

ENVIRONMENTAL DEGRADATION AS A SECURITY THREAT

Miloš BALABÁN
balaban@fsv.cuni.cz

Abstract

Almost all long-term development forecasts agree that environmental degradation will have in the long-term horizon an extremely adverse impact on economic, social and security development in the world. To quote UN Secretary General Pan Ki-mun: „deteriorating environment can threaten much that has been accomplished by the mankind in the course of the last several decades. It undermines our struggle against poverty. And finally, it can even threaten international peace and security“. Degradation of environment will have a negative impact to Europe, too. Extreme weather fluctuations will be a significant burden on the so-called critical infrastructure. This means in particular securing sufficient electricity (or maintaining energy infrastructure) under the conditions of extreme heat, drought or cold. This issue is directly associated also with the problem of ensuring energy security of the European Union which is and will be significantly dependent on supplies of energy from third countries outside of the EU. Also security systems of individual European countries and the EU as a whole must prepare for a new European climate reality. In this case, it means in particular investments in efficient warning and emergency systems. Also security systems of individual European countries and the EU as a whole must prepare for a new European climate reality. In this case, it means in particular investments in efficient warning and emergency systems. The ability to face anticipated higher level of migration from regions heavily affected by environmental degradation in Europe's closer or more distant vicinity (The Near East, North Africa, Sub-Saharan Africa) will be a serious challenge for Europe. Migration waves can burden social systems of European countries. These systems will also have to deal with the need for increased care for handicapped categories of citizens (in particular older people, people with disabilities), for whom it may be more difficult to cope with extreme weather fluctuations.

Keywords

Climate change, global warming, pollution, lack of resources, water resources, urbanization, desertification, population, migration, Kyoto protocol.

Almost all long term development forecasts agree that the environment degradation will have in the long-term horizon an extremely adverse impact on economic, social and security development in the world. To quote UN Secretary General Pan Ki-mun: “*deteriorating environment can threaten much that has been accomplished by the mankind in the course of the last several decades. It undermines our struggle against poverty. And finally, it can even threaten international peace and security*”¹.

Degradation of the environment is closely connected with negative climate changes which occur on the earth first of all due to two factors: industrialization and urban development². Exactly these two phenomena are the main sources of global warming whose extent is now so huge that its consequences could be only partly limited³, not stopped.

The Intergovernmental Panel on Climate Change report⁴ which was published in February 2007 in Paris draws the attention to negative impacts of global warming. The report confirms that since 1750 distinctly higher concentrations of so called green-house gases (carbon dioxide CO₂, methane CH₄ and nitrogen monoxide N₂O) have been the result of human activities⁵. According to the Report the world is on the way to a warmer climate and more extreme fluctuations of temperatures. This will cause the waves of big heat, the change of the air flow, even more drought in dry areas and on the contrary considerably more precipitations in other regions. The icebergs will be disappearing and consequently the sea levels will raise which among others is connected with the weakening glacial coat in Antarctica and Greenland (see the table I).

Due to negative climate changes in a global scale the assurance of sufficient water sources are crucially important for the life sustenance on the earth. Even if 71 % of the earth is covered with water, just 3 % of water is drinkable, nevertheless most of these 3 % is in the form of snow and ice. Less than 1 % of this water i.e. 0,03 % of world water reserves is accessible. The problem of water sources accessibility and distribution will be one of the most important problems of the following two decades and the entire 21st century⁸. At the same time economical, social and security dimension is being strongly pervaded. This is proved among others by the fact that 1,2 billion people do not have the access to drinking water⁹ and 2,4 billion people do not live in corresponding hygienic conditions. 80 % of all diseases in developing countries is connected with the lack of water. The prognoses of further development is not favourable at all, because it is supposed that in the middle of the 30s of the 21st century two thirds of world population will live in the areas with the lack of water¹⁰.

The situation is complicated by the fact that 40 % of the mankind live in 260 drainage areas, which are shared with two or more states. The effort to gain a bigger proportion of water sources for one state at the expense of the second one for the needs of population and industrial and agricultural production or pollution of water sources just because of this production might appear also as the source of two-sided or regional conflicts. The NATO study "Future Security environment" in this connection indicates 20 most risk areas where mentioned conflicts might occur¹¹.

Despite the fact that the process of the environmental degradation approves in a global scale, the width of its impacts in individual world regions will differ. Most markedly it will show in Africa and Asia where already now the scale of this degradation is strongly visible.

Table I

Facts from the report IPCC*

As long as the concentration of green-house gases in the atmosphere will reach the double level before industrial revolution, probably the average warming will be by 3 degrees Celsius (2 – 4,5°C).

Concentration of green-house gases 650 ppm⁶ would probably cause warming by 3,6°C. At level 750 ppm by 4,3°C, 1000 ppm by 5,5°C and 1200 ppm by 6,3°C. The level of green-house gases is difficult to forecast, it will depend on a row of factors.

During last 100 years the temperature on Earth raised by 0,74°C (1906-2005). The report of year 2001 itemized the lower data by 0,6°C. The reason was especially the row, one by another, of very warm years. Eleven of last 12 years belonged among the warmest years in the history of measurements since 1850. In the next two decades it is assumed that the raise of the average temperature always be by 0,2°C.

By the end of this century the sea and ocean level will raise at least by 28-58 cm (in 2001 the assumption was 9-88 cm) due to icebergs melting. However we cannot exclude that the raise will be by 1 meter.

The icebergs will be disappearing in the Antarctic and Arctic zone. By the end of 21st century in the Arctic will not be a year-long ice coat as long as the emissions of green-house gases raise the higher level of expected spectrum of development. The volume of ice in the Arctic Ocean is being lowered with the speed of 2,7 % in ten years.

The snow coat is being lowered in all world regions. In the second half of 20th century the maximal extent of frozen earth in the period winter-spring lowered by 7 % on the northern hemisphere. The day limit when on the northern hemisphere the rivers and lakes freeze in recent 150 years shifts approximately by 5,8 days in 100 years. The melting day in the same time period comes on the contrary by 6,5 days earlier.

It is “highly probable” that towards the poles the precipitations will increase and at the same time it is “probable” that the precipitations will decrease in subtropical regions. Such a development was obvious in the course of first years of the 21st century.

It is “highly probable” that the increase of extremely high temperatures and waves of big heat will continue. Since the 70s of the last century the length an intensity of dry periods, especially in tropical and subtropical areas have increased.

The volume of green-house gases highly exceeded the values from pre-industrial period. Concentrations of carbon dioxide increased from 280 ppm to 379 ppm in 2005. Concentration of methane increased from 715ppb to 1774ppb in 2005.

The panel report answers a row of questions, where, not so long ago, was just a question-mark. The temperatures of lower atmosphere measured from the satellites correspond with the data from ground stations. The question still is what role the clouds, icebergs and icy coats, oceans, deforestation and other changes on the Earth surface are playing. Neither do we know a reliable answer to the connection between the climate and biochemical processes.

* Source: Facts from the report IPCC taken from UN bulletin n.2/2007

In the African case it deals with a permanent lack of water, which concerns about 300 million of Africans and by the end of the third decade it might afflict as much as 40 % of African population. This situation is a result of a long-term drought and desertification of the territory, first of all in Sub-Saharan Africa, where it is basically impossible to grow a thing (desertification afflicts now 46 % of African territory). Drought will become a problem also for the equatorial Africa ,among others, with regard to vast deforestation, caused by high level of logging. Accompanying phenomena of a long term drought and high temperatures will be also the higher occurrence of infectious diseases, e.g. malaria or fever dengue. The degradation of the environment will be multiplied also because of increasing migration of population from country areas to towns without having efficient infrastructure for the assurance of minimal social and medical standards.

Cumulated problems with the degradation of the environment on the majority of the African territory will lead to further deepening of a political, economical a social chaos inside many African states that now can be classified in the category “ failed states” which creates also considerable security risks exceeding the region. The economist of Columbia university and the counselor of UNO secretary general Jeffrey Sachs emphasized in a given case that e.g. a conflict in Somalian Darfur is also caused by lack of water and food. The same reason has the security instability in the Ivory Coast or in Burkina Faso. Security instability causes that various states are now or might become the bases of terrorist groups, neither exclude the higher danger of armed conflicts which will afflict more states and will be accompanied by genocide of local citizens¹².

The biggest problem of Asia might be the increasing sea water level, as almost 40 % of Asian population (1,6 billion citizens) live in the distance of 100 km from the sea coast. Densely populated areas of Pakistan, India, Bangladesh, Sri Lanka, Myanmar, Thailand, Vietnam, Indonesia and Philippines¹³ are the most threatened areas. The flooding of vast territories of relevant states might evoke huge migration waves and because of them also armed conflicts might occur. With regard to growing economical importance of South and South-eastern Asia and because of global economy it is possible to expect that this development might have negative impacts on it.

The part of Asia in the immediate vicinity of Europe is also a long-term unstable Near East regarding security, where we can feel a strong deficit of water sources. The growth of population, industrialization, vast urbanization and extensive farming will deepen this deficit. Already now there are disputes about the usage of two largest watercourses – Eufrat and Tigris between Turkey, Syria and Iraq, disputes about waters of Galileo lake (Israel versus Syria), about the Jordan river and its inflows (Israel versus Palestine, Syria and Jordan) and about the rivers Wazzání a Hasbání (Israel versus Libanon)¹⁴. Potential conflicts because of water, let us say because of the access to it, in the region that keeps at its disposal about 57 % of worldwide oil reserves and 45 % of gas reserves and whose territory is permanently unstable due to the Israel-Palestine conflict and the conflict in Iraq, might that way further contribute to the worsening of security situation in a regional and global scale.

For the degradation of the environment in a global scale are, however, primarily most responsible its three biggest polluters: the USA, China and European Union. United states will remain in the perspective of 20 years the biggest world polluters of the environment. Americans, who share 5 % in world population,

burdened in 2006 the atmosphere with 25 % of green-house gases emissions in a world-wide scale. By the year 2030 only relatively slight change might occur: it will be by 3 % less, i.e. 22 %¹⁵. In the China case the emissions of carbon dioxide reached in the year 2003 15,2 % and in the year 2025 its emissions are supposed to reach almost one fifth (19 %)¹⁶. For China the degradation of the environment will become in the next decades a serious political, social and economic problem. For illustration it is possible to say that 30 % of the territory is negatively afflicted by acid rains, first of all due to fossil fuel burning and continuing industrialization; this problem is being raised by the economic growth¹⁷. One fourth of the country is afflicted by desertification and yearly there is a loss of 200 thousand of hectares of the farm land.

Neither are the United States kept away from the consequences of global warming. Long-term drought in the south and the Midwest of the United States which might negatively influence farming (first of all in three most important American states producing corn – Texas, Kansas and Nebraska) and water supplies for millions of Americans¹⁸. The intensity of tropical storms and hurricanes that will afflict first of all the south of the United States¹⁹ will increase. In this regard, the hurricane Katrina became warning experience for the United States. It extremely contributed to the devastation of New Orleans and its surrounding in August 2005.

Europe will also be confronted with the impacts of the environmental degradation. The scenarios of the climate development in Europe show that the warming will continue, the increase of temperatures in winter in the north and the same in summer in the south. Warming together with increased changeability of precipitations strengthens icebergs thawing and diminishes the area of constantly frozen earth, winter and spring floods will be more frequent. The south of Europe will be afflicted by big heats and drought which might cause the lack of water and the decrease of farm production in south European states (Spain, Italy, Greece, Balkan), In the middle Europe it is necessary to count on the fact that the climate changes will cause first of all more frequent occurrence of extreme weather which will bring among others higher frequency of floods and storms. The changes in precipitation regimes will reflect in many dimensions, first of all in the reserves of water and its quality, which will have a considerable impact on farming, forestry, and power supplies²⁰. The increase of temperatures will also influence the health conditions of population, e.g. the raise of pathogenes²¹. Climate changes will obviously influence the tourism as well, when due to the long-term extreme heat we can expect the decrease of the number of tourists in south European resorts or the shift of tourist seasons. Also tourist destinations in European mountains might remain without tourists because of the long-term lack of snow. Therefore it is necessary to look for new alternatives of economic activities for regions which are nowadays considerably or thoroughly dependent on “tourist industry”.

Extreme fluctuations of the weather will represent a considerable burden for the area of so called critical infrastructure. It is first of all the assurance of the sufficiency of the power (let us say sustaining of energetic infrastructure) in extreme heat, drought or coolness conditions. This question is directly connected with the assurance of energetic security of European Union which is and will be considerably dependent on energy supplies from regions outside the EU²².

Also security systems of individual European countries and EU as an integral have to prepare for new climate conditions. In a given case it is first of all the

investment in effective warning and rescue systems. A big challenge for Europe will be also the ability to face assumed increased scale of migration from the areas heavily afflicted by the environmental degradation in its nearest or farther surrounding (Near East, north Africa, Sub-Sahara Africa). Migration waves might represent also a burden for social systems of European countries. These systems will also have to cope with the need of raising care of handicapped categories of citizens (first of all old people, disabled) who might cope with extreme weather fluctuations worse²³.

Regardless the obvious facts about the scale of degradation of the environment and negative impacts of this degradation on the development in the world the truth is that the basic system change of the approach to protection of the environment is being postponed or is insufficient. The proof is among others the destiny of the Kjoto Protocol according to which the emissions of carbon dioxide into the atmosphere should decrease by 5 - 7 % by the year 2010 in comparison with the level of the year 1990. The goal which is an absolute minimum (according to ecology experts the break of negative trends in global warming requires limitation of emissions of carbon dioxide in a row of tens percent), will not be covered from several reasons. The protocol was not signed by the USA as the biggest world polluter and together with them other significant polluters such as China and India. Therefore the Protocol covers only one fourth of worldwide emissions. The EU itself do not cover the requirements of the Kjoto Protocol. In October 2006 e.g. the European agency for the environment published a report that 15 "old" EU member countries will decrease emissions only by 0,6 % by the year 2010 whereas by the year 2012 it should have been 8 %²⁴. The question raises to what extent it will be possible to cover other ambitious goals of the EU given during the German presidency in the first half of the year 2007, accordingly by the year 2020 to increase the share of renewable energies by 20 % and to decrease the emissions of carbon dioxide by one fifth.

Also the conclusions at the summit of world advanced countries G8 in German Heiligendamm at the beginning of June 2007 are possible to assess skeptically. States, though, concluded to decrease the emissions of green-house gases by the year 2050 substantially saying that during the setting of a definite goal they will "take seriously into consideration" the EU, Canada and Japan decisions. They promised to decrease emissions by a half; however, no concrete numbers have been given. Similar ending also had a conference on climate on Indonesian Bali in December 2007. The representatives of almost 190 countries of the world did not agree on concrete goals of green-house gases emissions decreasing. Only a schedule of negotiations about a new agreement was adopted. This agreement should replace the Kjoto Protocol in the year 2012. The new document should be adopted on the conference in Danish Copenhagen at the end of the year 2009²⁵.

Whatever progress in the fight against degradation of the environment in the world (Bali conference illustrated it) is preferably conditioned by the agreement on the necessity to stop and lastly invert so far negative trends in this area between advanced and dynamically developing countries, first of all by China and India. United States together with Europe will remain, though, the biggest polluters of the environment in a worldwide scale but economic and consumer growth of China, India and other developing states in Asia and Latin America this state will change in a near and mid-term horizon. In the year 2010 the proportion in production of harmful emissions between developing and advanced world is supposed to be half-

and-half. In the year 2025 the developing world is supposed to produce 75 % of worldwide emissions. Nevertheless in many cases it occurs that just into the developing world the enterprises from advanced countries are being established which would not be possible to meet strict ecologic standards in advanced world and therefore they would not be allowed to operate. The British expert Mark Leonard in this connection even talks about a potential formation of “pollution havens” in these countries²⁶.

Résumé

The issue of the degradation of the environment has become the first rate subject in the agenda of global strategic governance. Its solution (let us say un-solution) can decide about further sustainability of the world development. “The encounter of civilizations” might occur because of more than whatever else just because of the impacts of global degradation of the environment. Common procedure against such a development encompasses also significant economic aspects which is directly proofed by so called Stern study of the year 2006 elaborated by the prominent world economist Nicholas Stern per order of the former Chancellor of the Exchequer and present British Prime Minister Gordon Brown. The study in connection with the danger of global warming says that as long as the world commonwealth does not start to spend immediately on its elimination yearly about 184 milliard pounds (7,8 billion crowns), the economic growth will be seriously afflicted since the efficiency of the world economy might decrease as far as by 20 % in the horizon of the second half of the 21st century²⁷. In this given case it is not possible not to hinder from the comparison with the effectiveness of currant and prospective war expenses. For the present, unfortunately, it is evident that there will not be the volition to basically reevaluate the approaches to political, economic and social development in the world from the aspect of main world economic countries in favour of sustainable development of the earth and human civilization.

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NOTES:

¹ See UN Bulletin n. 2/2007.

² These factors are defined as principal by European Environment Agency (Sustainable Use and Management of Natural Resources, EAA Report 9/2005).

³ The example in this area is the prohibition of Freon usage.

⁴ Panel IPCC was established in 1988 by the UNO Program for the Environment (UNEP) and World Meteorological Organization (WMO). The degree of the Report validity is given by the fact that the scientific progress in the field of climate behaviour monitoring and analyzing of measured data provide the scientists with very high rate of certainty (90 %) in understanding how human activities influence the warming of the world. Nevertheless it is possible to introduce the opinion of

prof. Josef Svoboda from University of Toronto who thinks that the changes might occur even faster than we admit at present. According to prof. Svoboda, the year-long ice coat in Arctic will not be until the end of 21st century but rather earlier during 20s – 30s with the apprehension that some experts expect even faster development.

⁵ Report – The CAN Corporation “national Security and the Threat of Climate Change” (www.SecurityAndClimate.cna.org) states that the level of carbon dioxide in the atmosphere is higher than whenever else in last 650 thousand years.

⁶ ppm – parts per million, in Czech “parts or particles per one million” is the expression for one millionth of the total. Sometimes this expression is deduced from Latin pars per million.

⁷ ppb – parts per billion is the expression for one billionth of the total.

⁸ Climatology institute Hadley Centre for Climate Prediction and Research in Great Britain in one of its expert visions drew considerably pessimistic vision about the future. According to the study a half of the earth surface will be afflicted by catastrophic drought and lives of hundreds of millions people will be endangered by the end of 21st century. The accompanying phenomenon will be the hunger, mass migration of population, lack of water and wars because of it.

⁹ To decrease the number of people who do not have access to drinking water by the year 2015 by one half, it would be necessary to build daily 340 000 water-pipe and 460 000 sewer connections. Assurance of water availability in developing countries will require investments about 180 billion dollars per year (now it is spent 80 billion dollars a year).

¹⁰ See The DCDC Global Strategic Trends Programme 2007 – 2036 (<http://www.mod.uk/DefenceInternet/aboutDefence/Organisation/AgenciesOrganisations/DCDC>).

¹¹ The area Tigris and Euphrat, Nile, La Plata, Lempa, Orange, Incomati, Limpopo, Okavanga, Zambezi, Kunene, lakes Chad, Senegal basin, Jordan, Kura-Araksi, Obu, Aral Lake, Ganga-Brahmaputra – Mengha, Mekong, Yellow River, Hanu and Tumen Basin (See Future Security Environment, Draft 1.3 – Symposium FSE-04 Apr. 2006, s.25).

¹² Russian politics Jevgenij Satanovskij, president of the Near East Institution in Moscow predicts that in Sub-Sahara Africa will be a very dangerous development after the split-up of Sudan on Muslim north and Christian-animalistic south (Darfur crisis is its accompanying phenomenon). Other three states of Sub-Sahara Africa – Somalia, Eritrea and Djibuti – will be taken into the processes accompanying collapses of the former Ethiopia Empire with this connected border collisions, religion-tribal fights, epidemics and famine. The whole explosive situation in the region will flow into first continental megawar where most countries of Sub-Sahara Africa will join (see Satanovskij J. (2006),” New Near East, Russian in global politics, February 2006, page 125).

¹³ About the scale of threat might witness the consequences of tsunami evoked by submarine earthquake in the Indian Ocean, which in December 2004 took up 300 thousand victims.

¹⁴ More see Raděj, T.: Water sources in Near East issue, International politics n. 7/2004, page 11-14.

¹⁵ For illustration it is possible to state that each American burdens the atmosphere with 20 tons of carbon dioxide, an European with 9 and a Chinese with 5 tons.

- ¹⁶ According to the Netherlands Environmental Assessment Agency (NEAA) report of June 2007 – the Chinese emissions surpassed the American by 8 %. According NEAA China produced in 2006 6,2 billion tons of carbon dioxide of which 550 million tons is caused by cement industry. The USA in the same period launched 5,8 billion tons of carbon dioxide, whereas 50 million tons came from the production of cement (more see <http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html>).
- ¹⁷ The increase of China emissions are caused by coal power stations, their number are on increase, every week two new ones open.
- ¹⁸ More see the report The CAN Corporation “National Security and the Threat of Climate Change” <http://securityandclimate.cna.org/report/national%Security%20and%20the%20Threat%20of%20Climate%20Change.pdf> (s.32).
- ¹⁹ This report says that the United States must count on increased number of migrants of Caribbean states afflicted by natural catastrophes, first of all destructive hurricanes.
- ²⁰ Conclusions taken from the interview RNDr. Jan Pretel, the CR representative in IPCC “Periods of heavy precipitations and drought will take turns in Europe” (UN Bulletin, n. 4/2007, page 5) and climatologist Jan Pretel: “The Earth will be in trouble even if warming raises by 1 degree Celsius” *Právo* 5.5. 2007, page 13.
- ²¹ Pathogenes are micro-organisms or viruses causing diseases.
- ²² Dependence of Europe on energy source supplies from extra-European territories is supposed to increase in 2020 on 75 %.
- ²³ E.g. due to extreme big heats in summer 2003 more than 35 thousand people died (see Bhattacharya, S.: European Heat Wave Caused 35 000 Deads, *New Scientist*, 10.10.2003).
- ²⁴ The emissions decreased markedly first of all in Eastern Europe, Russia presents the decrease against 1990 by 40 % and Ukraine 55 %.
- ²⁵ Basic conclusions of the conference might be sup up into 5 points 1) Negotiations targeted to close “Kjóto II” are supposed to start in April 2008 and will have 4 go-rounds, final agreement will close in Copenhagen 2009. 2) Negotiations did not raise any concrete requirement for the decrease of emissions, They only referred to recommendation of scientists to low them by 25-40% against 2000. 3) Advanced countries should think about quantitative restriction of emissions, developing countries about their reduction. Advanced countries will carry the main portion of financing actions against warming namely through Adaptation Fond. This fond should dispose of 5 billion dollars in 2030 (just now it has only 38 million). 4) Advanced countries are supposed to supply ecologically more acceptable technology to developing countries in order to help them to decrease emissions without threaten their growth. 5) Tropical states will be able to preserve virgin forests as commercial commodity and since 2013 sell emissions permits (more about the conference conclusions on Bali see http://unfccc.int/meetings/cop_13/iotems/4049php).
- ²⁶ Leonard, M.. (2006): *Divided world: The struggle for primacy in 2020*. Centre for European Reform. London., s. 10.
- ²⁷ See Stern Review on the economics of climate change http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm.

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