

Typology of Environmental Crimes in Iran (Case Study: Crimes Related to Environmental Pollution)

Hossein Rabani¹, Askar Jalalian^{2*}, Mansoor Pournouri³

1. Department of Environmental Law, Faculty of Natural Resources and Environment, Science and Research Branch, Islamic Azad University, Tehran, Iran
2. Department of Law, Payam-e-Noor University of Southern Tehran, Tehran, Iran
3. Department of Law, Faculty of Law, Central Tehran Branch, Islamic Azad University, Tehran, Iran
Corresponding author: dr_ajalalian@yahoo.com

Received: 6 February 2020/ **Accepted:** 15 August 2020/ **Published:** 31 September 2020

Abstract: The purpose of the research is to identify the types of environmental pollution crimes in Iran. This research is a theoretical type that has been done by survey and analysis and has been done in 3 stages. Initially, an initial list of environmental crimes was used by a semi-structured interview method. Sampling was determined by the targeted method and the sample size was 169 people. All interviews were implemented and coded as text. In the next step, using expert opinions and the method of pairwise comparison, environmental crimes of weighting and their importance coefficient were determined. Then, by inquiring from the legal offices of the relevant organizations, the statistics of violations and environmental crimes by the provinces of the country between the years 2017 to 2019 were obtained. The results showed that the main crimes of environmental pollution in Iran can be divided into 8 main categories. Also, 23 criteria were determined for them. Among the eight crimes of environmental pollution, the highest weight belonged to air pollution (0.876) and then water pollution (0.797). Also; the lowest weight was allocated to wave pollution (0.114). A comparative comparison between environmental pollution crimes showed that between 2017 and 2019, statistically, the highest rate of crime was related to waste pollution and then water pollution. Mazandaran Province with 6674 cases of environmental crimes was among the top provinces of the country and Khorasan Razavi Province was introduced as the last province with 223 cases of environmental crimes.

Keywords: Air pollution, Environmental crime, Environmental pollution, Water pollution

1. Introduction

In Iranian law, the issue of environmental protection and the prevention of related crimes has been considered for many years, and legislative centers have tried to address this issue by passing several laws. For this purpose, the issue of using a healthy environment has been reflected and approved in Article (50) of the Constitution of the Islamic Republic of Iran (SIRI, 1989). Nowadays some of the main objectives of governments, companies and public and private organizations are technological advancements, expansion and development of various industries and producing various types of materials and products (Amirfazli et al. 2019). In order to manage pollution, first of all, the type of pollution must be known and then the origin and method of their production must be examined (Fataei et al. 2005). In the current world, various types of pollution are the result of the adverse effects of human activities (Soleimani, 2019).

Today, having a healthy environment and protecting it is one of the most important human concerns, and ways to preserve this environment by considering the resources available in it as a major challenge has been considered by the international community. Environmental management and conservation of natural resources require the use of various sciences and technologies, including environmental criminal law (Cochran et al. 2016). The criminalization of environmental degradation and pollution, as well as the use of criminal penalties in addition to compensation for damages caused by them, are among the reactions to these actions taken by human society (Brisman and South 2018). Today, in international environmental law, one of the most important aspects that have been considered is the typology of environmental crimes (Di Ronco et al. 2018), Because being aware of the motives, reasons, pressures, and all the factors that cause the offender to commit a crime can be effective in adopting the right strategy for

prevention and protection (Hajivand et al. 2018; Akrami et al. 2018).

Environmental law can be divided into two categories: natural environmental and the human environment. Natural environmental law examines ways to preserve the ecosystem and protect natural environments such as forests, pastures, national parks and protected areas, as well as wildlife, animals and aquatic life, and prevent their destruction (SEHN 2008).

Human environmental law includes those rules and regulations that protect a person's life in these environments, and because the problems and issues that may arise in this environment for the survival of the individual are related to the types of pollution; Human environmental rights include the rules and regulations necessary to combat pollution (Dabiri et al. 2016). Accordingly, in accordance with the legal approach, environmental crime refers to the commission or abandonment of an act for which the law provides for punishment (Pain, 2003).

In order for an act as a crime to be punishable, several cases are required. Some of these cases have a public aspect, meaning that their existence is necessary in all crimes, and some have a private aspect (Dabiri et al. 2016). In Iranian law and regulations, environmental crime is sometimes considered in a general way and in some cases in a specific way (Abedi et al. 2015).

Among the cases in which environmental crime has been considered in its general meaning is Article 688 of the Islamic Penal Code adopted in 1996 (Danesh Nari and Moradfar 2016).

In many deliberate crimes, in order for the crime to take place, the damage must be caused by the act. In other words, the fulfillment of environmental criminal liability depends on the outcome of the offenders and the infliction of losses (Heydarzadeh & Mozafari 2014). In terms of segregation, environmental crimes are divided into two main groups; intentional and unintentional (Table 1).

Table 1: Classification of environmental crimes (Dabiri et al. 2016; White, 2016)

Crime type	Description
Intentional	The majority of environmental crimes and natural resources fall into the category of intentional crimes. Criminal intent, which is necessary for the commission of an intentional crime, can be identified in various ways. Sometimes it is a deliberate crime to determine the crime; The legal term uses words such as science and intentional, intentional, and intentional fraud. There are also cases where such words are not mentioned in the text of the article, and from the content of that article, it should be found that the crime is intentional or unintentional.
Unintentional	Few cases of environmental crime and natural resources fall into the category of unintentional crimes. However, the crime of arson is a deliberate crime; However, according to the law, unintentional fire of natural resources is also considered a crime in certain cases, unintentional crimes cause criminal liability when a person does not observe precautions, regulations and government systems in committing them. Impunity and negligence and lack of skills and disregard for government systems are called criminal offenses. Examples of unintentional combustion crimes are Article 45 of the Law on the Protection and Exploitation of Forests and Rangelands, passed in 1967.

- Crimes committed against inanimate elements of the environment, such as climate, soil, sound and chemical pollution (Mirkamali & Hajivand 2017).

On the other hand; Crimes related to the environment and natural resources are divided into two categories: primary crimes and secondary crimes. Primary offenses are offenses that result directly from contamination and destruction of land resources. Crimes such as water pollution and the burning of forests and pastures are among the types of crimes that are as old as other crimes. But secondary crimes, which often constitute environmental crimes, are crimes that result from violations of environmental laws and regulations. Crimes related to non-compliance with legal rules and regulations in disposing of hazardous waste are among these crimes. Figure 1 shows a schematic

Environmental crimes are divided into two main groups according to their nature:

- Crimes committed against the living environment minus man, which includes all plant and animal organisms. According to the Law on the Protection and Improvement of the Environment, among the duties of the Environmental Protection Agency are the prevention and prevention of any kind of pollution and destructive action that disrupts the balance and fit of the environment. It also covers all matters related to wildlife and aquatic life. According to paragraph 2 of Article 6 of the same law, the destruction of forests and pastures is also one of the cases that upset the balance in the environment and therefore is considered a criminal act.

environmental crimes. Furthermore, violations of environmental laws and regulations lead to secondary environmental crimes than primary environmental crimes.

representation of the concept of primary and secondary environmental crimes. As shown in the figure, the destruction of resources and direct pollution lead to the formation of primary

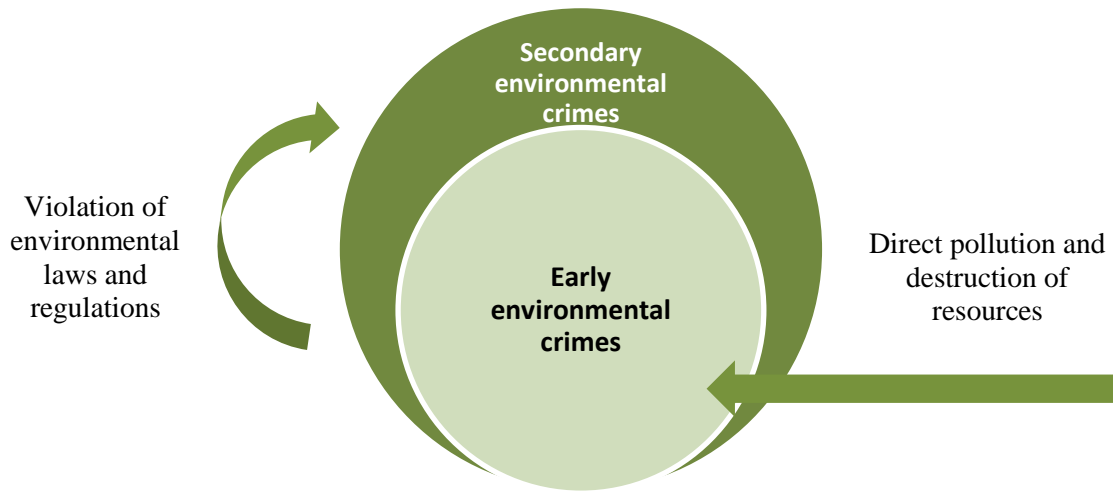


Figure 1: Conceptual form of the relationship between primary and secondary environmental crimes (Editorial, 2018)

Pollution prevention and environmental crime is the first step in response to environmental degradation. Prevention is one of the types of applied criminology that studies and examines the scientific and practical tools and facilities for the prevention of criminal acts. The penal system can also have a side effect of prevention in order to impose penalties. Article 15 of the Rio Convention stipulates that countries must establish preventive and supportive criteria based on their capabilities. Comprehensive environmental law in Iran also provides for the prevention of environmental crime. Iran's natural geography includes a diverse range of ecosystems. Deserts and deserts, mountains, aquatic ecosystems, plains and pastures, forests and trees are the main diversity of the land's natural geography. About 90% of Iran's territory is located within the Iranian plateau. About 180,210 square kilometers of Iranian soil is covered by forests, about 55.5 percent of which are in the oak forests of western Iran, 19 percent in the northern forests of Iran, 13.3 percent in the scattered lowlands in the south and east, 6.6 percent in the Aras mountains, and tropical and desert forests (Dabiri et al. 2016; Abedi et al. 2015). On the other hand, they are the most important factors in the occurrence of environmental crimes in the natural geography of Iran.

In the past, some studies have been conducted on environmental crimes in the country. These include the following: Study on the analysis of environmental crime prevention in the light of UN guidelines. The results showed that the application of the principles and rules in the guidelines of the United Nations, with the focus on the principle of

prevention of biological damage, can be helpful in the prevention of environmental crimes (Mirkamali and Hajivand 2017).

In another study, researchers examined the government's criminal responsibility for environmental crimes in Iran. The results showed that the participation of civil society in the field of environment is recommended by providing access to citizens and empowering them, as well as supporting non-governmental organizations and community-based organizations (Hajivand et al. 2018). In a relatively new study, environmental crime in Iran was analyzed economically (Abedi et al. 2015). Other experts have studied environmental crime prevention, especially in the field of aquatic ecosystems and aquatic resources (Heydarzadeh and Mozafari 2014). In another study, the components and challenges of developing environmental crime indicators from an international perspective were examined (Dabiri et al. 2016). Also, some researchers have investigated the similarities between green crime and green science (Lynch & Stretesky, 2011). UNICRI considers environmental crime, including its links with other forms of crime, a serious and growing danger for development, global stability and international security (UNICRI, 1991). The United States Environmental Protection Agency has conducted numerous investigations into the motives for environmental crimes (EPA, 2016). Past research has focused on the social and economic aspects of crime, as well as their behavioral causes. However, no study has been conducted on the environmental criminology.

The purpose of this study is to identify and classify the types of environmental crimes related to environmental pollution in the country, in the period 2017 to 2019.

2. Materials and Methods

This research is of applied type. It is also analytical-descriptive in terms of data analysis. The research process consisted of several steps:

A) Data collection; by examining and studying in depth and accurate files, reports, documents and official and reliable documents, various types of environmental crimes related to pollution were extracted. In order to verify the data and ensure the comprehensiveness of data collection, a semi-structured interview method was used. The statistical population of the present study includes managers and experts of the Forests and Range Organization and Department of Environment, trusted veterinarians, environmentalists and veteran

foresters and members of NGOs active and well-known in the field of environment. By examining and inquiring from the relevant institutions, the number of qualified people in each of the mentioned groups was determined (Table 2). In this way, it was possible to prepare an initial list of environmental crimes related to the natural environment. Sampling method, target type and sample size with 95% confidence ($Z_{Core} = 1.96$), 169 people were determined (Cochran et al. 2016). The questions were sent electronically to the statistical sample in the form of an audio file to answer them. This process was repeated in some cases. After collecting and preparing the data, they were categorized and thematically separated. For this purpose, all interviews were implemented and coded as text so that they could be more easily categorized. Thus, the initial classification of environmental crimes was obtained.

Table 2: Community characteristics and statistical research sample

Row	Group	Features and characteristics	Number of eligible people (Statistical Society)	Number of eligible people (Statistical Society)
1	Managers and experts in the legal department of the General Department of Natural Resources and Environment	- Have at least 20 years of work experience related to environmental law - Having a relevant education (at least a master's degree)	90 people	51 people
2	Trusted veterinarians	At least 10 years of experience working with the Environmental Protection Agency or approved by the relevant organization	27 people	15 people
3	Environmentalists of the Environmental Protection Agency	- Having at least 20 years of experience in the Environmental Protection Agency as an environmentalist - Having an associate degree (minimum) History of appearing in the courts as a judicial officer	84 people	47 people
4	Foresters of the Forest Organization, 2 rangelands and watershed management	- Having at least 20 years of experience in the Forests, Rangelands and Watershed Management Organization - Having an associate degree (minimum) Background in the courts as a legal representative	53 people	30 people
5	Members of NGOs	- Membership in the system of the Environmental Protection Organization as a well-known non-governmental organization and no bad record - Lack of communication with the public sector - Has at least 20 years of experience Having a relevant degree	49 people	26 people
Total			303 people	169 people

The validity of the questionnaire has been confirmed by professors. In this research, in order to achieve the validity of the questionnaire, an attempt has been made to avoid asking vague, irrelevant and complex questions in designing the questions. Also, since the exact understanding of the research problem determines what concepts need to be measured, the researcher has made every effort to do so. In this study, by conducting an interview as a prerequisite, some sections of the designed questions were corrected. Cronbach's alpha method was also used to measure the

reliability of the questionnaire. For this purpose, 20 preliminary questionnaires were distributed among the members of the statistical population, and after summarizing and analyzing by SPSS19 software, the results show that the validity is estimated to be 0.882, since this value is greater than it is 0.7, so the questionnaire has acceptable reliability.

B) Classification and weighting of environmental crimes: in the next stage, the coefficient of importance of environmental crimes related to environmental pollution in the country was determined. There are several ways to determine

the weight (importance) coefficient, the most common of which is pairwise comparison. To this end, 12 experts in the field of environmental management and natural resources were asked to determine the degree of importance of factors by comparing the factors of couples, so that a comparison between the degree of importance of environmental crimes with the number of occurrences and crimes can be made. Get. In this study, the computational mean method of pairwise comparison was used to calculate the relative weight. For this purpose, first the main matrix columns are normalized and then their linear average is calculated. The incompatibility rate in this matrix was calculated to be 0.01, which indicates the optimal validity of the matrix. Expert Choice software was used for the final analysis. The experts in this study had the following four conditions:

- Joining faculty or research centers across the country;
- Having an acceptable background in the field of environmental management and natural resources of the country;
- Having relevant writings and research;

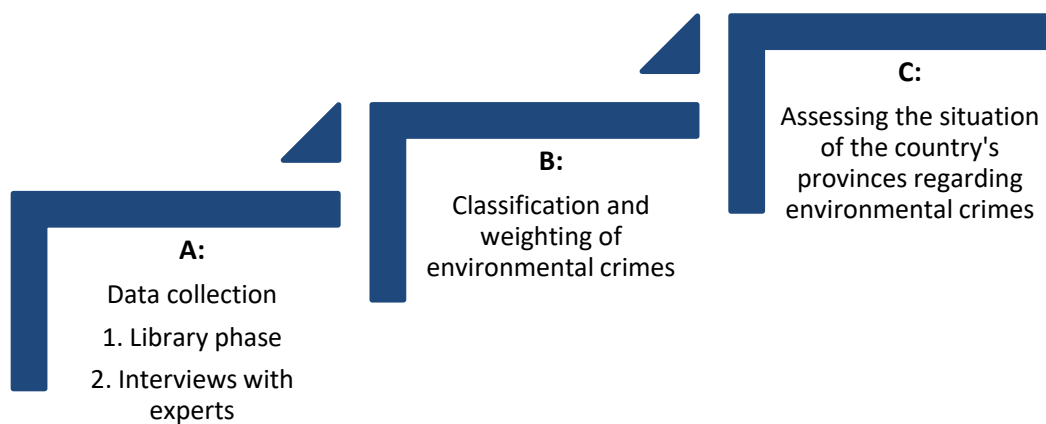
- Having a degree in Forensic Science and Natural Resources;

C) Assessing the situation of the country's provinces regarding environmental crimes: In the final stage, through inquiries from the legal and specialized offices of the relevant organizations, statistics related to violations and environmental crimes by provinces of the country in the period from the beginning of 2017 to the beginning of 2019 were obtained. In this way, it was possible to compare the type and number of environmental crimes in the desired time period and in the whole country. For this purpose, the following centers were inquired:

- Environmental Protection Department (Environmental Protection Unit, Hunting Office, Legal Deputy and Natural Deputy)
- Forests, Rangelands and Watershed Management Organization (Office of Legal Affairs, Department of Conservation and Land Affairs, Department of Forest Affairs, Department of Desert Affairs)

The research flowchart is shown in Figure 2.

Figure 2: Research flowchart



3. Results

According to the findings of semi-constructed interviews and coding, environmental crimes related to environmental pollution in the natural

areas of the country can be divided into 8 main categories (Table 3):

Table 3: Final classification of various environmental crimes related to environmental pollution in Iran

Macro factor	Main category	Indicator
Environmental pollution	Air pollution	<ul style="list-style-type: none"> • Deliberate arson of forests and pastures • Waste incineration • Mineral extraction and extraction (illegal) • Distribution of industries and factories • Burning fossil fuels
	Water pollution	<ul style="list-style-type: none"> • Waste release • Release of industrial effluent • Sewerage of agricultural wastewater to aquatic ecosystems
	Soil pollution	<ul style="list-style-type: none"> • Waste disposal in nature and leachate leakage • Burning waste and unhygienic burial • Sewage enters the soil • Introduction of toxic substances (chemical fertilizers, petroleum derivatives, etc.)
	Sound pollution	<ul style="list-style-type: none"> • Motor vehicles • Industrial activities • Military activities
	Thermal pollution	<ul style="list-style-type: none"> • Release of hot gas into the atmosphere • Release of hot industrial wastewater into aquatic ecosystems • Industrial and urban activities
	Visual pollution	<ul style="list-style-type: none"> • Destruction of natural resources • Damage to biodiversity
	Light pollution	<ul style="list-style-type: none"> • Inadequate and non-standard production of light with luxury (light intensity)
	Wave pollution	<ul style="list-style-type: none"> • Industrial activities • Production of radio waves, satellites, etc.

Then, through the votes of the experts, a pair of environmental crimes was compared to determine their importance from the experts' point of view. As shown in Figure 3, among the eight environmental pollution category, the highest weight belonged to

air pollution (0.876) and then water pollution (0.797). Also; the lowest weight was allocated to wave pollution (0.114).

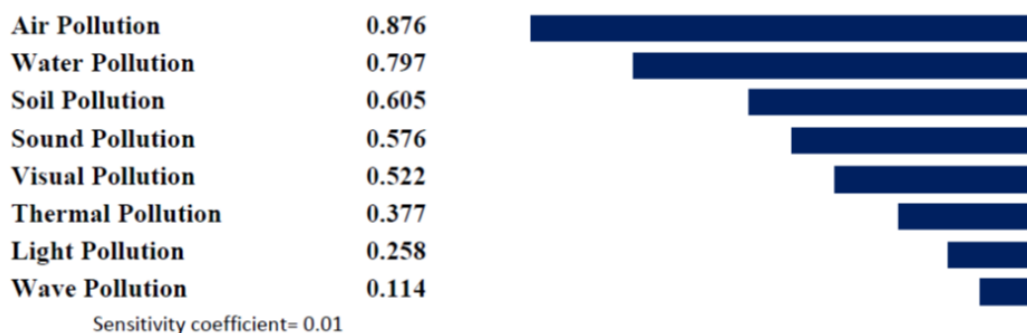


Figure3: A pair comparison of eight crimes from the perspective of experts

A comparative comparison between environmental pollution crimes showed that between 2017 and 2019, statistically, the highest rate of crime was

related to waste pollution and then water pollution. The results are presented in the form of comparative charts in Figures 4 and 5.

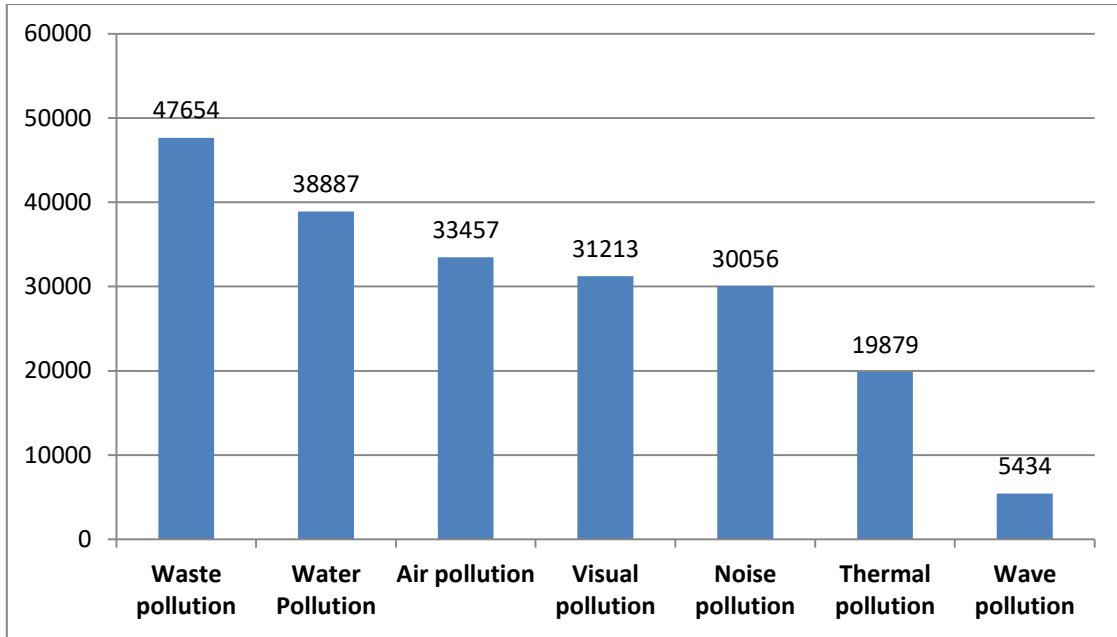


Figure 4: Comparison of the number of environmental pollution incidents in the years 2017-2019 (based on the number of crime cases)

Also; Figure 5 shows a comparative comparison of the years studied in terms of environmental crime. As it is known, in all cases, the process of

committing macro-environmental crimes from the beginning of 2017 to the beginning of 2019 is on the rise.

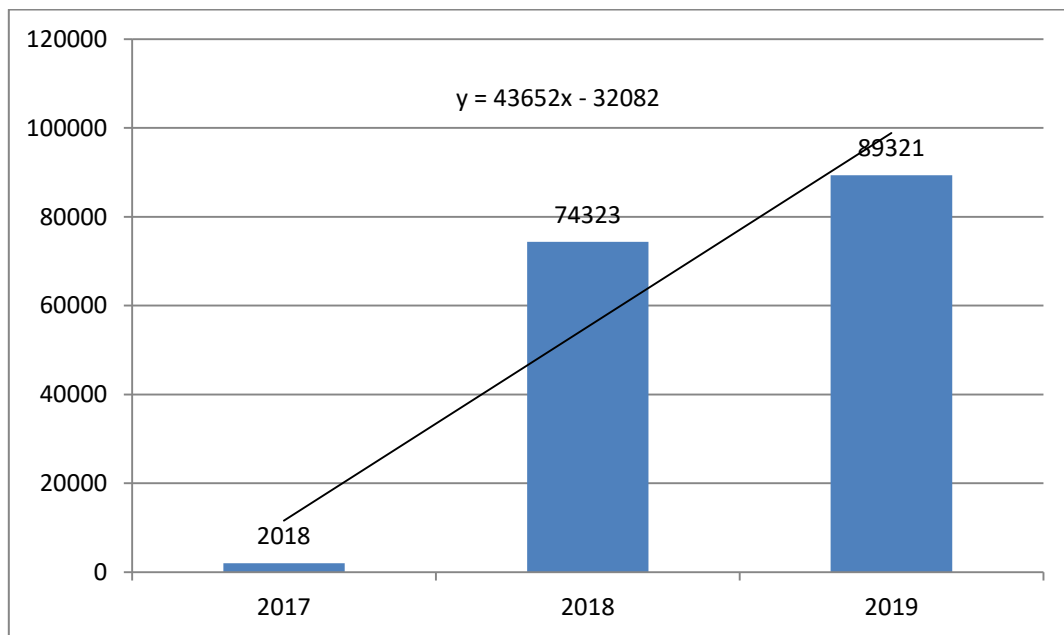


Figure 5: Comparison of environmental crime rates (related to pollution) based on years studied

By examining the archived files and analyzing the statistical data, the situation of the provinces of the country in terms of the number of total environmental crimes committed were determined in the years 2017 to 2019. Accordingly, Mazandaran Province with 6674 cases of

environmental crimes was at the top of the country's provinces and Khorasan Razavi Province with 232 crimes were at the bottom of the list (Figure 6). It is important to note that the upward trend in environmental crime has been observed in all provinces.

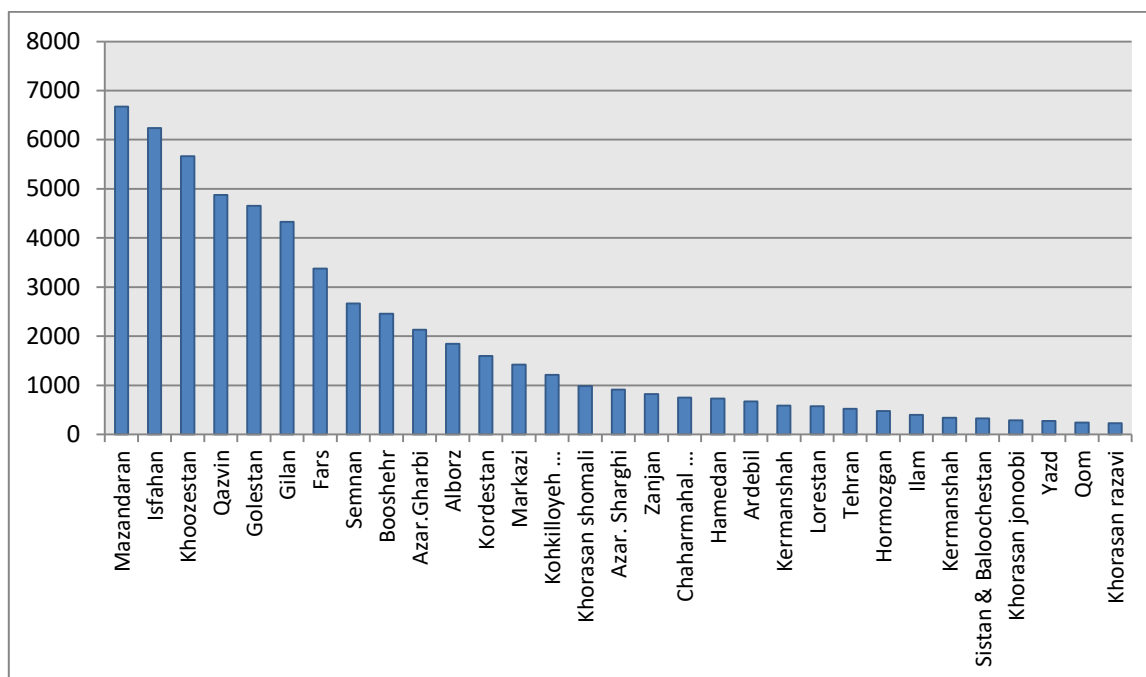


Figure 6: Comparison chart of the number of environmental crimes committed in the provinces of the country (2017-2019)

4. Discussion

The aim of this study is to provide a new typology for environmental crime related to environmental pollution. According to the results of the research, in terms of typology, the crimes of environmental pollution in the country can be classified into 8 main categories. Also; there are also 23 sub-categories related to crime. Among these, the two factors of "air pollution" and "water pollution" are more important. In general, the priorities for environmental pollution in the country are: air pollution, water pollution, soil pollution, noise pollution, visual pollution, thermal pollution, light pollution and wave pollution.

On the other hand, as presented before, between 2017 and 2019, statistically, the highest rate of environmental crimes related to environmental pollution, respectively, in the field of "waste pollution" and then "water pollution" and finally; "Wave pollution." The results of this section are consistent with the research findings (Hajivand et al. 2018). In this study, statistical and ranking data have been presented for the first time.

On the other hand, in all cases, the process of committing macro-environmental crimes has been on the rise from the beginning of 2017 to the end of 2019. The findings of this section are consistent with the overall results of research (Abedi et al. 2015) that believed that the trend of environmental violations is upward. In terms of the total number of environmental crimes in the country's natural areas, Mazandaran Province with 6674 cases of environmental crimes was at the top of the

country's provinces and Khorasan Razavi Province with 232 crimes are at the bottom of the list. Since no previous study has been conducted on environmental crimes in the natural areas of the country's provinces, therefore; there is no comparison between the results. However, as it is clear from the results, the difference between the provinces of the country in terms of the number of environmental crimes is very large. It can be said that factors such as the size of the province, the diversity and multiplicity of natural ecosystems, economic status and cultural characteristics of local communities are influential. The comparative results of the occurrence of crimes in the provinces of the country show that one of the main factors related to environmental crimes in the country is ecosystem diversity. Because with the increase of ecosystem diversity in a province, the diversity of environmental crimes will also increase. Of course, other factors are also involved. A study by (Heydarzadeh & Mozafari 2014) confirms this. The results of this study indicate those cultural characteristics; literacy level, income level and social and economic dissatisfaction in a community affect the rate of environmental crime.

Considering the increasing trend of the number of environmental crimes in the country and considering the variety and multiplicity of types of crimes, it is necessary to accurately identify the reasons and motivational causes of these crimes. In the present study, no study was conducted on the behavioral and motivational causes of environmental crimes. As noted in the research

findings, awareness of the motives, reasons and all the factors that lead the offender to commit a crime can lead to the adoption of the right strategy for the prevention and protection of the environment and natural resources. Some environmental crimes, such as environmental pollution, industrial waste and effluent release, mining, emission of pollutants from industry, and the entry of agricultural and municipal wastewater, are among the items that can be used to prevent or reduce crime through economic means. As stated in the study (Abedi et al. 2015), the use of economic tools such as green taxes, permissible licenses, deposit-repayment systems and environmental crimes are among the strategies that can be effective in correcting current behavior. Eventually, according to most previous studies, such as (Heydarzadeh & Mozafari 2014; Fataei 2017; Editorial 2018) this study also emphasizes the need to prevent the occurrence of environmental crimes. Finally, it is suggested that in the future, the psychological aspects and motives and reasons for committing environmental crimes be studied.

Grant Disclosures

There was no grant funder for this study.

Competing Interests

The authors declare there is no competing interest, regarding the publication of this manuscript

Author Contributions

5. Conclusion

In this study, an attempt was made to categorize the environmental crimes that occur in Iran and also to assess the rate of crimes committed in the provinces of the country. For this purpose, extensive library studies and interviews with experts were used. Then, the data were categorized and the crimes were weighed. As it is clear from the results of the research, the crimes of environmental pollution in the country can be classified into eight main groups. Also, these eight factors can be divided into 23 indicators in more detail. Due to the multiplicity and diversity of environmental crimes in the natural geography of Iran and considering that a large number of the country's provinces have high statistics and the process of committing crimes is increasing, it seems that the application of regulatory principles and punitive crimes for environmental violators is a necessity.

6. Additional information and declarations

Funding

There was no funder for this study.

Askar Jalalian: Analyzed the data, authored or revised drafts of the paper, and approved the final draft.

Hossein Rabani: Proposed the plan, prepared figures and tables.

Mansoor Pournouri: Analyzed the data

Data Availability

All the data are shown in the tables of this article.

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