



THE EFFECTS OF ANTHROPOGENIC AGENTS ON CLIMATE CHANGE

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ABSTRACT

**The purpose of the research** - There is a significant increase in consumption rates compared to the production levels of countries as a result of developing technologies and increasing population rate. This research investigates the main reasons for the emergence of climate change and anthropogenic factors and discusses the measures that can be taken to mitigate the harms of climate change

**The methodology of the research** - The reports and discussions of countries examining the positive and negative effects of climate change on agricultural lands were examined.

**The practical importance of the research** - Effects of greenhouse gas emissions on climate change and its consequences.

**The results of the research** - This research carefully screened the previous studies and compared the levels of farmland and agricultural production productivity affected by climate change.

**The scientific novelty of research** - This article investigates the main reasons for the emergence of climate change and anthropogenic factors and discusses the measures that can be taken to mitigate the harms of climate change

**Keywords**; climate change, anthropogenic factors, agriculture, greenhouse gases, nature.

Introduction.

Greenhouse gases increase as a result of the increase in the amount of gases in the atmosphere that is necessary for living creatures to survive. Increase in greenhouse gases is causing climate change (Gurbuz and Macabangin, 2019). Two main factors cause climate change. The first is natural factors, and the second is anthropogenic factors (Büyükşahin, 2018).

Natural factors are the factors that occur as a result of the ratio of the components in the atmosphere. Some of these are movements on earth such as the formation of plates pushing each other and elevations as a result of shifting orbits, increase in the amount of energy generated by sunspots, earthquakes, volcanic eruptions, etc. (Öztürk, 2002; Büyükşahin, 2018).

Anthropogenic (human-induced) factors are the factors that result from excessive carbon dioxide (CO<sub>2</sub>) release. Especially after the Industrial Revolution and with the effect of developing technology, carbon dioxide emission rates have increased significantly. The increase in consumption rate and population also increases carbon dioxide emissions (Büyükşahin, 2018).



Figure 1. Greenhouse Gas Emissions Per Capita by Countries

Source: IEA, (2017).

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Greenhouse gases that exist at normal levels in the atmosphere increase with anthropogenic effects and cause the temperature of the earth to increase. In the ongoing process, significant thermal increases are observed in the lands and oceans in the northern hemisphere and the southern hemisphere (Doğan and Tüzer, 2011). The carbon dioxide ratio that should be present in the atmosphere at normal levels is 0 / 00,03 (Aksay, et al., 2005).

### **Causes and effects of climate change**

It is known that people's energy needs lead to climate change, while climate change causes adverse effects on humans and the world. In order to produce the necessary solution, the causes of climate change must be examined in detail.

General causes of climate change;

- 1-increasing use of fossil fuels,
- 2-increase of industrialization,
- 3-decrease of forests and increase of destruction,
- 4-acceleration of population growth,
- 5-melting of glaciers and rising sea level as a result of this situation,
- 6-decrease in biodiversity and deterioration of the balance of nature,
- 7-increase in migrations
- 8-improper land use etc. (Başoğlu and Telatar, 2013; Varol and Ayaz, 2012)

It is important to determine the causes of climate change as well as the effects that will occur in subsequent processes. When the main effects of climate change are examined, it is envisaged that the balance of nature is beginning to deteriorate and that this balance will be further damaged in the future (Acıköse and Gürbüz, 2018). Drought, sudden changes in weather events, deforestation, sea-level rise are some of the effects of climate change. People are directly affected by the negative consequences of climate change and their health, lifestyle, food and water security, settlement patterns are greatly disturbed (Ilık Bilben, 2018).

Natural disasters and environmental problems increase as a result of climate change. These environmental problems have unfavourable consequences in many sectors, especially agriculture and economy (Yavuz and Gürbüz, 2000). States need to provide the necessary infrastructure and resources to deal with these negative consequences. However, underdeveloped and developing countries do not have such infrastructure and resources, so they are not as protected from the effects of climate change as developed countries (Gürbüz and Kadağan, 2019). As a result, underdeveloped and developing countries are the ones most affected by climate change (Başoğlu and Telatar, 2013; Gürbüz and Özkan, 2019).

Biologically, the effects of climate change on the species will be investigated, rapidly rising temperatures and rising sea levels in some species adapt to these changes will experience problems. As a result of the research, more than 1 million species of animals and plants are expected to disappear by 2050 (Aksay, et al., 2005). Glaciers found in polar regions have been reported to melt and thin on average 48 cm per year (Sağlam, et al., 2008). When the effects of climate change on species are investigated biologically, it is predicted that some living species will experience problems of adapting to these changes because of the rapid temperature increase and sea-level rise. Past research confirms that more than 1 million of the species of animals and plants are expected to disappear until 2050 (Aksay, et al., 2005). The glaciers in the Polar Regions are reported to melt 48 cm per year on average and show thinning (Sağlam, et al., 2008).

A study in Australia investigated possible responses in 13 species groups for predicted changes in salinity, temperature, marine chemistry, wind, sea level and cycles. These responses



were classified and defined in 4 main groups because of the differences in species and the lack of observation. These groups defined:

- Impacts on stocks and distributions: with global warming, species will move towards warmer regions, some living species will extinct (Hoveka et al., 2022).
- Impacts on time patterns of life cycle events: it is expected that plankton explosions will be seen earlier with the effect of temperature increase (Gurbuz and Ozkan, 2020), and there will be differences in animal migrations.
- Impacts on behaviour and physiology: changes in environmental aspects will have direct effects on metabolism, growth, reproduction, photosynthesis and respiration (Zeeman, and Solhaug, 2022).
- Impacts on productivity and communities: climate change will affect living species more, depending on the change in ecosystem functions. An example is a change in the location of the food chain of a species (Sağlam, et al., 2008).

### **Effects of Climate Change on Agriculture Sector.**

The agricultural sector and nature are interdependent. Climate conditions and weather events are the two main factors that the agricultural sector depends (Gurbuz, 2019). We believe that the sector most likely to be affected by climate change will be agriculture. Given the importance of the agricultural sector in sustaining people's lives, it is seen that these adverse impacts will cause problems in addressing essential needs. (Başoğlu and Telatar, 2013; Gurbuz, et al., 2019)

The negative effects of climate change also affect the agricultural sector (Gurbuz and Yildiz, 2019). The quality and quantity of the product farmers produce are linked to the climate. The decrease in yield on agricultural production is economically damaging to both the producer and the consumer (Bayraç and Doğan, 2016; Hayaloğlu, 2018). Research conducted in 8 Asian countries between 1972-2009 indicated that the increase in rainfall as a result of climate change had agricultural benefits, but that the increase in temperature had adverse effects (Akram, 2012). In the research carried out in India between 1971-2004, it was stated that when the increase in the rate of precipitation and temperature per hectare has a positive effect on the rice yield sown in the summer season, it does not affect the rice yield sown in the autumn season (Bayraç and Doğan, 2016). The Food and Agriculture Organization (FAO) states that it is advancing its work on climate change in line with three main objectives. These include improving the institutional and technical capacities of the member states, improving the integration of food security, agriculture, forestry and fisheries into the international climate agenda, and strengthening the internal coordination and presentation of FAO's work (FAO, 2019)

### **Result and Conclusions.**

Things to be done individually and socially to reduce the anthropogenic effects of climate change will be beneficial for reducing the harmful effects of climate change. Choosing public transport in transportation, cycling or walking to nearby places, shortening the waiting times of vehicles in traffic, raising awareness about the use of biofuel and expanding the use areas of biofuels will benefit in reducing the level of harm. Existing forests should be protected, and industrial facilities should be inspected regularly.

Increasing the measures to be taken to reduce climate change and the spread of conscious consumption will reduce the harmful effects of climate change. The prudent use of resources and the transfer of them to future generations is also vital in terms of ensuring sustainable development.



Subsequent studies should investigate what kind of support states can provide and what they need to do to raise awareness of the society. The supports that can be given to underdeveloped and developing countries, and their use in essential places and for the purpose is equally important.

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## ANTROPOGEN AGENTLƏRİN İQLİM DƏYİŞMƏSİNƏ TƏSİRİ

Özgecan Kadağan

### XÜLASƏ

**Tədqiqatın məqsədi** - Texnoloji tərəqqi və əhəlinin artımı nəticəsində ölkələrin istehsal səviyyələri ilə müqayisədə istehlak nisbətlərində əhəmiyyətli artım var. Bu araşdırma iqlim dəyişikliyinə əsas səbəblərini və insan faktorlarını araşdırır və iqlim dəyişikliyindən zərərin azaldılması üçün görülə biləcək tədbirləri müzakirə edir.

**Tədqiqat metodologiyası** - İqlim dəyişikliyinə kənd təsərrüfatı torpaqlarına müsbət və mənfi təsirlərini öyrənən ölkələrin hesabatları və müzakirələri öyrənilib.

**Tədqiqatın praktiki əhəmiyyəti** - İstixana qazlarının emissiyalarının iqlim dəyişikliyinə təsiri və onun nəticələri.

**Tədqiqat nəticələri** - Bu tədqiqat əvvəlki tədqiqatları diqqətlə seçmiş və iqlim dəyişikliyindən təsirlənən kənd təsərrüfatı torpaqlarının məhsuldarlığının və kənd təsərrüfatı istehsalının səviyyələrini müqayisə etmişdir.

**Tədqiqatın elmi yeniliyi** - Bu məqalə iqlim dəyişikliyinə və antropogen amillərin əsas səbəblərini araşdırır və iqlim dəyişikliyindən zərərin azaldılması üçün görülə biləcək tədbirlərdən bəhs edir.

**Açar sözlər** - iqlim dəyişikliyi, antropogen amillər, kənd təsərrüfatı, istixana qazları, təbiət.

## ВОЗДЕЙСТВИЕ АНТРОПОГЕННЫХ АГЕНТОВ НА ИЗМЕНЕНИЕ КЛИМАТА

### РЕЗЮМЕ

**Цель исследования** - в связи с развитием технологий и увеличением численности населения в странах наблюдается значительный рост уровня потребления по сравнению с уровнем производства. В рамках данного исследования рассматриваются основные причины изменения климата и антропогенные факторы, а также обсуждаются меры, предпринимаемые для минимизации вреда от изменения климата.

**Методология исследования** - рассмотрены исследования отчетов и материалов дискуссий стран, изучающих положительное и отрицательное влияние изменения климата на сельскохозяйственные угодья.

**Практическая значимость исследования** - воздействие выбросов парниковых газов на изменение климата и его последствия.

**Результаты исследования** – в рамках данного исследования был проведен детальный анализ предыдущих исследований и сопоставлены уровни продуктивности сельскохозяйственных угодий и сельскохозяйственного производства, на которые повлияло изменение климата.



**Научная новизна исследования** - в данной статье исследуются основные причины изменения климата и антропогенные факторы, а также рассматриваются меры, которые могут быть приняты для минимизации вреда от изменения климата.

**Ключевые слова:** изменение климата, антропогенные факторы, сельское хозяйство, парниковые газы, природа.