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# TABLE OF CONTENTS

<b>WE SHOULD SPEAK ABOUT THE LIBERATION OF THE CRIMEA</b> .....	<b>3</b>
<i>Interview with Member of Parliament of Ukraine Mustafa Dzhemilev for UA: Ukraine Analytica</i>	
<b>MINSK AGREEMENTS IMPLEMENTATION: ART OF IMPOSSIBLE</b> .....	<b>7</b>
<i>Hanna Shelest and Dmytro Shulga</i>	
<b>HUMANITARIAN CRISIS IN UKRAINE AS A FACTOR DESTABILIZING DOMESTIC AND FOREIGN POLICY OF THE STATE</b> .....	<b>23</b>
<i>Iuliia Tsyrfa</i>	
<b>GUIDELINES FOR MANAGING THE CONFLICT IN DONBAS</b> .....	<b>30</b>
<i>Mykola Kapitonenko</i>	
<b>THE ENVIRONMENTAL IMPACT OF MILITARY ACTIONS IN EASTERN UKRAINE AND THE ANNEXATION OF THE CRIMEA</b> .....	<b>38</b>
<i>Svitlana Andrushchenko</i>	
<b>CRIMEA TODAY: TRENDS AND DEVELOPMENTS</b> .....	<b>47</b>
<i>Natalya Belitser</i>	
<b>HUMAN RIGHTS MONITORING IN CRIMEA: MISSION IMPOSSIBLE?</b> .....	<b>56</b>
<i>Kira Spyrydonova</i>	
<b>ELECTORAL SECURITY AS AN ELEMENT OF PEACE-BUILDING AND SUSTAINABLE DEVELOPMENT</b> .....	<b>64</b>
<i>Iuliia Serbina</i>	
<b>DO VISA LIBERALISATION REFORMS HELP MODERNIZING UKRAINE?</b> .....	<b>71</b>
<i>Maryana Kuzio and Iryna Sushko</i>	

# THE ENVIRONMENTAL IMPACT OF MILITARY ACTIONS IN EASTERN UKRAINE AND THE ANNEXATION OF THE CRIMEA

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***The Ukrainian crisis demonstrated that lack of trust between major regional security players like NATO and Russia overshadows most regional disputes and conflicts. The article's main argument is that problems in the two parties' relations stem from NATO's and Russia's existential search for a new role after the end of the Cold War, when their roles and sets of strategies used to be clearly defined. The clash between NATO's liberal logic and Russia's realist logic shows that the two players are acting in different systems of coordinates and the minimal common denominator is still to be found.***

The contemporary concept of human security consists of a combination of social, economic and environmental dimensions of a human being. Issues such as access to water, food security through access to arable lands, clear air and spread of infectious diseases in combination may create conditions that call into question the basic fabric of communities and nations, and challenge their security in a very tangible way. Environmental insecurity as a result of armed conflicts threatens the livelihood, wellbeing and integrity of entire societies, prolonging the period of instability.

This article is aimed at the analyses of the existing environmental impact of the conflict in Eastern Ukraine and the annexation of the Crimea for the environmental security not only in conflict areas but also in Ukraine and Europe as a whole.

This issue of environmental security is multifaceted with several aspects, some of them are as following:

1. the necessity for Ukraine to incorporate the existing and possible environmental consequences of armed conflict in Eastern Ukraine and the annexation of the Crimea into the state environmental concept on the basis of its commitments according to the Ukraine's Intended National Determined Contributions (INDCs) to Paris Agreement on Climate Change 2015;
2. the issue of responsibility for environmental impact as a result of military actions and damages on the territories out of Ukrainian control;
3. constant access to environmental monitoring with the participation of international community and development of response strategies for possible environmental disasters influencing the whole territory of Ukraine;
4. environmental peace-making on the basis of 'society-to-society' models.


Prior to the armed conflict in Eastern Ukraine, in May 2014, the environmental situation within this region was in a difficult condition, due to the intensive air pollution by approximately 5300 enterprises in coal industry, ferrous metallurgy, chemical industry and power stations. In particular, the most methane emissions were registered in places with coal extraction enterprises location that is equal to 70% of total amount of emissions.<sup>1</sup> This situation was multiplied with the total low level of attention to the ecological situation all over Ukraine: the lack of comprehensive approach to the environmental degradation in Eastern Ukraine, low level of environmental consciousness, unsatisfying level of waste cleaning, overpollution of surface and underground waters, lands and air.

With the beginning of the active military actions in this part of Ukraine, the situation degraded dramatically. The main problem is the lack of proper environmental monitoring. The analysis was generally made on the basis of the NGO "Ecology – Law – Person"<sup>2</sup>, Eastern Ukrainian Environmental Institute<sup>3</sup> and Ecological network Zoi<sup>4</sup> research. The work of the Ukrainian State ecological inspections in Donetsk and Luhansk regions is paralyzed, out of 39 posts in the department of water resources in Donetsk region and out of 24 - in Luhansk region only 20 and 6 respectively are acting. Out of 25 only 11 in Donbas and 4 out of 11 in Luhansk stations of air pollution measuring operate at present. As

a result, volunteers remain the main source of data regarding the pollution level in the region of military conflict.

One of the important results of this is the impossibility to make a reliable estimation of the trans-border transfer of toxic substances in case of emergency disaster. Thus, it can lead to international claims for Ukraine and restrict actions on localization of accidents. The same concerns the environmental accidents on the territory of the annexed Crimea, and Ukraine bears responsibility for environmental degradation here in case of transborder air or sea pollution.

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***Armed conflicts result in some negative impacts on land and landscapes, plants, surface and underground waters. Military actions directly lead to risks of accidents at industrial enterprises and infrastructure.***

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The experts from the organization "Environment – Law – Person" propose to renew and to develop the system of environmental monitoring, including the Earth satellite distance probes with the participation of influential international partners. The task for Ukrainian government in cooperation with international organizations is to find ways of coordinating efforts for regular collection of environmental data.<sup>5</sup> Moreover, such com-

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<sup>1</sup> Кравченко О., Василюк О., Войцховська А., Норенко К. Дослідження впливу військових дій на довкілля на Сході України // Схід. - 2015. - № 2. - С. 118-123. - [http://nbuv.gov.ua/UJRN/Skhid\\_2015\\_2\\_23](http://nbuv.gov.ua/UJRN/Skhid_2015_2_23)

<sup>2</sup> Воєнні дії на Сході України: цивілізаційні виклики людству // Львів: ЕПЛ, 2015. — 136 с.

<sup>3</sup> Аверін Д., Денісов М. Війна на Сході України: бойові дії та екологічні наслідки // <http://euaeco.com/?environmental-consequences-fighting/ua>

<sup>4</sup> Denisov T., Simonett O., Weir D., Averin D., Ukraine war leaves a long shadow of pollution, ill-health and ravaged industries // <http://www.climateinfo.org.ua/content/viina-v-ukrajni-zalishae-dovgii-slid-zabrudnen-khvorob-ta-zruinovanaj-promislovosti>

<sup>5</sup> Аверін Д., Денісов М. Війна на Сході України: бойові дії та екологічні наслідки // <http://euaeco.com/?environmental-consequences-fighting/ua>

mon implementation of international programs may facilitate to estimate the levels of damage and harm to infrastructure and nature of Donbas with a view on defining reparations. At the same time, this proposal is hard to realize considering the restricted possibilities for access on the ATO territories. Nowadays the probes by volunteers mainly are the biggest source of information about the scale of the environmental impact.

### **Industrial Disasters**

Armed conflicts result in some negative impacts on land and landscapes, plants, surface and underground waters. Military actions directly lead to risks of accidents at industrial enterprises and infrastructure. Usually the main reason for pollution is not fighting itself but the damage of industrial infrastructure (oil, gas and ammonium pipelines, water supply systems) and disorganization of daily economic activity as a result of fighting. Environment pollution caused by the emergency stop of big enterprises, the lack of raw materials and energy resources for their uninterrupted activity is a dangerous consequence of fighting in Donbas. In some cases, it leads to the emergency releases of toxic substances, in some cases the consequence is prolonged negative effect on environment through the lack of adequate filtering or use of low-quality raw materials.

Among numerous damages of big enterprises there are Yasynivskiy, Avdiivskiy, Yenakiyevskiy coke plants, Yenakievskiy ferrous metallurgy plant, Lisichanskyy oil refinery, Donetskyy chemical plant, and power stations in

Slaviansk, Luhansk and Kurakhiv, Azot plant in Severodonetsk and Stiroil plant in Horlivka. For example, according to the report produced by the Zoï environmental network, we can follow the impact of the use of heavy weaponry in close proximity to industrial facilities, often directly against them.<sup>6</sup>

Since the conflict began in the region, electrical supply has been temperamental, systematically cut-off by the heavy bombardment of key infrastructure. This results in the intermittent collapse of ventilation systems and water pumps in the hundreds of coalmines in the region. When the electricity stops and ventilators shut down, harmful gases accumulate and are released when systems restart. In March 2015, a release and explosion of methane in the Zaysadko mine in Donetsk killed 33 of the 200 miners underground at the time. While it is not the first accident to occur at the mine, the chair of the mine's board attributed that incident to the heavy shelling nearby Donetsk airport. Similarly, flooding in mines damage installations and waterlogs in adjacent areas, causing groundwater to be polluted.<sup>7</sup>

### **Air Pollution**

Air quality has also declined because of the conflict. According to the study made by Eastern Ukrainian Ecological Institute, supply chains to coal power stations have been disrupted, and thus power stations have been forced to use lower-grade coal, which is much more polluting. The data from the only operating air monitoring station, located in the town of Shchastya

<sup>6</sup> The Ukraine Conflict's Legacy Of Environmental Damage And Pollutants / Sustainable Security. 21.04.2015 <http://sustainablesecurity.org/2015/04/21/the-ukraine-conflicts-legacy-of-environmental-damage-and-pollutants-2> Воєнні дії на Сході України: цивілізаційні виклики людству // Львів: ЕПЛ, 2015. — 136 с.

<sup>7</sup> Denisov T., Simonett O., Weir D., Averin D., Ukraine war leaves a long shadow of pollution, ill-health and ravaged industries // <http://www.climateinfo.org.ua/content/viina-v-ukrajni-zalishae-dovgii-slid-zabrudnen-khvorob-ta-zruinovanoj-promislovosti>

in the Luhansk oblast shows a marked increase in pollutants since the conflict began. However, peak concentrations of pollutants in the air do not correlate with periods of heavy combat, but rather with the reduction in supply of high-grade coal for the Luhansk power plant. After a key bridge in Nova Kindrashivka was destroyed, the railroad supply of coal to the power plant stopped, and destroyed electric power lines isolated Luhansk power plant from Ukraine's electric power system. As a result, the electric power station that supplies about 90% of regional energy consumers was forced to increase production while turning to lower-grade coal, resulting in a clear deterioration of the air quality.<sup>8</sup> In May 2015, as a result of shelling, Avdiivskiy plant was on fire, and this resulted in a leak of coke gas with a high content of benzol, toluene, naphthalene, hydrogen sulphide, ammonium and methane<sup>9</sup>.

At the moment, relatively little is known about the direct chemical impact of the war on the environment and people. Limited sampling by the NGO Environment-People-Law confirmed the expected range of some 'war chemicals' from the use of conventional weapons in impact zones. Similarly, large quantities of damaged military equipment and potentially hazardous construction waste will require disposal. The Ukrainian Ministry of Defence also raised concerns that depleted uranium weapons may have been used in the fighting around Donetsk airport, and proposed to determine whether this

was the case when conditions allowed.<sup>10</sup> However, this statement needs more detailed studies and regular measuring, which is complicated at present. Air pollution monitoring station in Shchasttya (Luhansk region) fixed on-line data with a high growth of toxic chemical substances (explosives remnants – sulphur dioxide, nitrogen etc.) at the periods of intensive shelling up to 5-8 times from maximum allowable level.



***Land degradation is another important impact of fighting in the Eastern Ukraine conflict. One aspect is the pollution of arable lands by heavy metals and nitrates after shells explosions, flooding of land by mine waters, spill and burning of fuels and lubricants.***

#### **Land and Natural Landscape Degradation**

Land degradation is another important impact of fighting in the Eastern Ukraine conflict. One aspect is the pollution of arable lands by heavy metals and nitrates after shells explosions, flooding of land by mine waters, spill and burning of fuels and lubricants. In case of areas of military actions in Donetsk and Luhansk regions, the concentration of titanium exceeded 150 times permitted levels and contained vanadium (free in normal state). It should be noted that the alloys of titanium and

<sup>8</sup> Аверін Д., Денісов М. Війна на Сході України: бойові дії та екологічні наслідки // <http://euaeo.com/?environmental-consequences-fighting/ua>

<sup>9</sup> Denisov T., Simonett O., Weir D., Averin D., Ukraine war leaves a long shadow of pollution, ill-health and ravaged industries // <http://www.climateinfo.org.ua/content/viina-v-ukrajni-zalishae-dovgii-slid-zabrudnen-khvorob-ta-zruinovanoj-promislovosti>

<sup>10</sup> Український Донбас став полігоном для випробування Збройними силами Російської Федерації новітнього озброєння та заборонених боєприпасів // <http://www.mil.gov.ua/news/2014/10/05/ukrainskij-donbas-stav-poligonom-dlya-viprobuvannya-zbrojnimi-silami-rosijskoi-federacii-novitnogo-ozbroennya-ta-zaboroneni-boepripasiv/>

vanadium are usually used in aviation and rocket industry.<sup>11</sup> The result is that arable lands in Donetsk region (about 64% of total lands in the region) cannot be used for agricultural purposes for a long period of time and it may lead to a dramatic decline in agricultural production.

Military actions on the territories of Donetsk and Luhansk regions led to the breach of landscapes of natural reserves parks. Multiple Donbas' natural reserves parks, such as Ukrainian state steppe natural reserve park "Khomutovskyi steppe", National natural reserves "Meotyda" and "Sviati hory", regional landscape parks and reserves "Donetskyi kriazh", "Zuievskyi", "Kleban-Byk", "Provalskyi steppe", "Triohizbenskyi steppe", "Stanychno-Luhanske" suffered as a result of building fortifications, deforestation, steppe and forest fires.<sup>12</sup>

Uncontrolled fires are yet another dangerous factor for the natural environment. According to the study of the influence of fire on natural landscapes on ATO territories (according to the NASA satellites data), in the second half of 2014, more than 3000 fires happened in forests, steppes and arable lands (three times more compared to the same period of 2013) and destroyed about 14% of total ATO territory, namely 18% of forests areas, 23,19% of steppes, 14% of arable lands within ATO territory.<sup>13</sup> The main reason for the rapid growth of fired areas is the restricted activity of forest protection bodies. The exact esteem of the areas damaged by fires directly as a result of fighting is complicated by the impossibility to check satellite data by means of full-scale

field studies. Such a task could be solved by using precision sensing data, which requires substantial financial resources that the Ukrainian state lacks at the moment.

Moreover, within ATO area there is expanded open extraction of natural resources, mainly coal. According to the experts of the National Environment Centre of Ukraine, the area of illegal extraction of coal under the presidency of Viktor Yanukovich (2010-2014) grew at triple, and equalled to the 57 sq.km with the main orientation for it illegal export to Russia.<sup>14</sup> Nowadays, with the absence of controlling bodies, this open coal extraction takes about two thirds of natural reserves lands.

The cultivation of arable lands and agricultural production is also complicated by new mine fields and unexploded ordnance. Combined with the lack of irrigational waters, these factors lead to the impediments in agriculture and may deepen food and humanitarian security problems within ATO territories.

### **Water Security**

The issue of water security in conflict areas of Eastern Ukraine is another important issue. The highest risks among different emergencies and damage of water supply systems in combination with long periods of cut-offs in water supply, led to the poor quality of water for local population. High mineralization level of local waters, caused by pollution of local rivers should be taken into account. Emergencies on plants and pump stations with usage of active chlorine resulted in poor level of drinking water and

<sup>11</sup> Кравченко О., Василюк О., Войціховська А., Норенко К. Дослідження впливу військових дій на довкілля на Сході України // Схід. - 2015. - № 2. - С. 118-123. - [http://nbuv.gov.ua/UJRN/Skhid\\_2015\\_2\\_23](http://nbuv.gov.ua/UJRN/Skhid_2015_2_23)

<sup>12</sup> Pro dolu zapovidnykiv v zoni ATO // <http://pryroda.in.ua/blog/pro-dolyu-zapovidnykiv-u-zoni-ato>

<sup>13</sup> Кравченко О., Василюк О., Войціховська А., Норенко К. Дослідження впливу військових дій на довкілля на Сході України // Схід. - 2015. - № 2. - С. 118-123. - [http://nbuv.gov.ua/UJRN/Skhid\\_2015\\_2\\_23](http://nbuv.gov.ua/UJRN/Skhid_2015_2_23)

<sup>14</sup> Pro dolu zapovidnykiv v zoni ATO // <http://pryroda.in.ua/blog/pro-dolyu-zapovidnykiv-u-zoni-ato>





## **Surface waters of the Eastern Ukrainian region suffer from the threat of emergencies at enterprises and flooded mines.**

use of surface waters. This is the basis for the spread of intestinal infections, especially in spring-summer periods. For example, Siverskyi Donets – Donbas channel's pump stations that supplied most of Donetsk region with water were damaged and it led to the supply of unrefined technical water for population<sup>15</sup>.

Surface waters of the Eastern Ukrainian region suffer from the threat of emergencies at enterprises and flooded mines. Possible damage of dams on cesspools of industrial enterprises because of shelling or any other military activity threatens to create an environmental disaster not only for the territory of the ATO area. The highest level of environmental threat belongs to the Azovstal plant, which is situated on the territory under the control of Ukraine, with some branches on the coast of the Azov Sea and within the ATO zone. In case of dam damage, which separates the Azov Sea from slag and ash collectors of the power station, as well as from slag heap of martin and convector production, an environmental disaster is inescapable.<sup>16</sup>

Some experts also point out a problem of flooded mines in Donbas. The waters from flooded mines in combination with mine gases present danger first of all for ground waters.<sup>17</sup> At present 35 mines are flooded, and one nuclear charge in Yunyi Comunar mine in Yenakiyvo is at the high level of risk. Poisoned and sometimes radioactive waters can get into the waters of Siverskyi Donets River and the Azov Sea and further strontium isotopes get into the Black Sea. Obviously, such radioactive pollution is dangerous not only for the territories of Donbas region but also for the neighbouring territories of Ukraine and Russia, not mentioning trans-border sea pollution in the Azov and the Black Seas.<sup>18</sup> The pumping of flooded waters from mines is an urgent issue for preventing the mix of these toxic ones with ground waters. This is dangerous for drinking water and irrigation.

### **Chemical Weapon Issues**

The conflict in Eastern Ukraine is known for debates over the issue of using these territories as probe grounds for chemical weapons. At first, this information appeared in connection with the massive shelling near Donetsk airport in summer 2014 and was mentioned by the Ministry of Defence of Ukraine as well as in the OCSE report in September 2014<sup>19</sup>. As it was noted above, this information needs field

<sup>15</sup> Dombas na porozi ekologichnoi katastrofy // <http://www.climateinfo.org.ua/content/donbas-na-porozi-ekologich-noj-katastrofi>

<sup>16</sup> Аверін Д., Денисов М. Війна на Сході України: бойові дії та екологічні наслідки // <http://euaeco.com/?environmental-consequences-fighting/ua>

<sup>17</sup> Denisov T., Simonett O., Weir D., Avenir D., Ukraine war leaves a long shadow of pollution, ill-health and ravaged industries // <http://www.climateinfo.org.ua/content/viina-v-ukrajni-zalishae-dovgii-slid-zabrudnen-khvorob-ta-zruinovanoj-promislovosti>

<sup>18</sup> Снегірьов Д. Прорив води на Єнакіївській шахті загрожує Причорномор'ю // <https://psb-news.org/pro-ryv-vody-na-yenakiyivskij-shahti-zag>

<sup>19</sup> Kyiv verifying reports that militants used chemical weapons at Donetsk airport // <http://www.kyivpost.com/article/content/ukraine/kyiv-verifying-reports-that-militants-used-chemical-weapons-at-donetsk-airport-378241.html>


Goltsmith J. Were Chemical Weapons Used in Donetsk Airport's Last Stand? // <https://www.bellingcat.com/news/uk-and-europe/2015/01/23/were-chemical-weapons-used-in-donetsk-airports-last-stand>

probes of land and air as soon as possible because of rapid volatility of gases.

In September 2015, in Western press information appeared regarding Russian intentions to use Eastern Ukraine as a testing ground for the newly developed chemical weapons. The matter is in so-called “non-lethal toxic compounds” for subversive and terrorist activities. Though, “non-lethality” of such substances is open to question. Since the corresponding tests were not carried out, so, the nature of influence of these substances to humans and further effects of such influence are not explored.<sup>20</sup> This information appeared in connection with Russia’s renewed activities in the Scientific Research Institute of Chemical Troops at Saratov and beginning the construction near the Ukrainian border (in the city of Pochepna in the Bryansk region on the territory of one military base) the Centre for restoring chemical weapon models.<sup>21</sup> The demonstrative fact is that the new development and opening of testing ranges occur against suspending all programs of chemical weapon recycling by the Russian Ministry of Defence.

According to the experts’ estimations, currently some tests of fighting poisoning

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 ***The basic danger of carrying out chemical weapon testing is that consequences will be extremely unpredictable for environment and human beings. It is also necessary to consider that it is happening on densely populated territories practically in the centre of Europe.***

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gases of G Group (GV - sarin, GD - soman) and VX Group (extremely toxic substances) are being carried out in those scientific centres. Also, the development of substances with code-named “beginners” that were synthesized in 1980th in the Soviet Union is carried out and chemical properties of this substance are still authentically unknown. These programs must be finished till the end of 2015 according to Convention on Prohibition of Development, Production, Stockpiling and Use of Chemical Weapons dated 1993 signed by Russia. The term is prolonged till 2020. Thus, we can suppose that in the conditions of the changed international situation, Russia is not ready to refuse from the chemical weapon development. Moreover, the participation in the military conflict in Ukraine provides Russia with ample opportunity to carry out tests of the newest chemical weapons in fighting conditions.<sup>22</sup>

The basic danger of carrying out chemical weapon testing is that consequences will be extremely unpredictable for environment and human beings. It is also necessary to consider that it is happening on densely populated territories practically in the centre of Europe. Therefore, such secret chemical weapon testing in Eastern Ukraine can cause one of the greatest anthropogenic, humanitarian and ecological accidents from which not only Ukraine, but also Russia and Europe, will suffer.<sup>23</sup> According to the Chemical Weapons Convention of 1993, any cases of chemical weapon use in conflict in Ukraine demands the most steadfast attention and careful investigation at the highest international level especially in circumstances of the lack of access to the ATO areas.

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<sup>20</sup> Eastern Ukraine as testing area of Russian chemical weapons // <http://ireport.cnn.com/docs/DOC-1268960>

<sup>21,22</sup> Eastern Ukraine as testing area of Russian chemical weapons // <http://ireport.cnn.com/docs/DOC-1268960>

<sup>23</sup> Eastern Ukraine as testing area of Russian chemical weapons // <http://ireport.cnn.com/docs/DOC-1268960>

Another pressing issue for Ukraine is the issue of responsibility for the environmental impact of activities of industrial and agricultural enterprises on the territory of the annexed Crimea with a view of Ukraine's INDCs to Paris Agreement on Climate Change 2015. This is unclear how to estimate damage in case of natural and industrial disasters. Moreover, Russian Federation's plans of militarization and nuclearization of the Crimean peninsula and the Black Sea Fleet as well as any other military bases<sup>24</sup> threaten the environmental security not only in Ukraine without any hopes for compensations and reparations but for all Black Sea states and should be addressed at the international level.

## Conclusions

Any contemporary military conflict has to take into account the environmental impact as a result of fighting and shelling. Specifics for Eastern Ukraine environment include a rather unsatisfying level of environment in Eastern Ukraine prior to the conflict caused by highly industrialized character of the region with outdated systems of environmental protection.

The main environmental impact of military actions in Eastern Ukraine are damages of industrial enterprises in chemical production, metallurgy, coal mining, coke industry, power stations and industrial infrastructure (gas, oil, ammonium pipelines), accompanied with extraction of toxic substances into air; land and water pollution, as well as damages of natural reserves parks. These dangers are intensified with the possibility of use of some chemical or other types

of weapons yet to test on the territories of the ATO. High levels of pollution in combination with minefields may lead to shortages in agricultural production and food crisis within the conflict area. The lack of access to the area for urgent on site probes in order to adequately analyse the data requires immediate international cooperation, including satellite data collection.

There is an urgent necessity to analyse the impact of the military conflict in Eastern Ukraine for the environment of the rest of the Ukrainian territory in order to develop short- and long term strategies of minimizing air, water and land pollution and its consequences for the whole Ukrainian population.

The issue of reparations for environmental damages in Eastern Ukraine and Crimea is outdated at present because of the non-recognition of any illegal actions by the Russian Federation as well as search for international assistance for industrial rebuilding and ecological modernization of Eastern Ukraine. The urgent issue is energy efficiency and environmental strategy for the whole of Ukraine with an accent on conflict-bordering areas.

The environmental impact of military conflict in Eastern Ukraine and the annexation of the Crimea are not only the issue of environmental security for Ukraine, it has a wider context of environmental security in Europe and the Black Sea area that stipulates the necessity for regional cooperation formats.

More than two years have passed since the occupation of the Autonomous Republic of

<sup>24</sup> Мілітаризація Криму: чим відповідатимуть країни Причорномор'я на виклик Росії?// <http://ua.krymr.com/content/article/26920825.html>

Мілітаризація Криму загрожує ще й Північній Африці та Близькому Сходу – Єльченко // <http://www.ukrin-form.ua/rubric-politycs/1966090-militarizacia-krimu-zagrozuje-se-j-pivnicnij-afriци-ta-blizkomu-shodu-elcenko.html>

Crimea (ARC) by the Russian Federation (RF) that was immediately followed by the illegal annexation of this part of Ukraine's territory by its neighbour. These events – unprecedented in the history of post-WWII Europe – signalled not only a brutal violation and breach of international law, but also a dramatic change in the whole architecture of the European and global security system.

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