



## **Robert Reczkowski**

Col., Ph.D., Doctrine and Training Centre of the Polish Armed Forces  
r.reczkowski@ron.mil.pl. ORCID: 0000-0001-7733-0815

## **Andrzej Lis**

Col., Ph.D., Faculty of Economic Sciences and Management, Nicolaus Copernicus University, Toruń;  
Doctrine and Training Centre of the Polish Armed Forces,  
andrzejlis@econ.umk.pl. ORCID: 0000-0003-4080-4137

# 'The Day that Changed the World': The Security Environment 20 Years after the WTC Attacks

## Introduction

The September 11 terrorist attacks on the World Trade Centre and Pentagon are considered to be one of the milestones in modern history. September 11, 2001 was 'the day that changed the world' and shaped the contemporary security environment. For the first time in its long history, the North Atlantic Treaty Organization invoked Article 5 of the Washington Treaty after the attack against one of its Member States. Poland, which joined NATO two years earlier (12 March 1999), responded together with other Allies to fulfil the obligations of the collective defence. Since that moment, the world has experienced numerous incidents which have significantly impacted the security environment, such as the Russian aggression against Georgia (2008), the illegal annexation of Crimea (2014), the ongoing armed conflict in Donbas (since 2014), the Arab Spring (2010–2012), the war in Syria (since 2011), the economic crisis (2008–2009) or recently the COVID-19 pandemic (2020). Simultaneously, we have observed a variety of forces and processes shaping geopolitical, economic, social, technological and environmental aspects of the security

environment. Thus, the upcoming twentieth anniversary of the September 11 attacks fosters reflexion on the past shifts and possible future trends in the security environment.

The aim of the paper is to identify and explore the key forces and trends<sup>1</sup> within the security environment, which have taken place in the last two decades and are likely to shape the future. The research process is focused on the following study questions: (1) What have been the key forces and trends within the security environment in the last two decades? (2) What are potential impacts of these forces and trends on the future security environment?

Data collection included both primary data (from unstructured interviews) and secondary data (from security environment reports and statistical data). In the research process, the authors benefited from their expertise acquired through participating in security environment analysis under the umbrella of the New Polish Battle Order [Nowe Urządzenie Polskie] NUP 2X35 campaign, led by the Doctrine and Training Centre of the Polish Armed Forces. NUP 2X35 is an inclusive project of the Polish Armed Forces aimed at forecasting future security and operational environments as well as developing new concepts of the conduct of military operations.<sup>2</sup> Unstructured interviews with the members of the NUP 2X35 communities of interest, focused around the aforementioned study questions, as well as the analysis of the reports from the NATO Strategic Forces Analysis (SFA)<sup>3</sup> and Polish NUP 2X35,<sup>4</sup> enabled the authors to identify leading forces in each of the themes of the security environment. Then, the analysis of data published by such organizations as NATO, the United Nations Conference on Trade and Development (UNCTAD), the World Bank, the International Monetary Fund and the World Meteorological Organization, in combination with the narrative literature review, were employed to study the changes related to each of the identified forces over the last two decades. The analysis process was structured around the segments/themes of the security environment used for the purposes of strategic foresight analysis. We followed the segmentation of the security environment applied in the NATO SFA and the Polish NUP 2X35, including the following themes: geopolitics, economy, society, technology and the natural environment. To validate our findings, we compared and contrasted them with the opinions of scholars and experts participating in research seminars conducted by the Doctrine and Training Centre of the Polish Armed Forces, as part of the NUP 2X35 campaign, under the umbrella of the 'The world after the COVID-19 pandemic' project.<sup>5</sup>

<sup>1</sup> Forces are the factors and processes in the security environment shaping national security systems, while trends indicate direction of the identified forces (i.e., increase, stabilization, or decrease). Cf. G. Gierszewska, M. Romanowska, *Analiza strategiczna przedsiębiorstwa*, PWE, Warszawa 2001, pp. 66–75, 265–266.

<sup>2</sup> J. Mokrzycki, A. Lis, 'Kampania NUP 2X35 narzędziem transformacji Sił Zbrojnych RP w organizację wiedzy', *Przegląd Sił Zbrojnych* 2020, no. 6, pp. 10–15.

<sup>3</sup> *Strategic Foresight Analysis 2017 Report*, Allied Command Transformation, Norfolk 2017.

<sup>4</sup> J. Mokrzycki, R. Reczkowski and S. Cieśla (eds.), *Security Environment Out To 2035 – NUP 2X35: The Polish Perspective*, Doctrine and Training Centre of the Polish Armed Forces, Bydgoszcz 2020.

<sup>5</sup> NUP 2X35, 'Dyskutujemy o wpływie pandemii COVID-19 na wymiar geopolityczny środowiska bezpieczeństwa', 19 February 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/dyskutujemy-o-wplywie-pandemii-covid-19-na-wymiar-geopolityczny-srodowiska-bezpieczenstwa> [ac-

While discussing the developments in the security environment in the last two decades, the limitations of the study should be taken into account. Firstly, due to the qualitative character of the analysis, there were no quantitative assessments or rankings of the analysed forces. Thus, the selection of the major forces was made on the basis of the authors' experience gained during the NUP 2X35 strategic foresight analysis. In consequence, such a choice may be flawed with subjectivity of assessment. Secondly, although the study analyses global forces, all the respondents contributing to the study through interviews as well as experts participating in the NUP 2X35 seminars represented the perspective of Poland, which may result in bias towards some trends, in particular in regard to the geopolitical theme.

## Results

### Geopolitics

The September 11 attacks, considered to be a volatile beginning of the 21<sup>st</sup> century, revised the post-Cold War global order and triggered weakening of the unflagging hegemony of the United States.<sup>6</sup> Such an observation is confirmed in reports of security environment analysis conducted in the Alliance.<sup>7</sup> Similarly, the report from the Polish NUP 2X35 strategic analysis campaign<sup>8</sup> indicates the shift from the unipolar world, characterized by the dominant position of the United States, towards the multipolar model, marked with regaining the position of global powers by China, Russia and India. Consequently, the role of the United States as the 'world policeman' is slowly fading away, and more and more countries are questioning the American dominance. In spite of its economic, technological and military advantage, the United States faces strengthening position of other competitors. On the one hand, emerging powers e.g., China, benefit from the existing global order (especially in the economic dimension), while on the other hand, questioning its principles.<sup>9</sup> Interestingly, some state actors, officially declaring the ideas of harmonious development, peaceful cooperation and global security, in fact seek to

---

cessed: 25.05.2021]; NUP 2X35, 'Świat po pandemii – wymiar ekonomiczny', 10 March 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/webinarium-swiat-po-pandemii-wymiar-ekonomiczny> [accessed: 25.05.2021]; NUP 2X35, 'Jak pandemia COVID-19 wpłynie na społeczny wymiar środowiska bezpieczeństwa?', 19 April 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/jak-pandemia-covid-19-wplynie-na-wymiar-spoeczny-srodowiska-bezpieczenstwa> [accessed: 25.05.2021]; NUP 2X35, 'Webinarium nt. nowych technologii w świecie postpandemicznym', 12 May 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/webinarium-nt-nowych-technologii-w-swiecie-postpandemicznym> [accessed: 25.05.2021].

<sup>6</sup> S. Koziej, *Między piekłem a rajem: szare bezpieczeństwo na progu XXI wieku*, Wydawnictwo Adam Marszałek, Toruń 2006, p. 178.

<sup>7</sup> *Strategic Foresight Analysis 2017 Report*, op. cit.

<sup>8</sup> J. Mokrzycki, R. Reczkowski and S. Cieśla, p. 10.

<sup>9</sup> L.E. Armijo, C. Roberts, 'The Emerging Powers and Global Governance: Why BRICS Matter', *Handbook of Emerging Economies*, Routledge, London 2014, pp. 503–524.

undermine the international order and return to the multipolar world, while operating on various levels: political, economic, financial, cultural and even military.<sup>10</sup>

In recent years, Russia has been trying to exploit the weakening hegemony of the United States to strengthen its geostrategic position in the new international order. Today, Russia's activities show an increasingly assertive global power policy, with a tendency to regain its former zones of influence. The examples of this policy are e.g., the massive cyber-attack on Estonia (2007), the military intervention in Georgia (2008), the annexation of Crimea and destabilisation of eastern Ukraine (2014), Russia's military involvement in Syria (2015), Libya (2019) and, most recently, Nagorno-Karabakh (2020). The shift from cooperation to confrontation in Russia's relations with NATO<sup>11</sup>, which has been observed over last 20 years, as well as cooling of relations with the European Union due to the EU sanctions imposed as a consequence of Russia's annexation of Crimea and strengthened in reaction to breaching international and human rights, may be considered another manifestation of self-assertive behaviours of the Russian Federation.

The changing role of NATO has been another force observed in the last two decades. In this context, for the first time in its more than 70-year history, NATO is forced to deter and defend against external competitors and cope with intra-organizational challenges. As Jamie Shea from the University of Exeter claims, so far, the Alliance has been in a relatively advantageous position for most of the past decades because it has had to face one challenge in one place at a time. For example, during the 50<sup>th</sup> anniversary (1999), the Alliance's activities focused on the military operation in Kosovo, and the 60<sup>th</sup> anniversary (2009) was dominated by discussions about a surge in the number of forces in Afghanistan. Today, having celebrated its 70<sup>th</sup> anniversary, NATO has to deal not with one, but three strategic fronts, not only geographically diverse, but also presenting different types of threats and requiring different responses. In the East, a resurgent and aggressive Russia has raised the alert in the eastern Allies and the situation requires the Alliance, after a nearly 30-year hiatus, to return to its original roots, to develop capability of deterring, defending and defeating an equivalent competitor with capable armed forces, extensive military experience and technologically advanced armaments. In the South, extremism, militias and criminal gangs permanently generate a range of security threats, from terrorist attacks to humanitarian crises and uncontrolled migration. Moreover, deepening polarisation has been experienced by some of Western societies, and access to new technologies has given sinister actors a new set of hybrid tools to spread confusion or influence<sup>12</sup>. In addition to strategic overload, the Alliance needs to cope with some intra-organizational challenges. Politics of Turkey and its relations with Greece may be provided as an example. In spite of the increase in the number of threats, there is further resistance among some Member States to spending 2% of their GDP on defence. Moreover, the ability to deal with provocations below the

---

<sup>10</sup> *Strategic Foresight Analysis 2017 Report, op. cit.*

<sup>11</sup> R. Reczkowski, 'Russkije igry z NATO – od współpracy do konfrontacji', *Przegląd Sił Zbrojnych* 2020, no. 6, pp. 26–33.

<sup>12</sup> J. Shea, '70. Rocznica NATO – Szansa na nowe "wzorcowanie"', 5 April 2019, *NATO Review*, <https://www.nato.int/docu/review/pl/articles/2019/04/05/70-rocznica-nato-szansa-na-nowe-wzorcowanie/index.html> [accessed: 2.03.2021].

threshold triggering collective defence (Article 5 of the Washington Treaty) procedure seems to be another challenge.

Summing up, the geopolitical theme of the security environment over the last 20 years has become more complex, multidimensional, and volatile. In consequence, the well established post-Cold War world order is being replaced by a multipolar system, most likely without one dominating superpower, which is difficult to clearly define and predict. The new international order will also require a new architecture for the global security system, the revised role of NATO, which will allow the international community to deal with new challenges and threats.

## Economy

The decades of the 2000s and 2010s have witnessed both the periods of economic growth and crisis. Analysing the GDP data provided by the International Monetary Fund<sup>13</sup>, in the last 20 years, the four following stages in the world economic development may be observed: (1) growth (2001–2007), (2) economic crisis (2008–2009), (3) recovery and stabilization (2010–2019), and (4) the COVID-19 crisis (2020). Another challenge for the economic situation has been an increase in debt. As noticed in the NATO SFA '[t]he growth in global debt in all sectors (government, corporate and household) is at unprecedented levels as a percentage of Gross National Product (GNP).'<sup>14</sup> In 2019, total debt reached the level of 197 trillion USD i.e., 226% of the world GDP. It seems to be a very serious problem, as a debt surge is expected due to the governmental assistance programmes supporting their economies in the pandemic and the level of the total debt before the pandemic was significantly higher comparing to 2007 i.e., the eve of the global financial crisis.<sup>15</sup>

For the decades of 1990s and 2000s, globalization has been one of the major forces driving the global economy and enhancing cooperation among nations. Nevertheless, in advanced economies, globalization has resulted in losing jobs, increasing social inequality and moderating nations' capabilities to generate tax revenues, which may lead to attempts to avert further globalization processes.<sup>16</sup> In the 2010s, interesting shifts have been noticed in global value chains. As reported by McKinsey, the five following trends have been observed: (1) decline in trade intensity of goods value chains, (2) growth in cross-border services, (3) decline in trade based on labour cost arbitrage, (4) growth of knowledge intensive value chains, (5) regionalization of value chains.<sup>17</sup> On the one hand, globalization of value chains enables companies to increase cost efficiency and contributes to strengthening international economic cooperation; however, on the other hand, associated risks,

<sup>13</sup> International Monetary Fund, 'Real GDP Growth', 2021, [https://www.imf.org/external/datamapper/NGDP\\_RPCH@WEO/OEMDC/ADVEC/WEOWORLD](https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD) [accessed: 22.03.2021].

<sup>14</sup> *Strategic Foresight Analysis 2017 Report*, *op. cit.*, p. 58.

<sup>15</sup> X. Han, P. Medas and S. Yang, 'The Pre-Pandemic Debt Landscape – and Why It Matters', 2021, IMFBlog, <https://blogs.imf.org/2021/02/01/the-pre-pandemic-debt-landscape-and-why-it-matters> [accessed: 23.03.2021].

<sup>16</sup> *Strategic Foresight Analysis 2017 Report*, *op. cit.*, p. 57.

<sup>17</sup> S. Lund et al., *Globalization in Transition: The Future of Trade and Value Chains*, 16 January 2019, McKinsey & Company, <https://www.mckinsey.com/featured-insights/innovation-and-growth/globalization-in-transition-the-future-of-trade-and-value-chains> [accessed: 27.02.2021].

vulnerabilities and potential disruptions to security of supplies must be taken into account. The COVID-19 pandemic highlighted these challenges. The McKinsey's study on 'Risk, resilience and rebalancing in global value chains' indicates, among others, the following implications: (1) 'shocks that affect global production are growing more frequent and more severe'; (2) 'value chains are exposed to different types of shocks based on their geographic footprint, factors of production, and other variables'; (3) 'value chains disruptions cause substantial financial losses'.<sup>18</sup> Similar observations regarding the shifts in global value chains in the 2010s are provided by the UNCTAD. Nevertheless, as highlighted in the World Investment Report 2020, '[t]he 2010s were only the quiet before the storm. The crisis caused by the COVID-19 pandemic arrived on top of existing challenges to the system of international production, arising from the new industrial revolution (NIR), growing economic nationalism and the sustainability imperative. These challenges were already reaching an inflection point; the pandemic looks set to tip the scales. The decade to 2030 is likely to prove a decade of transformation for international production'.<sup>19</sup>

Globalization has been a strong force influencing competitive positions of nations. As noticed in the NATO SFA report '[g]lobalization has shifted economic power. While globalization has opened markets and intensified economic integration, it also has increased the economic influence of emerging countries'.<sup>20</sup> In consequence, BRICs nations are nowadays listed among the countries with the highest value of Gross Domestic Product (GDP) in the global scale. As of 2017, they ranked respectively as the second (China), the fifth (India), the eight (Brazil), and the eleventh (Russia) nations with the highest GDP value.<sup>21</sup> The strengthening positions of emerging markets and developing economies is manifested in growth of their share in the GDP based on purchasing power parity (PPP). According to the International Monetary Fund, between 2001 and 2020, this measure increased from 43.7% to 57.51%, while the share of advanced economies declined from 56.3% to 42.49%.<sup>22</sup> Taking into account purchasing power parity, China became the largest economy in 2014. Nevertheless, its integration with the global economy remains at a lower level than expected. What is interesting, the ratio of China's exposure to the world (in regard to trade, technology and capital) decreased between 2000 and 2017 from 0.8 to 0.6, while the total exposure of other countries to China increased from 0.4 to 1.2.<sup>23</sup> The shift in global competitive positions between advanced and emerging economies is likely to continue. According to a forecast of the UK's Development,

<sup>18</sup> S. Lund et al., *Risk, Resilience, and Rebalancing in Global Value Chains*, 6 August 2020, McKinsey & Company, <https://www.mckinsey.com/business-functions/operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains> [accessed: 24.03.2021].

<sup>19</sup> *World Investment Report 2020: International Production Beyond the Pandemic*, 2020, UNCTAD, p. xii, <https://unctad.org/webflyer/world-investment-report-2020> [accessed: 22.03.2021]

<sup>20</sup> *Strategic Foresight Analysis*, op. cit., p. 57.

<sup>21</sup> Worldometer, 'GDP by Country', <https://www.worldometers.info/gdp/gdp-by-country> [accessed: 14.03.2021].

<sup>22</sup> International Monetary Fund, 'GDP Based on PPP, Share of World', 2021, <https://www.imf.org/external/datamapper/PPP/SH@WEO/OEMDC/ADVEC/WEO/WORLD> [accessed: 24.03.2021].

<sup>23</sup> J. Woetzel et al., *China and the World: Inside the Dynamics of a Changing Relationship*, 1 July 2019, McKinsey & Company, <https://www.mckinsey.com/featured-insights/china/china-and-the-world-inside-the-dynamics-of-a-changing-relationship> [accessed: 23.03.2021].

Concepts and Doctrine Centre '[b]y 2050, the combined size of the Emerging 7 (E7) economies (Brazil, China, India, Indonesia, Mexico, Russia, and Turkey) are likely to have surpassed the Group of Seven (G7) (Canada, France, Germany, Italy, Japan, the United Kingdom (UK) and the United States (US)).'<sup>24</sup>

Summing up, the economic theme of the security environment in the last two decades has been marked by economic cycles of growth and recessions, debt increase, shifts in global value chains and strengthening competitive positions of emerging economies. These changes have recently been catalysed by the COVID-19 pandemic which is expected to have a significant impact on the global economy in the nearest future.

## Society

Demographics has been one of the major forces shaping the security environment in the last two decades and it is expected to play an important role in the future. According to the World Bank's data<sup>25</sup>, the population increased from 6.194 billion in 2001 to 7.674 billion in 2019, although the global fertility rate decreased from 2.66% in 2001 to 2.41% in 2018.<sup>26</sup> Nevertheless, distribution of the population growth has been uneven, as very significant differences in fertility have been noted. As of 2018, the highest rates were achieved by African nations, with Niger (6.1%), Somalia (6.1%), the Democratic Republic of Congo (5.9%), and Mali (5.9%) as leaders. The lowest rates were reported in majority of European, North American, and some Asian nations. The World Bank's ranking is closed by Puerto Rico (1.0%) and the Republic of Korea (1.0%). The variations in the fertility rate seem to correlate with the income differences e.g., the average value in low-income countries is 4.6%, in middle-income countries – 2.3%, and in high-income countries – 1.6%.<sup>27</sup> Consequently, in the Euro-Atlantic area the processes of ageing and decrease in the amount of labour force have been observed, while African nations have been struggling to provide education and employment for growing ranks of the youth. Such inequalities combined with political instability and military violence in Africa and the Middle East have been catalysing migration processes, which were experienced as a great challenge by the European Union in the mid-2010s.

Political tensions, as well as growing economic and social inequalities, result in social polarization. Social polarization should be considered from two perspectives. On the one hand, polarization between countries is observed. In the global scale, in the last two decades the gap between the wealthy North and the poor South has remained valid in spite of strengthening the competitive positions of emerging economies. Simultaneously, some state actors have been behaving in a confrontational way, which leads to polarization in international relations. On the other hand, social

<sup>24</sup> *Global Strategic Trends: The Future Starts Today*, 2018, Development, Concepts and Doctrine Centre, p. 83, <https://www.gov.uk/government/publications/global-strategic-trends> [accessed: 25.02.2021].

<sup>25</sup> World Bank, 'Population, Total', 2021, <https://data.worldbank.org/indicator/SP.POP.TOTL?end=2019&start=2001> [accessed: 26.02.2021].

<sup>26</sup> World Bank, 'Fertility Rate, Total (births per woman)', 2021, <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?end=2018&start=2001> [accessed: 16.03.2021].

<sup>27</sup> *Ibidem*.

polarization within nations is becoming a thorny issue in the security environment. As noticed in the NATO Strategic Foresight Analysis '[w]idening inequality within nations is one of the most pressing trends that will continue to fracture and polarize societies.'<sup>28</sup> Intra-nation polarization 'can gradually cause a lack of cohesion and disagreement within society, which might eventually lead to civil unrest and benefit terrorist recruitment.'<sup>29</sup> In some Western democracies a widening gap between the elites and the mass society has been observed.

Urbanization has been another significant force driving the human theme of the security environment for the last two decades. Between 2001 and 2019, the share of urban population in the total population of the world increased from 47.1% to 55.7%.<sup>30</sup> As urban areas are of paramount importance both for national economies<sup>31</sup> and the conduct of military operations<sup>32</sup>, urbanization processes are considered to be a crucial component of the security environment. Under the umbrella of urbanization processes, two tendencies are worth noting i.e., an increase in the number and size of megacities<sup>33</sup> and the emergence and development of the concept of a smart city.<sup>34</sup>

To sum up, the major forces shaping the human theme of the security environment in the 2000s and 2010s include demographic changes resulting in ageing Western societies and challenges to support rapidly growing population in developing countries, which leads to migration processes, an increase in political, economic and social polarization between and within the nations, as well as urbanization processes.

## Technology

The last two decades have witnessed rapid technological development which has had a significant impact on human activities and behaviours. The emerging and disruptive technologies, identified by McKinsey Global Institute, include mobile internet, knowledge work automation, the Internet of Things (IoT), cloud technologies, advanced robotics, autonomous vehicles, genomics, energy storage,

<sup>28</sup> *Strategic Foresight Analysis 2017 Report, op. cit.*, p. 62.

<sup>29</sup> *Ibidem*, p. 40.

<sup>30</sup> World Bank, 'Urban Population (% of total population)', 2021, <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS> [accessed: 26.03.2021].

<sup>31</sup> J.V. Henderson, 'The Urbanization Process and Economic Growth: The so-What Question', *Journal of Economic Growth* 2003, vol. 8, no. 1, pp. 47–71, DOI: 10.1023/A:1022860800744; J.C. Davis, J.V. Henderson, 'Evidence on the Political Economy of the Urbanization Process', *Journal of Urban Economics* 2003, vol. 53, no. 1, pp. 98–125, DOI: 10.1016/S0094-1190(02)00504-1; R.L. Moomaw, A.M. Shatter, 'Urbanization and Economic Development: A Bias toward Large Cities?', *Journal of Urban Economics* 1996, vol. 40, no. 1 pp. 13–37, DOI: 10.1006/juec.1996.0021.

<sup>32</sup> *Framework for Future Alliance Operations 2018 Report*, Allied Command Transformation, Norfolk 2018; J. Mokrzycki, A. Lis and D. Szymańska, 'Urbanizacja a środowisko bezpieczeństwa: Wiodące tematy badawcze, trendy, implikacje', Paper Presented at GlobState II Conference, 13–14 November 2019, Centrum Doktryn i Szkolenia Sił Zbrojnych, Bydgoszcz 2019.

<sup>33</sup> D. Szymańska, M. Wylon, 'Macropolization in the People's Republic of China, 1950–2015', *Miscellanea Geographica* 2020, vol. 24, no. 3, pp. 161–75, DOI: 10.2478/mgrsd-2020-0018.

<sup>34</sup> D. Szymańska, M. Korolko, *Inteligentne miasta: Idea, koncepcje i wdrożenia*, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, Toruń 2015.



3D printing, advanced materials, advanced technologies of oil and gas exploration, and renewable energy sources.<sup>35</sup>

The technological development has been a force shaping the global economy, triggering the emergence of new industries and business models. Contributing to building relationships among customers and markets, the technological development has enabled nations and regions to achieve higher rates of economic growth and improve their competitive positions in global value chains. In consequence, this has resulted in an increase of political and military potential of some countries, their international position and the ability to influence other actors in the security environment.<sup>36</sup> Technological advances have resulted in the emergence of the Industry 4.0 concept, which assumes changes in manufacturing systems driven by information technologies (IT).<sup>37</sup> 'Industry 4.0 is a concept relating to the use of automation in industries, data processing and data exchange. The concept also encompasses artificial intelligence, the digitalization of the production process and introducing new technologies.'<sup>38</sup>

Besides the positive outcomes of technological development and access to advanced technologies, some related threats for nations and societies are worth mentioning, e.g., increasing intensity of crimes as well as espionage and cyberattacks in civilian, industrial and military domains. Another threat from the security perspective is the weakening technological advantage of state actors over non-state actors or potential adversaries resulting from easier access to advanced technologies.<sup>39</sup>

Summing up, in the technological sphere, emerging and disruptive technologies have contributed to the technological development and the rise of the Industry 4.0 concept. Nevertheless, from the security perspective, these changes should be perceived both as opportunities and challenges.

## Natural Environment

The natural environment theme of the security environment in the last two decades has been mainly driven by the climate change and its global, regional and local consequences. According to the World Meteorological Organization<sup>40</sup>, with the global average temperature 1.1°C higher comparing to the pre-industrial age, 2019 was the second warmest year in the history of recorded measurements. Similarly, the 2010s were reported as the warmest decade on record. In 2019, the second lowest sea ice extent was noticed in the Arctic and the Antarctic. In 2018, the highest level of greenhouse gases was reported. The increase in absorption of carbon dioxide

---

<sup>35</sup> J. Manyika et al., *Disruptive Technologies: Advances That Will Transform Life, Business, and the Global Economy*, McKinsey Global Institute, Washington 2013.

<sup>36</sup> *Digital Globalization: The New Era of Global Flows*, McKinsey Global Institute, Washington 2016.

<sup>37</sup> H. Lasi et al., 'Industry 4.0', *Business and Information Systems Engineering* 2014, vol. 6, no. 4, pp. 239–242, DOI: 10.1007/s12599-014-0334-4.

<sup>38</sup> A. Zakrzewska-Bielawska, I. Staniec (eds.), *Contemporary Challenges in Cooperation and Competition in the Age of Industry 4.0*, Springer, Cham 2020, p. v.

<sup>39</sup> *Joint Operating Environment (JOE) 2035*, U.S. Joint Chiefs of Staff, Washington 2016.

<sup>40</sup> World Meteorological Organization, *WMO Statement on the State of the Global Climate in 2019*, 2020, [https://library.wmo.int/doc\\_num.php?explnum\\_id=10211](https://library.wmo.int/doc_num.php?explnum_id=10211) [accessed: 12.03.2021].

by oceans reduces its amount in the air, but such a process leads to warming up ocean waters and rising the sea level. In 2019, the average sea level achieved its maximum value since measurements began.

Climate change results in increasing frequency and scale of extremely violent weather phenomena and natural disasters (droughts, floods), as well as in hunger and shortfalls of drinkable water. As a consequence of climate change and natural disasters, the intensity of economic, social and political tensions is increasing, which leads to migrations, terrorism and local conflicts. What is more, global warming and melting the Arctic ice enhance rivalry for access to natural resources and transportation routes. Climate change is more and more often perceived as a threat multiplier increasing the intensity of rivalries, tensions and instability. Negative consequences of climate change for countries and regions, both of humanitarian and political character, may lead to a greater risk of conflicts and hampering growth and development.<sup>41</sup>

Thus, due to its impact on international security, climate change requires a comprehensive political response. For instance, mitigating negative consequences of climate change is considered to be a prerequisite for achieving millennium development goals.<sup>42</sup> Climate change forces governments to undertake initiatives aimed at increasing their capabilities to cope with the challenges in the natural environment. These efforts have changed the structure of public spending as rising amounts of financial resources are needed to mitigate negative outcomes of climate change, e.g., violent storms, whirlwinds, droughts, and floods damaging infrastructure, natural habitats and agriculture and creating threats for life and health of citizens. Moreover, due to growing intensity of natural disasters, the armed forces have been more and more often engaged in providing humanitarian assistance and assistance to civilian administration.<sup>43</sup> The armed forces may be also exposed to extreme weather conditions while conducting operations. Due to the global warming effect, the armed forces are under pressure to invest in the most up-to-date technologies in military equipment, which increases the costs of modernization.<sup>44</sup>

To summarize, climate change, which has recently been gaining intensity, should be perceived as a threat multiplier increasing the risk of rivalries, tensions and instability in the security environment. Climate change results in growing frequency and scale of extremely violent weather phenomena and natural disasters.

## Discussion and Conclusions

In response to the first research question, in all five themes of the security environment under analysis significant changes have been observed since 2001. The following forces have shaped the geopolitical theme: the shift from the unipolar global

<sup>41</sup> B. La Shier, J. Stanish, 'The National Security Impacts of Climate Change', *The Journal of National Security Law & Policy* 2018, vol. 10, no. 1, pp. 27–43.

<sup>42</sup> European Commission, *Climate Change and International Security*, Brussels 2015.

<sup>43</sup> J. Mokrzycki, R. Reczkowski and S. Cieśla, *op. cit.*

<sup>44</sup> W. Lorenz, 'NATO wobec zmian klimatu – oczekiwania i możliwości', 2020, PISM, [https://pism.pl/publikacje/NATO\\_wobec\\_zmian\\_klimatu\\_\\_oczekiwania\\_\\_i\\_mozliwosci](https://pism.pl/publikacje/NATO_wobec_zmian_klimatu__oczekiwania__i_mozliwosci) [accessed: 2.04.2021].

order characterized by the dominance of the United States to the multipolar model, the rising political and military activity of Russia, as well as growing external and intra-organizational challenges faced by NATO. The economic theme in last two decades has been marked by economic cycles of growth and recessions, debt increase, shifts in global value chains and strengthening competitive positions of emerging nations. The major forces shaping the human theme in the 2000s and 2010s include demographic changes resulting in ageing Western societies and challenges to support a rapidly growing population in Africa, which leads to migration processes, an increase in political, economic and social polarization between and within nations, and urbanization processes. In the technological theme, emerging and disruptive technologies have contributed to the technological development and the rise of the Industry 4.0 concept. Nevertheless, from the perspective of security, these changes should be perceived both as opportunities and challenges. In the natural environment theme, climate change, which has recently been gaining intensity, should be perceived as a threat multiplier increasing the risk of rivalries, tensions and instability in the security environment. Climate change results in growing frequency and scale of extremely violent weather phenomena and natural disasters.

In response to the second research question, potential impacts of the identified forces and trends on the future security environment should be discussed. Increasing multipolarity is likely to strengthen the intensity of international rivalry and competition. This may result in shifts in strategic interests and creating short-term alliances aimed at contesting competitive positions of global and regional powers by non-content nations or groups of them. Such objectives may be achieved by activities increasing polarization of societies, and thus imposing political or economic concessions. The threats are expected not only within the military segment of the security environment but also in the political, economic and social themes. Hybrid activities are likely to strongly influence the dynamics of the security environment. The phenomena, processes, concepts, and technologies making the foundation of the security environment may be used to construct instruments of influence based on combining the most vulnerable factors in various segments and areas. This new reality might increase effectiveness of achieving such objectives as: (1) questioning fundamental values of democratic societies, (2) undermining public trust in national and international democratic institutions, (3) deepening social polarization both at the national and international levels, (4) gaining political power through undermining other actors, and (5) influencing decision processes made by political leaders.<sup>45</sup> The aforementioned activities may gain strength, even achieving the level of an overt or covert low-intensity conflict. Due to multidimensionality of such a conflict, existing mechanisms of international de-escalation may become insufficient and ineffective. In conducive conditions, these low-intensity activities may become

---

<sup>45</sup> G. Giannopoulos, H. Smith and M. Theocharidou (eds.), *The Landscape of Hybrid Threats: A Conceptual Model*, Publications Office of the European Union, Luxembourg 2021; Multinational Capability Development Campaign, *Countering Hybrid Warfare*, March 2019, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/784299/concepts\\_mcdc\\_countering\\_hybrid\\_warfare.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784299/concepts_mcdc_countering_hybrid_warfare.pdf) [accessed: 3.03.2021].

replaced by high-intensity warfighting of a limited geographical scope, conducted both by state and non-state actors.<sup>46</sup>

To sum up, September 11, 2001 was certainly 'the day that changed the world'. It may be considered a symbolic beginning of an era of dynamic changes in the relatively stable post-Cold War security environment. As already mentioned, in response to the September 11 attacks, for the first time in its history, NATO invoked Article 5 of the Washington Treaty after the attack against one of its Member States, which proved the unity of the Alliance. Twenty years later, this unity remains an unflagging promise for all democratic nations protecting their strategic interests in the more and more uncertain security environment.

Keeping in mind the conclusions from the analysis and the study limitations identified in the introduction section, recommendations for further research may be provided. Firstly, as regional aspects of the security environment more and more often have a global impact, it is suggested to perform the study again and discuss regional perspectives on global forces shaping security issues. Secondly, due to high volatility, uncertainty, complexity and ambiguity of the security environment, its analysis should be conducted on a continuous basis.

The study contributes to mapping and understanding of the multidimensional security environment. It also generates added value for both military analysts and executives. Its findings may be useful for strategic foresight analysis projects such as the NATO SFA, the UK's Global Strategic Trends or the Polish NUP 2X35. The study may also be found a source of valuable expertise supporting defence planning processes.

## References

- Armijo, L.E., Roberts, C., 'The Emerging Powers and Global Governance: Why BRICS Matter', *Handbook of Emerging Economies*, Routledge, London 2014, pp. 503–524.
- Davis, J.C., Henderson, J.V., 'Evidence on the Political Economy of the Urbanization Process', *Journal of Urban Economics* 2003, vol. 53, no. 1, pp. 98–125, DOI: 10.1016/S0094-1190(02)00504-1.
- European Commission, *Climate Change and International Security*, Brussels 2015.
- Framework for Future Alliance Operations 2018 Report*, Allied Command Transformation, Norfolk 2018.
- Giannopoulos, G., Smith, H. and Theocharidou, M. (eds.), *The Landscape of Hybrid Threats: A Conceptual Model*, Publications Office of the European Union, Luxembourg 2021.
- Gierszewska, G., Romanowska, M., *Analiza strategiczna przedsiębiorstwa*, PWE, Warszawa 2001.
- Global Strategic Trends: The Future Starts Today*, 2018, Development, Concepts and Doctrine Centre, <https://www.gov.uk/government/publications/global-strategic-trends> [accessed: 25.02.2021].

---

<sup>46</sup> The Authors are grateful to Col. Jarosław Mokrzycki, Director of the Doctrine and Training Centre of the Polish Armed Forces, for his comments to the draft of the manuscript concerning potential impacts of the identified forces and trends on the future security and operational environments.

- Han, X., Medas, P. and Yang, S., 'The Pre-Pandemic Debt Landscape – and Why It Matters', 2021, IMFBlog, <https://blogs.imf.org/2021/02/01/the-pre-pandemic-debt-landscape-and-why-it-matters> [accessed: 23.03.2021].
- Henderson, J.V., 'The Urbanization Process and Economic Growth: The so-What Question', *Journal of Economic Growth* 2003, vol. 8, no. 1, pp. 47–71, DOI: 10.1023/A:1022860800744.
- International Monetary Fund, 'GDP Based on PPP, Share of World', 2021, <https://www.imf.org/external/datamapper/PPPSH@WEO/OEMDC/ADVEC/WEOORLD> [accessed: 24.03.2021].
- International Monetary Fund, 'Real GDP Growth', 2021, [https://www.imf.org/external/datamapper/NGDP\\_RPCH@WEO/OEMDC/ADVEC/WEOORLD](https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOORLD) [accessed: 22.03.2021].
- Joint Operating Environment (JOE) 2035*, 14 July 2016, U.S. Joint Chiefs of Staff, Washington, DC.
- Koziej, S., *Między piekłem a rajem: szare bezpieczeństwo na progu XXI wieku*, Wydawnictwo Adam Marszałek, Toruń 2006.
- La Shier, B., Stanish, J., 'The National Security Impacts of Climate Change', *The Journal of National Security Law & Policy* 2018, vol. 10, no. 1, pp. 27–43.
- Lasi, H et al., 'Industry 4.0', *Business and Information Systems Engineering* 2014, vol. 6, no. 4, pp. 239–242, DOI: 10.1007/s12599-014-0334-4.
- Lorenz, W., 'NATO wobec zmian klimatu – oczekiwania i możliwości', 2020, PISM, [https://pism.pl/publikacje/NATO\\_wobec\\_zmian\\_klimatu\\_\\_oczekiwania\\_\\_i\\_mozliwosci](https://pism.pl/publikacje/NATO_wobec_zmian_klimatu__oczekiwania__i_mozliwosci) [accessed: 2.04.2021].
- Lund, S. et al., *Globalization in Transition: The Future of Trade and Value Chains*, 16 January 2019, McKinsey & Company, <https://www.mckinsey.com/featured-insights/innovation-and-growth/globalization-in-transition-the-future-of-trade-and-value-chains> [accessed: 27.02.2021].
- Lund, S. et al., *Risk, Resilience, and Rebalancing in Global Value Chains*, 6 August 2020, McKinsey & Company, <https://www.mckinsey.com/business-functions/operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains> [accessed: 24.03.2021].
- Manyika, J. et al., *Digital Globalization: The New Era of Global Flows*, McKinsey Global Institute, Washington 2016.
- Manyika, J. et al., *Disruptive Technologies: Advances That Will Transform Life, Business, and the Global Economy*, McKinsey Global Institute, Washington 2013.
- Mokrzycki, J., Lis, A., 'Kampania NUP 2X35 narzędziem transformacji Sił Zbrojnych RP w organizację wiedzy', *Przegląd Sił Zbrojnych* 2020, no. 6, pp. 10–15.
- Mokrzycki, J., Lis, A. and Szymańska, D., 'Urbanizacja a środowisko bezpieczeństwa: Wiodące tematy badawcze, trendy, implikacje', Paper presented at GlobState II Conference, 13–14 November 2019, Centrum Doktryny i Szkolenia Sił Zbrojnych, Bydgoszcz 2019.
- Mokrzycki, J., Reczkowski, R. and Cieśla, S. (eds.), *Security Environment Out To 2035 – NUP 2X35: The Polish Perspective*, Doctrine and Training Centre of the Polish Armed Forces, Bydgoszcz 2020.
- Moomaw, R.L., Shatter, A.M., 'Urbanization and Economic Development: A Bias toward Large Cities?', *Journal of Urban Economics* 1996, vol. 40, no. 1, pp. 13–37, DOI: 10.1006/juec.1996.0021 [accessed: 27.03.2021].

- Multinational Capability Development Campaign, *Countering Hybrid Warfare*, March 2019, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/784299/concepts\\_mcdc\\_countering\\_hybrid\\_warfare.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784299/concepts_mcdc_countering_hybrid_warfare.pdf) [accessed: 3.03.2021].
- NUP 2X35, 'Dyskutujemy o wpływie pandemii COVID-19 na wymiar geopolityczny środowiska bezpieczeństwa', 19 February 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/dyskutujemy-o-wplywie-pandemii-covid-19-na-wymiar-geopolityczny-srodowiska-bezpieczenstwa> [accessed: 25.05.2021].
- NUP 2X35, 'Jak pandemia COVID-19 wpłynie na społeczny wymiar środowiska bezpieczeństwa?', 19 April 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/jak-pandemia-covid-19-wplynie-na-wymiar-spoeczny-srodowiska-bezpieczenstwa> [accessed: 25.05.2021].
- NUP 2X35, 'Świat po pandemii – wymiar ekonomiczny', 10 March 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/webinarium-swiat-po-pandemii-wymiar-ekonomiczny> [accessed: 25.05.2021].
- NUP 2X35, 'Webinarium nt. nowych technologii w świecie postpandemicznym', 12 May 2021, <https://nup.wp.mil.pl/pl/articles6-aktualnosci/webinarium-nt-nowych-technologii-w-swiecie-postpandemicznym> [accessed: 25.05.2021].
- Reczkowski, R., 'Russkije igry z NATO – od współpracy do konfrontacji', *Przegląd Sił Zbrojnych* 2020, no. 6, pp. 26–33.
- Shea, J., '70. Rocznicą NATO – szansa na nowe „wzorcowanie”', 5 April 2019, *NATO Review*, <https://www.nato.int/docu/review/pl/articles/2019/04/05/70-rocznica-nato-szansa-na-nowe-wzorcowanie/index.html> [accessed: 2.03.2021].
- Strategic Foresight Analysis 2017 Report*, Allied Command Transformation, Norfolk 2017.
- Szymańska, D., Korolko, M., *Inteligentne miasta: Idea, koncepcje i wdrożenia*, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, Toruń 2015.
- Szymańska, D., Wylon, M., 'Macropolization in the People's Republic of China, 1950–2015', *Miscellanea Geographica* 2020, vol. 24, no. 3, pp. 161–75, DOI: 10.2478/mgrsd-2020-0018.
- Woetzel, J. et al., *China and the World: Inside the Dynamics of a Changing Relationship*, 1 July 2019, McKinsey & Company, <https://www.mckinsey.com/featured-insights/china/china-and-the-world-inside-the-dynamics-of-a-changing-relationship> [accessed: 23.03.2021].
- World Bank, 'Fertility Rate, Total (births per woman)', 2021, <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?end=2018&start=2001> [accessed: 16.03.2021].
- World Bank, 'Population, Total', 2021, <https://data.worldbank.org/indicator/SP.POP.TOTL?end=2019&start=2001> [accessed: 26.02.2021].
- World Bank, 'Urban Population (% of total population)', 2021, <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS> [accessed: 26.03.2021].
- World Investment Report 2020: International Production Beyond the Pandemic*, 2020, UNCTAD, <https://unctad.org/webflyer/world-investment-report-2020> [accessed: 22.03.2021].
- World Meteorological Organization, *WMO Statement on the State of the Global Climate in 2019*, 2020, [https://library.wmo.int/doc\\_num.php?explnum\\_id=10211](https://library.wmo.int/doc_num.php?explnum_id=10211) [accessed: 12.03.2021].

Worldometer, 'GDP by Country', <https://www.worldometers.info/gdp/gdp-by-country/> [accessed: 14.03.2021].

Zakrzewska-Bielawska, A., Staniec, I. (eds.), *Contemporary Challenges in Cooperation and Competition in the Age of Industry 4.0*, Springer, Cham, 2020.

## *Dzień, który zmienił świat: środowisko bezpieczeństwa 20 lat po ataku na WTC*

### *Streszczenie*

Celem artykułu jest zidentyfikowanie oraz zbadanie kluczowych zjawisk i trendów w środowisku bezpieczeństwa, jakie wystąpiły w ciągu ostatnich dwóch dekad, a także mają wpływ na jego przyszłość. Proces badawczy został skoncentrowany na poszukiwaniu odpowiedzi na następujące pytania problemowe: (1) Jakie były kluczowe zjawiska i trendy w środowisku bezpieczeństwa w ciągu ostatnich dwóch dekad? (2) Jakie są potencjalne skutki tych zjawisk i trendów w przyszłym środowisku bezpieczeństwa? Całość została opracowana na podstawie zebranych danych z wywiadów ekspertów, przeglądu literatury i danych statystycznych opublikowanych przez organizacje międzynarodowe w następujących obszarach środowiska bezpieczeństwa: geopolityka, gospodarka, społeczeństwo, technologia i środowisko naturalne.

**Słowa kluczowe:** środowisko bezpieczeństwa, analiza strategiczna, geopolityka, ekonomia, społeczeństwo, technologie, środowisko naturalne

## *'The Day that Changed the World': The Security Environment 20 Years after the WTC Attacks*

### *Abstract*

The aim of the paper is to identify and explore the key forces and trends within the security environment, which have taken place in the last two decades and are likely to shape the future. The research process is focused on the following study questions: (1) What have been the key forces and trends within the security environment in the last two decades? (2) What are potential impacts of these forces and trends on the future security environment? The analysis includes such issues as: geopolitics, economy, society, technology, and the natural environment. It is based on the data collected from unstructured expert interviews, narrative literature review and statistical data published by international organizations.

**Key words:** security environment, strategic analysis, geopolitics, economy, society, technology, natural environment

## *„Der Tag, der die Welt veränderte“: Das Sicherheitsumfeld 20 Jahre nach den Anschlägen auf das WTC*

### *Zusammenfassung*

Das Ziel dieses Textes ist es, die treibenden Kräfte und Trends im Sicherheitsumfeld in den letzten beiden Jahrzehnten zu identifizieren und zu erörtern, die aller Voraussicht nach auch Einfluss auf die Zukunft haben werden. Die Studie basiert auf folgenden Forschungsfragen: (1) Was waren die treibenden Kräfte und Trends im Sicherheitsumfeld in den letzten beiden Jahrzehnten? (2) Welche potenziellen Folgen werden diese Kräfte und Trends auf das Sicherheitsumfeld in der Zukunft haben? Die Analyse umfasst Aspekte,

wie Geopolitik, Wirtschaft, Gesellschaft, Technologie und Natur. Sie stützt sich auf Daten aus unstrukturierten Experteninterviews, einem Literaturüberblick und statistischen Daten, die von internationalen Organisationen veröffentlicht wurden.

**Schlüsselwörter:** Sicherheitsumfeld, strategische Analyse, Geopolitik, Wirtschaft, Gesellschaft, Technologie, Umwelt

*День, изменивший мир: сфера безопасности  
20 лет после атаки на Всемирный торговый центр  
Резюме*

В статье указаны и рассмотрены ключевые явления и тенденции в области безопасности, которые произошли в последние два десятилетия, а также влияют на обеспечение безопасности в будущем. Исследовательский процесс был сосредоточен на поиске ответов на следующие проблемные вопросы: (1) Каковы были ключевые явления и тенденции в сфере безопасности за последние два десятилетия? (2) Какими будут потенциальные последствия этих явлений и тенденций в будущей сфере безопасности? Исследование основано на данных, полученных во время интервью с экспертами, обзора литературы и анализа статистических данных, опубликованных международными организациями в следующих областях безопасности: геополитика, экономика, общество, технология и окружающая среда.

**Ключевые слова:** сфера безопасности, стратегический анализ, геополитика, экономика, общество, технология, окружающая среда