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CLIMATE CHANGE IN RELATION TO AGRICULTURE

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Abstract: *Climate change in Romania, will affect all sectors of the economy will lead to changes in vegetation periods and displacement the line between woods and meadows. Extreme weather events (storms, floods, droughts) will occur more frequently, and related risks and damages may become more significant. The areas affected by drought have expanded in the last decades the most exposed being in southeast and most of the country was affected by long lasting dry period. Together with floods, long periods of drought lead to significant economic losses in agriculture, transport, energy, water management, health and activity of households.*

Keywords: *agriculture, climate, climate change, greenhouse environment.*

INTRODUCTION

Today we have a number of environmental problems, many of which are closely related. The most important issue is climate change. During Earth's history, the climate has changed many times, sometimes dramatically. The ages of warmer replaced and superseded always been glacial. However, the climate of the past about 10 000 years has been particularly stable. During this period has developed the human civilization. In the last about 100 years - since the beginning of industrialization - the global average temperature has increased by approx. 0.6 ° C (after IPCC (Intergovernmental Panel on Climate Change)), faster than ever in the past 1000 years.(fig 1)

Climate changes observed during a period of time comparable to the early industrial era is the result of human activities directly or indirectly for change the composition of the global atmosphere and which adds to the natural climate variability.

Global warming affects both physical systems and biological ones. Among the direct effects can be mentioned: average global temperature increase to significant variations regionally, reducing the volume of the polar ice caps and thus increase ocean levels, changing hydrological cycle, the increasing area of arid changes in the course of the seasons, increased frequency and intensity of extreme weather events, biodiversity loss, etc.

The Intergovernmental Panel on Climate Change recommends the need to establish policies and measures to reduce emissions of greenhouse gas (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride), as without these measures there will be increases global temperature. Limiting average global temperature increase with a maximum of 2 °C above the pre-industrial period 2100, requires reducing greenhouse gas emissions by at least 50% toward current level.

The United Nations adopted the United Nations Framework Convention on Climate Change, in Romania it was transposed into Law no. 24/1991 - ratification of the United Nations Framework Convention on Climate Change.

The Kyoto Protocol was transposed into Law No.3 / 2001 - ratification of the Kyoto Protocol of the UN Framework Convention on Climate Change; It became mandatory on 16 February 2005.

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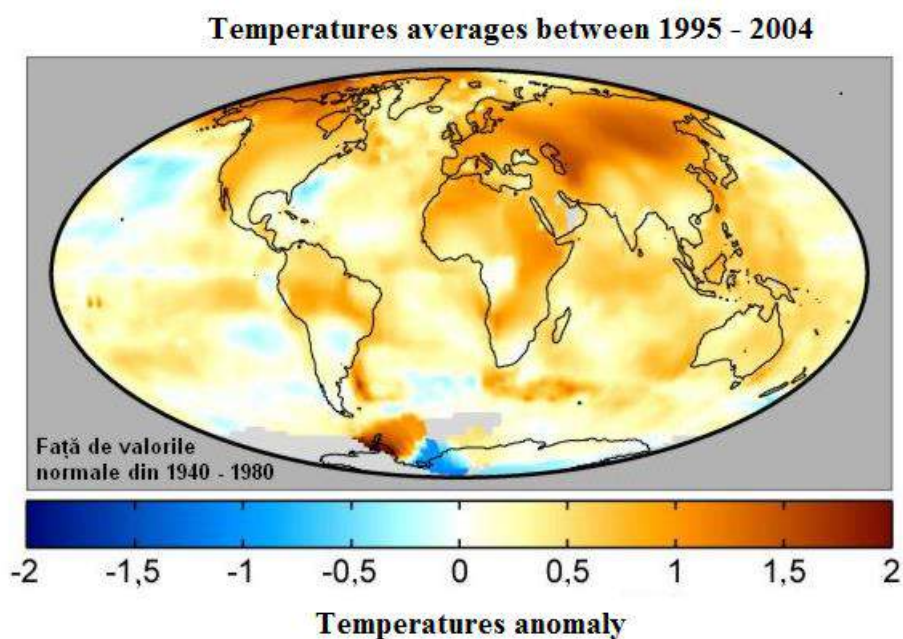


Fig.1 Global average temperature between 1995-2004

The Directive of European Community 2003/87 / establishing the scheme for the trading of emission allowances for greenhouse gas emissions issued in the European Community, as amended by Directive 2004/101 / EC, the so-called The Directive Contact, linking scheme emissions trading within EU to other emissions trading schemes and CO₂ reduction projects (JI - JI and Clean Development Mechanism - CDM).

Romania, by participating in the - Third Conference on Climate Change in Kyoto has taken place in Japan in December 1997 adopted a legislative framework within which the activities relating to climate change.

The characterization of climate factors for Romania

Air temperature

The average annual temperature ranges in our country from 11 °C to 8 °C in the south and north. The isotherm annual averages are 11 °C and limit the Danube valley along a wide strip of 20-30 km. In coastal and Danube Delta average temperatures above this level. Most of the North Dobrogea and Tisa plain had annual average temperatures between 10 °C and 11 °C. From 10 °C isotherm the highlands annual average temperatures decrease depending on altitude, reaching the isotherm 0 °C to meet at 2000 m altitude.(fig 2)(Busuioc, 2003)

The annual average values are lower in the north and on the slopes with northern exposition along river valleys while large average temperatures are higher than in the corresponding high areas.

An extreme temperature (maximum and minimum) as well highlights the continental climate in our country. The highest maximum temperature (40 °C) was recorded in Bărăgan and lowest minimum (below -30 °C) in the region Gheorghieni – Vatra Dornei.

Precipitation regime

Climatic analysis of data has led to the amount of 637 mm average annual rainfall quantity falling on our country. If we analyze the geographical distribution of rainfall is a noted significant difference: thus, there are differences between western regions, subjected of invasion humid air, and eastern, driest; between the highlands, with high rainfall (1000 - 1400 mm), and bass poorer in precipitation between slopes with different orientations.

Differences are reported and where depressions safe from Western currents (Gheorghieni, Ciuc, Braşov) where quantities are falling below 600 mm. In the Piedmont Plateau fall about 600 mm and in northern and central Moldavian Plateau 500-600 mm. In the south of the Getic Plateau, in Baragan Plain and Dobrogea fall below 500 mm and the Danube Delta and coastal below 400 mm. In Tisa Plain annual fall about 600 mm, while in the Western Hills 700-800 mm.

Some of the causes of these differences is the position in relation to the movement of the Carpathian peaks western fronts intensified activity in their passage over the mountains, intense thermal convection of warm weather, and more.

Analysis of rainfall distribution in both seasons shows that are differences between the warm and cold season and between different regions of the country. In summer, due to the predominance of north-west movement in high mountain areas in Transylvania Plateau fall about 70% of the total annual rainfall. In the remaining countries fall between 55 and 65%, except Black and Delta, where 55% fall southwest Oltenia and Banat, where fall below 50%. In the winter, due to the anticyclone regime fall less precipitation, excepted southwest of Oltenia and Banat.

Rainfall is the highest parameter variability in time and space and this is supported by the outstanding amounts from the annual average recorded in some years. Thus, in regions characterized by moderate amounts of precipitation, as the Romanian Plain values were recorded 1160 mm (Vidra), 1048 mm (Mărculeşti), 1014 mm in Rm. Sarat, etc. In dry years the amounts of rainfall in the Romanian Plain amounted just 120 mm (Drăgăneşti-Vlaşca, Tămădău). Another problem noted above is the heavy rains, frequent especially during the summer, giving exceptional water quantities and pursued enhancing thermal convection

The snow, due to geographical location of our country, is a significant part of the annual rainfall. The number of snowy winter days grows gradually from the plains to the mountains. A special importance is the thickness of the snow, but for which no assessment can only be very general, because in this case local conditions, especially wind direction and strength, leading to differentiated deposition of snow. It accepts, however, increase the thickness of snow with altitude: 5 cm in Dobrogea at 5-20 cm in the plains and hills and over 1 m in the mountains.

Global warming affects our country, the most pronounced effects are hot and dry winters. Romania is significant increased frequency of extreme weather events and rare: hot summers, tornadoes, floods. Meteorological records for more than 100 years shows a clear trend of desertification on an area of 3 million hectares in the east of the country (Dobrogea), East Muntenia and southern Moldavia, of which 2.8 million arable hectares (20% of Romania's agricultural fund). For the last century was highlighted average increase of the temperature 0,3 °C until, with an increase made after 1960. The increases are differentiated being more pronounced in the southeast with values of 0,8 °C stations Bucharest - Filaret and Constanta. The increases are lower in the central and northern part of the country except Baia Mare depression were highlighted where values of 0,7 °C. Data recorded at the main meteorological stations in the country and weather stations in Southern and Western Carpathians, located at altitudes between 1090 and 2504 m for the period 1961-2000 reveal the following:

- The trend of increasing global average air temperature at earth surface, accelerated in the last 25 years;
- A slight increase in mean annual temperature and decreased precipitation quantities for mountain areas;
- A slight increase in mean annual temperature stations Vf. Omu (2504 m) and a clear increase in Stâna de Vale for the period 1979-2000;
- The Scărişoara Glacier melt and reducing it by 2.0 m in the last 100 years, of which the most significant reduction was reported in the last 25 years;
- Raising the water level in different sections located on the Black Sea coast up to 45 cm in a period of 130 years;
- The occurrence of extreme temperatures, such as those recorded on 5 July 2000 data station 43,5°C Giurgiu and Bucharest 42.4 C in 1984.

As examples of changes to the climate, 2000 was characterized by the generalized drought and excessive temperatures. Recordings carried out revealed that summer of 2000 was the driest in the last 100 years, preceded by spring range which was also extremely dry. In terms of rainfall, significant regional differences are reported with a slight increase in the south, west and east and annual decreases in the remaining territory. It is clear accentuation of torrential rainfall which is manifested by the fall of large amounts of rainfall in short periods followed by a long period of drought. Even in dry years produce the major floods rainfall during spring snowmelt when combined with in summer. The most destructive flood was produced on rill Pârâul Mare (Retezat Mountain) on 11 July 1999, which result 13 victims, 21 people injured and two blocks was destroyed. Rapid alternation of rainy periods with dry periods, a significant example in this respect was 2000, when after a spring in which there were major floods followed a very dry period in June and July. (Sandu, 2010)

For example, year 2005 rains fall between rainfall floods which caused major in Moldova and Banat and many type flush floods in hilly and mountainous area. For winter we have highlighted significant warming, combined with melting snow pronounced shift to spring suddenly being made. For autumn a slight cooling of the climate of the western half of the country, and in summer temperature variations are recorded with long oscillations falling into the general trend of variation.

RESULTS AND DISCUSSION

Weather climate change in Romania agriculture

Drought is one of the most severe effects of global warming and this phenomenon is present in Romania. Catalin Simota - Director of the Institute of Soil Science in Bucharest says that "On the basis of global warming arising from human activity, areas that were at risk in case of water shortages are facing a higher risk, they become desert. When become desert, it changes the whole balance radioactivity, all vapour flows in the area, leading to an accentuation of global warming which, in turn, affects even more land. "

For evidence negative effects of climate change has been proposed several scenarios.

Under climate change scenarios in Romania for the next 20 years is projected a temperature increase between 0.7 °C - 1.1 °C, the highest values are recorded in the mountainous area. Rainfall will present a fall in the winter months - december and february, an increase in october, the month of June will bring the significant decreases in the plain. From these estimates it follows that with an increasing temperatures will have processes of degradation of lands favouring the effects of drought: - destruction of vegetation, soil erosion - water and wind, damage soil structure, compaction of soil crust and filling porosity and soil salinization. (Busuioc, 2003)

In case of an increase in average annual temperatures cumulated with the absence of rainfall during the growing season result possible losses to agricultural production.

CONCLUSIONS

According to data from the National Institute of Meteorology for the period 2021 - 2050 provided for a multi annual average temperature increases by 1.4 C compared to the reference period 1961 - 1990. For the century temperature rise will be 3.1 C.

For rainfall is expected to decrease in the summer months throughout the country average of 20%. Extreme events - droughts and floods - climate change accompanying this aspect.

In the last years Romania has succeeded to halve the emissions of greenhouse gases, although climate change recorded globally continues to affect us by extremely high temperatures, said Monday the Minister of Environment, Water and Forestry Grațiela Gavrilescu conference

presentation of the report 'the European environment - state and the perspectives 2015 ~ - SOER 2015 prepared by the European Environment Agency. As for climate change, even with the reduction of gas emissions greenhouse, they still affect the Romania.

Regarding climate change, even with the reduction of gas emissions greenhouse, they still affecting Romania. Last week, our country went through a difficult period marked by extremely high temperatures. Like other European countries, Romania has registered between 1988 and 2010 average annual temperatures increased by about 0.5 °C, a value very close to the global average of 0.6 °C. This increase is the source of today's problems; keenly felt not only in agriculture but also in discomfort and health of the population, "said Environment Minister.

The data 18th of September 2015, Member of the European Union States had reached an agreement on the goals that they will support the International Conference on Climate Change (COP21) taking place in Paris between November 30 to December 11 - 2015. Ministers of environment have decided to advocate that emissions of greenhouse gases is reduced globally by 40% by 2030 and by 50% by 2050, and should be close to zero by 2100 so that the average temperature increase global does not exceed 2 °C in 2100 compared with the pre-industrial times.

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