

STUDY CONCERNING CLIMATE CHANGE FROM THE PRESENT TIME

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Abstract: One of the harsh realities of our times is represented by the intensification of the climate changes phenomenon. If fifty years ago the possibility of climate change was seen only as a hypothesis or as an event that was less probable to happen among the society, humanity is increasingly feeling its effects nowadays. A considerable number of domains and essential economic activities are impacted by fact (agriculture, forestry sector, the management of natural resources, energy, infrastructure, tourism, etc.). Unfortunately, the well-being of local communities also has to suffer as a result of the climate changes. This study's main objective is to create an analysis of the climate changes' effects in Romania from the present-time, which can be seen as the consequences of extreme weather phenomena and the identification of associated risks in the previously mentioned areas, but also of solutions and proposals to improve the existing situation. Secondly, the aim is to present the consequences of this climate phenomenon in two of the essential domains of the Romanian economy and society, which are agriculture and tourism. Moreover, this study intends to also explore the measures and the action plans that are currently existent, and those that are proposed to be adopted in the near future as well.

Key words: climate changes, agriculture, tourism, agrotourism, extreme weather

INTRODUCTION

Over the last few centuries, the whole world has faced numerous environmental problems. These have caused many difficulties in the process of living and have strongly influenced the quality of life [7]. Across the globe, there have been human losses, epidemics caused by these disasters, poverty, and even food shortages.

Of all these, climate change had and continues to have the greatest impact on the planet, with these difficulties becoming more noticeable from year to year. These phenomena refer to meteorological deviations that differ from the standard pattern and manifest themselves in extreme weather events. They occur in all parts of the world and, as a result, the planet is facing extreme events such as floods, heavy rains, droughts, tornadoes, heat waves or cold spells, seasonal instability, or even fires that destroy vegetation [1, 14, 17].

There are two types of climate change: natural (heavy rainfall, floods, strong storms, winds, droughts, fires), but also anthropogenic, caused by the society, due to excessive pollution, which leads to the greenhouse effect, so harmful to human health. The most disadvantaged people are those in poorer areas [18, 19]. It is important to focus on human-induced climate change, as this is likely the main cause of the changes that take place [6].

Our country is not immune to these climate changes either. Year after year, Romania is facing increasingly high temperatures and, in recent years, severe heat waves, resulting in scorching summers, lack of rainfall, and warmer winters with increasingly rare snowfall [14].

One of the areas most affected by climate change in Romania is agriculture [14]. This activity, which is fundamental to the national economy, requires, for the cultivation of species recognized in our country (cereals, sunflowers, rapeseed, legumes), climatic

conditions that are as favorable as possible for plant growth and development and furthermore, for obtaining the expected harvests.

In recent years, the effects of climate change have had a major impact on agriculture, becoming increasingly noticeable and affecting more and more categories of cultivated species. Whether we are talking about autumn or spring crops, vegetation factors such as temperature and water show the greatest changes, and sometimes these vary significantly from one agricultural year to another, even creating an alternation between rainy years with moderate temperatures and dry years with extremely high temperatures.

Among the weather phenomena with a major impact on agriculture, we can mention capricious, rainy springs with low temperatures, heat waves and prolonged droughts from June to September, frequent hailstorms, floods, and sudden temperature variations from one day to the other. Not only crops are affected by extreme weather events, but also the elements necessary for cultivation, such as soil and soil water. Farmers must find strategies to adapt to these climate changes, which may intensify in the future [1]. Returning to our country, climate change affects not only agricultural activity, but also the relief and natural landscape, so that southern and southeastern regions, once considered fertile, are facing increasing aridity due to lack of rainfall and drought [1]. Ecological problems are also increasingly common in natural grasslands, one of the most notable being soil imbalances, which lead to erosion.

In addition to agriculture, another key area deeply affected by climate change is tourism. This sector is important for every country and represents a significant source of income. However, with the onset of summer heat waves, floods, torrential rains, periods of drought, and even high levels of pollution, many tourist attractions are being affected by climate change, and tourists are forced to seek other destinations. It is clear that these phenomena play a significant role in the tourism process and are illustrated by the change in destination choices in recent years, with affected regions being increasingly avoided [9]. This explains why tourism is much more developed and stable in some regions, being an important source of income. From this perspective, climate change contributes to the widening of economic gaps between areas, regions, and even countries in some places.

When it comes to Romania, tourism has a wide variety of natural attractions, but with climate change, these can be damaged or even destroyed. It is important for people to be aware of these changes and to take the necessary measures to ensure that this activity can continue in the context of climate change. In addition, it is important to analyze the seasons in order to streamline the tourism process. Although each year brings new changes that are difficult to predict, climate change that are closer to the present may be easier to detect than those that are more distant [11].

MATERIALS AND METHODS

The paper focuses on defining the concept of climate change in our times and how it affects humans, reflecting in particular the major impact it has on two important economic areas: agriculture and tourism. This study presents the results and consequences of climate change in Romania. Furthermore, it proposes a series of useful methods and techniques that help to combat the negative effects and prevent damage that may occur as a result of extreme weather events.

The main method applied in this study was a bibliographic analysis of the current specialized literature in the field of research (books and scientific papers included in international databases such as Web of Science, Scopus, Google Scholar), along with a comparative analysis between the current situation in Romania and Europe in the present, by consulting recognized databases (Eurostat, INSEE).

RESULTS AND DISCUSSIONS

Of all the economic sectors most affected by climate change in recent decades, agriculture has suffered the most severe consequences. Vegetation factors are among the most affected elements of cultivation. Extreme weather events have major negative consequences for all agricultural crops known in our country, and in difficult years, they can even contribute to the complete loss of harvests. Climate change increasingly threatens the future of humanity and the way we live, affecting all human activities [16, 18].

Therefore, it is easy to see that temperatures have gradually increased over the last few decades, including during the cooler seasons (autumn and winter). Unfortunately, during the warm season, the so-called heat waves have become increasingly frequent, meaning periods of time lasting more than 2-3 days with unusually high temperatures for that time of the year (days with temperatures above 32 degrees Celsius). These significantly affect all ecosystems, they cause crop losses in agriculture, and can also have a negative impact on human health, especially for the risk groups. The occurrence of these heat waves was slightly noticeable in the summer of 2024, with the average European temperature recorded being the highest in the last 80 years, according to the European climate service Copernicus.

Water quantity and quality are other important aspects to consider in agriculture. In recent years, there has been a significant moisture deficit in the soil due to prolonged periods of drought and the lack of modern irrigation systems in our country. The insufficiency of this essential element for cultivation significantly affects agricultural crops, slows down plant growth and development, and causes multiple physiological imbalances.

The impact of climate change can also be seen in surface waters, one example being the Danube River. It is currently quite polluted and has a high water level, making it prone to flooding in winter, while in summer its level drops significantly [17]. Therefore, these floods, as well as droughts, affect agricultural crops, being difficult to find a balance.

At the same time, another effect of climate change on agriculture is related to the shortage of agricultural products. Agricultural products are becoming increasingly difficult to obtain and, as a result, their quantity is decreasing, which is causing producers and farmers to raise prices. According to data presented by Eurostat, at the European Union level, there has been an increase in prices between 2012 and 2024, but this increase is gradual and steady, not sudden. In contrast, in our country, the increases and decreases are very sudden, so there is a major inconsistency from one year to the other in Romania. Agricultural prices fell considerably in 2015 and 2016, then rose sharply, then fell again in 2020, and during the pandemic and until 2024, they rose very much, one of the causes being extreme natural phenomena such as lack of rainfall or, conversely, floods, severe storms, fires, and droughts, which can destroy agriculture and reduce the cultivation of agricultural products [21].

For agriculture to function properly, it is important to take immediate and priority measures to combat and adapt to climate change. These include the following:

1. Using plant varieties that are adapted to change, with greater resilience, and practicing crop rotation. A high level of crop diversification ensures the continuity of agriculture even in difficult climatic conditions, through the use of various crops that are more resistant to change [5]. Furthermore, crop and soil cover is essential for protecting and maintaining soil moisture, and even planting trees along crops to combat erosion through agroforestry [5, 10].

2. New and modern methods of agricultural production. This goal means adopting modern, highly digitized land preparation systems so that water can be retained in the soil and erosion does not occur.

3. Promoting the concept of sustainability in agriculture in all decisions taken at national level in this field, reflected in both legislation and public policies. Decisions taken

at national and European Union level to promote sustainability are essential to ensure the smooth running of the agricultural process [1, 8].

In addition to agriculture, another sector of major importance for the proper functioning of a country such as Romania is tourism. This sector has become increasingly sought after and is experiencing rapid growth. Tourism in Romania should be viewed from the perspective of how it contributes to the development of other sectors, leads to the creation of new jobs, creates a good image of our country, and promotes Romania's values [13, 15].

Romania's geographical position is a great advantage for tourism, as it has a variety of landscapes, access to the Black Sea, and is crossed by the Danube River [13]. However, tourism is increasingly affected by climate change. Extreme weather events threaten cities, the coastal area, and natural tourist attractions.

To ensure the continuity of tourism in a sustainable way, we can take a look at a branch of tourism that seems to be increasingly sought after by those eager to travel, namely agritourism. This sector is growing steadily both in our country and in many other European countries. As people want to escape the hustle and bustle of the city and take refuge in nature, many choose to travel to rural areas. This is beneficial because the rural environment offers nature, agricultural products, and authentic food. In addition, agritourism encourages the development of rural areas and the production of local products. Romania has a fairly extensive rural environment, spread throughout the country.

Agritourism is based on the consumption of local agricultural products [4], but it also involves the promotion of cultural and natural resources, therefore preserving the entire heritage [15]. It is important that the region in question is analyzed first to ensure that it has what is necessary for agritourism, namely well-equipped farms, accommodation facilities, and the region's willingness to support this project, as well as the community's desire and openness to welcome tourists [2]. Also, even the European Union encourages the development of rural areas and considers them places of sustainable development [12].

Unfortunately, Romania is not currently a destination of great interest to foreign citizens, either in terms of mass tourism or agrotourism, as prices are rising and the quality-price ratio is not advantageous [4]. This is also true for the Black Sea coast. The advantage of having access to the sea is enormous, but no importance is given to the real and balanced development of our country's coastline.

One thing to note is that in recent years, it is not only older people who are attracted to agritourism, but also young people who want to relax in a quiet place, surrounded by nature, with authentic farm products. [3, 13]. Urban centers are more prone to natural disasters caused by climate change, with older people being the most affected [20]. Therefore, in contrast to the urban congestion and high levels of pollution, more and more people are seeking oases of tranquility in places less altered by humans. Currently, agritourism is experiencing a revival, with accommodation facilities becoming increasingly modern and attractive, and restaurants offering increasingly sophisticated menus, promoting local products according to the international farm-to-table concept. For these reasons, we believe that Romanian agritourism has high development potential and could even become a key sector for tourism in our country. But this development must be achieved in a sustainable manner, without negatively affecting rural areas in any way.

CONCLUSIONS

Following this study, it is clear that climate change affects all aspects of human life. One of the main areas affected by climate change in Romania is agriculture. This is vital for humanity, as it involves food production, without which we cannot live. Therefore,

appropriate prevention and adaptation measures are needed, involving crop diversification, soil protection, and the use of crops that are more resistant to change. Then, digitization is another effective way to be introduced into the agricultural process, followed by the development of sustainable agriculture and raising public awareness of the risks and problems that may arise as a result of pollution and climate change.

In addition to agriculture, tourism is another sector deeply affected by climate change at the national level. However, agritourism supports tourism by promoting it in rural areas, which have enormous potential for local development. Agritourism supports local communities and encourages visits to rural areas and the natural landscapes found there. Moreover, if these rural areas develop in a sustainable way, agritourism becomes an important part of tourism, but with a reduced impact on the environment. Farmers and family businesses will benefit in this regard, and people will be able to enjoy a peaceful place, away from the noise of cities, surrounded by nature and fresh air.

Therefore, climate change will become increasingly visible throughout the world, in Europe and also in Romania. In order to adapt as best as we can to these changes, we must find urgent measures to protect resources and the environment, which both present and future generations greatly need in order to lead a decent life.

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