

POSSIBLE ADVANCES OF THE CLIMATIC CHANGE IN AGRICULTURAL PRODUCTION AND IN HUMAN NUTRITION

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About global climate change

The relationship between nature, economy and society came into the foreground in debates about sustainable development for nearly two decades they. Many people agree today, that the destruction of the natural environment may cause social and economic problems thus may turn into a political issue as well. The period of the global warming began according to the representatives of the science, the climate change came into the foreground, the average temperature of the surface of the Earth has already risen by nearly a degree. We got used to the fact of the climate change, on the other hand the debates are going on if global warming is merely a natural phenomenon (according to historical records there were times when such happened), or it is a consequence of human effects (human activity). It's possible, that both factors prevail collectively and they intensify each other mutually.

The phenomena demonstrating climate change

Extreme meteorological and environmental phenomena such as floods, internal waters, droughts, heat waves, wind-storms, early and late frosts, hails and mud avalanches call the attention for the climate change. They existed in the past and certainly they will also appear in the future causing considerable damage. It was observed that these extreme meteorological phenomena appeared more frequently with the global warming. It serves the clarification the changes and their reasons if we adjust to the environmental phenomena (adaption), both on the level of society and on the level of economy. Considering prevention and relieving the harms we may rightfully suppose that with reducing the quantity of green-house gases getting into the atmosphere because of human activities the situation can be stabilized.

The judgement of the climate change

The debates about the reason of the climate change are not over yet, but there is a definite opinion not to wait for the end of the debates; it is necessary to decide, to get ready and to act. (LÁNG I., 2008) Our Earth sends unambiguous alarm signals, this is why the emission of gases with a greenhouse effect causing the global warming should be reduced.

The academic world reckons with a continuous warming. The „Rio Declaration” issued in 1992 created the principle of a precaution, according to which in case of vague or serious situations it is not necessary to wait for full scientific certainty; it is necessary to look for solutions and to apply them.

Hungarian events and phenomena linked to climate change

The storms and hails caused severe damage in Hungary beside the local phenomena of recurrent floods entailing mud avalanches on the River Tisza and on smaller rivers and

brooks. The average temperature rose unambiguously between 1975 and 2006, the moisture decreased. At the same time heat-waves and drought years spoiled the population's living conditions and economic conditions. Especially the agriculture suffered because of these extreme meteorological phenomena, due to which – through the crop fall-out - food production and consumption decreased. The bush fires and forest fires as well as the increasing UV radiation new pests (e.g. insects) appeared in the Carpathian Basin. Environment change researchers reckon with 11 phenomena that will be more frequent in Hungary in the future.

Hungarian climate change

From among the domestic changes the best measurable are the temperature values: in the past 100 years the winters and springs differed from the yearly average less, while the summers got hotter and the autumns less warm. When examining the monthly average temperatures the temperatures of 11 months shows an increase, with December as an exception. The months of the summer half-year show a significant increase while we experience positive and negative trends equally at the others. Based on the climatic model forecasts we can count on an accelerated warming. The middle part of the country is getting warmer, while the South-West and its South-East areas less warm. The summer heat is growing as well as the number of the warm nights, which spoils the essential life conditions and the health of living beings significantly.

Changes linked to precipitation

The moisture (precipitation) is a much more unsettled parameter than temperature therefore it is more difficult to draw conclusions. In Hungary the decrease of the annual amounts of precipitation can be observed, but an increasingly bigger part of it falls down in the form of intensive rainfalls. The natural and economic utilisation of the moisture is deteriorated for two reasons: less moisture arrives and it drains away because of the intensive rainfall (less can leak into the soil so less can be stored). The agricultural damage is increased if the upper layer of the soil does not become saturated with water at the beginning of the vegetation period. Droughts and inundations have always been in Hungary, but while the country was rarely inhabited, meteorological phenomena occurring on the smaller areas remained unnoticed.

Proposals for the utilisation of plant production benefits

The plough-land and horticultural cultures already suffer because of the changes in the temperature and the moisture. On the plough-land the preference of drought-resistant species and kinds is expedient on the one hand through the traditional, natural cross-breeding work, on the other hand through the results of modern biotechnology (genetic technology) where the country's economic-political and environment protection interests make it possible. The European Union promotes the growing of durum wheat in Hungary, particularly with the aim to replace the eggs used to give a yellow colour in the production of the pasta. In the field of horticultural production today we can already reckon on the growing and harvesting of plants, mainly from the Mediterranean zone, which were not provided until now. From among the woody plants we can mention the olive tree. In case of the ripening of the crop of the olive tree olive oil extraction is possible in the future. Because of its oleic acid combination olive oil has much better nutrition physiology

characteristics, than the present sunflower (and rape) oils. We can already find fig trees here and there in Hungary, which can give ripe fruit.

Possible changes in animal production concerning the forage

The climate change can be expected to affect the grasslands mostly, since observations in the past few decades found damages on this area in the pasture farming. The regional livestock concentration is not followed by the designation and cultivation of the grazing areas thus, expectedly the proportion of livestock kept on dry forage will increase. Regarding the corn-based and Soya-bean-based fodder the Soya bean may cause tension because Soya-bean is imported mainly from non-EU areas. The production in Hungary depends on irrigation mostly.

Changes caused by climate change in the population's nourishment

The Hungarian population have already made changes in their nourishment up to now, therefore the main principles of modern nourishment for instance the food and drink of the popular Mediterranean cuisine are presumably not unknown for them. Like the other member states of the European Union we also took over the Italian pastas (and pizzas) and the consumption of green salads at the beginning of dining. Due to the warming it would be wise to eat little but more times daily; the smaller consumer portions and packaging methods can contribute and help it. The wide choice of the Mediterranean fruits and their accessibility all year round for Hungarian people have already changed a lot in fruit (and not only seasonal fruit) consumption habits. The demand for mineral water may be growing in the coming years while in grape growing it is possible that vine-giving grape species with an increased alcohol content-usual on the Mediterranean areas come into the foreground In Hungary.

SUMMARY

1. In Hungary a long term increase of gradual warming, the decrease of the quantity of the moisture and the increase of extreme meteorological events and their intensity and damage can be expected.
2. It is necessary to prepare the economy and the population for a warmer and drier period according to the strategy of adaptation.
3. It is necessary to make conditions to provide a fast response for the prevention of the deleterious effects of extreme meteorological events coming forward unexpectedly on organizational and technical level.
4. From among the regional concerns of the expected changes primarily the eastern and northwest areas of Hungary dominate in getting warm, while it will be the least in the country's middle part, at the same time it is difficult to draw conclusions on the moisture amount in the region.
5. Although Hungary is situated on the border of the zones with opposite signs, we can count on a decrease in precipitation just like the Mediterranean areas.
6. As for the cultivation of native plants the drought-resistant kinds should be promoted while from among the Mediterranean species the ones adapted to the new conditions are to be planted.

7. Regarding animal production with the increase of the irrigated areas it possible to insure the needs of races demanding the green fodders.
8. In the Hungarian population's nourishment the so-called Mediterranean diet should be highlighted taking advantage of the conditions of the wide-range food trade provided by the European Union.