

INFLUENCE OF GLOBAL WARMING ON THE LIVING ENVIRONMENT

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Abstract

The paper analyzes the influence of global warming on the environment. First a potential of global warming is presented, as well as the consequences influencing the living world, and the measures that need to be taken to mitigate the effect of global warming have been considered.

In the second part of the paper a new strategy in fighting the global warming which is a result of a five-year project of American academic scholars has been presented.

Key words: global warming, environment, climate change, greenhouse.

POTENTIAL OF GLOBAL WARMING

UN Framework Convention on Climate Change of 1992 (FCCC) [1] expresses determination to prevent dangerous anthropogenic interferences in climate system. One of the instruments defined as a tool in implementation of this policy is utilization of an index, called Global Warming Potential (GWP). GWP is a weighted factor which enables comparison between 1 kg of any greenhouse gas on global warming and the influence of 1 kg of CO₂. This is a no-dimension quantity and it includes a time horizon within which the concerned influence will be felt. For example, a 20-year GWP for N₂O amounts to 280, which means that 1 kg of N₂O emitted today will cause 280 times bigger global warming over the next 20 years, than the global warming caused by 1 kg of CO₂ emitted today.

When GWP for every greenhouse effect is multiplied with the emission rate for this year, it is possible to determine the real measure of influence of any gas. By including the time horizon, GWP explains a bigger influence that any gas with longer lifetime has, compared to the gas that disappears quickly after the emission. The choice of time horizon that will be made by those who create the policy depends on the issue which is being solved in the given context. For example, a shorter time horizon may be used speaking of the rate of change of global temperature, rather than for the ultimate increase of temperature. A short

time horizon may also be suitable when it is necessary to define the most adequate strategy to fight the greenhouse effects in case of possible abrupt climate changes, after a certain threshold is crossed. On the other hand, a long time horizon may be used when assessing the strategies for avoiding long, slow irreversible influences such as changes of sea level. Standard time periods used for the tables that present GWP include 20 years, 100 years and 500 years.

CONSEQUENCES FOR THE LIVING WORLD

Consequence of global warming on man

Warming of atmosphere affects both the quality and length of people's lives: according to the estimates of the World Health Organization (WHO), every year global warming causes the minimum of 150.000 deaths. WHO also predicts that in case that the current warming trend continues, the mankind will face bigger number of injuries, diseases and deaths as consequences of natural disasters and heat waves, higher frequency of diseases transmitted by food, water and vectors, as well as bigger number of premature deaths and diseases that are a consequence of air pollution. Moreover, in many parts of the world, a big part of population will be displaced due to increased sea level and will be in jeopardy because of draught and famine. Hydrogeological cycle and the productivity of arable land change with the melting of glaciers, all of which has far-

reaching consequences for people's health. It is predicted that, due to the global warming, by the year 2050, according to the climate scenarios, between 15 and 37% of the plant and animal species will be "doomed to extinction".

"Due to climate changes, destruction of forests and the population growth, the flood will endanger two billion people by the year 2050 in those parts of the world which are currently endangered by that natural disaster" [2], it is written in UN report. Already now, one billion of people, or one sixth of the world's population, lives in the areas with recurring floods. UN University of Tokyo. The report also warns that by the year 2050 the number of population endangered with floods will have doubled.

Presently, there are about 500.000 people living in the flood areas in the world. The death toll of floods is 250.000 human lives a year and a huge material damage caused by destruction of houses, crops and cattle. The most floods take place in Asia where about 400.000 people are jeopardized. During the period 1987 to 1997 Asia sustained 136 billion \$ damage caused by floods. Warnings that global warming will cause disturbances in the world agriculture proved to be true: high temperatures and shortage of water have already decreased crop yield throughout southern Europe. Corn and sugar beet yields in Italy are cut by one fourth, and the crop of wheat fell by one third in Portugal [3] according to the report of the Joint Research Centre of the European Union in Brussels.

Harvest is better in northern Europe, which is in accordance with these announcements. Due to warmer weather, yields of sugar beet in Ireland increased by one fourth and by 5% in Denmark and Sweden. The yield of oilseed rape is by 12% better in Finland. That sample is almost completely in line with the forecasts on the effect of global warming in this century [4]. Production of milk will be difficult to sustain in the South due to the dry climate (draught), and there will be parts of Europe in which it will be not possible to engage in agricultural production any more. In fight for water, agriculture will probably lose to towns, said Olsen from the Danish Institute of Agricultural Sciences [4].

In the USA, the scientists of the Research Institute for Global Changes [5] predict that

there will be more rain throughout the planet, especially near the end of the century. That group of researches predicts that global warming will bring better crop yield to American farmers. However, central federal states, Kansas, Colorado and Nebraska could be affected by severe draughts. Both the European and the American experts warn that the recent heat wave gave idea about what kind of changes are ahead of us.

The main factors of the environment that affect health include: acid rains, quality of air and water, climate changes (especially global warming), pollution of water, air and soil, noise, toxic matters and various types of radiations.

In small places, without big pollutants in the vicinity, the quality of air is quite good, while in big cities and especially close to big roads and industrial plants, the quality of air is significantly worse. Besides the influence of local factors (those coming from the close vicinity), the quality of air is also influenced by global factors that are mainly not possible to control. The ozone depletion (creation of ozone holes) presents a big problem, and is to the biggest degree influenced by the most developed countries. No matter how persistent they may be in disciplining the small countries speaking of some other issues, there is mostly very little that they do to stop spreading ozone holes. As a matter of fact, almost all countries stopped producing refrigerators and air conditioners that contain gases detrimental for ozone layer, but this is not by far enough, because the biggest pollutants are not among the households, but in large industries that make huge profits and do not want to give up what they have at the moment.

Therefore, USA is the world's biggest ozone destructor, however they consistently refuse very strict protocols that would result in at least slowing down if not complete discontinuance of negative climate changes and appearance of new ozone holes.

Proposal of measures

Global warming caused by intensive use of fossil energies [6] is responsible for catastrophic floods, draughts and hurricanes that endanger human lives and the economy on the whole, highlights the report made by the experts on behalf of 17 organizations among which Friends of the Earth, Greenpeace and World

Wildlife Fund [6]. The report highlights that the international goal to eradicate the poverty by the year 2015 will not be attained unless drastic measures are taken to stop the increase of global warming. The report seeks the cost estimate of adjustment of poor countries to climate conditions, limiting the emission of noxious gasses to 60-80% above the 1990 level, which is quite more than prescribed by the Kyoto Protocol.

The USA is the biggest producer of the waste CO₂ in the world. Other developed industrial countries such as Japan, Great Britain, Germany and Sweden, have already developed programs applied against global warming. At the Kyoto meeting, the USA expressed its reserve toward adopted declarations and did not commit to signing any. The Protocol that was signed in Kyoto to the end of stopping global warming proves to be quite inefficient in some of its parts. That protocol demands the countries to eliminate CO₂ from the atmosphere by planting forests, and by changes in the manner of exploitation of forests.

Also, a reduction at the level of the pollution atmosphere with CO₂ is requested. The idea seems fabulous, but it has a fatal flaw. In fact, nobody is able to measure the extent to which trees and other plants absorb CO₂, nor what happens to carbon after the forests grow and disappear. The inefficiency of Kyoto Protocol was only further highlighted during the recent debacle at The Hague conference where it became apparent that the majority of developed countries still cared most about their political and economic prosperity.

The world will continue to heat up, and the effect of climate changes will vary from one country to another. Richer and more developed societies, such as North America, Europe and Japan are likely to use their technologies to mitigate the consequences. They will invent new types of grain, construct new irrigation systems and limit the use of coasts. Some northern countries, as Canada and Russia will also benefit from future warming to a certain degree. Their harvest will be improved, the cost of heating rooms will be reduced and climate will become more comfortable. On the other hand we can expect major crises among the economically undeveloped countries, such as most parts of Africa, Asia or South America. They will be severely

struck by the coming global warming and climate changes that they entail. Deserts in Africa will certainly dramatically expand. It is a known fact that the developing countries by far lack the resources that the rich countries have; therefore they will not be able to afford projects of neutralization of harmful effects. Tensions in social relations and political unrests are to be expected, as well as uncontrolled migration of people and growth of international terrorism and wars.

The Kyoto Agreement has been subject to frequent criticism, because it is regarded as restrictive by some countries, and as neo-colonialists by some undeveloped countries. The future of the Kyoto Agreement is uncertain, especially because it was refused by America. In order to be valid, the Kyoto Agreement must be ratified by at least 55 countries which are responsible for 55% of CO₂ emission in 1990. As former American president Bush withdrew the USA (the world's biggest pollutant, responsible for over 33% of emissions of carbon-dioxide) from the protocol, assessing it as detrimental for American economic interests, EU is convincing other countries (especially the Russian Federation with 17.4% of emission of CO₂) to ratify the Agreement. Currently the Agreement has been ratified by 119 countries, responsible for about 44.07% of CO₂ emission.

The real environmental integrity may be reached only by the common endeavor of us all. The environmental crisis is the crisis of basic life values. In order to be able to look at the world in a different way, we need to change ourselves. With changes that we can do in our everyday life, it is still more important to change policies at the national and international levels. This implies that the call for ecological changes should deepen our understanding of climate changes and of ecological problems. Education in that sense is necessary, not only in order to warn at whatever endangers our planet, but also to discover the essence of our existence.

Here are some ideas as to what can be done: design methods of preserving natural wealth, adopt common life decisions which lead to preservation and recycling; individuals need to get in contact with local environmental protection non-governmental organizations and help realization of their projects and campaigns; invite environmental protection activists to talk to your community [7].

Then, consumers' habits should be reviewed; buy and use only products in environmentally friendly packages; request washing powders, soaps and cleaning products marked with eco-labels; recycle anything recyclable: plastic, remains of fruit and vegetables, paper, cardboard, glass; make organic fertilizers – compost, and add to it leaves and a few worms, as well as other waste from the garden. Compost will be natural and highly effective soil fertilizer; encourage producers to be more responsible and recycle consumed and used devices, parts in products such as TV and computers.

It is necessary to reduce water consumption, use of automobiles, burning non-recyclable materials, reduce the Freon emission as well as electricity consumption by using the appropriate fluorescent lamps.

Remind: the local authorities and sponsors to recycle and reduce waste, as well as enact modern laws on recycling, constantly remind domestic producers to use simple packages for their products, remind local authorities to save electrical energy and use more efficient electrical systems, remind state authorities to keep promises made regarding environmental protection, remind everyone we meet in everyday life that we live too comfortably and that for our consumers habits we need to follow the principle: reduce-recycle-reuse-remind.

New strategy in fighting global warming

In order to fight global warming considered, which is considered as the biggest environmental evil of the present, American University scientists started a five-year project called the Western Mountain Initiative, for which each year 1.2 million \$ will be allocated from the federal budget. The team of scientists will analyze the frequency of fires, floods, droughts and tree deaths in the past, and then, by using computer models, it will predict their occurrence in the future, explained Nathan L. Stephenson, research ecologist from the American Geological Institute and one of the project organizers [8].

Wildfires became more extensive and more serious in the past several years, and they represent a threat to the wood and water supply, said Craig Allen, one of the project participants [8]. Also, in recent years big snow covers on the mountains are melting faster than before, which poses a threat to the water supply of nearby towns and villages. Glaciers also melt due to the increase of the air temperature. In 3 years the scientists working on that project

will publish a book about unpleasant surprises in the past and about predictions as to what can be expected in the future.

Greenhouse effects and global warming, in addition to causing floods in areas with water and droughts in the inland area, bring about catastrophe in polar region. Thus, in Antarctica the world's largest iceberg B15 with a surface almost as large as Jamaica broke off because of the temperature increase. In their studies of climate, the scientists observe changes occurring in the atmosphere caused by human influence. Although the nature has great adaptability, its ability cannot follow the development of civilization.

Reducing the emission of greenhouse gasses (especially the emission of dominant CO₂) is our big chance in fight against global warming. The best solution to these problems would be a complete shift to energy sources which do not emit significant amounts of greenhouse gasses, and these are majority of renewable energy sources and nuclear energy. That shift is only theoretically possible, because energy demand is increasing day by day, and therefore we need some technological solutions in order to mitigate the emissions from existing energy sources.

One possible solution could be a method developed by scientists at Newcastle University. They have developed a highly energy-efficient method of converting waste carbon dioxide in the chemical mixture of cyclic carbonates. This blend is widely used in manufacturing industries producing products such as solvents, paint removing agents, biodegradable packaging. Moreover, it can be used in chemical industry, too. However, only pure energy sources are real progress in fighting global warming.

CONCLUSION

There is no doubt that developed countries produce the biggest quantities of gases, which automatically means that they have the highest production per capita. At the same time they have the biggest impact on making decisions which will contribute towards reducing emissions, but unfortunately they do not want to do it, or do so only nominally, because they do not want it to affect their living standards. On the other hand, we have undeveloped countries which want to reduce a gap between them and developed countries through accelerated development. In order to do so, they intensively use

resources of the Earth in a way that directly or indirectly contributes towards increase of emission of greenhouse gasses, and thus towards global warming, which ultimately results in a large climate change.

Something that is derived as a conclusion from all said above is that we are in a vicious circle from which it is difficult to break. We all agree that we are in trouble, and at the same time we agree more or less that that we all have contributed to creation of such situation. The only thing that we do not agree on is who should change the habits so the situation in this field can start to stabilize, and in the long term, to improve.

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