Influence of the Climate Changes on the Human Life Quality, in Rural Areas

DORINA NICOLETA MOCUTA*
University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, Bucharest, Romania

Humanity is currently facing global climate changes and their disastrous effects, such as: increasing air and oceans water temperature, increased flood risk, drought, lack of drinking water, increased risk of fire and reducing natural vegetal resources, changes in ecosystems and degradation of natural resources, increased risk of diseases. The changes at climate and ecosystems level are endangering even the foundations of the human health (the access to adequate food resources, clean air, drinking water and safe housing) and represent at the moment the greatest challenge of the 21st century, with regard to public health [1].

Keywords: Global warming, climate changes, life quality, food resources.

The global warming creates great worries among specialists and population, regarding the climate future of the planet. But alongside, it generates great material damages, in the different domains of social life, determining phenomena that seem to change irreversibly the face of the world and, implicitly, general living conditions. Its most widely publicized effects are: slow but constant rise of sea level, increasing frequency of climatic extremes, progressive melting of glaciers and glacial calotte, extinction of many species, significant influencing of human and animal health. In the last century, arctic temperatures increased two times more than in the previous century, while atmospheric carbon dioxide concentration increased from 278 particles per million, as it was in the pre-industrial period, to 379 particles per million in the year 2005. Specialists affirm that over two decades, in arctic summer, the ice from poles will melt completely, which will be a tough test of survival, for many polar species. Some forecasts indicate an increase in global temperature of about 3-4ºC, until 2100, which would equalize with a real caloric shock, both for the environment and for humans [2] The consequences of these phenomena can impugn the capacity of human, society and ecosystems to adapt. Some extreme weather phenomena (heatwaves, dog-days, prolonged droughts, heavy rainfall, floods, strong storms, tornadoes, hurricanes, typhoons, season disturbances etc.) also have less known ecological effects. These favor producing of vast vegetation fires, progressive melting of permanently frozen soils (permafrost) and the disappearance of some lakes (already 125 glacial lakes have disappeared), the early flowering and maturation of plants, migration of some animal species in higher areas, excessive overgrazing and unpredictable migration of some insect species, the recurrence of some eradicated diseases, the increased incidence of allergies etc.

Experimental part

Evaluations by scientists show that a climate warming from 2 to 4.5ºC would make between 1 and 3.2 billion people to be affected by water scarcity. Up to 120 million people in addition to the current ones would be exposed to hunger; the number of deceased persons due to heat, droughts, floods, diseases related to the poor drinking water distribution or to major disruptions in ecosystem functioning and the extinction of some species will increase (Dupont, 2007). The climate changes will determine massive migrations of some populations - the so-called *climatic refugees*, especially from coastal areas that will be flooded, but also from large metropolises where, due to overcrowding and overheating of the environment, life will become more difficult. On such a background, some forecasts indicate for the next two decades a global economy decline of between 5 and 20%, with total economic losses estimated at over 7 000 billion dollars. Global warming is expected to have an effect comparable to the losses suffered in the two world wars [3]. Drought and associated phenomena, such as aridity (excessive descent of the groundwater) and desertification (reduction of the soil surface covered by vegetation and considerable soil impoverishment and erosion) represent, after pollution, the second major problem faced by humanity at present, affecting all regions of the earth. Globally, 3.6 billion ha, out of the 5.2 billion ha of dry arable land, are predisposed to drought. Annually, desertification extends by 50,000 hectares of land worldwide.

Desertification, present in over 110 countries, affects around 1 billion people, and its annual damages are estimated at 42 billion dollars. Drought and desertification affect sustainable development through interrelation with the social problems that they generate and potentiate: - reducing water reserves, food production potential and, implicitly, food safety of population; - poverty, as the most grave dysfunction in the areas affected by these phenomena; - deterioration of the population health, due to inadequate food consumption, which generates anemia and malnutrition.

Floods are the natural destructive phenomena with the highest frequency in the world. They cause numerous losses of human lives and material damages. Annually, floods produce more than 20,000 victims on earth, and 100 million people are affected to a different extent by the consequences of this phenomenon.

Regarding our continent, the climate of Europe warmed with almost 1 °C in the last century, faster than the global average. A warmer atmosphere contains more water vapors, but the new rainfall regimes vary greatly from one region to another. The amounts of rain and snow increased considerably in northern Europe, while in the southern continent, droughts periods have become more and more frequent [4].

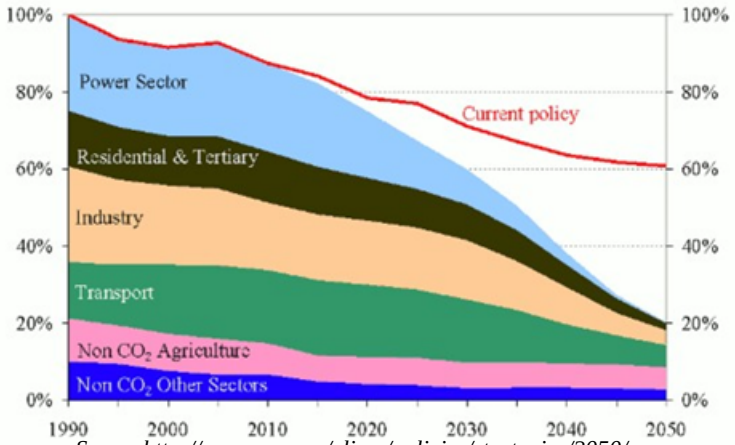
* email: dorinamocuta@yahoo.com

Table 1
QUANTITY OF CO2 EMISSIONS

Ţara	Milioane tone de echivalent CO2/ 2013
Belgium	123.43251
Bulgaria	56.35274
Czech Republic	128.00436
Denmark	57.0825
Germany	976.32638
Estonia	21.83024
Ireland	60.57586
Greece	107.6046
Spain	335.31298
France	506.37931
Croatia	24.78483
Italy	446.55714
Cyprus	9.04455
Latvia	11.29352
Luxembourg	12.29726
Hungary	57.92212
Malta	3.12464
Netherlands	206.32844
Austria	81.59547
Poland	396.42036
Portugal	67.8948
Romania	111.42262
Slovenia	18.23937
Slovakia	43.764
Finland	64.95812
Sweden	58.043
United Kingdom	604.27168
Iceland	5.06591

Source: http://ec.europa.eu/eurostat/statistics, 2013

In the most part of the climate changes the greenhouse effect is involved, meaning the contribution of certain gases emitted naturally or artificially to the atmosphere. It is well-known that human, whether conscious or not, is largely responsible for greenhouse effect gas emissions and mainly for CO_2 emissions (the most wide-spread among greenhouse effect gases). Thus, the total CO_2 emissions for Romania were 118 million tons in 2013, representing 2.42% of total EU emissions. According to EUROSTAT data, in 2013 Romania ranks 10th regarding the amount of greenhouse effect gas emissions equivalent to CO_2:



Sursa: http://ec.europa.eu/clima/policies/strategies/2050/index_en.htm [14]

Fig. 1. Contribution of the main economic sectors to the generation of greenhouse gas emissions at EU level

Causes of climate changes

Many of the activities exercised by people influence increasingly the climate and, implicitly, the earth's temperature through actions such as: burning fossil fuels, cutting forests, intensifying animal breeding, etc. These activities generate enormous quantities of greenhouse effect gases, which are added to those already naturally present in the atmosphere, thus contributing to greenhouse effect and global warming. We can affirm that human activity resulted in increasing concentration of some of them, especially of:

- carbon dioxide (CO_2)
- methane
- nitrous protoxide
- fluorinated gases

In addition to the above, the energy sector has a major influence, which, through its activities, develops the largest amount of greenhouse gases.

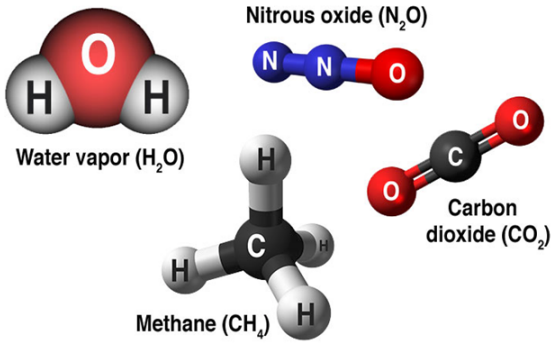
Water vapor. The most abundant greenhouse gas, but importantly, it acts as a feedback to the climate. Water vapor increases as the Earth's atmosphere warms, but so does the possibility of clouds and precipitation, making these some of the most important feedback mechanisms to the greenhouse effect.

Carbon dioxide (CO_2). A minor but very important component of the atmosphere, carbon dioxide is released through natural processes such as respiration and volcano eruptions and through human activities such as deforestation, land use changes, and burning fossil fuels. Humans have increased atmospheric CO_2 concentration by more than a third since the Industrial Revolution began. This is the most important long-lived *forcing* of climate change.

Methane. A hydrocarbon gas produced both through natural sources and human activities, including the decomposition of wastes in landfills, agriculture, and especially rice cultivation, as well as ruminant digestion and manure management associated with domestic livestock. On a molecule-for-molecule basis, methane is a far more active greenhouse gas than carbon dioxide, but also one which is much less abundant in the atmosphere.

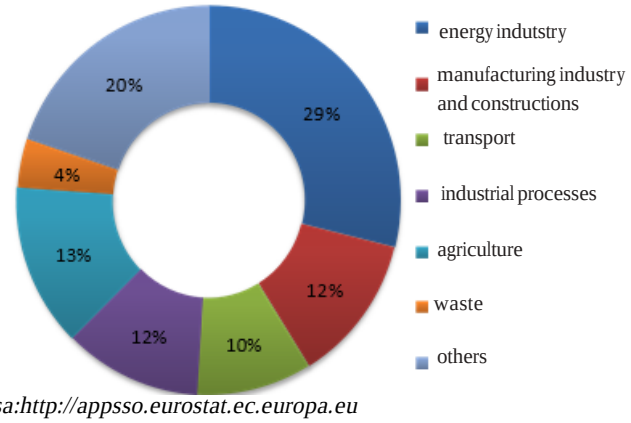
Nitrous oxide. A powerful greenhouse gas produced by soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning [5].

Chlorofluorocarbons (CFCs). Synthetic compounds entirely of industrial origin used in a number of applications, but now largely regulated in production and release to the



Sursa: NASA: ***Climate Change*** *and Global Warming*

Fig. 2.



Sursa:http://appsso.eurostat.ec.europa.eu

Fig. 3. Sectoral composition of greenhouse gas emissions emissions

atmosphere by international agreement for their ability to contribute to destruction of the ozone layer. They are also greenhouse gases [5].

In Romania, the average annual amount in all sectors, in million tons CO_2 equivalent, is 137.22 for the period 2000-2013, with the following structure:

- energy industry-39.63;
- agriculture -18.58;
- manufacturing industry and constructions;
- 16.86, industrial processes and product use;
-15.89, transport-13.47, waste-5.54. ([11] http://appsso.eurostat.ec.europa.eu)

Major effects and consequences of climate changes

Due to air that becomes more and more polluted, according to statistics, the population health at global level shows that over three million people die prematurely due to constant exposure to lead, ozone or mercury.

The main major effects of global warming are two categories with significant impact on economic and social life:

Melting glaciers and rising sea levels (when the water gets warms, its volume increases); melting glacial calottes and glaciers. Together, these changes lead to increased sea and ocean levels and, implicitly, to the flooding and erosion of coastal areas and lowlands;

Extreme weather phenomena, changing the rainfall regime (torrential rains and other more frequent weather phenomena). These cause floods and also lead to water quality decrease and water resource diminishing for some regions.

The risks generated by global warming effects are manifested through:

Threatening the survival of many species of plants and animals. Many terrestrial, soft water and marine species have already migrated. Some plant and animal species may disappear if global average temperatures will continue to increase uncontrolled.

The sectors that are highly dependent on temperature and precipitations, such as agriculture, forestry, energy and tourism, are particularly affected.

Risks for human health. Climate changes have a particular impact on health, so there has been an increase in the number of heat-related deaths in some regions and a decrease in the number of those caused by cold in others; modifying the distribution of some diseases transmitted by water or vectors. All these generate costs for society and economy. During 1980 - 2011, more than 5.5 million people were affected by floods and the direct economic losses resulted were over 90 billion Euro.

The residents of many poor developing countries are among the most affected. Besides the fact that their lives often depend to a great extent on the natural environment, they also have the least resources that they can afford to cope with climate changes [1].

It is estimated that, in the most industrialized countries, the level of fine powders in suspension (a category of pollutants known as being among the most dangerous) is three times higher than the limit allowed by the international safety norms.

Moreover, Romanians can *boast* with the most polluted capital in European Union, according to national environmental authorities. A World Health Organization report in the year 2007 shows that 9,400 people die annually in our country due to polluted air.

How does body feel the effects of pollution: we cough without reason, we feel tired all the time, and we have lot of headaches. These are the surface effects of pollutants from the air and from food, which penetrate into the body and destroy our health step by step [6, 12].

In the EU countries it is estimated that mortality increases by 1-4% for each temperature degree rise, meaning that heat-related mortality could increase by 30,000 deaths per year by 2030 and by 50,000-110,000 deaths per year by 2080 (PESETA project). Elderly people with a reduced capacity of body and temperature control, have the highest risk of death due to caloric shock and cardiovascular, renal, respiratory and metabolic disturbances (Matthies et al., 2008). While the total number of deaths is closely related to the size of population, the change in the mortality rate may be more pronounced in the regions where warming is highly manifested [7].

The diseases are the result of environmental changes and health and happiness can be regained, according to Voltaire, *only if we learn again to walk in four legs*. According

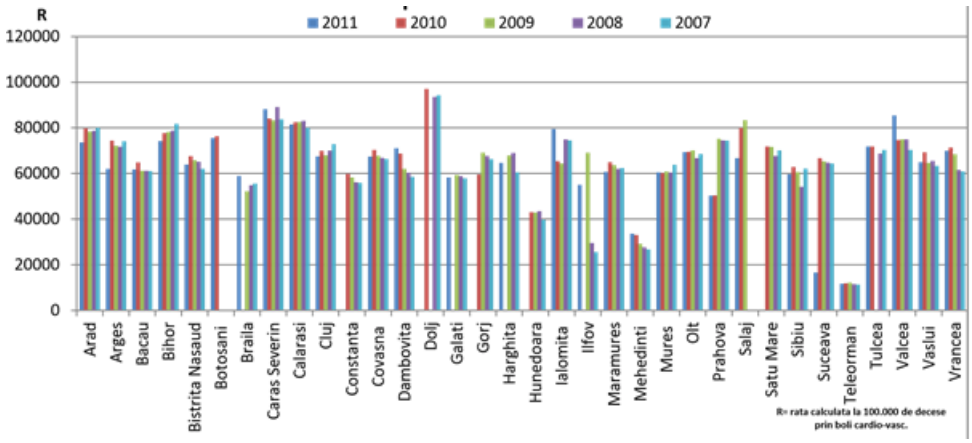


Fig. 4.Mortality through cardiovascular diseases

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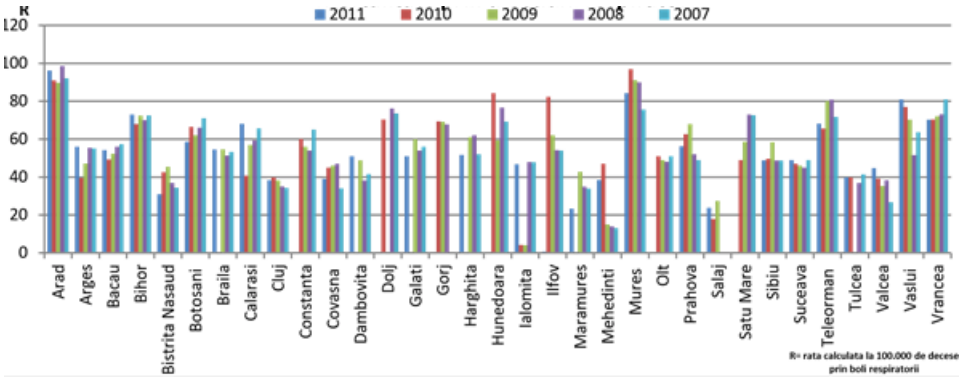

Fig. 5. Mortality through respiratory diseases

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as the humanity has become aware of the fact that the environment offers both resources and prospects, the problem of environmental quality and protection has become current, under the form of emphasizing the need to preserve and more efficient use of the productive potential of the environment. This is why, both globally and nationally, attention is increasingly being given to the environmental protection activity and to the synoptic surveillance of changes in its quality.

Results and discussions

In time, the humanity has become aware that the environment is the one that offers both resources and prospects and the problem of environmental quality and protection has become current under the form of emphasizing the need to preserve and more efficient use of the productive potential of the environment. This is why, both internationally and nationally, more and more attention is paid to environmental protection and implicitly to the quality of human life [7].

The assessments carried out in a number of European countries, as well as WHO-EURO and IPCC analysis suggest that climate changes will influence the epidemiology of many diseases and health conditions, as a negative impact of climate changes on human health [4].

More and more, the idea of *adapting to climate changes* is being circulated, so it is recognized that these no longer can to be stopped, but there may be ways to predict and / or minimize them. Thus the problem of operating the surveillance system becomes more acute, which should not be a new created system, but it is necessary improving and integrating the existing one. Thus, this should have as main objectives: creation and updating a database; identifying and evaluating measures to adapt to the effects of climate changes; taking early anticipatory measures. European Commission has begun the public consultation process in order to prepare the process of developing the EU Adaptation Strategy to the Effects of Climate changes. It was finalized in March 2013 and includes recommendations for all vulnerable sectors at EU level.

In the current context, changing and continual updating of legislation that protects the environment but also the quality of human life require additional attention and effort on behalf of everyone working in this domain.

Thus, the establishing and strengthening the existing mechanisms that build the guaranty of effective implementation, by promoting the local implementation of all existing and future mechanisms, by optimal collaboration with other sectors, by applying, updating and improving legislation and increasing the performance of health and environment systems becomes an indispensable pillar [7].

NATIONAL PUBLIC HEALTH INSTITUTE proposes several main directions:

- CONTINUING ACTIVITIES FOR THE PROTECTION OF POPULATION HEALTH, through all means of monitoring and surveillance of the main health indicators that can be influenced by environmental factors;
- PROTECTING THE POPULATION HEALTH AGAINST CLIMATE CHANGES by integrating the health aspects into all measures to prevent their impact on quality of life;
- PROMOTING PROPER NOURISHMENT AND PREVENTING IMPACT OF FOOD QUALITY ON POPULATION HEALTH STATUS.

As a result of sustained efforts and awareness of danger, it is climate change by international organizations, according to data from the International Energy Agency,global energy-related carbon dioxide emissions were flat for a third straight year in 2016 even as the global economy grew, according to the International Energy

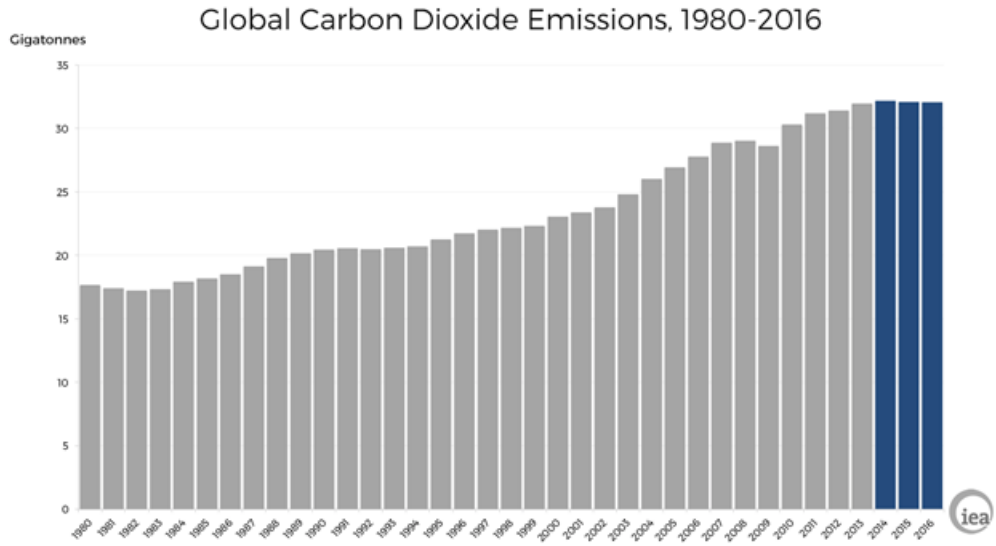

Fig. 6. Global Carbon Dioxide Emissions, 1980-2016

Sursa: International Energy Agency, 2016

Agency, signaling a continuing decoupling of emissions and economic activity. This was the result of growing renewable power generation, switches from coal to natural gas, improvements in energy efficiency, as well as structural changes in the global economy [8].

IEA finds CO2 emissions flat for third straight year even as global economy grew in 2016.

The biggest drop came from the United States, where carbon dioxide emissions fell 3%, or 160 million tonnes, while the economy grew by 1.6%. The decline was driven by a surge in shale gas supplies and more attractive renewable power that displaced coal. Emissions in the United States last year were at their lowest level since 1992, a period during which the economy grew by 80%.

Conclusions

Now it is vital to put the scientific knowledge achievements in the service of human and social life and not in the service of death by pollution, wars, global poverty etc. The transition in the XXI century means the passing to the practical responsibility era for using the scientific knowledge from the perspective and in the support of the increasing and development of the life quality [10];

The quality of human life must be interpreted from the perspective of the imperatives of life that Adler spoke about, as lived life, work and love [9];

The real economy must serve by its results, as well as through the mechanisms it uses, to the human and environment health, as generations of living that coexist and succeed inevitable in the evolution of our microcosm.

Since the evolution of the whole common living takes place in conditions of uncertainty, it arises the question to protect the human health, the other components that this is interrelated, meaning the families health, the environmental health, the health of the organizations and the health of the institutions.

We are aware that the aggregation of different indicators, linked directly or indirectly to the rural quality of life is a complex, difficult and sometimes contradictory process, but so aware we are that, in terms of the health of the all common living, we must find those relationships and those indicators with which to build a functional whole that to give the possibility of a proper evaluation, but also to help in remedying some factors of influence, determinants for the quality of life.

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