ENVIRONMENTAL SECURITY AND CLIMATE CHANGE IMPACTS IN SOUTH – EASTERN EUROPE

Цветан СПАСОВ, д.н.,
Нов български университет

Tsvetan SPASOV, Dr. Sc.
New Bulgarian University

Резюме: През последното десетилетие нараства броя на учените, които изучават по-задълбочено темите свързани с екологичната сигурност и взаимовръзките между социално-икономическите и природните процеси и как изчерпването на природните ресурси подкопава сигурността на хората. В тази статия се обсъжда въздействието на климатичните промени върху обществата и някои ключови икономически сектори, като земеделието и енергетиката. Ние ще анализираме въздействието на настоящи и потенциални бъдещи социално-икономически процеси, катализирани от климатичните промени, които в съчетание с демографския бум в традиционно нестабилни райони като Близкия изток, вече оказват сериозно влияние върху сигурността и икономическото развитие на България и Европейския съюз.
Ключови думи: climate change, adaptation, mitigation, environmental security.

Summary: Over the last decade, the number of scientists increases, who study in more depth topics related to environmental security and the relationships between socio-economic and natural processes and how the depletion of natural resources undermines human security. This article discusses the impact of climate change on communities and key economic sectors such as agriculture and energy. We will analyze the impact of current and potential future socio-economic processes catalyzed by climate change, which in combination with the population boom in traditionally unstable regions like the Middle East, already seriously affect the security and economic development of Bulgaria and the European Union.
Keywords: climate change, adaptation, mitigation, environmental security.

After the Cold War the environment as the planetary support system began to be viewed as an increasingly important security related issue on which depends all political, social, cultural, religious, and economic systems. An increasing number of scientists and policy decision-makers are now convinced that “national security is not just about fighting forces and weaponry, but it relates also to watersheds, croplands, forests, and climate” (Myers 1986) as most security problems are generated from complex situations. The role of environmental degradation effects are now assessed by those who study security issues such as terrorism and violent civil conflicts because of their potential to lead to human insecurity, destabilize regimes, displace populations and thus be the reason for military operations (Allenby 2000, Graeger 1996 and Glenn et al. 1998).

Since the United Nations highlighted the environmental security (1994) as the intersection of economic, food, health, environmental, personal, community and political needs (Nyong 2005) in the recent years it became a national security priority for all UN

members. Furthermore, in the beginning of the 21st century the governmental environmental security policy reflects the ability of a nation to withstand environmental asset scarcity and to satisfy its basic human needs such as food, water and shelter, without which - stable peace cannot exist.

Therefore in the recent years one of the most popular and debated environmental issue is the climate change (global warming), which is increasingly referred to as a security issue. It is mainly because some negative effects of climate change as the increasing severity of weather disasters, deforestation, droughts, decline in agriculture productivity (Lobell et al. 2011; Strategy Unit 2008), increase of infectious diseases, water scarcity, food insecurity and undernutrition (Cohen et al. 2008) are projected to affect almost 50% of the world's population living in developing regions (WHO 2010, Battisti and Naylor 2009).

It is hard to give an accurate, top-down assessment of variability of the impacts and to design appropriate policy responses because all nations are vulnerable in different degree to climatic changes. In general the two main policy responses to climatic changes are mitigation and adaptation. The mitigation strategies address the causes that lead to global warming, by reducing greenhouse gas (GHG) emissions, while adaptation aims to lower the risks to humans and nature posed by the effects of climate change. We need to consider both approaches, even if GHG emissions are successfully decreased by 2050, because we will still need to adapt to warmer temperatures, storm frequency and flooding that have already been set in motion. According to the analysis the climate change impacts will vary across the regions and climatic zones, but the magnitude of the effects will depend on the individual country's level of economic development and capacity to adapt (IPCC 2001).

Among the most threatened and economically disadvantaged countries is Bulgaria. Until recently Bulgaria was a country in transition and now is one of the poorest within the European Union (EU). The country is located in South –Eastern Europe (SEE) and since its accession to the EU in 2007 is responsible to guard 1647 km of the Union's external borders with its own state funds.

As the country is split by the Balkan Mountains the climate is continental in the North and close to Mediterranean in the South. The barrier effect of the Balkan Mountains produces abundant snowfall during winter and hot, dry weather in the summer. Starting from the mid-1980s warming is observed and in 2007 the temperature is 1.6^0C above the average over the period 1961-1990, which is the warmest year recorded since the measurements are made in Bulgaria. Over the past decade the climate became drier but totals of precipitations have increased resulting in rarer but heavier rains and severe floods (notably in 2006 and 2014) and reductions in winter precipitation (Alexandrov 1997).

Bulgaria has been actively involved in the global processes and efforts for mitigating of climatic changes and ratified the UNFCCC in 1995 and the Kyoto Protocol in 2002 and as a member of the EU has committed to joint EU "20-20-20" targets. The country has met its international commitments for emissions' reductions by decreasing emissions between 1988 and 2012 by 46.3 %. In 2014 the Government published its Climate Change Mitigation Act and National Adaptation Strategy, which represent mitigation and adaptation as key priorities laying down the principles of the state policy in the climate sector and establishment of a single internal energy market, while overcoming high energy and carbon intensity of the economy and dependency on energy imports (UNFCCC 2016).

The agriculture is one of the most important sectors of the Bulgarian economy, which is also the most vulnerable to climate change impacts with high risks to cause economic downturn and social consequences. Traditionally more than 30% of Bulgarian population is occupied in agriculture, due to the excellent natural conditions for the development for example the arable land covers 48% of the country's territory. Warming temperatures in some arid and semi-arid areas in Southern Bulgaria with intensive agricultural activities may lead to different forms of desertification affecting human welfare (Conway and Hulme 1993). Decline of productivity is projected for spring agricultural crops and crops cultivated on infertile soils and non-irrigated areas, where precipitation quantities will be insufficient for normal growth and vegetation (Alexandrov 1997). Climate change may alter the seasonal patterns and abundance of pests and diseases, which currently flourish in Southern Europe. (Boxall et al. 2009).

Agricultural adaptation in these areas may lead to the development of new crops and livestock species bred or engineered to survive in different climatic conditions or to emit less GHGs. The use of more efficient irrigation systems can be expected because of the need for tighter water management practices to counter increased demand. Irrigation will be the main factor for the sustainable development of Bulgarian agriculture, giving guarantee for stable and quality plant production in years, varying in terms of the climate and accepting the challenges due to the expected periods of drought and water deficit in the years to come. Many agricultural practices, such as conservation tilling, terracing, and planting vegetation will protect fields from water and wind erosion and can help retain moisture and soil fertility by reducing evaporation and increasing water infiltration. However, the warmer temperatures and the doubling of CO2 concentration is expected to improve the agro-climatic thermal potential and crop productivity (cereals, oilseeds and sugar beet) in Northern Bulgaria.

Another economic sector at risk is energy, which has a strategic role for Bulgaria's economic development and national security. The country is making efforts to reform its energy sector, to increase its independence and to make a sustainable transition to low-carbon technologies without disproportionate impacts on electricity prices. The domestic production of primary energy satisfies about 60% of gross domestic consumption, but 37.8% (2013) are still met by imports, mostly from Russia. The tendency to decrease energy dependency started in 2008 when it was 52.1%, and since 2011 it has been about 36-37% (UNFCCC 2016). In 2011 the Government adopted a new energy strategy until 2020, which is in respect to the EU principles of sustainable, independent, clean energy. Climate change mitigation measures resulted in increased investments in renewables, which reached in 2012 the country's target for energy from renewables (16 % by 2020) in the gross final consumption of energy. The EU Emissions Trading System, introduced in September 2005, is Bulgaria's main carbon pricing initiative, which revenues are used for activities to reduce the adverse impact of climate change through financing of energy efficiency projects and measures to improve the administrative capacity (EU ETS, 2016). However, the energy sector is still heavily influenced by the strong coal and nuclear lobbies in the country.

Forestry is an important economic sector, with significant state investments over the last 40 years. In 2011, forest covered 37.4% of the country and forests support valuable ecosystems and control soil erosion. They are also recognized as having a key function for climate change mitigation through carbon sequestration. In the last decade the sequestration

of GHG from forest areas offsets between 10.7%-18.9% of total GHG emissions (UNFCCC 2016). However, the quality and quantity of forest land is threatened by several factors, including fires, floods, wind damage and disturbances by insects. Between 2007 and 2013 more than 500,000 ha forests were damaged by forest fires.

The transportation sector is one of the largest emitters of GHGs. The most significant contributors to emissions are private cars and heavy-freight vehicles, due mainly to a significant reduction of subsidies for the railway transport and closure of some railway routes, leaded to a shift in the transport structure. The National Program for Promotion of the Biofuels Use in the Transport Sector 2008-2020 (2007) sets the national indicative targets for biofuels consumption: from 2% in 2008 to 10% in 2020. Other measures have been taken to promote the use of renewables in the transportation sector, including tax exemptions for electrical vehicles.

The above examples prove the mitigation and adaptation efforts made by the Government and the increasing knowledge base on climate change effects that are expected to impact the economy. Science based decisions are vital for the country's long-term planning as only well informed decision - makers are able to anticipate hitherto unforeseen security concerns and to adapt the nation to global warming. Timely adaptation science based measures may also include large-scale infrastructure projects to protect against coastal flooding, to improve production technologies and quality of road construction, to optimize water and energy consumption, to assist farmers in planning of different agricultural activities and growing new crops in areas that were previously unsuitable. However, in the case of Bulgaria - weak governance and the lack of financial resources may hamper adaptation efforts, but planning ahead, strengthening of policies, institutions and building of capacities will result in lower costs.

At the SEE regional level, global warming is expected to stress existing mechanisms and partnerships for sharing resources like transboundary forests, rivers and arable land (Graeger 1996). The intergovernmental organizations such as EU, United Nations Environmental Program, Organization for Security and Co-operation in Europe, Central European Initiative etc. will have to provide more intensive technical assistance to developing countries in the Western Balkans to enhance knowledge on climate change effects and their interrelation with security in helping governments to identify hotspots. The support for regional dialogue and coordination initiatives will be of key importance to further facilitate the sharing of information, risk communication and raising awareness on security impacts of climate change, which are essential for SEE regional cooperation and transboundary projects. Regional initiatives will help governments to strengthen relevant policies, institutions and capacities on national and regional levels in addressing climate change risks and developing regional strategies to better adapt the pan- European region to global warming.

If the international community delays or fails with the mitigation and adaptation measures most probably the climate change impacts will become more severe in the following decades, which will trigger more intensive and violent civil conflicts and regional wars for limited or scarce resources. This trend will require huge investments to counter emerging external threats, military missions, weaponry, peacekeeping and counter-terrorism operations in countries and regions at the highest risk.

One example is the Middle East and Northern Africa, which suffered over the past decades from civil conflicts for access to, and control of, natural resources, particularly water and arable land. States are often run by authoritarian regimes with limited accountability, representing ethnic or religious minorities and increased sympathy for Islamist organizations. In the region, which is a close neighbor of the EU are still boiling several prolonged unresolved conflicts such as the Israel-Palestinian conflict (Kramer 2008), the crisis in Iraq, the conflict over Iran's nuclear program, active terrorist networks, the legacy of the "war on terror", and of course the Syrian civil war, which is the deadliest conflict of the 21st century.

The adverse impacts of climatic changes pose a serious threat to these regions with still weak or missing transboundary cooperation. According to the regional climate model projections for the 21st century the area will experience continual warming of about 1-3°C (2010–2039), to 3–5°C (2040–2069) and 3.5–7°C by 2099 (IPCC 2001). The projected negative climate change effects may converge with the socio-economic processes such as the population growth rates and decreased employment opportunities and to further exacerbate existing water and food scarcity, resulting in potential economic downturns. In the long-term the two major sources of wealth and income, which are the oil production and agriculture are expected to diminish (Carius et al. 2008). If sudden crisis events occur (food or water shortages, ethnic or religious conflicts) they may trigger violent riots, which could further destabilize fragile states and governments and increase support for extremist groups leading to global repercussions (Fragile States Index 2016).

The civil war in Syria started in 2011 with peaceful street protests in the city of Deraa, which shortly was turned into a battle field. In early 2014, in neighboring Iraq, a radical militant group called Islamic State (IS) began to use violence against anyone who doesn't agree with their extremist views and shortly took over large areas of Iraq and Syria. The Syrian war is already creating profound effects and global tensions as since its beginning in 2011 more than 400 000 Syrians have been killed, and almost 11 million Syrians - half the country's prewar population - have been displaced from their homes. Today inside Syria there are 13.5 million people, including 6 million children, who require some form of humanitarian assistance. About 70% of the population is without access to drinking water, 1/3 are unable to meet their basic food needs, 2 million children are out of school, 4 out of 5 people live in poverty. More than 4.7 million people have fled Syria towards Lebanon (1 033 513), Turkey (2 728 986), Iraq (249 395), Egypt (114 911) and poor, arid Jordan (656 198), who are forced to accommodate large and growing numbers of Syrian refugees (UNHCR 2016).

Syria's neighbors lack the financial wherewithal to handle this burden, which could be better accommodated if they receive proper help. The unpredictability of the Syrian conflict and the poor conditions in the under-resourced camps pushed about 10% of Syrian refugees to seek safety in Europe, sowing political divisions as member states argue over sharing the burden (EASO 2015). Only in 2015 Syrian migrants crossing by sea and by land into Europe are more than 1 800 000 (Frontex 2015).

The question of how to best deal with the Syrian refugee crisis and the flood of refugees is tearing apart the EU as member states are not able to agree on a master policy for immigrants. The lack of capacity to accommodate thousands of asylum seekers and because of security concerns some countries such as the United Kingdom already considered leaving the EU, which is a sign of European disengagement from dealing with large issues, such as

immigration. The Syrian refugee crisis will be the stress test for the future of integrated Europe with 28 member states and population of over 510 million. The legitimacy and the capacity of the EU supranational institutions will be also examined as recently new conflicts are escalating in Eritrea, Libya and Yemen, which will continue to drive regional refugee flows.

Another possible threat to the EU is the youth generation phenomenon that societies are experiencing in Middle East, Africa, and South Asia and how well their governments will integrate them economically, politically, and socially. The youth populations of large countries like Egypt and Nigeria, where 1/2 of the labor force is younger than age of 30, Afghanistan, Angola, Chad, East Timor, Niger, Somalia, and Uganda where more than 2/3 of the population is under the age of 25 and are set to double by 2045. These hundreds of millions of young people have the power to transform entire regions, making them more prosperous or they could also unleash a flood of instability and violence if their countries and environment are not able to accommodate their human needs generating waves of migration for decades.

It's time for international organizations such as the EU to take another step forward to anticipate and react to the changing nature of environmental security threats in unstable and fragile regions. Europe must further invest in the development of more précised early-warning systems to predict mass movements of potential political conflicts, threats such as climate change, sea level rise, water and food scarcity etc., rather than to deal with problems until they reach the EU borders. The EU should provide proper assistance to refugees where the event occurs, which will require less funds and will not challenge the common social policy, labor market and health services. In the wake of security developments and projected climate change impacts in Europe, there is a demand among the member states and citizens for an increasing role for the EU as a security provider and for strengthening of its Common Foreign and Security Policy and Common Security and Defense Policy in order to prevent or better manage crises.

According to the Stern Review (2006) without any further action to limit emissions, the damage caused by climate change would eventually reduce global GDP by between 5% and 20% a year, while taking early action to stabilize GHG concentrations would cost around 1% of GDP. In Europe mitigation and adaptation costs will be higher as the EU should assess and calculate also the costs of managing potential large refugee flows from the arid areas in the Middle East. The economic advantages of taking strong and early further actions to predict and control crisis, to reduce emissions and adapt to climate change will not be only less costly but might help EU member states to even benefit from some new business opportunities, which may occur. Any delayed decisions may be critical for the future of the EU, because some member states will consider leaving the Union, while others such as Bulgaria may suffer of internal economic and political crisis after being flooded with immigrants from the Middle East.

The outlined future climate change impacts in the SEE region and the EU are a useful starting point for policymakers when shaping effective adaptation policies for Europe. The magnitude of the effects will vary across the regions but it is expected that the poorer regions and developing countries will suffer most. At the same time, the cumulative impacts of climate change on poorer countries in unstable regions such as the Middle East and Northern

Africa will also affect Europe, as growing water scarcity and other repercussions could pose social and security challenges through increasing risks of conflicts and migration pressures.

The results of this study represent an overview of the climate change impacts on some key economic sectors in Bulgaria and recommendations to the stakeholders responsible for the development of long- term adaptation strategies for the SEE region and the EU. Despite of the uncertainty about some local and regional effects, it is clear that Southern Bulgaria may suffer of prolonged periods with temperatures above the comfort zone and the accompanying effects on increasing water scarcity, droughts, forest fires, desertification, decreasing agricultural productivity, while most positive impacts will be in Northern Bulgaria, which could receive more river flood disasters but also benefit from higher crop yields.

Fighting climate change through domestic and international action is thus not only a matter of solidarity, but clearly in the self-interest of the EU and all of its member states.

References:

1.Alexandrov, V., 1997. Vulnerability of agronomic systems in Bulgaria. Climatic Change 36, 135–149.

2.Allenby, Brad R. (2000). Earth Systems Engineering. The World as Human Artifact. Bridge 30 (1), 5-13.

3.Banse M, Van Meijl H, Tabeau A, Woltjer G. 2008. Will EU biofuel policies affect global agricultural markets? Eur Rev Agricult Econ 35:117–141.

4.Battisti DS, Naylor RL. 2009. Historical warnings of future food insecurity with unprecedented seasonal heat. Science 323:240–244.

5.Boxall ABA, Hardy A, Beulke S, Boucard T, Burgin L, Falloon PD, et al. 2009. Impacts of climate change on indirect human exposure to pathogens and chemicals from agriculture. Environ Health Perspect 117:508–514.

6.Carius, Alexander, Dennis Tänzler and Achim Maas 2008: Climate Change and Security.– Challenges for German Development Cooperation. Eschborn: GTZ.

7.Cohen MJ, Tirado C, Aberman N-L, Thompson B. 2008. Impact of Climate Change and Bioenergy on Nutrition. Rome:International Food Policy Research Institute.

8.Glenn E. P., Brown J.J. and O'Leary J. W. 1998. Irrigating crops with seawater. Sci Am 279(2): 76-81

9.Conway, D. & Hulme, M. Climatic Change (1993) 25: 127. doi:10.1007/BF01661202

10.Graeger, N.,1996. Environmental security? Journal of Peace Research, 33 (1), p.109; Dalby, 2003. op. cit.

11.IPCC. 2001. Climate Change 2001: Synthesis Report. Contribution of Working Groups I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change.

12.Watson, Robert T., ed. New York: Cambridge University Press, 397 pp.

13.Kramer, Annika 2008: Regional Water Cooperation and Peacebuilding. A case study from the Middle East. Brussels: Initiative for Peacebuilding.

14.Lobell DB, Schlenker W, Costa-Roberts J. 2011. Climate trends and global crop production since 1980. Science 333:616–620.

15.Spassov, Tz. I. (2016). Analyzing U.S. policies for adapting of natural and social systems to climate change impacts, International Roundtable Proceedings "South-East Europe: New threats to national security", vol.3 (p.245-251), New Bulgarian University.

16.Strategy Unit. 2008. Food Matters: Towards a Strategy for the 21st Century. London: Cabinet Office.

Other print and online media sources (last accessed on May 12, 2016)

17. EU emissions trading system (EU ETS). 2016. Available Online. http://ec.europa.eu/clima/policies/ets/index_en.htm

18. European Asylum Support Office (EASO). 2015. Annual Report on the Situation of Asylum in the European Union 2014. Luxembourg: EASO. Available Online. https://www.easo.europa.eu/

19. Fund for Peace. 2016. Fragile States Index 2016. Available Online. http://fsi.fundforpeace.org/rankings-2016

20. Frontex. 2015. Annual Risk Analysis 2014. Warsaw: Frontex. Available Online. http://frontex.europa.eu/news/frontex-publishes-eastern-european-borders-annual-risk-analysis-2014-8pfjcb

21. Myers, N. Environmentalist (1986) 6: 251. doi:10.1007/BF02238056

22. *Nyong A (2005) Impacts of climate change in the tropics: the African experience.*
23. *United Nations High Commissioner for Refugees (UNHCR). 2016. Data Syrian Refugees 2016. Available Online. http://data.unhcr.org/syrianrefugees/regional.php*
24. *United Nations Framework Convention on Climate Change (UNFCCC). Summary of GHG Emissions for Bulgaria 1988 – 2012. Available Online. https://unfccc.int/files/ghg_emissions_data/application/pdf/bgr_ghg_profile.pdf*
25. *WHO (World Health Organization). 2010. Trade, Foreign Policy, Diplomacy and Health. Food Security. Available Online. http://www.who.int/trade/en/*