



Geography and human relationships, winter 2024, vol6, no3, pp 124-144
**Climate change and the possibility of environmental terrorism in
Iran**

Maryam verij kazemi

PhD Student political Geography, Department of Geography, Faculty of Human
Sciences, Science and Research Branch, Islamic Azad University, Tehran, Iran

Submit date:2023.04.24

Accept date: 2023.05.08

Abstract

The purpose of this research is to investigate the possibility of environmental terrorism due to the impact of the consequences of climate change in Iran. Therefore, an attempt is made to answer the question of whether the consequences of climate change in Iran, while creating security challenges, can create the conditions for conflict over resources that are the background. The analytical - descriptive method and the latest data from Iran's research centers are used too for ans the question about The emergence of environmental terrorism,? To answer this question, the impact of climate change on the watersheds of the country as a pole of agricultural production is investigated first. And it is expected that due to the increase in temperature and frequent droughts and as a result the reduction of food production efficiency in the most important watersheds of Iran, along with the increase of conflicts over natural resources, double pressure on scarce resources and biological facilities as an efficient weapon appear. It can serve the extralegal activities of divergent forces from the central government and lead to the emergence of institutions and groups with radical ideologies or strategies.

Keywords: climate change, environmental terrorism, agriculture, security, Iran

Introduction

Changes in the natural environment caused by the consequences of climate change lead to instability in social, political and economic relations and systems, and this is a problem for Iran, which is located in an arid and semi-arid region and with a lack of water, both for agricultural purposes and for the consumption is facing, it creates the context of conflicts over water reserves as the most important biological element. Due to the fact that most of Iran's agricultural products are produced in low-rainfall catchment areas, and climate changes, including heavy rainfall events and numerous droughts, cause serious damage to it, therefore, it seems that the formation is unsafe. The most food regions of the country provide the basis for the emergence of marginalized communities provides internal migration and displacement of thousands of disaffected citizens who are prone to violent activities. according to the findings of the research, it is expected that despite the other negative consequences of climate change on the environment and human activities, with the decrease in the efficiency of the agricultural sector in Iran, we will see an increase in tension and conflict over water resources and land suitable for agriculture, which disaffected groups They will use environmental resources as a powerful weapon to achieve their desired goals.

Problem statement

The most important consequence of climate change, including heat increase, change in precipitation pattern, drought, flood, etc., affects food and water security and directly affects the national security of societies. Thus, this research seeks to answer the question whether the consequences of climate change in Iran, while creating security challenges, can provide the conditions for conflict over resources, which is the background for the emergence of environmental terrorism. The hypothesis that is formed in this direction emphasizes that the consequences of climate change by making Iran's watersheds vulnerable, which play an important role in the country's food and human security, while intensifying the crisis and tension, weaken the government's performance, especially in areas that are economically, they are more vulnerable, and it paves the way for the instrumental use of environmental factors, especially water-food resources, in the direction of political ethnic-religious divisions and economic stagnation, as well as the formation of divergent or centrist forces. Especially the water needs pose a serious threat to Iran, by which terrorist acts will have very destructive consequences in a country where agriculture plays a major role in providing food needs and rural-urban employment.

Research method

This research has been carried out with analytical-descriptive method, and the information has been collected from the statistical data of study centers related to the research topic and scientific-specialized articles of research-university centers.

The theoretical framework of the research

Climate change and its consequences

Whenever the climate indicators of a region deviate from its expected behavior in the long term (based on recorded and observed information in the region) and this change is irreversible, climate change occurs. This definition refers to any change in the climate that is caused by human activities or natural instability of the climate system and is different from short-term climate fluctuations (Ghaffari esmaeili et al., 2017: 333). The emission of greenhouse gases as a result of the growth of urbanization and industrialization has caused global warming and subsequent global climate change (Erfanian, 2017: 175). Although the issue of climate change is not new (Kashki, 1396: 181), but over the past two decades Most international organizations, including the United Nations, the European Community and the Group of Seven industrialized countries, have recognized the effects of climate change as a security threat, which increases political violence and the coefficient of public security threats. The consequences of climate change, especially the lack of water, the increase in desertification in agricultural areas and the general increase in temperature, strengthen political instability and the fragility of governments (Spardo, 2020: 67), because the effects of climate change can intensify fragile and conflict-affected environments. and create a space for the activities of extremist groups. For example, the drought of the late 2000s in Syria, which was linked to climate change, led to large-scale internal migration, and in 2011, these climate migrants played an effective role in internal tensions. On the other hand, one of the main effects of climate change is the increase in the sea level, which brings the geographical factors effective in maritime territorialization, especially the tides, with extensive changes, and this issue will create many challenges in the geopolitical seas in the future. (Mirhaider, 2018: 33). However, the rate of temperature increase on land surface has been much faster than that of oceans and seas in both hemispheres (Esmaili et al., 2017: 90). In the interior regions of the continents, droughts aggravate water and food shortages and increase the competition for resources, thereby creating the potential for mass migrations, new tensions, and the expansion of terrorist groups' activities For example, the severe drought in Nigeria intensified the activities of the Boko Haram terrorist group, which tries to focus on the Muslim-populated parts of weak neighboring countries (Rasouli, Shariati, 2019: 225).

In the Horn of Africa, especially in Kenya, climate change has created concerns about poverty, unemployment, food insecurity, water insecurity, and insecurity about ownership, land use, and even military interventions. Also, the Southeast Asian region, which is affected every year by natural and climatic disasters such as floods, droughts and tropical storms (Sazmand, 2012: 73-95), experiences a critical situation from extremist groups, for example in Indonesia, the increase in temperature during the rice growing season can increase the occurrence of terrorist attacks and other violent events (Battikh, 2022: 45). Also, Islamic extremists throughout the Middle East region

may be affected by the destabilizing effects of climate change and reaction. inefficient government to promote militancy and violence (Telford, 2020: 19).

However, an increase in the temperature of the earth up to 2 degrees Celsius will be associated with losses equal to 1 to 7% of the global GDP, and if this increase reaches 5 degrees Celsius, the economic losses may reach 30% of the global GDP (Malakootikhah, Farajzadeh, 2019: 223). Therefore, many countries committed to formulating their own climate policy (Dudley, 2022: 54).

Environmental terrorism

It sees climate change as a "threat multiplier" that could exacerbate global challenges from pandemics to terrorism. In this way, natural disasters caused by climate change by creating or intensifying vulnerability within the governance of a state provide a favorable environment for the activities of terrorists (Adam, 2020: 39). Climate change promotes terrorism in two different ways: First, where people use violence against property and civil rights to defend the environment to directly change environmental policies. Second, environmental terrorism, in which the destruction of the environment through war or terrorist acts is intended to create fear in communities to achieve certain goals (Spadaro, 2020: 67). Two factors are important in evaluating the current reality in relation to environmental terrorism and distinguishing it from traditional terrorism: firstly, new terrorist groups and sects, unlike traditional terrorists, are looking for massive deaths to the extent that this is the main goal in Their planning is for attacks. Second, the use of pathogenic and toxic agents in the context of modern terrorism forms part of the new dimensions of terrorist actions (Mashhadi et al., 2018: 117). It should not be neglected that bio-terrorism and agro-terrorism are among the subcategories of environmental terrorism (Mirkamali et al., 2021: 389). Thus, environmental terrorism is considered more dangerous than conventional terrorism Because physical injuries are not limited to the direct effects of violence, and as a result, they create long-term and widespread consequences for the affected population. For example, terrorists may take control of water and electricity in a region by attacking a hydroelectric dam. In this regard, during the research of an institute in Germany, a farmer from Herat, Afghanistan, explained that the Taliban controlled the river and its dams and were trying to intensify the water war against the neighbors. However, the evidence related to environmental terrorism in Syria, Iraq and Afghanistan emphasizes that the connection between resource scarcity and national security is growing, and the possibility of attacking water systems, power plants, and using resources as targets, weapons, etc. And the tool shows that society under environmental terrorism may become more vulnerable to climate events (Kohler, 2019: 28). For example, in recent years, the impact of terrorist activities on agricultural production, crops and livestock, especially in sub-Saharan African countries, has grown (Fadare, 2022: 89). On the other hand, environmental pollution has strong effects on sustainable development and the spread of terrorism. The main driver of environmental pollution is the increasing consumption of non-renewable energy sources, which causes the production of greenhouse gases and negatively affects the quality of the environment (Shaari, 2020: 3312). In addition, the use of various chemicals and heavy metals (iron, copper, steel, and depleted uranium) related to weapons of mass destruction used by terrorists has a high pollution potential for soil, air, and water (Bildirici, 2020: 23)

It should be noted that in recent years, chemical facilities and related industries have emerged as attractive targets for terrorist acts due to operational disruption, property destruction, environmental damage, health or loss of life (Villa,2017: 311). However, the act of destroying the environment can only be called "environmental terrorism" if these two criteria are met: 1)- the act or threat violates national or international laws governing the disturbance of the environment in peacetime or wartime; 2) The act or threat has the essential characteristics of terrorism. That is, the act or threat of violence has specific goals and violence is a symbolic goal (Porhashmi et al., 2022: 162).

Research findings

Consequences of climate change in Iran

The negative effects of climate change are more severe in countries with a drier climate and lower income (Rezaee,et al., 2022: 152). Because the most important impact of climate change can be fluctuations in the amount of surface water and its quality, but the most important concern for governments is the potential reduction and quantity of underground water resources, which is the main source of drinking water for humans and irrigation of agricultural production all over the world (Rezai Banafsheh,Jalai,2016: 144).

A large part of our country has an arid and semi-arid climate due to being located in the desert belt of the world, and because of this it receives little rainfall (one third of the world average rainfall), which also has severe rainfall in different years(Pazaveh,2023:110). Being located in the hot and low rainfall region of the world, Iran is facing not only the problem of supplying water needed for agriculture, but also the limitations of access to drinking water (Khosravipour,et al., 2017: 79). In the past, in some parts of Iran, water was reached at a depth of 20 meters, but now the water depth has reached more than 400 meters. Soil is lost (Ahmadi,2022: 25).This situation has widely caused increasing economic, social and ecological consequences in Iran (Farzaneh et al., 2015: 57). In this way, climate change is considered very important in Iran because the increase in temperature and lack of rainfall, in addition to negative effects on water resources and food security (Sofi,Alijani,2013: 45), lead to social and economic problems (Akbari,Sayad,2021: 37).

Although different economic sectors such as agriculture, tourism, industry, forestry, water, energy and even financial and insurance markets are affected by climate change, but the most dependent sector on climate is the agricultural sector, so that the change in rainfall pattern and The temperature damages the production of all kinds of horticultural and agricultural products, which are the main sources of food in Iran. It is predicted that until 2030, the production of the agricultural sector will decrease due to the high impact of climate change, and the amount of this decrease will reach 4.469 percent (Ghaffari Esmaeili,2017: 333-340).

The temperature changes in the northwestern region of Iran (Urmia, Tabriz, Zanjan, Sanandaj, Qazvin, Kermanshah and Hamedan) will increase in the future under scenario A1B (medium

scenario), scenario A2 (maximum or pessimistic scenario) and scenario B1 (minimum or optimistic scenario). In total, the highest temperature increase of 0.7°C related to the A2 scenario for the period of 2030-2011 and 2.3°C under the A1B scenario for the period of 2065-2046 was revealed (Zolfaghari,2017: 221). Also, the effects of climate change in the provinces of Sistan and Baluchistan, Kohgiluyeh and Boyer Ahmad, Qom, Bushehr and Alborz will be the most vulnerable (Basiri Sadr et al.,2021: 123).

In recent years, the amounts of rainfall and surface flows of the 30 catchment areas of Iran, from which most of the agricultural products are supplied, have decreased drastically compared to the last half century. The long-term rainfall trend of all basins is negative and the average volume of renewable surface flows in the last twenty years has decreased between -13 and -16% compared to the average of fifty years and it seems that the reason is climate change (Sourinejad,2019: 351). This situation makes Iran's food security face challenges. In the following, we will examine the consequences of climate change in the most important watersheds, which can become a source of tension and socio-political crisis due to the direct impact on the economic and social life of Iranian citizens in the future:

- The security consequences of climate change in the central watershed (824,611.2 square kilometers) with 9 sub-basins, in addition to the unfortunate social, political, economic and environmental consequences for the residents of this vast region of Iran, has the ability to take into account the approximate share of 48% It is associated with fundamental challenges in the country's gross domestic product, as well as its belonging to one of the most frequent civilization axes of Iran, the country's security on a national scale and the scope of Iran's cultural geography (Karimi et al., 2016: 73). Zayandeh Rood basin is the only permanent and abundant river of the Central Plateau in the area of dense population and dry and semi-arid climate, which lost its natural flow and became a seasonal river since the mid-80s and caused many protests in the provinces that use it. It has been formed (Talebi Some Sarai et al., 2018: 133).
- Gavkhoni basin (41.550 square kilometers)- The sub-category of the Central Plateau watershed- is experiencing deep climate changes, so that the humidity level of the area has increased by nearly 1.5 times and the ambient temperature has increased by about 5 degrees centigrade (Kaviani Rad et al., 2015: 213).
- The effects of climate change in the central Zagros of Iran as a water supplier for the rivers of the Central Plateau and the Khuzestan Plain (Heidarybeni et al., 2017: 373) have had destructive consequences, so that major changes will occur in the spatial distribution of oak forests. gave, the most severe of which is a decrease of 42.9 percent until 2070 in the pessimistic scenario (Safaei et al., 2022: 247).
- The effect of climate change in the Kor river basin (9.650 square kilometers) in Fars province shows that the temperature of the basin in the period 2011-2040 for scenario A2 (maximum or pessimistic scenario) is between 0.8 and 0.2 degrees Celsius compared to the base period. increase. Also, the range of precipitation changes for the A2 scenario in that period will be between 61 and 315 percent (Hejazi zadeh et al., 2014: 44).

- The simultaneous study of land use change and climate due to long-term drought vulnerability and dryness indicates the imposition of high pressures on the environment of the Kashan plain basin,-central desert- which if the current trend continues, this basin will face irreparable damages (Hemmesy,2018: 613).
- In the catchment area of Hableh River (3200 square kilometers),-in the central desert catchment area-changes in temperature and precipitation and accordingly climate changes along with the occurrence of hazards such as floods and droughts have great effects on the hydrology of this river. The results of the data show that the temperature and precipitation in the Hableh River catchment area in the years 2021 to 2050 are increasing in almost all months (Baghbanan et al.,2021: 27).
- Climatic changes have caused changes in the distribution of precipitation in the northern part of the Persian Gulf (Dehghani et al., 2017: 90). The Persian Gulf, which is located in a shallow area, is facing an increase in water temperature and annual evaporation under the influence of global warming and climate change, while the results of the research show the amount of sea level rise until the end of this century in the vicinity of the Strait of Hormuz for climate change scenario A1B. middle scenario) between 64 and 75 cm and for climate change scenario A2 (maximum or pessimistic scenario) between 90 and 105 cm. In this regard, the fishermen of Bushehr province will potentially experience a high vulnerability (Ghorbanian,zibaei,2021: 101).
- On a monthly, seasonal and annual scale, the water surface temperature of the Caspian Sea has a significant increasing trend. The rate of increase in the water surface temperature of this sea is about 0.5 Celsius per decade. Considering that the Caspian Sea is a closed system, any noticeable increase in water surface temperature can have harmful effects on aquatic life, water resources, and consequently on the level and state of sea pollution (Zahraei et al., 2018: 217). In general, climate changes will lead to an increase in thermal stress in the hot period of the year in the Caspian region (Najafi,2020: 4).
- It is predicted that the catchment area of Heraz River (18.644 kilometers) in Mazandaran province under the critical scenario (RCP8.5) from 2020 to 2079 will have maximum, minimum and average temperatures of 0.91, 1.13, and 0.96 degrees Celsius respectively. Compared to the base period (1984-2015), rainfall will increase and decrease by 1.15 percent (7.4 mm) (Kia, Karimi,2019: 145).
- .In the river basins of Gilan province, including Shafarud, Navroud, and Chafrud basins, the temperature has been increasing and this trend is significant in most of them, but no significant trend has been observed for rainfall (Sohrab Nia et al., 2019: 121).
- Climatic changes in the Aras river basin (39.534 square kilometers) have caused the rainfall patterns of this basin to change and mainly lean towards high geographical latitudes. This has caused the precipitation in Aras basin not only to decrease, but also to change the type

of precipitation. Also, the base flow of this river is sensitive to the water of the tributaries entering from Iran, Turkey, the Republic of Azerbaijan and Armenia. And it increases the deterioration of political relations, especially in connection with energy issues, including water (Nami, Khazaei, 2012: 121).

- Climatic variables in Urmia lake basin (51.801 square kilometers) had a share equal to 16%. In this way, the use of the dams in the Urmia lake basin (26%) along with the increase in water demand (16%), especially in the agricultural sector, has resulted in a 42% decrease in the surface flow entering the lake (Azizi et al., 2016: 1).
- The research results show the significant impact of climate change on Ardabil watersheds (Ars River, Balkhali River, Qarasu River, Kheyav River, Heroabad River and Noor Lakes, Shorabil Lake, and Sablan Peak Lake). In this basin, the amount of rainfall decreased by 3.68%, and the minimum temperature increased by 16.48% and the maximum temperature by 39.5%, which has led to a 16% decrease in runoff. Also, the number of peak flow occurrences has increased and the highest increase is related to the Yamchi hydrometric station with an average flow rate of 2.09 and 16 peak flow events above 6 cubic meters per second (Aghabeigi et al., 2019: 2).
- The research shows that the large watershed of Karun (67.257 square kilometers)-in khuzestan Province- has been built and is under construction with about 12 large dams and has the potential to generate 20,000 megawatts of power, which is of great importance (Eskani Kazzazi, 2015: 235). By the end of this century, with a 17.2% decrease in precipitation and 22.6% and 26.1% increase in temperature and evaporation, the flow of the Karun River will decrease by an average of 10.9% (Akbarian Aghdam et al., 2014: 215).
- The results in the area of the border catchment area of the East, especially in the Khash region,-Sistan and Baluchestan Province- show that if the current conditions continue until 2044, 54.88% of the water stored in the aquifer will be emptied and the average underground water level will drop by 13.67 meters (Zeraati, 2022: 163).
- The average temperature of the Kashf River basin (15.650 square kilometers) in Razavi Khorasan Province shows a significant increasing trend with a reliability level of 90, 99, 99.9% (Sheikh Rabiei et al., 2022: 125).
- Climatic changes in Hamedan-Bahar plain by reducing access to water will reduce production and increase food prices, and reduce consumer welfare surplus, and in all scenarios, total economic welfare will decrease, so even with optimistic climate changes, consumer welfare and As a result, the food security in this region decreases (Moazzezi et al., 2021: 250).

As mentioned, the changes in the quantity and quality of Iran's climatic seasons are in harmony with global warming (Aziz Ebrahim et al., 2022: 14). Thus, Iran is more vulnerable to widespread droughts and droughts than many countries and its consequences. It can have more depth and expansion (Yarahmadi et al., 2018: 195). Especially the pressure of climatic consequences on the border areas will be more critical. In a research sample of the border villages of Salas Babajani

village of Kermanshah province, it was shown that the consequences of climate change have affected that region, so that most people are worried about floods and droughts. In addition, some former farmers have turned to the borders of other villages for livelihood, which can face serious challenges and insecurity in the border area of Salas and its villages in the future (Kaviani Rad et al., 2019: 297).

Climate change and Iran's food security

About 77% of Iran's agricultural crops are produced in semi-arid areas, especially in the central watershed, and climate changes can affect agricultural production in this basin (Ali Bakshi et al., 2019: 127). It is expected that one degree increase in temperature compared to its average will result in a five percent decrease in production (Malakoutikhah, Farajzadeh, 2019: 2). Therefore, it is predicted that until 2025, climate variability will cause different variability, such as changes in the yield of cultivated area and available water in selected products (rainy and wet wheat, wet and dry barley, and grain corn).) that this has caused a change in the income of agricultural operators and has affected the amount of export and import of these products (Ali Bakshi et al., 2018: 5). Therefore, climate change and warming in the future can be mentioned as a serious risk for reducing the yield and income of farmers, which naturally leads to a decrease in the motivation of agricultural production (Ashk Tarab, 2014: 39).

On the other hand, the effects of climate change on fruit trees will reduce the length of the growth period of these trees, in fact, fruit trees will complete their vegetative and reproductive cycle earlier (Ahmadi et al., 2017: 35) and this issue is for countries that are major exporters. Fruits can have negative consequences. For example, apple is one of the major strategic horticultural products, which is considered a well-known advantage of Iran's agricultural economy, and the emergence of the global warming phenomenon and the increase in the demand for water resources have made its production and quality risky (Sobhani, et al., 2018: 529).

Also, in addition to the effects of climate change on the phenology of almonds in Chaharmahal and Bakhtiari province (Seyd Abdulahi et al., 2018: 58), the investigation of rice phenology stages in different scenarios shows that with an increase in air temperature for more than one period, the beginning of the cluster Fruiting, flowering and physiological maturity will be delayed in the conditions where the plant's water needs are met (permanent flooding) (Mohammadi et al., 2014: 187). In this regard, it is predicted that during the years 2065-2046, the rice cultivation calendar in Gilan and Mazandaran provinces will change towards winter with differences, and according to the different temperature conditions, the agricultural calendar of Golestan province will move towards spring (Shah Nazari et al., 2019: 99).

In the grape planting areas, the average minimum temperature in the forced scenarios (RCP8.5 and RCP4.5) in the periods of 2050-2020 and 2056-2090 are 1.6, 4.2, 1.2 and 2.3, respectively. The degree of Celsius will increase compared to the base period (Shojaei, et al., 2019: 129). Also, the results of temperature and precipitation indices on date production are 0.45 and 0.66 for the hot

and humid region and 0.3.04 and 0.18 for the hot and dry region, respectively, which indicate regional influence (Ali Ahmadi et al.,2019: 57). In the following, we will examine the effects of climate change on the agricultural sector of Iran, especially the areas that are prone to critical conditions:

- In the study area of the lands downstream of Taleghan Dam,-Alborz Province-, the effects of climate change on agricultural production and the income status of farmers indicate that the decrease in rainfall and increase in temperature affect the yield of selected agricultural crops and climate change significantly affects the yield of selected crops. In fact, these changes have a positive effect on the yield of barley, corn, beet and alfalfa, and have a negative effect on the yield of wheat and canola, and the yield of tomato is also affected by positive changes in temperature and negative changes in precipitation (Parhizkari,2016: 142).
- Bushekan plain of Bushehr province is one of the agricultural hubs of Bushehr province, with climate change, the cultivated area and farmers' profits in the optimistic scenario will increase by 25.5% and 42.45% respectively, and in the pessimistic scenario by 38.6% and 55.26%. It will decrease compared to the reference (Daneshgar et al., 1400: 63). Also, the amount of water available in the Bushkan Plain will decrease by an average of 14.4 to 18.5 percent in the period of 2050-2019 (Daneshgar et al.,2021: 259).
- In South Karkhe basin (45.460 hectares) of Khuzestan province, climate change leads to a decrease in the area under crops and agricultural profit by 17.93% and 44%, respectively (Nik Mehr, Sabeti,2019: 63).
- Jiroft plain located in the Halil River basin-Kerman province-, which has extensive agriculture, climate change has directly affected the water resources of this basin and caused the drying of many wetlands, including the Jazmurian wetland in the downstream of this basin, which has a significant contribution in reducing fine dust in the province and Even the country has it, it has become (Mirzaei, Zibaei,2019: 398).
- In the tropical regions of Kerman province, climate change shows the changes in the occurrence of cold stress on the potato plant, on average, early frosts occur 10 days earlier and late frosts occur 14 days later than the long-term climate average in the study area (bayanati et al., 2019: 63).
- The growth of water corn in Kermanshah region, despite the increase in the period due to the increase in temperature, the yield potential of the product in the future will decrease significantly to an average of 22% due to the decrease in rainfall in parts of the region as well as the decrease in relative humidity. The biggest reduction in yield will be in the Sarpol Zahab area in the lowland and tropical region of the west of the province by 28.7% (Mojarad et al., 2015: 227).
- In the Khorasan region, the consequences of climate change will lead to a decrease in the production of wheat, barley and rainfed barley in 2030 (Shayan Mehr,2022: 95).
- In the Shahrood watershed-Semnan province-, climate change caused by the decrease in precipitation has led to a decrease in available water resources, an increase in the economic

value of irrigation water, a decrease in the total area under cultivation of irrigated crops, and a decrease in the gross profit of farmers (Parhizkari et al., 2016: 23).

- In Ahar city-Azerbaijan sharghi-, the yield of the crop due to climate change based on the model (HadCM3) under the release scenario A2 (maximum or pessimistic scenario) has an increasing trend, according to which the yield risk due to climate change was reduced (Dashti et al., 2017: 151).

Analysis and conclusion

The findings of the research show that the greatest impact of climate change in Iran is focused on water resources and agricultural products. Temperature changes disrupt the activity of the agricultural sector as the main pillar of the country's economy, and this crisis paves the way for increasing food insecurity and, as a result, the formation of collective dissatisfaction. In this way, climate changes with frequent droughts in different regions of Iran cause a decrease in rainfall and the volume of runoff and excessive use of underground water tables, and ultimately reduce the efficiency of Iran's agricultural sector.

Considering that a large part of the country's agricultural and horticultural lands are located in watersheds that are directly affected by significant climate changes, we will undoubtedly witness an increase in tension and conflict over water resources and agricultural lands. Also, with the reduction of the cultivated area in the catchment basins, we face the high price of agricultural products and the import of agricultural products, which will impose a double burden on the country and affect the security of Iran. Because all the six main open and closed watersheds as the economic pulse of Iran, which are heavily affected by temperature changes and other climate hazards, act as unstable centers that create a favorable environment for exerting pressure on the central government by networks From critics to economic and environmental policy making.

This situation combined with the vulnerabilities caused by the high rate of poverty in the working class and farmers, political and economic instability, insufficient infrastructure, soil salinization, the growing trend of climate migrants, loss of biodiversity, environmental degradation of watersheds, growth Marginalization and security threats will expand. In addition, with the intensification of migration and the emptying of most villages and small towns, conditions are created for the expansion of slums on the outskirts of big cities, a situation that leads to the emergence of poverty and social anomalies. Economic inequalities in Iran have always been introduced as stimulating factors for violent acts and terrorist activities, and according to the research conducted in the watersheds of the country, a decrease in the efficiency of agricultural and livestock production is predicted in all of them. This will greatly contribute to widespread dissatisfaction by causing severe environmental damage.

Since the national security of every country is summed up in the security of water, food and energy, with the aggravation of the consequences of climate change, especially in the border areas that do not have strong economic infrastructure and are dependent on common resources located on both

sides of the border. Conflicts over natural resources can end in ethnic conflicts, and the resulting violence on a limited scale can lead to the emergence of institutions and groups with different ideologies or strategies from the central government, which align with the interests of neighboring countries, and in addition to It paves the way for the establishment of environmental racism as an efficient weapon that can serve the extralegal activities of divergent forces.

In this regard, the consequences of climate change in Iran, which with increasing droughts, floods and irregular rainfall patterns can lead to a reduction in the volume of surface runoff and groundwater aquifers-reduction in land productivity, have a direct impact on the agricultural economy and food insecurity. So that drastic changes in the crop planting season and reduction of agricultural production will cause dependence on the import of strategic agricultural products, and the economic shock caused by high food prices will lead to an increase in malnutrition and excessive use of forest lands and pastures. With the occurrence of these conditions, the formation of divergent forces is inevitable, so that with the inability to pay living expenses, confusion and collective conflict over resources leads to internal migration and the spread of dissatisfaction caused by climate injustice by the central government. Finally, using the environment as a weapon to disrupt public order and pressure the central government, destroying the environment to create collective fear, socio-economic and security disintegration paves the way for the emergence of environmental terrorism in Iran.

Since the formation of environmental terrorism and conflict over natural resources is related to the loss of water reserves and fertile agricultural lands, short-term and long-term solutions are necessary to reduce vulnerability to climate risks while adapting to climate change should be compiled, and the following suggestions are presented:

- Preparing a road map to deal with the effects of climate change and creating a working group on climate risks;
- Implementation of land improvement plans and operationalization of new watershed management methods;
- The use of intelligent management of surface water sources and underground water tables, the use of waste water in the urban-rural-industrial and agricultural sewage sector; Creating channels in the path of seasonal floods, building and developing large water reservoirs in the path of water channels;
- Operationalizing new ways of cultivating low-consumption and high-yielding agricultural products, mechanizing agricultural operations by increasing the services of modern agricultural machinery and skilled labor;
- Managing information and communication and strengthening financial resilience and cash transfer programs for families against climatic and environmental shocks;
- Creating job opportunities and allocating subsistence allowances and health care for climate migrants located on the outskirts of big cities.

Reference

Ali Bakshi Hassan; Durandish, Arash; Sabohi, Mahmoud(2018), **Consequences of climate change on the market of agricultural products**, Journal of Agricultural Economics, Volume 13, Number 4, pages: 55-86,URL: <https://www.sid.ir/paper/378981/fa>

Ali ahmadi, Neda ; Hashmitabar, Mahmood; Hoseini, seyed Mehdi(2020), **Assessment of the effect of climate change on the production of horticultural products with a randomized production approach, Case Study: Date product.**, Journal Agricultural Economics Research, Volume 12, Issue 48,,Pages: 56-82,DOR: [20.1001.1.20086407.1399.12.48.3.9](https://doi.org/10.1001.1.20086407.1399.12.48.3.9)

Ail bakhshi, hasan ; Dourandish, Arash; Sabouhi, mahmood (2020), **Investigating the Effects of Climate Change on Agricultural Market in Semi-arid Regions.**, The Journal of Agricultural Economics & Development, The Journal of Agricultural Economics & Development, Pages: 127-148,,Doi:[10.22067/jead2.v34i2.82775](https://doi.org/10.22067/jead2.v34i2.82775)

Azizi, Ghasem; Nazif, Sara; Abbasi, Faezaeh (2017), **An Assessment of the Influence of Climate Change on Urmia Lake's Water Level Reduction**, , Quarterly Journal of Interdisciplinary Studies in Humanities, Volume 9, Number 4, pages: 1-21.<https://doi.org/10.22631/isih.2017.2482.2901>

Aziz Ebrahim, Mahnaz ;Saligheh Mohammad; Nassrzadeh mohammad hossein, Alijani bohlo(2022),**The role of climate change in the movement of climatic seasons in Iran**, Applied Research Journal of Geographical Sciences, Volume 22 No:64,pages:1-16,URL: <http://jgs.khu.ac.ir/article-1-3241-fa.html>

Aghabeigi Nayer ; Esmali Ouri, Abazar; Mostafazadeh, Raoof; Golshan, mohammad (2020), **Assessing the effects of climate change on suspended sediment values in some watersheds of Ardabil province**, journal Geography and planning, Volume 24, Issue 73, Pages: 47-66,, [Doi:10.22034/gp.2020.11233](https://doi.org/10.22034/gp.2020.11233)

Adam, Antonis,EviTsavou(2020), **Do natural disasters fuel terrorism? The role of state capacity**, Economic Modelling, Volume 115,<https://doi.org/10.1016/j.econmod.2022.105950>

Akbari, mehry; vahideh sayad,2021, **Analysis of climate change studies in Iran**, Physical Geography Research Quarterly, Volume 53, Issue 1, Pages: 37-74,Doi: [10.22059/jphgr.2021.301111.1007528](https://doi.org/10.22059/jphgr.2021.301111.1007528)

Akbarian, Asadolah; Aghdam, Alimohammad Ahmadvand; Saeed Alimohammadi(2015), **Management of Hydropower Future Production Under Climate Change Impacts. Case**

study: Karun 4 Plant, Industrial Management Journal,, Volume 7, Issue 2 - Serial Number 2, Pages: 215-242,Doi: [10.22059/imj.2015.57201](https://doi.org/10.22059/imj.2015.57201)

Ahmadi, Saeedah (2022),**Effects of the economic and security consequences of the water crisis in the country**, economic security Volume 9, Number 8, Series 91, pages: 25-36, URL: <http://ensani.ir/fa/article/471232>

Ahmadi Hamzeh, Fallah Ghalhari Golam abbas, Baaghideh Mohammad(2018), **Investigating the effects of climate change on the pattern of heat accumulation in apple trees cultivation areas in Iran during the future period**, Journal of Spatial Analysis Environmental Hazards; Volume 5, No 2 pages:35-54, URL: <http://jsaeh.khu.ac.ir/article-۱-۲۷۶۶-fa.html>

Askh Trab, Nilofer; Liani, Qasem; Soltani, Gholamreza(2014), **Evaluating the effects of climate change and government policies on the yield and area under cultivation of corn in Iran: a combined data approach**, Economy and agricultural development, Volume 29, Number 1, April 2014, Pages: 31-42,, Doi: [10.22067/jead2.v0i0.37268](https://doi.org/10.22067/jead2.v0i0.37268)

Bildirici, Melike, Seyit M.Gokmenoglu(2020), **The impact of terrorism and FDI on environmental pollution: Evidence from Afghanistan, Iraq, Nigeria, Pakistan, Philippines, Syria, Somalia, Thailand and Yemen**, Environmental Impact Assessment Review, Volume 81, <https://doi.org/10.1016/j.eiar.2019.106340>

Battikh, Joe Y., VirginiaBodolica,Michael O.Wood(2022), **Disasters triggered by natural hazards and terrorism: A bibliometric network analysis into the intellectual structure of a cross-disciplinary research field**, International Journal of Disaster Risk Reduction,Volume 77,<https://doi.org/10.1016/j.ijdr.2022.103045>

Bayanati, Fateme; Fallah Ghalhar, Gholam Abas; Karami, Mokhtar; Taei Samiromi, Javad (2020), **The effects of climate change on the risk of cold stress in autumn crop pattern (Case study : Tropical and subtropical areas of Kerman province)**, Journal of Natural Environmental Hazards, Volume 9, Issue 24 - Serial Number 2, Pages: 63-78,,Doi: [10.22111/jneh.2019.29471.1507](https://doi.org/10.22111/jneh.2019.29471.1507)

Basiri sadr, Mohamad; Akhbari, Mohamad; Faraje rad, Abdoreza; Borna ; Raza(2021), **Mapping the regions of the country of Iran based on geopolitical indicators of climate change impacts**, Journal of Natural Environmental Hazards, Volume 10, Issue 27 - Serial Number 1,,Pages: 123-144,Doi: [10.22111/jneh.2020.33474.1629](https://doi.org/10.22111/jneh.2020.33474.1629)

Baghbanan, Parasto; Abadi, Ali Ahmad; Karimi, Ayat (2021), **Investigating the effect of climate change on hydrological changes in Hableh rud catchment**., journal Climate Change Research, Volume 2, Issue 5 - Serial Number 5, Pages: 27-40,,Doi: [10.30488/ccr.2020.251868.1025](https://doi.org/10.30488/ccr.2020.251868.1025)

Daneshgar, Hamidah; Bagheri, Mehrdad; Mardani Najafabadi, Mustafa (2021),**Evaluating the consequences of climate change and its adaptation strategies in bushkan plain Bushehr**

province, Journal of Economics and Agricultural Development, Volume 35, Number 1, pages: 78-63. Doi: [10.22067/jead.2021.17812.0](https://doi.org/10.22067/jead.2021.17812.0)

Daneshgar; Hamide, Mehrdad Bagheri; Mostafa Mardani Najafabadi; Fatemeh Alijani; Gholamreza yavari(2021), **Effects of climate change on hydrological and economic conditions of Bushkan plain farmers.**, Journal "Agricultural Economics Research., Volume 13, Issue 2 - Serial Number 50,, Pages: 259-280, DOR: [20.1001.1.20086407.1400.13.2.13.4](https://doi.org/20.1001.1.20086407.1400.13.2.13.4)

Dashti; Ghader, Bagheri; Parya, Pishbahar, Esmaeil ; Majnooni, Abulfazl (2018), **The Calculation of Yield Risk Caused by Climate Change for Rainfed Wheat in Ahar County: Weather Value at Risk Approach Application**, The Journal of Agricultural Economics & Development, Volume 32, Issue 2 - Serial Number 40, Pages: 139-153,, Doi: [10.22067/jead2.v32i2.68545](https://doi.org/10.22067/jead2.v32i2.68545)

Dudley, Harriet, Andrew Jordan, Irene Lorenzoni(2022), **Advising national climate policy makers: A longitudinal analysis of the UK Climate Change Committee**, Global Environmental Change, Volume 76, <https://doi.org/10.1016/j.gloenvcha.2022.102589>

Dehghani, Tayebah; Sasih, Mohammad; Alijani, Bahlul(2018), **The effect of climate change on the amount of precipitable water in the northern coasts of the Persian Gulf**, Applied Research Journal of Geographical Sciences, Vol 18, No49,, pages: 75-91,, Doi: [10.29252/jgs.18.49.75](https://doi.org/10.29252/jgs.18.49.75)

Eskani Kazzazi, Gholam Hussein(2017), **simulated effects on water on resources and disaster management of large Karun Basin (The case study: Ahwaz)**, Geography (Regional Planning) Journal, Volume 7, Issue 1 - Serial Number 25,, Pages: 235-242, DOR: [20.1001.1.22286462.1395.7.1.35.1](https://doi.org/20.1001.1.22286462.1395.7.1.35.1)

Esmaili, Hossain; Roshani, Ahmad; Shakiba, Alireza; Parak, Fatemeh (2019), **Trend Analysis of Climate Compound Extreme Indices in Iran**, Journal of Geography and Environmental Hazards, Volume 7, Issue 4 - Serial Number 28, Pages: 89-110,, Doi: [10.22067/geo.v0i0.67984](https://doi.org/10.22067/geo.v0i0.67984)

Erfanian, Maryam; Ansari, Hussein; Alizadeh, Amin; banayian aval, Mohammad (2017), **The risk of autumn wheat production affected by extreme climatic conditions caused by climate change (case study: Razavi Khorasan province)**, Journal of Natural Environmental Hazards, Volume 7, Number 17, pages: 175-194. Doi: [10.22111/jneh.2017.3344](https://doi.org/10.22111/jneh.2017.3344)

Farzaneh, Mohammadreza; Bagheri, Ali; Ramezani Qavamabadi, Mohammad Hossein(2017), **Institutional Origins of Crisis in Groundwater Resources Management in Iran**, Economic Research Quarterly, Volume 17, Issue 64 - Serial Number 1, Pages: 57-94, <https://doi.org/10.22054/joer.2017.7668>

Fadare Olusegun, Giacomo Zanello, Chittur Srinivasan (2022), **The joint effects of terrorism and land access on livestock production decisions: Evidence from northern Nigeria**, World Development Perspectives, Volume 27, <https://doi.org/10.1016/j.wdp.2022.100447>

Ghaffari Esmaeili, Seyed Morteza ; Akbari, Ahmad ; Kashiri Kolaei, Fatemeh (2020), **The Effect of Climate Change on Economic Growth (Dynamic Computable General Equilibrium Model Approach in Iran)**, International Journal of Business and Development Studies, Volume 12, Issue 1, Pages: 111-122, Doi: [10.22111/ijbds.2020.5440](https://doi.org/10.22111/ijbds.2020.5440)

Ghorbanian, Effat; zibaei, mansour (2021), **Assessing the Vulnerability of Fishing Communities to the Effects of Climate Change: A Case Study of Fisheries in Southern Iran** A case study of fisheries in southern Iran, Journal Agricultural Economics Research, Volume 13, Issue 3, Pages: 97-116, Doi: [10.30495/jae.2021.21014.2001](https://doi.org/10.30495/jae.2021.21014.2001)

Hemmesy, Maliheh Sadat; Yarahmadi, Darush ; Ownegh, Majid ; Shamsipour, Ali akbar (2020), **Evaluation of Landuse Changes with Emphasis on Green Land Use Planning in Kashan Plain Watershed**, Physical geography research quarterly, Volume 51, Issue 4, Pages 613-632, Doi [10.22059/jphgr.2019.267865.1007288](https://doi.org/10.22059/jphgr.2019.267865.1007288)

Hejazi zadeh ,Zahra beygom; sadat Ashofteh parisa; fatahi Ebrahim; Gholampour Zahra (2015), **Analysis of Stream flow Changes under Climate Change Using Rainfall-Runoff Model in the Kor River Basin**, Journal of Applied researches in Geographical Sciences, Volume 15 ,No 38, pages: 31-47, URL: <http://jgs.khu.ac.ir/article-۱-۲۶۱۸-fa.html>

Heidarybeni, Mehran; Yazdanpanh, Hojjatollah ; Mehnatkesh, Abdolhamid (2018), **Impacts of Climate Change on Canola Yields and Phenology (Case Study: Chahrmahal Va Bakhtiari, Iran)**, Physical Geography Research journal, Volume 50, Issue 2, Pages: 373-389, Doi: [10.22059/jphgr.2018.239399.1007101](https://doi.org/10.22059/jphgr.2018.239399.1007101)

Kia, Eassa; Karimi, Valiollah (2021), **Investigation of Temperature and Rainfall Parameters of Haraz River Basin affected by Climate Change**, Journal of Natural Environmental Hazards, Volume 9, Issue 26 - Serial Number 4, Pages 145-160, Doi [10.22111/jneh.2020.32606.1596](https://doi.org/10.22111/jneh.2020.32606.1596)

Khosravipour, Bahman; Zanganeh, Maryam; Khodamoradpour, Mohammad (2017), **Water crisis and drought (challenges and solutions)**, bimonthly specialized scientific research in art and human sciences, year 3, number 4, 12 consecutive, pages: 79-91. URL: <http://ensani.ir/fa/article/384832/>

Kashki, Abdul Reza (2018), **Analysis of the Polar Vortex Trend in the Northern Hemisphere under Climate Change Conditions**, Journal of Geography and Environmental Hazards, Volume 6, Issue 3 - Serial Number 23, pages: 181-197. Doi: [10.22067/geo.v6i3.62149](https://doi.org/10.22067/geo.v6i3.62149)

Karimi, Yadullah; Kaviani Rad, Murad; Fahmi, Hidayat; Karmi, Sadegh(2016), **Explaining the security consequences of climate change in the central watershed of Iran**, Applied Research Journal of Geographical Sciences, 17, No. 46, pages: 73-92,DOR: [20.1001.1.22287736.1396.17.46.4.4](https://doi.org/10.22287736.1396.17.46.4.4)

Kohler, Christina, CarlosDenner dos Santos, MarcelBursztyn(2019), **Understanding environmental terrorism in times of climate change: Implications for asylum seekers in Germany.**, Research in Globalization, Volume 1, <https://doi.org/10.1016/j.resglo.2019.100006>

Kaviani Rad, Morad ; Toulabi nejad, Meysam; Rezaei, Farid (2020), **Climate change reflects on security of the border villages, case study: Salas Babajani border villages**, Applied Research Journal of Geographical Sciences, Volume 20, Issue 57, pages: 297-316 ,Doi:[10.29252/jgs.20.57.297](https://doi.org/10.29252/jgs.20.57.297)

Mirheidar, Doreh; Gholami, Bahareh; Pishgahifard, Zahra; Azizi, Ghasem; Ranjbarian, Amirhossein (2019), **The role of tides in maritime territoriality and the impact of climate change on it**, Quarterly Journal of SEPHR, Volume 28, Issue 111 - Serial Number 111., Pages: 23-40,,Doi:[10.22131/sepehr.2019.37495](https://doi.org/10.22131/sepehr.2019.37495)

Malakoutikhah, zahra; Farajzadeh, zakaria (2020), **The Effect of Climate Change on Economic Growth in Iran**, The Journal of Agricultural Economics & Development, Volume 34, Issue 2 - Serial Number 48, Pages: 223-238,Doi:[10.22067/jead2.v34i2.86135](https://doi.org/10.22067/jead2.v34i2.86135)

Mashhadi, Ali; Salem, Behnam; Niaghi, Omid (2018), **Environmental terrorism: a structural analysis of its types and perpetrators**, Scientific Journal of Defense Policy, 27, No. 106, pages: 113-141.URL: <https://www.sid.ir/paper/396977/fa>

Moazzezi, fatemeh; Yavari, Gholamreza; mosavi, seyed habibollah; Bagheri, mehrdad (2021), **Assessing the Impact of Climate Change on Food Security and Economic Welfare: Case Study Hamedan-Bahar Plain**, Journal of Agricultural Economics and Development, Volume 29, Issue 2 - Serial Number 114,,Pages: 249-292,,Doi:[10.30490/aead.2021.352780.1288](https://doi.org/10.30490/aead.2021.352780.1288)

Mirkamali, alireza ; hajivand, amin; nabati, ali (2021), **Analysis of the Jurisdiction of Iranian Courts in the Investigation of Environmental Terrorism, Bioterrorism, and Agro terrorism as Crimes Against National Interests and Security.**, Quarterly Journal of National Security, Volume 11, Issue 39 , Serial Number 39,, Pages: 377-404,DOR: [20.1001.1.33292538.1400.11.39.13.7](https://doi.org/10.1001.1.33292538.1400.11.39.13.7)

Mohammadi, Hossein; Rabbani, Fatima; Mazaheri, Dariush(2014), **Simulating the effect of climate change on the phenology of rice plants under different irrigation managements in**

the Caspian region: Rasht Station, Applied Research Journal of Geographical Sciences, year 15, number 38, pages: 187-205, DOR: [20.1001.1.22287736.1394.15.38.10.0](https://doi.org/10.1001.1.22287736.1394.15.38.10.0)

Malakootikhah, Zahra; Farajzadeh, Zakariya (2020), **Climate change impact on agriculture value added**, Journal of Agricultural Economics and Development, Volume 28, Issue 3 - Serial Number 111,,Pages: 1-30,,Doi:[10.30490/aead.2020.305725.1093](https://doi.org/10.30490/aead.2020.305725.1093)

Mirzaei abas; , Mansor Zibaei(2021), **Investigation of Adaptation Strategies for Agricultural Water Resources Management under Climate Change in Halil-rud River Basin**, The Journal of Agricultural Economics & Development, Volume 34, Issue 4 - Serial Number 50,,Pages: 397-419,Doi:[10.22067/jead.2021.17801.0](https://doi.org/10.22067/jead.2021.17801.0)

Mojarad, Firouz; Naderi, Leila; Farhadi, Bahman; Hafez Parast, Maryam (2015), **Investigating corn yield changes under the influence of climate change in Kermanshah province**, Space Planning and Planning Quarterly, Volume 20, Number 4, pages: 227-255. URL: <http://hsmasp.modares.ac.ir/article-21-5826-fa.html>

Nikmehr, siyamak; Zibaei, mansor (2021), **Assessing the Effects of Climate Change on Hydrological and Economic Conditions of South Karkheh Sub-basin**, Quarterly Journal of Agricultural Economics and Development, Volume 34, Number 1, pages: 63-79,,Doi:[10.22067/jead2.v33i4.84531](https://doi.org/10.22067/jead2.v33i4.84531)

Najafi, Mohammad Saeed(2020), **Simulation of Climate Change Impacts on Heat Stress over the Caspian Sea Region**, Climate Change Research, Volume 1, Issue 2, Pages 1-12,,Doi: [10.30488/ccr.2020.111110](https://doi.org/10.30488/ccr.2020.111110)

Nami, Mohammad Hassan; Khazaei, Mehdi(2012), **The effect of climate change and atmospheric circulation pattern fluctuations on Aras border river**, scientific research quarterly of new attitudes in human geography, year 4, number 4, pages: 121-134.,DOR: [20.1001.1.66972251.1391.4.4.8.0](https://doi.org/20.1001.1.66972251.1391.4.4.8.0)

Pazaveh, Abduljabbar(2023), **Investigation of drought and wet season in Chahbahar city using SPI index**, The Journal of Geography and Human Relations, Volume 5, Issue 4 - Serial Number 20, Pages: 110-127, Doi:[10.22034/gahr.2022.346601.1725](https://doi.org/10.22034/gahr.2022.346601.1725)

Porhashmi, Abbas; Bazghi, Nazanin; Hermidas Bavand, David(2022), **The criteria of eco-terrorism in protecting the common heritage of humanity with an emphasis on international documents**, Iranian Political Sociology Monthly, Volume 4, Number 4, Serial Number 16, pages: 162-182, Doi:[10.30510/psi.2022.359729.3903](https://doi.org/10.30510/psi.2022.359729.3903)

Parhizkari, Abozar (2018), **Evaluate the Effects of Climate Change Impertinence on Agricultural Production and Farmer's Income Situation in Down Lands of Taleghan Dam**, Journal Agricultural Economics Research, Volume 9, Issue 36 - Serial Number 36,,Pages: 125-152,DOR: [20.1001.1.20086407.1396.9.36.7.8](https://doi.org/20.1001.1.20086407.1396.9.36.7.8)

Parhizkari, Abozar; Mahmoodi, Abolfazl; Shokat Fadaee, Mohsen (2017), **Economic Analysis of the Effects of Climate Change on Available Water Resources and Agricultural Products in the Watersheds of Shahrood.**, Journal Agricultural Economics Research, Volume 9, Issue 33 - Serial Number 33,,Pages: 23-50,DOR: [20.1001.1.20086407.1396.9.33.2.7](https://doi.org/20.1001.1.20086407.1396.9.33.2.7)

Rasouli, Majid; Shariati, Shahrouz (2020), **Geopolitical analysis of Boko Haram terrorism threat in West Africa**, International quarterly of Geopolitical, Volume 16, Issue 59,,Pages: 203-228,DOR: [20.1001.1.17354331.1399.16.59.8.8](https://doi.org/20.1001.1.17354331.1399.16.59.8.8)

Rezai Banafsheh, Majid; Jalai, Tahereh,(2016), **Evaluation of the impact of climate change on the underground water level of the Tasuj watershed**, Scientific Research Journal of Geography and Planning, 21, No. 60, pages: 143-160.URL: <http://ensani.ir/fa/article/376917/>

Rezaee, azam; shirani bidabadi, farhad ; bahadoran, farzaneh (2022), **Climate Change Consequences on Rain-Fed Wheat Farming and its Relationship with Rent in Iran.**, Journal Agricultural Economics Research, Volume 13, Issue 4,,Pages: 149-159,,Doi:[10.30495/jae.2021.24052.2131](https://doi.org/10.30495/jae.2021.24052.2131)

Sobhani, Behroz ; Ahmadyan, Minoo; Jahanbakhsh Asl, Saeed (2019), **The impacts of Climate Change on Growth Period and Water Requirement of the Apple Tree (Case Study: Semirom and Urmia, Iran)**, Physical Geography Research Quaternary,, Volume 51, Issue 3,, Pages: 529-544,,Doi:[10.22059/jphgr.2019.273067.1007327](https://doi.org/10.22059/jphgr.2019.273067.1007327)

Seyed abdolahi, Maryam ; Alijani, Behloul; Azizi, Ghasem; Asadian, Farideh (2020), **The effect of climate change on almond phenology in Chaharmahal and Bakhtiari province**, Journal of Natural Environmental Hazards, Volume 8, Issue 22 - Serial Number 4,,Pages: 41-58,, Doi:[10.22111/jneh.2018.24286.1383](https://doi.org/10.22111/jneh.2018.24286.1383)

Sohrab Nia, Nima; Alijani, Bahlul; Akbari, Mehri(2019), **Modeling the water supply of rivers in selected basins of Gilan province in the period of climate change**, Journal of Spatial Analysis of Environmental Hazards, Year 7, Number 2, pages: 121-136.URL: <http://ensani.ir/fa/article/440210/>

Sourinejad, Ali (2020), **Assessment of Climate Change Effects on Renewable Surface Water Resources due to 30 Basins in IRIR**, Physical Geography Research, Volume 52, Issue 3,Pages: 351-373,Doi:[10.22059/jphgr.2020.270634.1007309](https://doi.org/10.22059/jphgr.2020.270634.1007309)

Spadaro, Paola A (2020),**Climate Change, Environmental Terrorism, Eco-Terrorism and Emerging Threats**, Journal of Strategic Security , Volume 13 Number 4 Vol. 13, No. 4 Climate Change and Global Security, pp. 58-80,,<https://doi.org/10.5038/1944-0472.13.4.1863>

Shaari M.S., Karim Z.Abdul., Zainol Abidin N(2020),**The effects of energy consumption and national output on CO2 emissions: New evidence from OIC countries using a panel ARDL analysis**,Sustainability, 12 (8), p. 3312,,Retrieved from <https://www.mdpi.com/2071-1050/12/8/3312>

Sazmand, baharh(2012), **climate change and environmental security of Southeast Asia; Analyzing the activities of ASEAN**, International Organizations Quarterly, year 1, number 2, pages: 73-98,URL: <http://ensani.ir/fa/article/447926>

Sheikh Rabiei; Mohammad Reza; peyравan, Hamidreza; daneshkar arasteh , Peyman; Akbari, Mehri; Motamed vaziri(2022), **Evaluating the effectiveness of climate change models in simulating temperature and precipitation components (case study of Gorganrud aquifer)**, Quarterly Journal of Geography and Environmental Studies, year 11, number 41, pages: 123-142,URL: https://journals.iau.ir/article_686019.html

Shojaei, Tayebah; Falah Qalhari, Gholam Abbas; Kashki, Abdul Reza(2019), **Effects of Climate Change on Grape Tree Phenological Date Change in Iran**, Natural Geography Research, Volume 52, Number 1, pages: 129-145.,Doi:[10.22059/jphgr.2020.284132.1007404](https://doi.org/10.22059/jphgr.2020.284132.1007404)

Shahnazari, Mojtaba; Hejazizadeh, Zahra ; Saligheh, Mohammad (2021), **Effects of Climate Change on Agricultural Calendar in the North of Iran**, Applied Research Journal of Geographical Sciences,Volume 20, Issue 59 ,pages: 99-117,Doi:[10.29252/jgs.20.59.99](https://doi.org/10.29252/jgs.20.59.99)

Shayan mehr, Samira; shahnoushi, naser; Sabouhi Sabouni, Mahmoud; Rastegari, Shida (2022), **Climate Change and Its Consequences on Food Security in Khorasan Region**, Agricultural Economics, Volume 15, Issue 4 - Serial Number 4,,Pages: 95-128,,Doi:[10.22034/iaes.2021.534502.1852](https://doi.org/10.22034/iaes.2021.534502.1852)

Safaei, Mohammad; Rezayan, Hani; Zeaiean Firouzabadi, Parviz; Torahi, Ali asghar(2022), **Modelling potential impacts of climate change on the oak spatial distribution (Case study: Ilam and Lorestan provinces)**, Applied Research Journal of Geographical Sciences,Volume 22, Issue 65 ,pages: 247-264,Doi:[10.52547/jgs.22.65.247](https://doi.org/10.52547/jgs.22.65.247)

Sofi, Masoomah; Alijani, Bohloul (2012), **Climate change in the Zagros region,, Territory journal**, Volume 9, issue 2,Pages: 47-66,URL: https://sarzamin.srbiau.ac.ir/article_5523.html

Telford, Andrew (2020), **A climate terrorism assemblage? Exploring the politics of climate change-terrorism-radicalisation relations**, Political Geography, Volume 79, <https://doi.org/10.1016/j.polgeo.2020.102150>

Talebi Some Sarai Mahshid; Saeed Zakai, Mohammad; Fazli, Mohammad; Jomepour, Mahmoud(2018), **Sociology of a crisis; Social Pathology of Water Crisis in Zayandeh Rood**

Basin, Quarterly Journal of Interdisciplinary Studies in Human Sciences, Year 11, Number 4, Series 44, pages: 133-165. <https://doi.org/10.22035/isih.2020.3652.3833>

Villa Valeria, Genserik L.L.Reniers, NicolaPaltrinieri, ValerioCozzani(2017), **Development of an economic model for the allocation of preventive security measures against environmental and ecological terrorism in chemical facilities**, Process Safety and Environmental Protection, Volume 109, Pages 311-339, <https://doi.org/10.1016/j.psep.2017.03.023>

Yarahmadi, Elham; Karampoor, Mstafa; Ghaemi, Hooshang; Moradi, Mohammad; Nasiri, Behrouz (2020), **Statistical Analysis Anomalies of Maximum and Minimum Temperature in Cold Period in order to Understand the Effects of Climate Change on Different Regions of Iran.**, Quarterly Journal of Geography and Environmental Hazards, No. 29, pages: 171-197. Doi:10.22067/geo.v0i0.73539

Zolfaghari; Hossein; Masoompourv, Samakosh Jafar; Chahvari, Shabnam (2018), **Estimating the Growing Degree Days in the Northwest of Iran based on Climate Change Models.**, Applied Research Journal of Geographical Sciences., Volume 18, Issue 49, pages: 221-240., Doi:[10.29252/jgs.18.49.221](https://doi.org/10.29252/jgs.18.49.221)

Zahraei, Akbar; Khoshhal Dastjerdi, Javad; Ghamghermeh, Abdolazim (2019), **Assessment of Climate Changes in the Caspian Sea by trend analyzing the sea surface temperature**, Journal of Natural Environmental Hazards., Volume 8, Issue 20 - Serial Number 2., Pages: 217-232., Doi:10.22111/jneh.2018.23338.1361

Zeraati, Ebrahim; Zeinodini, Samira ; Pirzadeh, Bahareh ; Hashemi Monfared, Seyed Arman(2022), **Determining Optimized Depth of Wells in a Catchment Considering Climate Change and Water Resources Management (Case Study: Khash watershed).**, Journal Agricultural Economics Research, Volume 13, Issue 4, Pages: 160-174., Doi:[10.30495/jae.2021.21316.2013](https://doi.org/10.30495/jae.2021.21316.2013)