

# Peace or War? Intelligent Development of Iran Environmental Diplomacy

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## Abstract

The issue of environment is one of the most important axes of a country's development, in other words, Sustainable development of a country is in its environmental group. Attention to the natural environment of the country, water resources, forests and pastures, protected areas and national parks, sensitive habitats. All of them is considered as a key component of a set of neighborhoods, regional and international sustainable development. Economic, industrial and social progress in the past few decades in Iran has caused the environment to be exploited beyond its resource capacity, an issue that left devastating consequences in this area. Iran's strategic position in the Middle East and the world and its financial, economic and political relations have made it more sensitive to environmental issues. Water issues with neighbors, Issues related to environmental pollution and resource constraints, import of various products, Chemical pollution, dust and fire in the eastern, southern and western part of the country, requires strong environmental diplomacy for the country. In this regard, Iran's relations with neighboring countries are the first priority. The main question is whether we are in an environmental war or we are at peace. The purpose of this study is to express multilateral environmental issues with neighbors and create a framework for environmental diplomacy in the country. In this regard, reviewing the process of environmental diplomacy in Iran and providing scientific and strategic frameworks can be a great way for Iran's future in the region.

**Keywords:** Environmental Diplomacy, Smart Framework, Environmental Pollution.

## Introduction

Environmental diplomacy can be divided into two general categories: Regulations for the use of natural resources and regulations related to pollution. In any case, the main issue is that political boundaries rarely show biological boundaries, so that, because the national economy consumes resources and produces pollution, spreading environmental problems beyond their national borders. In the United States, its vast economic dimensions give it both the power to destroy the

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environment around the world and the influence of pressure on diplomatic efforts to protect the environment (Carroll, 1990; Susskind and Ali, 2014; Du and Li, 2020).

History of the United States which has been one of the most prominent countries in the field of environmental diplomacy, but at the end of the twentieth century, the United States found itself mostly outside of it. Because Global debates led to treaties that were increasingly unacceptable to the US government (Chasek, 2001; Flippen, 2008). This loss of leadership coincides with a shift in the direction of bilateral treaties, first to small multilateral treaties and then to conventions that are free for each country. This shift in rational response to international awareness has increased that some of the biggest threats to human society are global environmental problems, but that means that the United States is not in a position to shape events in its favor (O'Brien, 2012).

Environmental diplomacy is almost always a secondary or even a third goal of the foreign policy of a country like the United States. However, at the same time this diplomacy is often the product of intense domestic political pressure. Because NGOs have done an eminent act to the concerns of their members in the diplomatic agenda. In this way, it usually represents the main and interior goals of diplomatic and time (Mead, 2013). Thus, in the twentieth century, such trends and policies as Progressivism, good neighborly policy, restraint, degeneration and the environment, as well as the state of the national and global economy, played a key role in shaping specific treaties (De Grazia, 2009). In addition, increasing scientific knowledge and also public awareness and belief in this science are important elements in shaping the course of diplomacy.

The United States almost always support the use of science strongly as a neutral tool in international environmental protection, especially in moving towards static pacts to dynamic bodies that can cause problems. Finally, it must be acknowledged that as there are formal and informal forms of diplomacy, there is also a type of environmental diplomacy. While the focus here is broadly on conventions and treaties, you need to keep in mind that the United States' overwhelming passion for imported goods has unintended international environmental impacts which, in fact may be created by environmental diplomacy more than what is done by formal diplomacy (Finger and Princen, 2013).

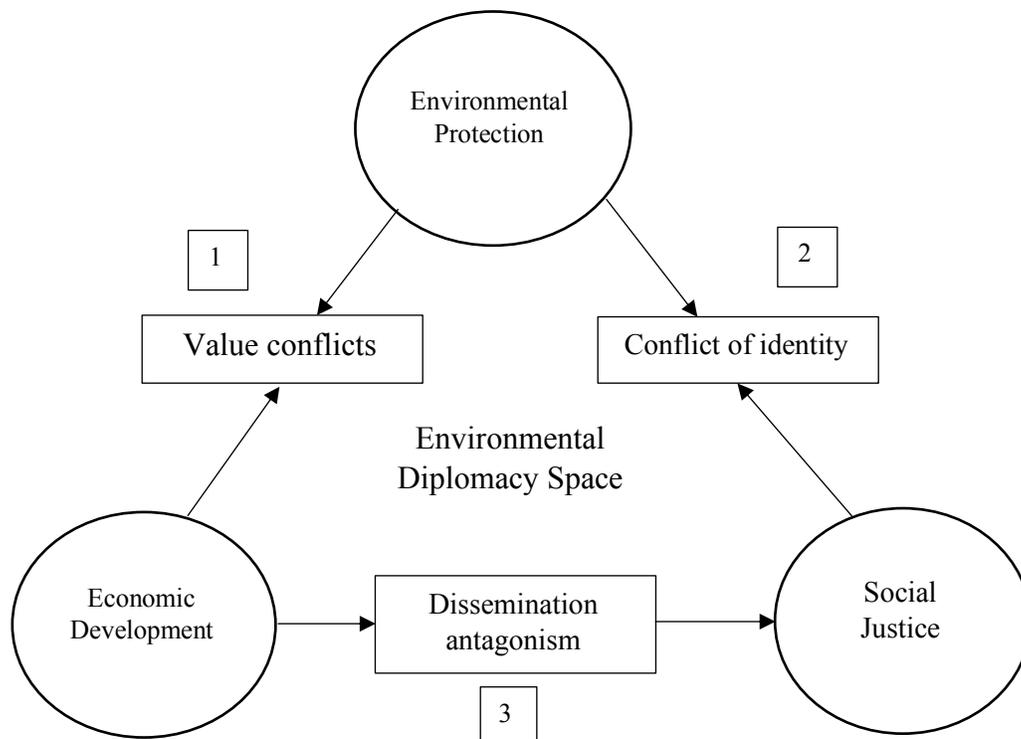
The term "environmental diplomacy" still remains and remains contradictory in terms of definitions. The main researchers of international relations consider the framework of the definition of environmental diplomacy in the negotiations between the governments of the two countries in order to monitor the environment (Tolba, 2008; Stoller, 2015). However, for researchers in interdisciplinary environmental studies, the term has a broader meaning in the context of natural resource dispute negotiations as well as the use of tool-based dispute resolution and making peace. After establishment of the United Nations Environment Program (UNEP) in 1973 environmental diplomacy has gained its true value, due to the importance of this issue, environmental issues will be given more attention soon. However, it can be said that environmental diplomatic efforts can use by International Convention on the Regulation of Whaling, which initially signed by 15 countries in 1946 and 1948. The term has become more widely used after United Nations Conference on Environment and Development (UNCED) in 1992, which known as the World Summit or Rio leader's convention, after the Rio de Janeiro conference was common. The advent of this international assembly that has connected world leaders, noticed the world leaders from various specialists in the fields of international law, political science and regional planning (McAllister, 1992; Wapner, 2003; Chasek, 2001; Al-Saidi, 2019).

Lawrence Susskind, Founder of the Public Disputes Program at Harvard University, published the environmental diplomacy in 1994, the second edition of this book was published 20 years later, which expanded the revision of term and its use.

Susskind used this term in his early concepts that includes multilateral environmental agreements and how most of them negotiate on broader international security priorities.

Diplomacy in the past was more understood in the sense of interaction based on the right of sovereignty between nation-states. So environmental diplomacy in this conventional view was also considered in the context of interactions between national governments in environmental policy. The term implies the provisions of any international dispute over global environmental management (such as South Pole treaty) or a preventive treaty process to manage global issues (such as ozone depletion or climate change). However, the use of this term has expanded today to address ways to resolve environmental disputes arising from conservation prioritization efforts. Sometimes the term is also used to refer to routes that can be manually in diplomatic activities between enemies. Some kind of literature in this field is called as "peace building the environment"

Environmental conflicts occur at the intersection of ecology and society and hence the limitations of natural systems on the one hand and social values, on the other hand, are limited and what is important to note is that environmental conflicts are about governing ecosystems and the value that we may want to preserve such areas of shared resources for future generations (Houballah et al., 2020; Fabinyi et al., 2014; Rogers et al., 2013). Ecologists have a long-term vision for the future and more comprehensive understanding of global problems and hence they avoid the scope of future declines more than economists, whose accounting processes pose major challenges to resolving environmental issues and decision-making (Martin et al., 2020; Rees, 2003; King, 2020). We can identify three key components of any environmental conflict that are consistent with the sustainable development literature: environmental protection, economic development; and social justice, illustrated in figure 1. (Orr et al., 2008; Ali and Vladich, 2016)



**Figure 1.** Structure of environmental interactions and cooperation opportunities for diplomacy

## **Iran International Environmental Conflicts and disputes**

### *Pollution of the Caspian Sea*

Currently, 75,000 tons of oil products and waste flow into the Caspian Sea through rivers every year. And this while each tone Oil pollutants pollute an area of about 12 square kilometers. The Volga River in Russia with 300 adjoining branches passing through the lives of 80 million people, only 95% of the Caspian Sea is polluted by dirt. Russia's Ural River also enters the Caspian Sea through radioactive contaminants (Azimi et al., 2020; Hassanshahian et al., 2012; Ivanov et al., 2012; Sanei, 2001). The situation in other countries is also unsatisfactory. Currently, in the coastal areas of the Caspian Sea, in total, there are more than 200 towns and villages that send their industrial, domestic and agricultural wastewater to the Caspian Sea. Only from the industrial city of Baku about 300 annually One million cubic meters of wastewater enters the Caspian Sea and according to the statistics of the non-governmental organization "Greens" of Azerbaijan about 3,000 oil wells in the ABSHERON region of Azerbaijan pollutes 35,000 cubic meters of Caspian water. In some parts of the Caspian Sea, oil pollutants are up to 10 times and other pollutants up to 3 times the standard level, and recently areas without environment Biology has emerged in the Caspian Sea, which contains up to 20 times the standard level of pollutant density. Lack of sufficient attention of the coastal countries to the environmental situation of the Caspian Sea and the unresolved issue of the legal regime of this closed sea in case of Continuity can become an irreparable crisis (Salahova et al., 2017; Bastami et al., 2015; Kostianoy and Kosarev, 2005).

Of course, the presidents of the Caspian littoral states in a meeting in Tehran in 2003 made regulations for the protection of the marine environment of the Caspian Sea called the "Tehran Convention" and this convention as the first comprehensive agreement of the five Caspian littoral states is encouraging. However, maps related to pollution, environmental and animal resources of the Caspian Sea is not very promising (Akhmadiyeva and Abdullaev, 2019; Bayramov, 2020; Rizzolio, 2020). In addition to the issue of Iran's share of the Caspian Sea, there are also taints that is said some uranium to be present in the Caspian Sea.

### *Persian Gulf pollution*

Environmental pollution has been one of the major challenges in this area in recent years. Construction of oil rigs, centers and pollution of the Persian Gulf Refineries around the Persian Gulf and the entry of oil, chemicals and effluents into the water are the main culprits of this pollution. Annually more than 10,000 vessels pass through the Persian Gulf and the Sea of Oman which 75% of them are related to the transportation of crude oil and petroleum products and following it the dumping of various wastes are the other defendants of the southern gulf of Iran (Mafi-Gholami et al., 2017; Modarress et al., 2012). Due to the different natural conditions prevailing over the water area and the lands of the Persian Gulf, this region has little capacity for self-improvement and Natural wounds on its body destroys more suitable areas of life. reviewing over the environmental situation in the Persian Gulf in the years 2004 to 2013 can be referred to the factors of population growth in the coastal settlements, industrial activities, increase of coastal tourism, Illegal hunting and trapping of birds and aquatic animals high use of agricultural pesticides, high use of agricultural pesticides, adverse spread of urban and rural wastewater and low quality of purification sewage , lack of integrated management of municipal and hospital waste, as well as regarding agricultural drainage , uncontrolled extraction of sand and ballast from sea and rivers, lands use change, increasing exploration activities and oil and gas extraction and related

industries, also declining biodiversity and habitat degradation and the arrival of invasive non-native species was referred (Sharifinia, 2018). According to studies, about 1.5 million tons of oil leaks into the Persian Gulf annually based on recent studies in the ROPME area, the amount of oil pollution in sediments has decreased in recent years and most of the pollution is related to the region of Bahrain and Qatar (Nadim ET AL., 2008).

One of the most disturbing pollutants that darkens the waters of parts of the Persian Gulf is hydrocarbons. Hydrocarbons that are so concentrated that are three times more concentrated than in North Sea and twice as concentrated as in the Caribbean and have disturbed this Persian Gulf. Power plant and desalination plants are not deprived to sea pollution. So that 175 thousand cubic meters per hour, the effluent is discharged to the sea per hour. Pollution also ranks first in the electricity and desalination industries (Soltani et al., 2019; Jafarabadi et al., 2018; Wilson, 2011).

#### *Dust in the west and southwest of Iran*

One of the air pollutions that we have witnessed in recent years, sometimes in the western, southwestern and recently central regions of Iran, is the phenomenon of dust or, to be more precise, dust storm. This phenomenon occurs due to climate change due to reduced rainfall and drought in the desert areas of most countries such as Iraq, Saudi Arabia, Iran, Pakistan, etc. in the warm seasons and it can be called a natural geographical process. In recent years, due to the expansion of deserts and human activities that have caused the drying up of wetlands and lakes and the movement of large masses of fine-grained soil in Iraq, Syria and Saudi Arabia, and in the form of a huge front of dust, severe air pollution in large areas of Iran. According to research conducted by the US Air Force Research Center NOAA in Iraq, the main cause of the intensification of sandstorms, especially dust in Iran, is the spread of deserts in the eastern parts of Iraq, especially in the Aljazireh region. This region is located near Baghdad, between the two rivers Euphrates and Tigris, which in the past had countless wetlands and lakes. However, the ongoing droughts in the region since 1990-91, along with declining rainfall and the percentage of moisture and environmental factors such as water divisions in the upper Euphrates by Syria, the construction of dams in several parts of the Tigris River by the Turkish government. The indiscriminate use of water by rivers, lakes and even wetlands for agricultural purposes has caused all the lakes and wetlands in the desert, especially the Al-Jazeera region, to dry up completely (Bolorani et al., 2020; World Bank, 2019; Zoljoodi et al., 2013; Albarakat and Lakshmi, 2019; Middleton, 1986). On the other hand, with the drying up of existing water resources, vegetation and reeds in these areas have been almost completely destroyed due to successive droughts, livestock use and, most importantly, the effects of the Iraq-US war, and thus particles The bed of lakes and lagoons, which are very small (about clay), are easily placed in the path of strong monsoon winds in Iraq called the north wind (Shamal) and are suspended (Williams, 2007).

#### *Southeastern Anatolia Plan*

The Southeastern Anatolia Project, or GAP for short, is a development project under which the Turkish government intends to build a series of dams and hydropower plants on the upper reaches of the Tigris and Euphrates rivers. In this project, 14 dams on the Euphrates, 8 dams on the Tigris and a total of 19 hydroelectric power plants will be built. After the completion of this project, it is planned to irrigate 1.7 million hectares of agricultural land and generate 55 billion kilowatt hours of electricity annually (Bilgen, 2019; Bilgen, 2018; Tortajada, 2004; Atalan, 2001).

With the final completion of the Gap project, Turkey will control about 45% of the waters of the Tigris and Euphrates rivers. According to some estimates, the cumulative effect of water abstraction for agriculture and industry, evaporation from the dam lake surface, disturbance of the hydrological system of the watershed of these two rivers and the effect of climate change and global warming, can reduce the next one or two decades up to 80% of the water entering Iraq.

The Euphrates River enters Syria from Turkey and, passing through this country, enters Iraq and finally flows into the Hoor-al-Azim Lagoon. The Tigris River enters Iraq directly from Turkey and after irrigating the country, it finally reaches the Hoor-al-Azim Wetland, so most of the water entering this wetland on the border with Iran is supplied through the Tigris and Euphrates.

One of the most important dams in this project is Ilisu Dam; The Turkish government, which has prevented water from entering Syria and Iraq in the past two decades by building many dams in the southern Anatolian Basin and its main sources and the Euphrates, is building the 43 billion cubic meter Ilisu Dam with a capacity equivalent to three times Iran's largest. (Karkheh). The Ilisu Dam will eventually lead to the drying up of agricultural lands in Iraq, starving many farmers and ranchers, and destroying the thousands of years of Iraqi civilization in the middle of the river (Bachmann et al., 2019; Al-Ansari and Knutsson, 2014; Ahmmad, 2010; ansen, 2012; Al-Najim, 2005). According to many experts, one of the main reasons for the drying up of wetlands in the West Asian region, especially in Iraq, Iran and Syria, and consequently the rising dust in the region, is due to the implementation of the huge Anatolian project in Turkey. More worryingly, an environmental disaster struck in southwestern Iran as the Turkish government prevented Euphrates water from entering Iraq and eventually the Hoor-al-Azim wetland and the pond, which was once a fishing ground for residents and a natural air-cooling system, is gradually losing its function. In the current situation, the finalization of the Ilisu Dam on the Tigris River, another water source of Hoor-al-Azim Wetland, must wait for the imminent death of this wetland and a major environmental disaster in Iran (Zarei, 2020; Yousuf et al., 2018; Warner, 2012; Hamza, 2010).

### *Silent water war between Iran and Afghanistan*

Reducing or increasing most of Iran's water and environmental problems in the eastern and southeastern parts of the country depends on the type of natural resource management in Afghanistan and how Iran interacts with this country; A country that has significant water resources and a large part of the seasonal and permanent currents of eastern Iran, such as the Helmand River, originates from this country. Hamoon International Wetland is one of the most important wetlands in the world and the largest freshwater lake in the Iranian plateau, with an area of about 5700 square kilometers and a depth of 1 to 5 meters in the desert and desert region of the east, located in the Sistan region. During the successive drought and the cut off of the Helmand River by the Government of Afghanistan, the water of this wetland has dried up and has created many problems for the environment and the economy of the region; Most of the residents near the wetland, whose source of income was from mat weaving and fishing from the wetland, are currently unemployed. According to the analytical report of the official website of the Turkish State Radio and Television Organization, in general, the view of the Afghan government on water is as a source of hydrocarbons, and in the natural view of the Afghan government, water is like oil and the government must cover part of its expenses by selling water to its neighbors (Akbarzadeh, 2014; Dehgan et al., 2014; Najafi and Vatanfada, 2011; Yousefi et al., 2017).

In just one case in the 1980s, the Iranian government provided \$ 2 billion in financial assistance to Afghanistan. In terms of importance, this amount should be compared to the total US financial assistance to Afghanistan during the Cold War, which was close to \$ 500 million; Afghanistan

believes that by controlling its outflows to Iran, it is able to control Iran's behavior and political decisions regarding the sale of cheap oil and the reception of migrants (Vekerdy et al., 2006; Rubin, 2013; Thomas and Varzi, 2015, Afghanistan et al., 2016).

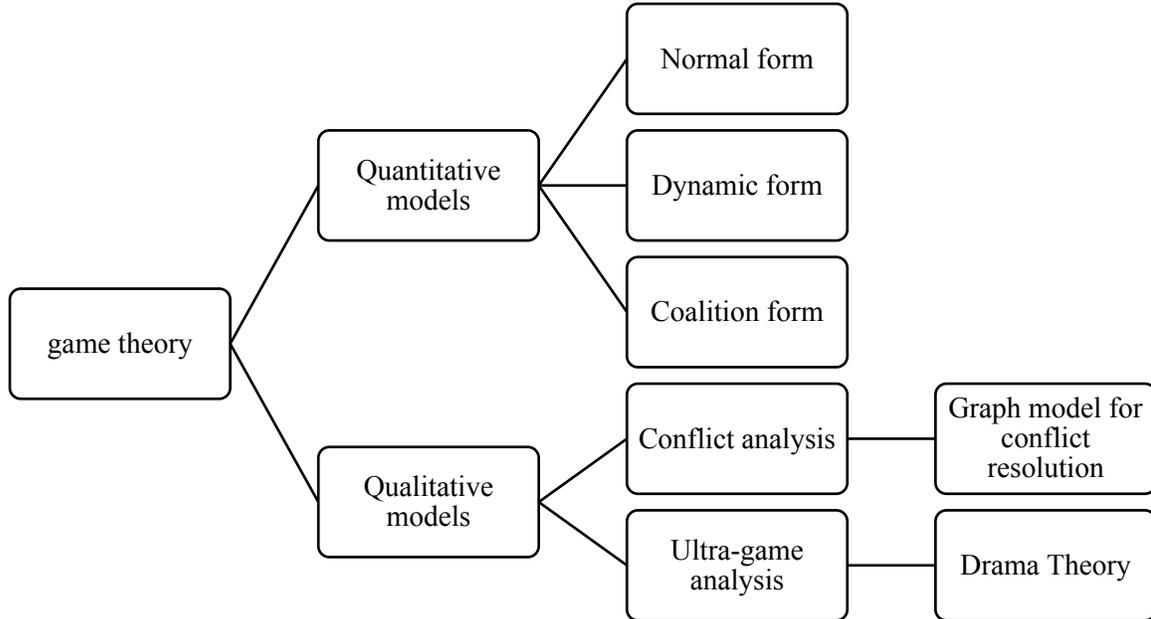
The main problem between Iran and Afghanistan began when British colonial-backed Afghan political leaders in the early twentieth century considered the Helmand River to be an internal river and considered any use of its water to be their "exclusive right" (Barfield, 2004; Islam, 2011).

In this regard, Afghanistan has so far received many concessions from Iran for allowing the entry of river waters. Afghanistan's water policy (despite its unstable dominance in its political sphere) is influenced by the country's geopolitics. All Afghan rulers of all persuasions know that they will be able to control their neighbors through water control. Ashraf Ghani Ahmadzai remarks in Tehran indicate part of Afghanistan's new geopolitical policy toward Iran through various blue levers. In a way, it can be called the policy of "water against immigrants"(TRT, 2019). He said at the Afghan embassy in 2015: "Kabul is not in a weak position in the face of neighboring countries. Neighboring countries also need Afghanistan. We have not begged Tehran to solve the problem of migrants. There is no need to beg" (TRT, 2019).

Ghani referring to the "Harirod water basin", said: If the Iranian government does not take action to resolve the refugee problem, Kabul will not see the need to comply with Iran's demands regarding Iran's "Water right." Kabul is not in a weak position in the face of neighboring countries, and neighboring countries also need Afghanistan. "If Iran continues to deport Afghan refugees, Afghanistan will cut all trade relations with this country"! This threat has been made in exchange for more concessions for Afghan refugees, and the severance of trade ties between the two sides with a volume of two billion dollars a year is considered as a guarantee of its implementation (TRT, 2019). However, the Iranian government's treatment of Afghan refugees has been unparalleled over the past three decades, and the United Nations has thanked Iran for this; but it seems that the Afghan government intends to solve part of its internal problems by migrating its citizens to neighboring countries and importing currency from those countries. Looking at the issues mentioned above, it seems that the situation in Iran at this time is very difficult in the face of environmental problems and requires complex regional and international tactics against its neighbors.

## Materials and Methods

In this study, considering that Iran must act with each of the opposing parties through a specific process and strategic decision-making, it is suggested to benefit from game theory (Mediavilla et al., 2020; Luo et al., 2020; Kelly, 2003; Bond et al., 2016). In this study, based on the issue of water between Iran and Afghanistan, tactical analyzes are performed and after discussion and conclusion, approaches to the development of environmental diplomacy in Iran are presented. Game theory is the study of mathematical models involved and collaborating in the decision-making method and the intelligent and logical selection of decision makers in a game. Game theory is a branch of applied mathematics used in the social sciences, especially in economics, biology, engineering, political science, international relations, computer science, marketing, philosophy, and poker (Li et al., 2020; Long et al., 2020). Game theory attempts to use mathematics to estimate behavior in strategic situations or in a game in which one's success depends on the choices of others. Game theory attempts to model the mathematical behavior that governs a strategic situation (conflict of interest). This situation arises when a person's success depends on the strategies that others choose. The ultimate goal of this knowledge is to find the optimal strategy for the players. The types of classification of different models of game theory are presented in figure 2. (Han et al., 2012; Colomer, 2000)



**Figure 2.** Types of different models of game theory

Initially, game theory was equivalent to a zero-sum game, in which one participant's profit (or loss) is exactly equal to the other participants' losses (or profits), and players gain what another player has lost. Today, game theory is a mother word for sciences that analyze the logical interaction of humans, animals, and computers. A game consists of a set of players, a set of moves or strategies, and a specific outcome for each combination of strategies. Winning in any game is not only a function of luck but also has its own principles and rules and each player during the game tries to use those principles to get closer to victory. Competition between the two countries for nuclear energy, the mechanism governing relations between the two countries in resolving an international dispute, competition between two trading companies in the commodity exchange market are examples of games. This model consists of a finite set of  $N$  actors, for each actor  $i$ , a set of movements  $A_i$  and a priority relation on the set of movements.

Consider each motion view  $a = (a_j)_{j \in N}$  as an output, and represent the set of all outputs  $\times_{j \in N} A_j$  with  $A$ . The main difference between a strategy game and a decision problem is the need to define the priority function of each player  $i$  on set  $A$  instead of  $A_i$ . Each actor must not only be concerned about his own movements, but must also pay attention to the movements of other actors. The following is a general definition of a strategy game:

- $A$  finite set  $N$  (set of actors)
- $A$  complete set of  $A_i$  for each actor  $i \in N$  (set of available moves for actor  $i$ )
- $A$  priority function  $\succeq_i$  on  $\times_{j \in N} A_j$  for each player  $i \in N$  (actor priority relationship  $i$ )

If the set of movements of each actor  $i$  is finite as  $A_i$ , we call the game finite.

The high degree of abstraction of this model makes it possible to use it in a wide variety of situations. An actor may be a human being as an individual, or any other decision-making entity such as a government, the board of directors of a company, the leader of a revolutionary movement, or even a plant or animal. The model has no restrictions on the set of movements available to an actor. However, the scope of application of the model is limited due to the need for a priority relationship for each actor. An actor's priority relationship can simply reflect his or her feelings

about possible outcomes, or about a living being [like a plant] that does not act consciously, his or her chances of success in reproduction. The fact that the above model is a very abstract model on the one hand has its advantages that lead to its application in a wide range of problems, but because the model does not depend on the unique features of the problem, it is a weakness for it. In fact, at this level of abstraction, few results are obtained from the outcome of the game; to get interesting results from a problem, one must also pay attention to its specific features.

### **Game components**

Each game in this theory can be presented according to 5 main components. These three components are:

*Players:* Each decision maker in a game is named as a player. The player can actually be in the form of an individual or a group that can vary between two, three or n players depending on the type of game.

*Strategy at the disposal of each actor:* It is a regular chain of actions that the actor can choose in different steps of the game. Every possible choice of a player in a game is called strategy. Strategies are the same set of possible actions for each player and the choice of each player will lead to different consequences for that player.

Game sequence: what actor moves in each step of the game?

*Information structure:* At any moment of the game, each actor can know what information from the movements and preferences of the other side.

Game outputs: The final result and the amount of return to each player at the end of the game, which includes the desirability of each player and can be in the form of arithmetic value such as dollars or numbers and ... or ranking (ordinal). It should be noted that players will always seek to get the most out of a game.

### **Game types**

Game types can be classified as follows:

- 1- Playing with a total of zero: In this game, the profit of one actor is equal to the loss of another player.
- 2- Playing with a non-zero sum: In this game, the decisions of an actor may end in favor of all actors.
- 3- Cooperative game: In this type of game, there is a possibility of compromise and collusion with others.
- 4- Non-cooperative game: In this type of game, there is no possibility of compromise and collusion between the participants.

### **Nash equilibrium**

This non-cooperative balance was first proposed by John F. Nash, winner of the Nobel Prize in Economics in 1994.

In this form, the balance of each player, without collusion or cooperation with others, and regardless of the welfare of the community or any of the other actors, adopts the best possible strategy in line with their interests. Nash equilibrium follows the game with the goal of reaching a win-win situation. In other words, this is a way to predict what the outcome will be if several individuals or institutions are involved in simultaneous decision-making and if the consequences

depend on the decisions of others. John Nash's simple approach and basic idea is that if we analyze the decisions of different decision makers separately; As a result, we cannot predict the outcome of their choices. Instead, we have to ask what each player does, considering the decisions of the others. Also, the presuppositions of this game in its simplest type are such as one-sided, non-fuzzy, non-coordinated, symmetric, non-participatory, non-random, with full awareness, wise and non-dominant and mechanically.

The Nash equilibrium model looks for a point at which no actor (assuming the rest of the game is fixed) will benefit more if he takes the next step and changes his game. Therefore, at the Nash equilibrium point, all actors are in a state of relative satisfaction or absolute satisfaction and are reluctant to change their game due to the knowledge that it is damaged. Basically, in Nash equilibrium game theory, three general components must be considered. Actors, actors' actions and behaviors, determining the preferences and finally evaluating each actor's behavior in relation to other actors' behaviors. But the game of environmental pollution or the arms race in which competition between producers is to the detriment of countries and people and consumers is a kind of dysfunctional non-cooperative balance. Of course, arms control pacts can turn this balance into a less dysfunctional non-cooperative balance, and competitors can increase their margin of safety and well-being (Yan, 2020; Daskalakis et al., 2009).

### **The principle of pareto efficiency**

This concept is a state of resource allocation in which it is not possible to improve the situation of one person without worsening the situation of another person. In an initial allocation of resources among a group of individuals, a change in that allocation that causes an individual condition to occur without a negative change in another individual condition is called a pareto promotion the allocation is called pareto optimization in which pareto upgrade cannot be applied.

If economic allocation in a system does not have pareto efficiency, there is a potential and potential factor for pareto improvement and an increase in pareto efficiency through redistribution. Improvements and improvements to the condition of at least one person can occur without reducing the good condition of any other person. It is important to note that changing from a non-optimal allocation to an optimal allocation is not necessarily a pareto upgrade. In game theory, the same can be said, in other words, in games that are based primarily on full cooperation between decision makers, in fact, in search of the best pareto solutions, pareto upgrade (Isac, 2002; Carlier et al., 2012; Gayer et al., 2014).

### **Results**

To investigate and predict the situation in the silent water war between Iran and Afghanistan, in game theory, we follow the Nash equilibrium model in the game stage. It should be noted that the current situation in Iran is in the best situation in terms of Afghanistan and the enjoyment of 50% of Helmand water rights for Hamoon Wetland in Iran is in the best situation in terms of Iran. The future situation that we are currently negotiating is the establishment of 26 cubic meters per second (less than one third of Iran's right) water rights set in the 1331 agreement for Iran and the admission of illegal Afghan immigrants and the establishment of excellent living conditions.

The reason for choosing the preferences of each game needs to be further explained, which is not included in this study, but a summary of it is mentioned in the introduction in the section on silent water war between Iran and Afghanistan.

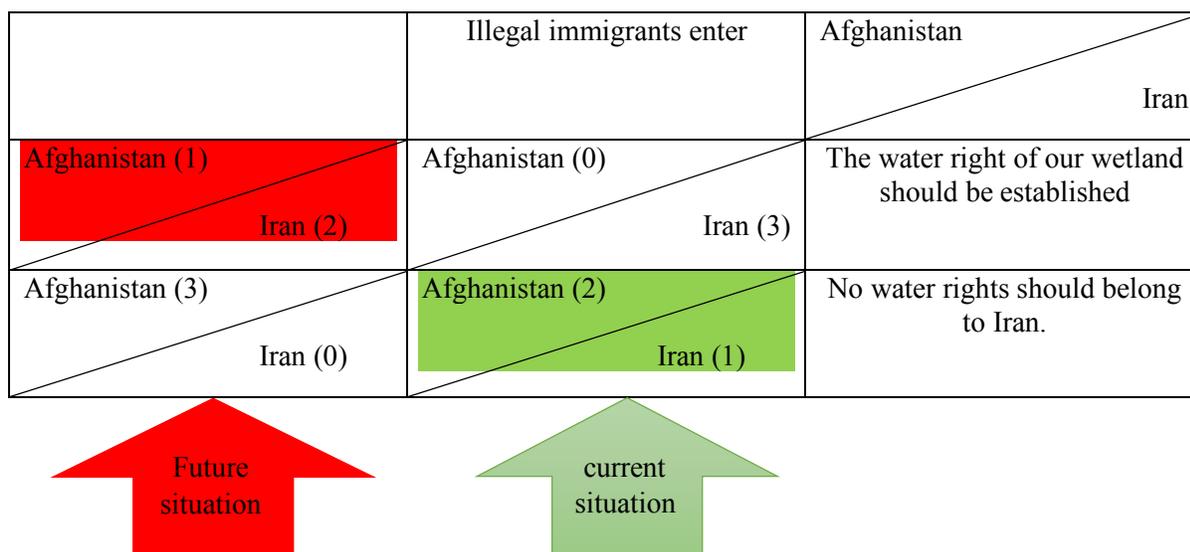
*Game between two actors [Afghanistan] and [Iran]*

Actors »[Iran] and [Afghanistan]

Behaviors »Iran: Accepts or does not accept illegal immigrants / US: Accept and give or not accept the right to water of Hamoon Wetland (water needed by Sistan).

Preferences »Iran: Illegal immigrants, do not enter + the right to water of Hamoon Wetland should be established / Afghanistan: Illegal immigrants, enter + the right of water should not belong to Iran.

Evaluation of Behaviors »Iran: Illegal Immigrants, enter + The Water Right of Hamoon Wetland should be established (2), Illegal Immigrants, should enter + No water right should be granted to Iran. (0), Illegal immigrants, do not enter + water rights of Hamoon wetland should be established (3), Illegal immigrants, do not enter + water rights do not belong to Iran. (1) / Afghanistan: Illegal immigrants, enter + water rights of Hamoon wetland are established (1), illegal immigrants, enter + water rights do not belong to Iran. (3) Illegal immigrants, do not enter + water rights should be established in Hamoon wetland (0), illegal immigrants should not enter + water rights should not belong to Iran. (2) The behavioral evaluation matrix is shown in figure 3.



**Figure 3.** Behavior evaluation matrix

*The green box means the state that "illegal immigrants do not enter + no water rights belong to Iran" is the state of balance in the Iran-Afghanistan game. Because, firstly, Afghanistan does not want to change the game because it goes from 2 points to 0 points and does not have problems with its welfare and security and tends for immigrants to enter Iran in any way; Secondly, Iran does not want to change the game because it goes from 1 point to 0 points. In other cases, one of the parties does not want to change his game.*

*As a result, it should be noted that at this stage the balance is not reached in a situation where illegal immigrants do not enter, and No water rights should belong to Iran. In other words, this is exactly the situation we are in. That is, the parties are reluctant to take the next step and change this situation.*

Game theory can be one of the main methods proposed to resolve disputes of shared resources, especially in the field of water resources and the environment. Of course, it is worth noting that the

use of this method in resolving water and environmental disputes is less than other dispute resolution methods and is a relatively new topic.

Among the various models, game theory used to resolve these disputes, the use of qualitative and non-cooperative models is much less than cooperative models; as can be seen in the above issue, and the work model is a non-cooperative model. As can be seen in this issue, Nash's solution, other definitions of equilibrium in the water disputes of game theory have been made by only a few people. According to experts, non-cooperative models have advantages such as: considering the conflict of decision makers and a strong desire to increase personal profits (illegal immigrants or water rights of Hamoon Wetland), no need to weigh a little on the criteria and Decision makers, use of qualitative and relative data and reduce the relative volume of calculations.

Environmental conflicts and disputes, especially in the water basin, which is the source of life of a land, are part of the common issues in the management and engineering of systems, which are multi-criteria and multi-decision-making in nature. In other words, these issues have several stakeholders with conflicting preferences who must interact with each other to make managerial decisions (Sobhanieh, 2014). Afghanistan views the Helmand and Harirod rivers as a political tool and bases its foreign policy doctrine on Iran and Pakistan on this; Continuation of this policy will lead to the closure of life in the eastern half of Iran and will create crises such as unemployment, migration, dust, marginalization and, most importantly, the civil war over water. In Iran, widespread propaganda based on the environment was one of the most important propaganda axes of the 2016 presidential election, which shows the sensitivity of the issue in the major provinces of the country.

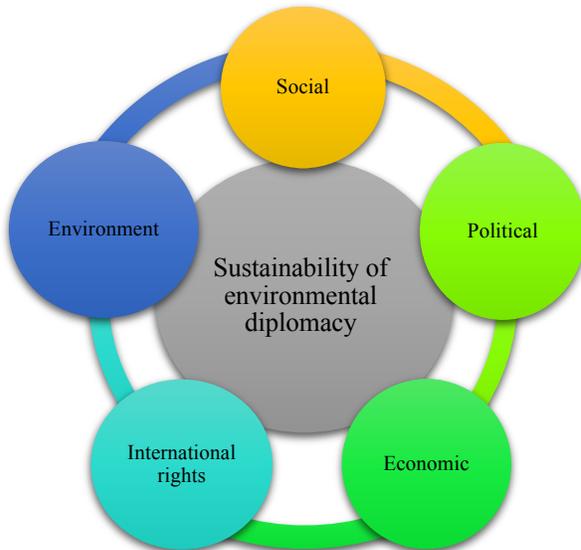
### **Pareto upgrade solutions or pareto optimal**

Collaborative models assume full cooperation between players to achieve the optimal result for the system. Thus, in collaborative models, the problem is changed from multi-decision and multi-criteria to single-decision and multi-criteria and then solved. Such similarities, according to game theory experts, have led to easier understanding and familiarity of researchers with these models than non-cooperative models. In fact, in these models, the decision functions of the decision makers are merged with each other and a hybrid goal function is created so that the problem is changed from multi-objective to single-objective. In such matters, only one informed and powerful decision-maker is defined, and then the final decision is made fairly and according to the criteria announced by the stakeholders in the issue.

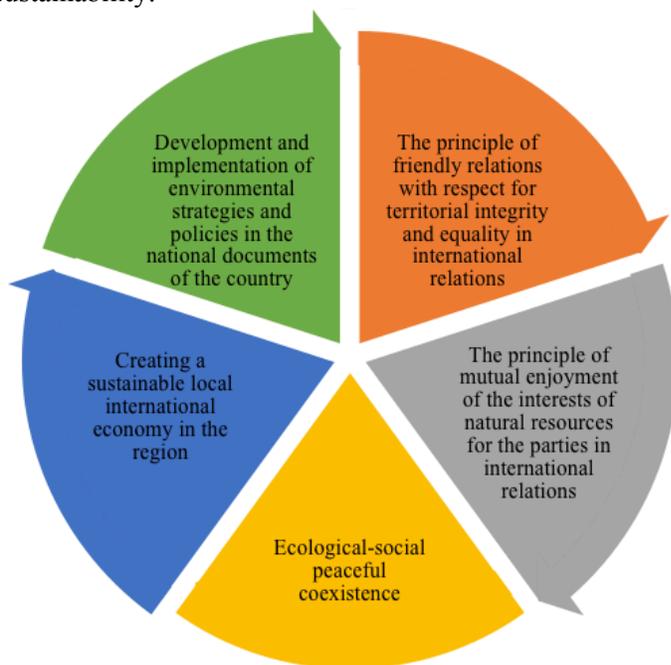
In non-cooperative models, stable results do not necessarily predict pareto optimally. Because the premise of this model is that the main concern of players, maximizing their personal benefit in the game, knowing that the final results of the game are the product of all decisions made by players. Just like Afghanistan's non-cooperative model with Iran, this situation imposed on Iran will gradually cause more serious damage to the ecosystem and the environment, and has clearly become a challenge that could jeopardize national security. While the results in non-cooperative games such as Iran and Afghanistan are not necessarily pareto optimal. In fact, pareto optimism is a situation under which there is no possible result for players that by changing the players' strategy, the outcome of all players increases simultaneously (Najafi, 2012). Exploitation of shared waters in eastern Iran has become hydro political, and the issue of Helmand water has become a political-economic lever in the hands of the Afghan government to use in political relations and the balance of power with Iran. Iran's location to the west and the end of the Helmand Basin have put the country in a precarious position.

### Proposed Approaches to Iran's Environmental Diplomacy

Environmental diplomacy is considered as one of the important pillars in the international relations of countries. The main purpose of this diplomacy is to strive for peaceful dialogue around the world and to build constructive relations and prevent misunderstandings and reduce social and economic conflicts and the environment and its consequences and the promotion of world peace and stability by strengthening and protecting the environmental benefits for all (Padash and Rajabzadeh, 2020; Padash et al., 2016a; Padash et al., 2016b). Therefore, in this section, a model based on the sustainability of environmental diplomacy in social, economic, political and international and environmental law is presented (Figures 4 and 5).



**Figure 4.** Presents the proposed axes of Iran's environmental diplomacy based on the dimensions of sustainability.



**Figure 5.** Framework of proposed axes of environmental diplomacy

## Conclusion

### *a- The principle of friendly relations with respect for territorial integrity and equality in international relations*

In the system of international order, borders are an important element, borders are the practical basis for the effective implementation of the principle of territorial integrity of states, the principle of non-interference and the principle set forth in paragraph 4 of Article 2 of the Charter: "All states must refrain in their international relations from threatening or using force against the territorial integrity or political independence of other states or from any other action contrary to the purposes of the United Nations". The 1970 Declaration on the Principles of Friendly Relations makes it very clear that the principle of equality of the rights of nations cannot be construed as a license or practical incentive of any kind to undermine the territorial integrity or political unity of any sovereign state.

Decompose or threaten the independent in whole or in part. It is also important to note that regarding the principle of territorial integrity and the inviolability of borders, the basic principle that has been generally accepted in international law since the collapse of colonialism is the principle of respect for territorial integrity. The territory that will be transferred to the new government will be transferred based on the already existing borders. Therefore, it should be noted that the agreements and treaties of the parties are also binding and need special attention.

### *b- The principle of mutual enjoyment of the interests of natural resources for the parties in international relations*

With regard to the importance of natural resources, development of protection strategies and sustainable use of these resources as a fundamental necessity is felt more than before. In such a situation, the main role is played by living beings, who are the main beneficiaries of these resources in local communities. Therefore, the benefits of these resources must be properly achieved for all stakeholders.

Integrated management of natural resources, especially water resources in catchment area is a process which is implemented through the development of protection and benefit strategies by promoting the necessary coordination between stakeholders for the development and management of water resources, land and other inputs, aiming to maximize economic prosperity and society in a fair way without compromising the sustainability of vital ecosystems. Although this principle can be easily planned and implemented within geographical boundaries. However, it is important to note that natural resources, especially water resources, are resources that should benefit all local stakeholders from source to end in the wetland or sea, and everyone can enjoy it 's ultimate benefit. Cooperation of watershed (catchment area) stakeholders in form of the International Coordinating Council for Integrated Natural Resources Management (Water Resources) can make this approach more objective.

The most important barriers to participation in the benefits of natural resources are the following:

- lack of goodwill and mutual trust between governments
- lack of attention to human life and friendly relations, especially in border area
- Prioritizing domestic political interests despite violating the rights of cross-border stakeholders
- lack of clear definition of the international benefits of natural resources all cross-border stakeholders
- silence or violation of the inalienable right of natural benefit in the corner of Political relations or secret colonial relations

*c- Peaceful ecological-social coexistence*

As mentioned, environmental diplomacy is considered as one of the important pillars in the international relations of countries. The main goal of this diplomacy is to strive for peaceful dialogue around the world and to build constructive relations and prevent misunderstandings and Reduce social, economic and environmental conflicts and their consequences and promote world peace and stability by strengthening and protecting the environmental interests of all.

Real coexistence is based on the principle that countries with different social regimes can live side by side, live peacefully and strive to secure the common benefits. The principle of peaceful coexistence is one of the most important issues in the field of interaction between governments and societies. Today, following the phenomenon of globalization, we are witnessing the increasing interconnectedness of regions, countries, neighborhoods and citizens around the world, and that is why international politics is becoming more complex and multi-layered. Therefore, at the same time, peaceful coexistence should be considered for both countries from a social and ecological point of view for the countries of the world, especially the borders between the two countries. Social ecology is the simultaneous study of natural and human ecosystems especially social relations that affect the whole of nature. Social ecology develops a global perspective, appropriate technology, reconstruction of degraded ecosystems, and creative human action. This approach links equity and social justice considerations to energy efficiency and appropriate technology. Social ecology goes beyond purely environmental perspectives. The aim of this axis is that all countries, not only economically and profitably but also with a social and ecological approach, to maintain the best living conditions for human beings downstream on the borders between the two countries and the sub-habitats. But with a social and ecological approach to maintain the best living conditions and human life for downstream residents on the borders between the two countries and the sub-habitats

*d- Creating a sustainable local international economy in the region*

A local economy is considered a vital element for sustainability. This includes job opportunities, infrastructure and services, and suitable weather conditions. A sustainable economy is also diverse. So that it cannot easily disrupt events or internal or external events, and such an economy does not simply change the cost of maintaining its health in other areas or in the oceans or the Earth's atmosphere.

A sustainable local economy cannot be based on unlimited population growth, high consumption or irreversible resources. Feasibility study and creation of a stable and local economy in the international arena in both border areas of the two countries can create optimal and ideal conditions for the life and livelihood of border cities in two countries. Creating a good environment leads to good agricultural products, good natural resources and diverse wildlife, following that, the local economy of that region also develops. Therefore, establishing a proper mechanism for mutual benefit of natural resources in that area and downstream, can create a good future for the prosperity of the region and strengthen the security and friendship of the two nations and governments.

*e- Development and implementation of environmental strategies and policies in the national documents of the country*

Formulation and implementation of specific environmental policies is another solution in the field of environmental and water policies of a country.

It is necessary for different experts to reach a single consensus on the country's environmental policies. And develop a roadmap for implementing these policies. The communication of general environmental policies by the Supreme Leader in the national security documents of the Islamic

Republic of Iran has led to the formation of comprehensive policies in this regard. However, planning and prioritizing these strategies and their implementation is particular importance and can overcome many of the country's environmental border problems. It can overcome many of the country's environmental border problems.

### *Suggestions*

The fact is that in the contemporary industrial world, attention to the environment has gone beyond a simple preoccupation and is tied to national security and even the survival of nations

Although environmental diplomacy is still in the early stages of development, but fortunately, a process is taking shape that helps us to have a constructive partnership and cooperation with our neighbors. At the same time, make better use of international aid. Some suggestions are presented here regarding the issue of the silent water war between Iran and Afghanistan

Afghanistan's governing body has insisted at times that Helmand is an inland river. This approach seems to have become a policy of the government after more than a century. This policy is in fact aimed at escaping the effects and consequences of international rivers.

The most important point regarding the issue of waters in the east of the country and the water basins of Afghanistan with attention to the root of the problem (the border) is that Iran must take this issue seriously and at the highest levels of decision-making, and avoid escaping or postponing policy-making in this area.

Win-win diplomacy, especially with a focus on transit concessions in CHABAHAR and the Indian Ocean, is one of the important practical options for shared water resources, which is referred to as a major deal with Afghanistan. Adopting a clear hydro political policy is another solution in the field of environmental and water policies. It is necessary for different experts to reach a single consensus in the field of outlet and outlet water to Iran and to create a balance between this issue with focusing on national interests. The lack of a clear hydro political policy in the national security documents of the Islamic Republic of Iran has prevented the formation of water policy in the Ministry of Foreign Affairs, and so on.

Also, on November 17, 2015, the Supreme Leader raised the following issues in the general environment policies of the country in the field of strengthening Iran's environmental diplomacy:

- 1- Efforts to create and strengthen regional institutions to deal with dust and water pollution.
- 2- Developing relations and attracting targeted and effective bilateral, multilateral, regional and international partnerships and collaborations in the field of environment
- 3-Effective utilization of international opportunities and incentives toward Low carbon economy and facilitate the transfer and development of technologies and Related innovations.

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