important role in wastewater treatment for a symbiotic relationship with bacteria. In the presence of sunlight and minerals, the algae have begun photosynthetic activity, resulting in the production of new algae and dissolved oxygen. Existing bacteria can use dissolved oxygen to oxidize the organic matter in the sewage (Diagomanolin et al., 2004).

1.1.10.2. Keynotes to prevent water pollution in Iran

Urban dispersal refers to population migration from densely populated areas to low-rural areas that make cities more populated in rural areas. Population dispersal causes erosion, increased traffic, environmental and health issues. The growing demand for land acquisition causes replacement of the natural environment, including various plant and animal species. Indeed, water pollution cannot be completely prevented, but the following key points can significantly slow its progress:

1. Prevent wastewater from entering the rivers.

2. Educate people, especially farmers.
3. Wastewater treatment.
4. Save water, which no longer requires contaminated water treatment.
5. Lack of use of fertilizers and agricultural insecticides.
6. Applying a Green Infrastructure Approach to Improve Runoff Management Capacity throughout the System, and Reduce Oil Overheads in Refineries (Figs. 8 & 9).
7. Repair and replacement of faulty equipment.
8. Increase the hydraulic capacity of the sewage collection system.
9. Burying manure in the soil for six months (Ostad-Ali-Askari et al., 2017).



Fig. 7. Use of Algae pounds for water purification.

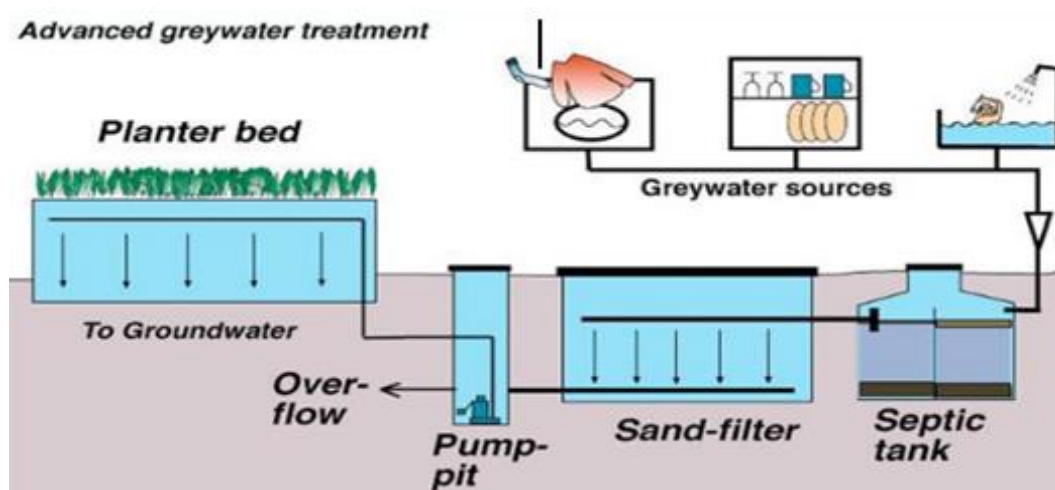


Fig. 8. General and schematic system of wastewater treatment complex in Iran.

1.1.10.3. The most important water crisis in Iran

- ✓ *Water shortage*: According to the trend of controlling water resources, it was estimated that two-thirds of the world's population would face water shortages by 2025.
- ✓ *Lack of access to clean and hygienic drinking water*: Despite international efforts, it was estimated that 2 billion people lack access to clean drinking water, and 4.9 billion lack access to clean water.
- ✓ *Water quality control*: Industrialization, urbanization, metropolitan growth, and intensive agriculture have all caused pollution of waterways, groundwater, and a decrease in water quality.

✓ *Interruption of Water Resources Management Network*: National and international water resources management plots a disruption path. Instead of focusing on water constraints and the intrinsic relevance of the water cycle components in nature, it focuses solely on providing immediate needs.

✓ *Dedication of dedicated funds*: Water supply, irrigation, drainage, flood control, treatment, and watershed protection systems are currently facing financial difficulties due to lack of investment.

✓ *Lack of awareness in decision-makers and people*: The illusion of an abundance of water and quality without changing water sources has caused public confusion. This illusion can go on for so long that water resource scarcity becomes a reality and reduces quality to an unusable level.

✓ *Endangering the Peace and Security of Communities*: Water is an essential element in the community's socio-economic life and its surroundings. Declining access to water is increasingly threatening peace and security in many parts of the globe (Tavakol et al., 2017). Many countries facing water shortages suffer from political unrest, social tensions, and public unrest (Fig. 10).

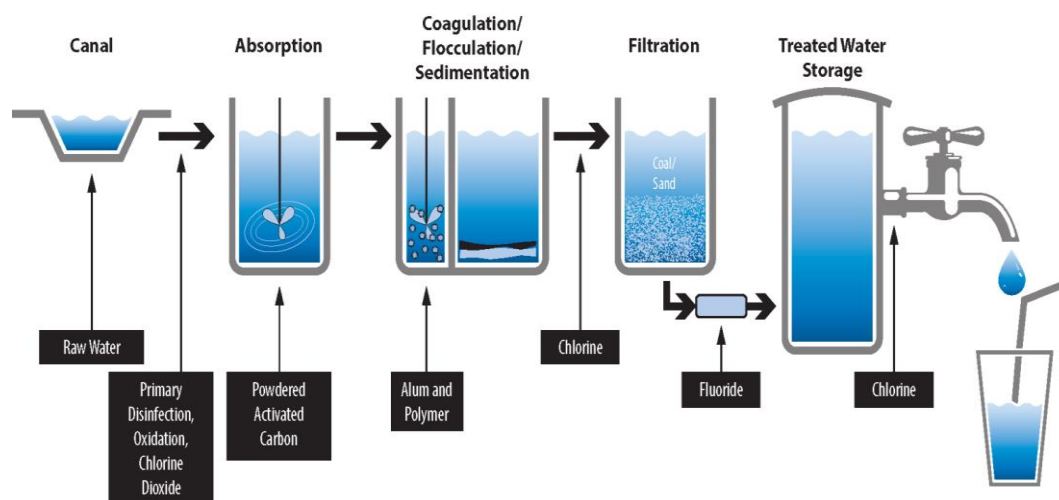


Fig. 9. The common process of raw water treatment for drinking in Iran.

1.1.11. Urban dispersal

Urban dispersal refers to population migration from densely populated areas to low-rural areas that make cities more populated in rural areas. Population dispersal causes erosion, increased traffic, environmental and health issues. The growing demand for land acquisition causes replacement of the natural environment, including various plant and animal species (Farahani and Bayazidi, 2018; Hosseini and Shahbazi, 2016).

1.1.12. Public health issue

Currently, environmental problems created lots of risks for humans and animals. The most significant risk to human health is contaminated water. Rivers contain a large number of toxins, chemicals, and diseases. Contaminants cause respiratory infections, such as asthma and cardiovascular problems. Rising temperatures cause infectious diseases such as dengue fever (Salehi et al., 2018).

1.1.13. Genetic engineering

Genetic modification of nutritional material using biotechnology is Genetic Engineering. Since genes can be transferred from an antigenic plant to the final plant, genetic modification of nutritional material enhanced poisons and diseases, genetically modified crops can create serious environmental problems that can be proven to be genetically engineered for toxic wildlife. Another disadvantage is the increasing use of pesticides, which can make plant insects resistant, and as a result, makes organisms more resistant to antibiotics. The need for change in daily life, as well as governmental actions, is to be increased. There are many factors, such as voting, governmental issues, and the tendency to keep going daily that prevent necessary actions from being addressed. People are ignorant of their work on future generations. If human beings move forward with

such destructive methods, there will be no other future to consider. Although the issues that it could not physically avoid thinning of the Ozone Layer (And scientists are still struggling to find out what causes it) is authentic but already with current knowledge, many actions help prevent the thinning of Ozone. Increasing community awareness and concern about issues can help create a more friendly environment conscious of survival (Ebadi and Hisoriev, 2018).

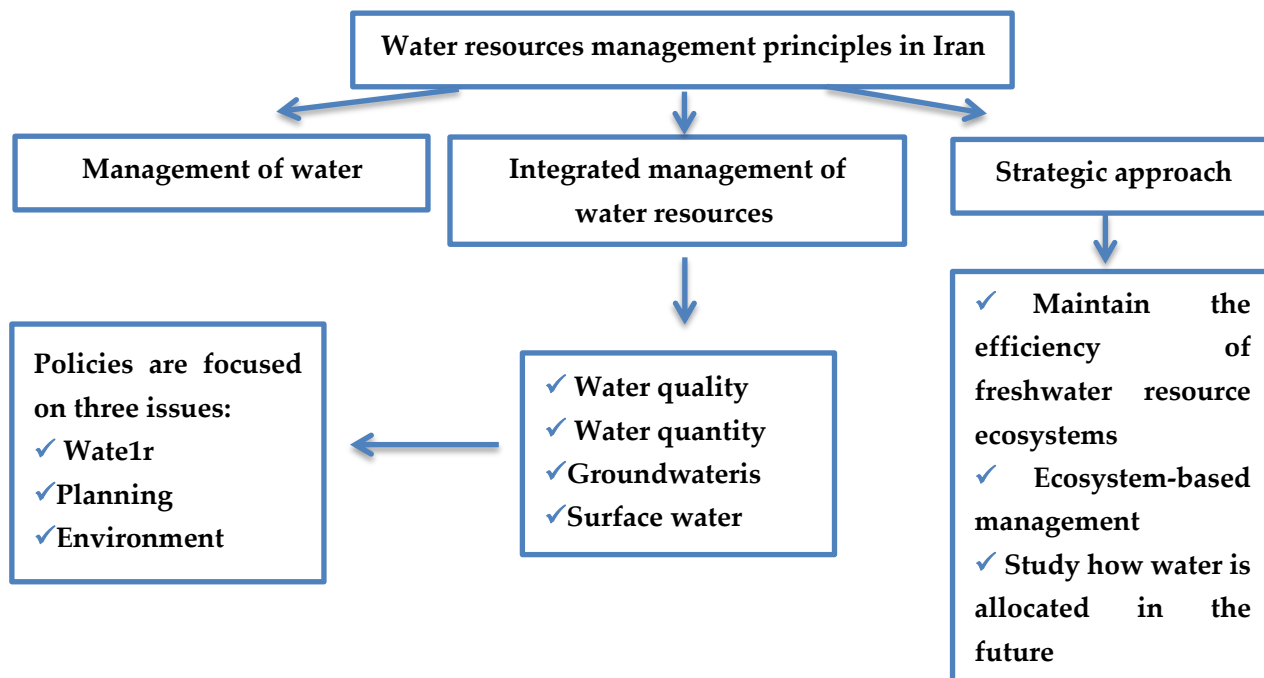


Fig. 10. Water resources management principles in Iran (Yousefi et al., 2019).

Although Article 45 and 50 of Iran's constitution, Emphasize environmental protection and related subjects, it is not enough for encompass everything. For example, Article 50 states that "It shall be considered a public duty in Iran to protect the environment in which the present and future generations shall have a developing social life .Therefore, economic activities or otherwise, which cause pollution or irreparable damage to the environment shall be prohibited". The Impressions from this Article can be the following items:

1. Of the essential necessity of growing the human generation is a healthy environment.
2. Environmental protection is the duty of the whole right and legal individuals in Iran.
3. Creation of pollution in the natural, artificial, and social environment is prohibited.
4. Irrecoverable destruction of the environment is not permitted.
5. All economic, social, political, and cultural activities caused environmental pollution is not allowed.
6. All activities cause irreversible environmental destruction is prohibited.
7. Continuous education and awareness of true and legal individuals regarding environmental issues are essentially obligated to protect environmental protection.
8. Making an introduction to growing social life for future generations is the government's responsibility, policymakers, and managers.
9. The principal prerequisite is organized intersection activity to implement the above mentioned and preparing environmental standards and regulation. ALSO preparing the appropriately reply to ex-generation, ex-sectional and ex-boundary referent is all in central concentration.

Besides, environmental impact assessment rules were compared in developed countries and Iran. Results demonstrate that the established regulations, as well as pollutant management, were not comprehensive in Iran. In EU countries, including Germany, France, and Canada, comprehensive environmental regulations

dominated. Also, in the mentioned countries, environmental rules, and the EIA (Environmental impact assessment) studies are inevitably essential (Farahani and Bayazidi, 2018).

2. Conclusions

Men around the world are experiencing new and challenging environmental problems daily. Some of these problems are likely to affect the ecosystem's health, but somehow they change the recent landscapes. The planet is on the verge of a massive environmental crisis. Environmental problems make human beings vulnerable to natural disasters occurs currently and in the future, as well. So due to the growing issues of the environment, this is an emergency. In case of ignoring these difficulties, then life ends up in disaster and doomed to destruction. The critical environmental crisis should refer to Global warming, Overcrowding, Decreasing Natural Resources, Garbage Disposal, Ozone Layer Destruction, Deforestation, Rainfalls; Water Pollution; Public Health Issues; Genetic Engineering, etc. So due to the growing problems of the environment, this is an emergency. In case of ignoring these difficulties, then life ends up in disaster and doomed to destruction. Therefore, the current environmental situation needs urgent considerations. There are many factors to be addressed. Increasing community awareness and concern about issues can help create a more friendly environment conscious of survival.

Acknowledgments

The authors will present deep thanks from Prof. Dr. Qaisar Mahmood, for his creator and valuable comments in this paper.

References

- Diagomanolin, V., Farhang, M., Ghazi-Khansari, M., Jafarzadeh, N., 2004. Heavy metals (Ni, Cr, Cu) in the Karoon waterway river, Iran. *Toxicol. Lett.* **151**, 63–67. <https://doi.org/10.1016/j.toxlet.2004.02.018>
- Ebadi, A.G., Hisoriev, H., 2018. Ecological Assessment of Heavy metals in Sediments of the Farahabad Region (Iran). *Polish J. Environ. Stud.* **27**, 1033–1039. <https://doi.org/10.15244/pjoes/76792>
- Ebadi, A.G., Hisoriev, H., 2018. Biodiversity of Algae from the Tajan River Basin (Mazandaran-Iran). *Egypt. J. Aquat. Biol. Fish.* **21**, 33–52. <https://doi.org/10.21608/ejabf.2018.5034>
- Ebadi, A.G., Hisoriev, H., 2019. Gasification of algal biomass (*Cladophora glomerata* L.) with CO₂ /H₂ O/O₂ in a circulating fluidized bed. *Environ. Technol.* **40**, 749–755. <https://doi.org/10.1080/09593330.2017.1406538>
- Ebadi, A.G., Hisoriev, H., 2018. Physicochemical characterization of sediments from Tajan river basin in the northern Iran. *Toxicol. Environ. Chem.* **100**, 540–549. <https://doi.org/10.1080/02772248.2018.1460929>
- Ebadi, A.G., Hisoriev, H., Zarnegar, M., Ahmadi, H., 2019. Hydrogen and syngas production by catalytic gasification of algal biomass (*Cladophora glomerata* L.) using alkali and alkaline-earth metals compounds. *Environ. Technol.* **40**, 1178–1184. <https://doi.org/10.1080/09593330.2017.1417495>
- Farahani, H., Bayazidi, S., 2018. Modeling the assessment of socio-economical and environmental impacts of sand mining on local communities: A case study of Villages Tatao River Bank in North-western part of Iran. *Resour. Policy.* **55**, 87–95. <https://doi.org/10.1016/j.resourpol.2017.11.001>
- Hosseini, V., Shahbazi, H., 2016. Urban Air Pollution in Iran. *Iran. Stud.* **49**, 1029–1046. <https://doi.org/10.1080/00210862.2016.1241587>
- Mohammadiha, A., Malakooti, H., Esfahanian, V., 2018. Development of reduction scenarios for criteria air pollutants emission in Tehran Traffic Sector, Iran. *Sci. Total Environ.* **622–623**, 17–28. <https://doi.org/10.1016/j.scitotenv.2017.11.312>
- Ostad-Ali-Askari, K., Shayannejad, M., Ghorbanizadeh-Kharazi, H., 2017. Artificial neural network for modeling nitrate pollution of groundwater in marginal area of Zayandeh-rood River, Isfahan, Iran. *KSCE J. Civ. Eng.* **21**, 134–140. <https://doi.org/10.1007/s12205-016-0572-8>
- Salehi, S., Chizari, M., Sadighi, H., Bijani, M., 2018. Assessment of agricultural groundwater users in Iran: a

cultural environmental bias. *Hydrogeol. J.* **26**, 285–295. <https://doi.org/10.1007/s10040-017-1634-9>

Tavakol, M., Arjmandi, R., Shayeghi, M., Monavari, S.M., Karbassi, A., 2017. **Developing an environmental water quality monitoring program for Haraz River in Northern Iran.** *Environ. Monit. Assess.* **189**, 410-426. <https://doi.org/10.1007/s10661-017-6125-x>

Yousefi, H., Haghizadeh, A., Yarahmadi, Y., Hasanpour, P., Noormohamadi, P., 2018. **Groundwater pollution potential evaluation in Khorramabad-Lorestan Plain, western Iran.** *J. African Earth Sci.* **147**, 647–656. <https://doi.org/10.1016/j.jafrearsci.2018.07.017>

Yousefi, M., Kafash, A., Valizadegan, N., Ilanloo, S.S., Rajabizadeh, M., Malekoutikhah, S., Yousefkhani, S.S.H., Ashrafi, S., 2019. **Climate Change is a Major Problem for Biodiversity Conservation: A Systematic Review of Recent Studies in Iran.** *Contemp. Probl. Ecol.* **12**, 394–403. <https://doi.org/10.1134/S1995425519040127>



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

How to cite this paper:

Ebadi, A.G., Toughani, M., Najafi, A., Babaee, M., 2020. **A brief overview on current environmental issues in Iran.** *Cent. Asian J. Environ. Sci. Technol. Innov.* **1**(1), 1-11.