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Climate Landscape Analysis for Children (CLAC) in Ukraine

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The data used in the report excludes data on the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol and part of the temporarily occupied territories in the Donetsk and Luhansk oblasts. Where there is no data table for the indicator, the source is understood to be the executive authority, who is responsible for providing this data and indicating the date of expected receipt (according to the order issued by the Cabinet of Ministers of Ukraine).

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We regret any errors or omissions that may unwittingly have been made.

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ACRONYMS

ACR	Attributable Community Rate
BaU	Business as Usual
CEE	Climate, Environment and Energy
CPD	Country Programme Document
DRR	Disaster Risk Reduction
DALY	Disability-Adjusted Life Years
DI	Disposable Income
EADRCC	Euro-Atlantic Disaster Response Coordination Centre
EBRD	European Bank for Reconstruction and Development
EDC	Endocrine Disrupting Chemicals
EGD	European Green Deal
EMS	Emergency Management Service
ENVSEC	Environment and Security Initiative
EPA	United States Environmental Protection Agency
ERCC	Emergency Response Coordination Centre
ERW	Explosive Remnants of War
EU	European Union
EUWI+	European Union Water Initiative plus
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas Emissions
GIZ	German International Cooperation
GLAAS	Global Analysis and Assessment of Sanitation and Drinking-Water
HAB	Harmful Algal Blooms
HDI	Human Development Index
ICD	International Classification of Diseases
IDP	Internally Displaced Person
INDC	Intended Nationally Determined Contribution
IMR	Infant Mortality Rate
IPH	State Institution O.M. Marzeiev Institute for Public Health of National Academy of Medical Sciences of Ukraine
JMP	Joint Monitoring Programme for Water Supply and Sanitation
LMIC	Low- and Middle-Income Countries
LULUCF	Land Use, Land Use Change and Forestry

MOH	Ministry of Health
NAP	National Adaptation Plan
NCD	Non-Communicable Disease
NCPH	National Centre of Public Health
NDC	Nationally Determined Contribution
NECP	National Energy and Climate Plan
NENC	National Student Youth Centre for Environment and Nature
NGO	Non-Governmental Organization
OSCE	Organization for Security and Co-operation in Europe
REC	Regional Ecological Centre
RECPC	Resource Efficient and Cleaner Production Centre
RCP	Representative Concentration Pathway
SDC	Swiss Development Cooperation
SDG	Sustainable Development Goal
SEARCH	School Environment and Respiratory Health of Children
SESU	State Emergency Service of Ukraine
SOP	Standard Operating Procedure
Toe	Tons of Oil Equivalent
TPP	Thermal Power Plant
UAH	Ukrainian Hryvnia
UCBG	Universal Child Birth Grant
UCPM	Union Civil Protection Mechanism
U5MR	Under 5 Mortality Rate
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNITAR	United Nations Institute for Training and Research
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY AND KEY FINDINGS

Climate change affects many of the social and environmental determinants of health, such as clean air, safe drinking water, sufficient food and secure shelter.

The literature review on climate change shows that Ukraine is already facing changes, which will only become more pronounced over time. Over the past twenty years (1991–2010), the average annual air temperature has increased by 0.8°C compared to the 1961–1990 average¹.

Although there has been no significant change in national rainfall averages, precipitation seems to vary widely between seasons. Natural meteorological phenomena are the most dangerous manifestation of climate instability. In Ukraine, the most common natural meteorological phenomena are very heavy rains that cause floods, as well as strong winds and drought events. These can result in agricultural losses and wildfires that damage ecosystems. They can also negatively impact human health.

Climate change is expected to intensify these trends. According to the results of climate modelling, the temperature for the whole of Ukraine² will increase by 0.44°C by 2030. The number of hot days and tropical nights is also projected to rise. While precipitation projections are less conclusive, increasing variability and heavier rain events and snowstorms are predicted, as well as flooding and landslides. Increased heat and precipitation variability will lead to increased evapotranspiration in summer, resulting in a decrease in river flowing conditions in Ukraine. Other major climate change risks include: fires in natural ecosystems (in forests and peatlands), desertification of the southern and eastern regions, and drinking water shortages in the central, southern and eastern regions. Climate change is therefore increasing the risk of emergencies that are likely to have significant environmental, economic and social repercussions.

Environmental pollution and degradation have been affecting human well-being in Ukraine for a long time. That being said, the key factors driving the deterioration of the environment are: man-made disasters (in particular, the Chernobyl accident); the development of the extractive industry (damage to land, surface and ground waters); industrial pollution of air and water, especially by the energy, chemical and metallurgical industries; irrational farming practices; and the improper management of household and industrial waste. A more recent environmental degradation factor is the ongoing armed conflict in eastern Ukraine.

The areas with the most highly degraded environment are the eastern and southern regions of Ukraine, which have high urbanization rates and population densities. With the exception of the largest cities, these regions have a relatively lower (albeit still somewhat high) proportion of children. The western and central regions, which are relatively less urbanized, have access to better water and air quality. Compared to the rest of the nation, the western regions have a higher proportion of children in the overall population and higher birth rates.

The above notwithstanding, the connection between climate change, the environment and energy, and the health of the population, especially children, in Ukraine remains poorly studied. The empirical studies that do exist are largely fragmented (by territorial coverage, population group and/or health aspects).

One of the most studied environmental factors is air quality, which unsurprisingly is worse in urban areas due to their high concentrations of industry, thermal power plants, road transportation and use of poor-quality fuel. Being the largest environmental cause of disease and premature death in the world today, pollution disproportionately kills the poor and the vulnerable. With a death ratio

¹ http://www.meteo.fr/icuc9/LongAbstracts/poster_3-14-7831638_a.pdf

² <https://climateforumeast.org/uploads/other/0/708.pdf>

attributable to air pollution of 123.6/100,000 population in 2016, Ukraine tops the list of 183 countries in the World Health Organisation (WHO) global database³.

Ukraine's water sources are also heavily polluted due to anthropogenic pressure (pollution by heavy metals and chemicals, in particular due to agriculture), which is exacerbating freshwater shortages. The water-scarce eastern and southern regions, which are both densely populated and highly industrialized, are consequently in need of both drinking water and technical-grade water for industrial purposes. Poor availability and quality of drinking water directly affects the health of children, as well as adults, and this is an area that requires immediate attention and improvement. As surface water is mainly used for water supply, the issue of water availability and quality will become more acute with climate change.

Another observed trend is land degradation. The regions where the most significant land degradation has been recorded are those that have the largest share of rural population, as well as the highest birth rate and the greatest share of children in the population. Environmental degradation (due also to climate change) poses a challenge for food security in the rural areas of Ukraine, due to both the higher proportion of children and the fact that self-employment provides for 16 per cent of total household income. As a result, the risk of loss of household income in rural areas, including for families with children, could increase.

The loss of biodiversity and the fragmentation of natural ecosystems have an impact on children, in particular by reducing their opportunities for recreation, rehabilitation and healthcare. Household incomes in regions experiencing a loss of biodiversity could also decline (for example, this could affect the income-generating activities of harvesting berries, mushrooms and other natural resources in the Carpathians and Polissya).

As a party to the Paris Agreement, Ukraine has set its Nationally Determined Contribution (NDC) at a reduction of 60 per cent of Greenhouse Gas Emissions (GHG) from the 1990 baseline level. This GHG reduction in Ukraine correlates largely with the dynamics of economic development (which significantly declined in the early 1990s). The largest contributor to GHG remains the energy sector, in particular thermal power plants.

The energy sector also contributes significantly to the deterioration of air quality and surface water in Ukraine, with large thermal power plants having an especially negative impact as they are often located in areas of high population density, and thus also adversely affect children. The use of renewable energy sources and modernization of the energy supply system are expected to both reduce GHG emissions and improve air quality, as well as reduce energy costs.

In Ukraine, all consumers have access to electricity. Energy security is a growing issue, as modern households and buildings, including those that provide basic services, are basically impossible to run without electricity. With climate change, an increase in the number of extreme weather events will increase the load on the power grid at certain periods (especially during waves of cold and heat); in addition, the destruction of infrastructure due to these weather events could make normal life impossible.

When combined with specific local microclimates, the high population concentration in cities and Ukraine's urban population growth (up to 69.4 per cent in 2019) may aggravate certain adverse effects of climate change in these cities. Extreme high air temperatures contribute directly to deaths from cardiovascular and respiratory diseases, diseases with already high morbidity and mortality in Ukraine. More frequent heatwaves are likely to put children at risk of heat stress, renal disease and respiratory illness. Warmer temperatures could increase the incidence of diarrhoea and other bacterial diseases, as well as introduce a greater range of vector-borne diseases.

³ [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/ambient-air-pollution-attributable-death-rate-\(per-100-000-population\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/ambient-air-pollution-attributable-death-rate-(per-100-000-population))

Floods, which are among the most common natural emergencies in Ukraine, contaminate freshwater supplies, heighten the risk of waterborne diseases and create breeding grounds for disease-carrying insects, such as mosquitoes. They also cause drownings and physical injuries, damage homes and disrupt the supply of medical and health services. Yet another risk is posed by vegetation fires, which can release substantial quantities of fine particles (PM_{2.5}) that are harmful to health.

Specific impacts on children

The **social consequences of climate change and of related extreme weather events** range from those that have a direct impact on the situation of children – such as disruptions in access to education and other essential services in the aftermath of natural disasters, which contribute to children’s multidimensional poverty – to those that affect children indirectly, such as suspected higher risks of violence against children due to the impact of Climate Environment and Energy (CEE)-related stressors on caregivers’ mental health. Given the multidimensional nature of this impact, developing a comprehensive system of **children’s social protection** is central to mitigating the adverse effects of climate change on children, regardless of the specific type of effect.

Children with disabilities are rendered especially vulnerable by natural disasters. The risks extend to the child’s right to grow in a family environment, given that children with disabilities may experience a higher risk of institutionalization in the aftermath of a disaster.

In turn, **climate change is known to affect children’s health**. As will be discussed in more detail in the body of the report, there is a reported association between temperature extremes and cardiovascular disease mortality rates. Similarly, there is an observed cause-and-effect relationship between health-amplified levels of air pollutants, especially in urban areas, and increases in respiratory disorders and cardiovascular disease⁴. Children are at high risk of pollution-related disease, and even extremely low-dose exposure to pollutants during windows of vulnerability in utero and in early infancy can result in disease, disability, and death in childhood and across their lifespan⁵. In order to monitor the environmental health risks liable to increase the environmental burden of diseases for children under five years, the main indicators are perinatal-, respiratory-, diarrhoeal- and vector-borne diseases and injuries. Children’s ill-health is also related to poverty, poor housing (including using biomass for cooking and heating, and at least one adult smoking), poor basic water, sanitation and hygiene services, living in the vicinity of heavy traffic, and living in disaster-affected areas and/or informal settlements. Climate change and environmental contamination are likely to contribute to children’s vulnerability.

Environmental contamination and the overuse of natural resources, exacerbated by climate change, negatively impact on children’s development and well-being. Often, families with children in poor regions rely on income received from exploiting natural resources (such as timber, berries, mushrooms and mining). With no sustainable management and protection measures in place, the uncontrolled and sometimes illegal use of natural resources leads to environmental degradation and contamination, as well as a reduction in family incomes. Climate change will place further pressure on the availability of natural resources. Energy poverty in this context forms a part of a ‘vicious circle’. Low family incomes reduce families’ ability to access good quality energy resources, leaving them with no option but to use low-quality and potentially hazardous energy sources, which adversely affect their and, more specifically, their children’s health.

The **disruption in access to education and other essential services** merits specific attention as extreme weather events have been known to interfere with access to vital educational and housing services and facilities – the most prominent examples being the 2020 floods in western Ukraine or fires in north and eastern Ukraine. The disaster risk reduction policy would benefit from placing

⁴ World Bank: Turn Down the Heat, 2012: <https://www.worldbank.org/en/topic/climatechange/publication/turn-down-the-heat>

⁵ The Lancet Commission on pollution and health, Article published in the Lancet, October 2017. <https://www.thelancet.com/commissions/pollution-and-health>

greater emphasis on school safety (which is currently primarily addressed in the context of conflict-related hazards, rather than natural emergencies), as well as on promoting children's and community participation to build resilience. In developing such policies, the needs of children living with disabilities should be assessed and incorporated into the policy.

Similarly, while hard data on the impact of drought on children's well-being in Ukraine is unavailable, droughts are known to exacerbate existing social challenges, especially when they occur in densely populated areas already affected by marginalization. When developing regional social and economic development policies, there is therefore a need to consider CEE factors as potential social stressors, and to pay special attention to children's social well-being.

Climate change and the impacts of traumatic stress related to extreme weather events are known to adversely affect **children's mental health**. These impacts extend beyond both the direct effects of stress, such as post-traumatic stress, anxiety and depression, and negative stress management strategies, such as substance abuse. The secondary effects of stress experienced by children of parents affected by climate change are also a cause for concern, as natural emergencies put children at an increased risk of intra-family violence and exposure to other adverse childhood experiences, such as addiction in the family.

Climate change induced displacement may also negatively impact children's mental health. This is an under-researched area in Ukraine, where research on the relationship between emergencies and children's mental health has been largely restricted to the conflict area in eastern Ukraine. However, given the likelihood of future natural emergencies and the resulting need to develop evidence-based strategies to improve children's and community resilience, there is a need to study the effects that recent extreme weather events have had on children's and their caregivers' mental health, and to look more closely at displacement caused by natural emergencies. UNICEF and other international organizations working on child protection, health and migration could promote research into these issues.

Interventions by state and non-state stakeholders

Both state and non-state stakeholders are aware of the risks posed to society by climate change, and of the resulting need to take action. National-level CEE initiatives are being set up to respond to these needs with support from the international community and donors, including the European Union (EU), United Nations Development Programme (UNDP), United States Agency for International Development (USAID), European Bank for Reconstruction and Development (EBRD), the World Bank, Global Environment Facility (GEF), and development agencies such as German International Cooperation (GIZ) and Swiss Agency for Development and Cooperation (SDC).

As part of Ukraine's commitments under the Paris Climate Agreement, the government has developed the Concept on state policy on climate change and its Action Plan by 2030, and has adopted a Low Emission Development Strategy. It is now working on preparing the second Nationally Determined Contributions (NDCs), improving GHG monitoring and reporting, and developing the national climate change adaptation strategy. Non-for-profit organizations are also involved in climate change processes. These include the non-governmental organisation (NGO) Working Group on the Climate, which has been advocating for the transparent use of the Kyoto Protocol and Paris Climate Agreement (that replaced the Kyoto Protocol) mechanisms, the introduction of emission reduction policies, and for raising public awareness on climate change and promoting civil society action. The Centre for Environmental Initiatives, Ecoaction, for its part, advocates for energy efficiency, the use of renewable energy, tackling climate change, clean air for all, and sustainable development of transport and agriculture in Ukraine. Finally, the Ukrainian Youth Climate Association is working to facilitate multi-stakeholder cooperation over pressing environmental issues and create opportunities for active young people from all over the country to kick-start their own sustainability projects (see part II. Responses to CEE in Ukraine at different levels).

Focusing specifically on the Sustainable Development Goals (SDG) that are particularly relevant to children's environmental health (6, 7, 9, 11 and 13), according to the latest Ukraine SDG VNR report of 2020, only the target for SDG 6 – improving water, sanitation and hygiene – is likely to be reached and only with substantial effort. For SDG 7 – the transitioning to clean energy – more resources and commitment are needed. Three SDG targets may not be achieved by 2030 – SDG 9 – better infrastructure, 11 – building healthy cities, and 13 – reversing climate change.

Notably, Ukraine has made considerable progress with **integrating environmental content into the nation's formal and non-formal educational curricula**, and with increasing support to the green economy in general and to children's involvement in this economy in particular.

With regard to the green economy, while children's and young people's involvement in CEE in Ukraine is promoted using both bottom-up and top-down approaches (the top-down approach is mainly applied at city level), and while there are some success stories at the municipal level, the concept of child-centred adaptation to climate change is largely missing from the national agenda. This is predominantly due to the lack of a child-specific focus on the impacts of climate change. In other words, children are seen as a subset of the larger population, rather than a group with distinctly specific needs. As a result, children's interests and needs are insufficiently reflected in policymaking, which is also partly due to the fragmented and limited nature of children's participation in decision-making.

KEY RECOMMENDATIONS

Based on the reviewed literature relating to climate change, environmental pollution, energy accessibility and potential risks for children's health, social development and well-being, as well as on the key findings verified during interviews with the national stakeholders, the Team of Experts has produced the following recommendations for consideration during the development of UNICEF's next country programme in Ukraine:

Establish a coordination mechanism to mainstream children's interests and needs, and consider them a target group, when developing and implementing CEE-related policies

- Promote the consistent mainstreaming of children's issues into CEE strategy development and decision-making at different levels. Develop a standard methodology to promote this mainstreaming that covers climate change, Disaster Risk Reduction (DRR), child participation in environmental protection, the rational use of resources, sustainable consumption and production, and sustainable development.
- Consistently conduct impact assessments on the situation of children when developing CEE-related policies and adjust policies accordingly as and when required.
- Support domestic stakeholders, including line ministries, regional administrations and local self-government bodies, to continue with existing initiatives to promote child-friendly and eco-friendly environments, including by conducting impact assessments on children's rights and well-being at the development stage of each project, followed by rigorous monitoring.
- Promote the concept of budgeting for climate risk mitigation and response as a cross-cutting concern.
- Support the creation of a comprehensive vision of child and youth participation in climate action. In particular, it is recommended that UNICEF explore how Ukraine can better harness children's potential to effect change. This could be achieved through a scoping study as a starting point, followed by more targeted interventions.
- Ensure that the role of children and youth in climate action is comprehensively analysed and that actionable recommendations are developed for putting mechanisms in place for child and youth participation in climate action design, decision-making, planning and implementation at national and regional levels.

- Promote the development of regional social and economic development policies that include due consideration of CEE issues and climate change-related risks (such as extreme weather events) as potential stressors in terms of children's health, well-being and social protection.
- Form a regional-level interagency structure/network to ensure that children's interests and agenda are also considered in regional (oblast) level policies and action plans.
- Work with local authorities to increase their understanding of CEE issues and impacts on children, and ensure they reflect children's CEE needs in local strategies and plans.

Promote a system of child-sensitive indicators across the CEE area in Ukraine

- Review current indicators to ensure better disaggregation of health and social data by region, gender and other factors as applicable, and to facilitate better assessment of the impact of CEE factors on the various aspects of children's health, well-being and social protection.
- Promote proactive research by relevant stakeholders (including joint research) on the CEE and children nexus to address evidence gaps created by emerging phenomena (in areas such as natural emergencies and disaster reduction, impact on child protection, education and early childhood development, and health, including mental health) for use as a basis for further policy development.
- Engage with the Ministry of Health (MOH) and WHO to support greater data capture, availability and analysis of information relating to the linkages between environmental and human health, with a strong focus on air pollution, ensuring child morbidity and mortality rate data is specifically included and disaggregated by age and sex and promote research.
- In collaboration with WHO, consider supporting the MOH's national electronic medical emergencies system, and also include excess child mortality and morbidity in the data collected during episodes of floods, fires, drought and heatwaves.
- Consider including exposure indicators related to childhood respiratory diseases in upcoming national surveys (e.g. MICS, DHS, STEPS) and collecting data on health outcomes such as intrauterine growth retardation in new-born children, child morbidity and mortality due to acute respiratory infections, and the prevalence of chronic respiratory diseases.
- Consider conducting a national nutritional survey, along with regular updates, to ensure that the linkages and impact of CEE issues on nutrition (including that of children) are properly studied and constantly monitored.
- Support the introduction of an early warning system for floods, fires and heatwaves that includes children's needs and child protection.

Improve child, family and community resilience to ensure children are better protected from CEE-related shocks

- Consider prioritizing health interventions in oblasts/cities that have poor health indicators linked to climate change and environmental contamination, in order to reduce children's vulnerability.
- While continuous WASH (Water, Sanitation and Hygiene) support to conflict areas remains necessary, consider providing support to kindergartens and (pre-) schools that are not yet connected to a centralized water supply or local water supply network.
- Ensure that social adaptation strategies target the economic sectors and geographical regions that are most vulnerable to climate change-induced hazards, ideally based on the early identification of vulnerable families with children.
- At national and regional levels, support the development of reskilling and livelihood diversification schemes for families with children in CEE shock-prone regions to ensure that they form an integral part of social protection policy.

- Support and promote a radical review of the existing policy of mitigating the impact of a rapid adjustment of energy prices on vulnerable consumers (including families with children) to take into account the multifaceted nature of energy poverty.
- Promote and support the programming to improve the energy efficiency of buildings, including both housing stock and facilities serving children, as part of the strategy to reduce energy poverty.
- Promote and support investment in community-based mental health services, with a specific emphasis on the nexus between natural emergencies, mental health and violence against children. A pilot project in an area that is especially prone to natural emergencies may serve as an entry point.
- Build stakeholder capacities to implement needs-based and shock-responsive budgeting.

Strengthen CEE and sustainable development-related education, civil society training and child participation

- Consider supporting the training of health staff on climate and environmental health impacts, with a focus on children.
- Lend support to ensuring the sustainability of nationwide, regional and local level methodological clearing houses and innovation hubs for environmental education and CEE awareness raising.
- Further promote the infusion/mainstreaming of environmental content into secondary school and pre-school curricula, as well as into teacher training curricula regardless of the subject, including through the provision of expert assistance and the promotion of national and international sharing of good practice.

Reform DRR to make it child-sensitive and child-centred

- Promote and help ensure that DRR awareness-raising for children, families and communities at the regional level includes content to increase child resilience and promotes the use of individual family emergency plans (including information such as emergency contacts, family contacts and multiple meeting points).
- Prioritize environmental safety as a component of school safety. This should encompass the concept of resilient school infrastructure (possibly including a model design for school/pre-school buildings and related structures), as well as life-skills training for children (such as action to take during emergencies and first aid).
- Ensure that the emergency response system incorporates a more proactive approach and focuses on disaster preparedness as a key element of resilience, and that this is also included in the Safe School concept and in child-friendly disaster preparedness training at the school and community levels.
- Develop a multi-stakeholder mechanism for family reunification in emergencies using existing good practices, and which would include mandatory development of school emergency plans, containing a built-in standard operating procedure (SOP) for family reunification that is based on a model SOP for schools in disaster-prone regions, as part of the wider school safety policy.
- With national, regional and local stakeholders, jointly prioritize building resilient housing in CEE-prone areas as a key component of DRR, followed by recommendations for further improving construction policies and standards.
- Promote the child-centred DRR concept as an essential component of the national DRR agenda, ensuring that the needs of children with disabilities are mainstreamed into it.

INTRODUCTION

CEE-related issues and their impact on human health, well-being and human rights in general are increasingly becoming the focus of stakeholder attention, both globally and nationally. Children are particularly vulnerable to the potentially adverse effects of deteriorating CEE factors. The resulting risk to children's health, protection and well-being calls for further research that can then be used as the basis for evidence-based interventions to prevent and respond to emerging CEE issues.

Ukraine has not remained unaffected by climate change. This Eastern European country has a surface area of 603,628km² (including the territory of Crimea that was annexed by the Russian Federation in 2014), and is home to approximately 42 million people, 25 per cent (10.5 million) of whom are children and young people under 25 years of age.

As an economy in transition⁶, Ukraine ranks 74th on the Human Development Index⁷. It is characterized by low income per capita⁸ and suffers from severe corruption⁹. However, because of its extensive fertile farmland, Ukraine has a comparative advantage in food and agriculture production, especially sunflower seeds, oil and cereals (corn, barley, wheat)¹⁰. Ukraine's GDP in 2019 was US\$153 billion. Industry is the leading economic sector, and metallurgy and chemical production is particularly well-developed. Ukraine produces and processes its own natural gas and petroleum; however, for the most part, these fuel commodities are imported.

The high population concentration in cities and Ukraine's growing urban population, which rose to 69.4 per cent in 2019¹¹, has made cities much more vulnerable to climate change compared to other types of settlement. The large proportion of children living in cities in Ukraine¹² makes climate change all the more relevant to risks related to children well-being.

While the geographical coverage of UNICEF's work on environmental matters has so far been limited and focused primarily on the Donetsk and Luhansk oblasts¹³ where the armed conflict is currently underway, UNICEF plans to extend its environmental portfolio to include CEE issues and children's needs nationwide. Aware of the risks that climate change poses to children, UNICEF has initiated a study on Climate Change Analysis for Children in Ukraine. The aim of the study is to obtain a comprehensive understanding of how the climate, environment and energy landscape affects the situation of children in Ukraine.

⁶ United Nations, 2020 a. World Economic Situation and Prospects 2020.

https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2020_FullReport.pdf

⁷ United Nations, 2020 b. Human Development Report 2020. <http://hdr.undp.org/sites/default/files/hdr2020.pdf>

⁸ World Bank, 2020. World Bank Open Data <https://data.worldbank.org/indicator/NY.GNP.PCAP.CD>

⁹ World Bank, 2019. World Governance Indicators 2019. <https://databank.worldbank.org/source/worldwide-governance-indicators>

¹⁰ UNCTADstat, 2020. Revealed comparative advantage <https://unctadstat.unctad.org/EN/RcaRadar.html>

¹¹ State Statistics Service of Ukraine. Statistical Yearbook of 2018.

http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/Zb/11/Zb_Yearbook_2018_E.Pdfhttp://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf

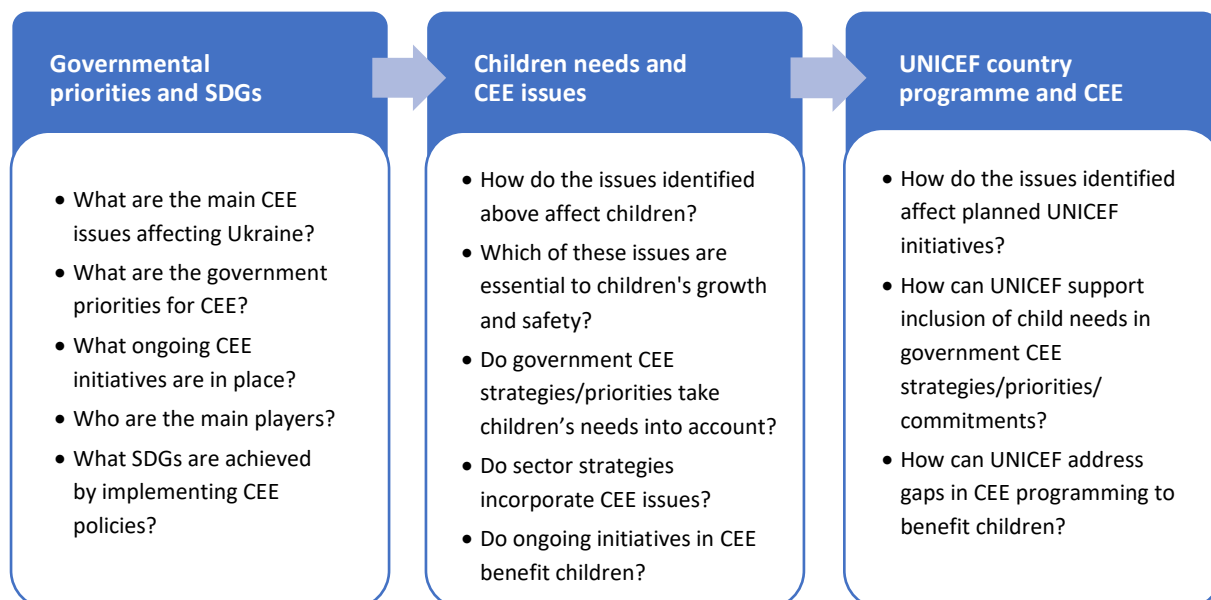
¹² As at 1 January 2019, children and young people up to 24 years of age account for 25% (10.5 million) of the urban population.

¹³ Oblast – administrative region in Ukraine

SCOPE OF WORK AND OBJECTIVES

As evidenced by the above, there are several CEE initiatives already in place in Ukraine that seek to address the country's numerous issues. Thus, the report will summarize these initiatives and challenges by answering the key questions that have been defined (below), and will produce recommendations to address the gaps identified, including potential priorities for UNICEF's future work in Ukraine.

With this aim in mind, the analysis covers the following key thematic areas and issues:



METHODOLOGY

Following the example of the Environment and Security Initiative (ENVSEC)¹⁴, which develops integrated climate vulnerability assessments, and environmental and security risk assessments, the Hydroconseil Team of Experts took a systematic approach to assessing children's CEE vulnerability and to identifying possible responses to addressing children's CEE-related needs. A range of approaches, including a mixed-method approach, a participatory approach, and a collaborative learning and adapting approach, were used during the preparation of the report.

The preparation of the report was conducted in three main phases:

Phase 1: Inception phase and desk review

Aim: To conduct a desk study and develop a preliminary assessment of the main climate change, environmental and energy implications for children in Ukraine, to identify possible benefits, and prepare recommendations for action by relevant stakeholders in CEE-related areas.

Approach: A mixed-method approach was used to develop insightful and robust findings, conclusions and recommendations that can be used by UNICEF, decision-makers, other stakeholders and non-profit organizations in Ukraine. This approach included:

- i) The use of various quantitative and qualitative data collection methods and sources to gather, triangulate and analyse data/information. Information was collected *on the environment*: the state of the environment and pollution of its assets (water, air, land); the state and availability of natural resources; climate change trends and implications; extreme weather events;

¹⁴ The Environment and Security (ENVSEC) Initiative grew out of discussions at the OSCE Economic and Environmental Forum. It was launched in May 2003, simultaneously at the Fifth Environment for Europe Ministerial Conference in Kyiv and the OSCE 11th Economic and Environmental Forum in Prague: <https://www.osce.org/ocea/446245>.

accessibility and development of energy resources. Data was also collected *on health*: health indicators associated with climate change/extreme weather events and the environment, with a focus on children in general and in Ukraine for different age groups; morbidity and mortality statistics; trends and distribution of relevant diseases in Ukraine. Finally, information was collected *on social issues and child protection*: monetary and multidimensional poverty data for children; mental health and child safety data. This data was disaggregated by region wherever possible to detect correlations with climate change trends – both direct, such as disaster-induced disruptions in access to services, and indirect, such as the exacerbation of children’s vulnerability to intra-family and community violence.

The quantitative and qualitative data is provided in the Annexes to this report. When analysing the environmental, social and health indicators per oblast, the Team of Experts provided their opinion on the most vulnerable oblasts with regard to the impact of CEE issues on children. Sources that were consulted include: official statistical data from the State Statistical Service of Ukraine; international statistical databases (UNstat, Eurostat, FAOstat, etc.); official reports from the Ministry of Ecology and Natural Resources, the MOH, the Ministry of Social Policy, the Ministry of Education, State Service of Emergency Situations and others; scientific literature (reports, assessments, reviews, policy briefs, articles, etc.) available on the internet; official websites of national governmental and international organizations; popular links that list environmental, social and health-related activities undertaken by NGOs, civil society organizations, regions and local authorities/municipalities.

- ii) An analysis of CEE issues and implications and children needs. The Team of Experts reviewed the above literature and gathered quantitative and qualitative data in order to analyse CEE issues and identify the negative repercussions these could have on children’s well-being and development. Where possible, the analytical chapters are accompanied by brief summaries of key findings.
- iii) A review of existing responses. The Team of Experts reviewed a broad range of existing responses: national policy documents, strategies and plans covering environmental protection, social development and protection, health, nutrition, and water, sanitation and hygiene (WASH); national legislation; ongoing or planned national programmes, as well as the programmes and projects implemented by international organizations in these areas. Additionally, an inclusive approach was taken to assess the extent to which existing policies and programmes respond to children's needs, and the extent to which children are informed about environmental and climate issues.
- iv) Validation and preparation of the questionnaire. To validate the draft findings and supplement the draft desk study/report, the Team of Experts developed a questionnaire and identified stakeholders with whom to conduct online interviews. The questionnaire (in English and Ukrainian) consisted of a broad range of general questions and specific thematic questions (such as questions on climate, environment and energy, social policy, education and child protection and health, nutrition and WASH), with a total of 64 questions. The questionnaire was the key tool used to conduct the stakeholder interviews (the interviews are described in Phase 2, below).
- v) Preparation of the recommendations for action by UNICEF (within its country programme) and other stakeholders in Ukraine. Once the literature had been reviewed, and preliminary analysis of the existing situation and stakeholder interviews had been completed, the Team of Experts prepared the recommendations. Taking the UNICEF workplan for next few years into account, the Team of Experts developed a list of recommendations on CEE and children, and proposed potential areas of intervention for UNICEF and/or a revised approach to existing interventions in order to integrate the CEE-children nexus.
- vi) Presentation and discussion of the draft report with UNICEF. The draft report was presented to and discussed with the UNICEF team in Ukraine. UNICEF’s comments were subsequently integrated into the draft report.

Output: Qualitative analysis of existing CEE studies in Ukraine and of the main problems and risks, as well as of policies, programmes and stakeholders that respond to children’s needs and CEE issues; analysis of existing primary and secondary data; qualitative analysis of existing CEE studies that cover children’s health, nutrition, education, WASH, child protection, inclusion and well-being as related to the main problems identified.

Phase 2: Analysis phase and consultations

Aim: To hold national and regional (oblast) consultations with a range of stakeholders to validate the preliminary desk study/report findings and supplement the report by obtaining different stakeholders’ perspectives on CEE and children’s needs.

Approach: A participatory approach was taken to ensure that the study/report results were validated and acknowledged by UNICEF and stakeholders, and to promote national ownership by ensuring that the findings and recommendations were useful and actually implemented. Interaction with UNICEF at all stages of report preparation was essential. The involvement of the key actors and stakeholders was also key to ensuring the success of the report. A collaborative learning and adapting (CLA)¹⁵ method was applied to facilitate the involvement of all participants and to stimulate continuous and joint learning. The preliminary findings, conclusions and recommendations were discussed with key stakeholders so as to ultimately inform their programmatic activities, whether undertaken in cooperation with UNICEF or independently. The Team of Experts identified over 40 key stakeholders in Ukraine that work either on all three areas covered by the report (environmental, social and health issues and their linkages to children’s needs) or directly on one or two of these three areas. The following stakeholders were identified for the semi-structured interviews:

- i) National/regional level authorities and state bodies (such as ministries, sector agencies, regional administrations in the oblasts most vulnerable to CEE issues);
- ii) International organizations, development partners and donors that implement CEE-related projects and programmes in Ukraine, support the government with sustainable development transformation and implement concrete pilot projects in the regions of Ukraine;
- iii) NGOs and other civil society organizations (e.g. youth associations).

The semi-structured interviews were conducted using the questionnaire developed by the Team of Experts during Phase 1 of the project and agreed with UNICEF. Interviews were conducted remotely (online meetings, by phone) in January-February 2021. The stakeholders were also given the option of providing responses to the questionnaire in writing and submitting them to the Team of Experts for further consideration. The interviews helped to verify and triangulate the preliminary report findings, as well as fill information gaps, in particular on the stakeholders’ plans for addressing children’s CEE-related needs. Once the interviews had been completed, the Team of Experts summarized and analysed the responses and additional resources provided, which served to further inform the report.

Output: Interviews and consultations with key stakeholders and counterparts (national/regional governmental organizations, international organizations and donors, NGOs).

Phase 3: Finalization of the joint analysis and dissemination phase

Aim: To finalize the report based on feedback from the UNICEF team and stakeholder interviews, which included identifying the CEE issues and hotspots (most vulnerable oblasts) most liable to affect children’s well-being and protection, and communicating these CEE implications and areas of concern, priorities and recommendations.

¹⁵ <https://www.globalcommunities.org/publications/2017-USAID-CLA.pdf>

Approach: A participatory approach was adopted that allowed the Team of Experts to present the report's findings and recommendations to the key stakeholders and collect their feedback. The Team of Experts submitted the preliminary findings and recommendations to the UNICEF team and addressed comments received from UNICEF. The Team of Experts conducted a final participatory workshop with UNICEF in order to discuss and validate the findings, and to co-construct the final recommendations.

Output: Final version of the '**Climate Landscape Analysis for Children in Ukraine**' report that sets out the key CEE challenges and priority areas to be addressed for children in Ukraine and recommendations.

1

THE CLIMATE, ENVIRONMENT AND ENERGY SITUATION IN THE COUNTRY



The current climate, including variability

Most of Ukraine has a moderately continental climate, and there is a subtropical Mediterranean climate on the southern coast of Crimea. In Ukraine, the climate is clearly expressed by four seasons: winter, spring, summer, autumn. The continental climate expands from west to east. Within Ukraine's temperate climate zone, there are two climatic regions, which differ primarily in the extent of their continental climate: the Atlantic-continental region (which is humid and covers the western, northern and central parts of the country), and the continental region (which is arid and covers the south and east). The climate of Ukraine is characterized by frequent changes in weather linked to the arrival of cyclones (an average of 45 cyclones per year) and anticyclones (an average of 36 anticyclones per year). Despite there being a higher number of cyclones, Ukraine has more days of anticyclonic (clear, sunny) weather (230-235 days a year)¹⁶.

Average climate data from across the country for 1991-2016 is as follows¹⁷:

- Summer temperature: + 21.51°C (July being the warmest month);
- Winter temperature: -3.43°C (January being the coldest month);
- Total precipitation: 566 mm (550-750 mm in the mixed forest area; 450-700 mm in the forest-Steppe area; 350-500 mm in the Steppe; more than 1,000 mm in the mountains [1,000-1,500 mm in the Carpathian Mountains, and up to 1,200 mm in the Crimean Mountains]).

Observed and projected changes in climate

The average annual air temperature over the 1991-2010 period increased by 0.8°C compared to the climatic norm^{18 19}, with the largest increase in air temperature occurring in January (a rise of approximately 2°C)²⁰.

Ukrainians are already seeing an increase in the number of days with extremely high air temperatures, or 'heatwaves'. During the 1911–2010 period, the highest number of heatwaves in Ukraine were recorded during the last decade of the period, i.e. 2001–2010, with the highest temperatures and longest heatwave recorded in the eastern and southern regions (continental climate) in August 2010. The difference between the average air temperature in August 2010 and the average temperature in August 1961–1990 was abnormally high. For some cities like Kyiv and Kharkiv, this exceeded 5°C²¹. While in previous years, the Kyiv region recorded temperatures over 30°C on about 10 days per year, over the last decade this indicator has increased to 20-30 days. The Kherson region previously saw temperatures of over 30°C on 30-40 days per year, and this has subsequently risen to 60-70²². The findings of a study conducted by the Department of Meteorology and Climatology in Ukraine using data from 1951 to 2010 indicate that most of the heatwave episodes occurred at stations²³ located in eastern Ukraine²⁴.

¹⁶ National Atlas of Ukraine / Institute of Geography of ANAS of Ukraine. Kyiv, 2014.

¹⁷ World Bank's Climate Change Knowledge Portal (CCKP):

<https://climateknowledgeportal.worldbank.org/country/ukraine/climate-data-historical>

¹⁸ Shevchenko O., Vlasyuk O., Stavchuk I., Vakolyuk M., Ilyash O., Rozhkova A. Assessment of vulnerability to climate change: Ukraine. — Kyiv, 2014. — 74 p.: https://necu.org.ua/wp-content/uploads/ukraine_cc_vulnerability.pdf

¹⁹ USAID Climate change risk profile Ukraine: <https://www.climatelinks.org/resources/climate-change-risk-profile-ukraine>

²⁰ Fifth National Communication of Ukraine on Climate Change / Ministry of Ecology and Nature Protection, 2009.

https://ucn.org.ua/upl/ukr_nc5rev.pdf

²¹ Shevchenko O., Vlasyuk O., Stavchuk I., Vakolyuk M., Ilyash O., Rozhkova A. Assessment of vulnerability to climate change: Ukraine. — Kyiv, 2014. — 74 p.: https://necu.org.ua/wp-content/uploads/ukraine_cc_vulnerability.pdf

²² Climate change: How global warming threatens Ukraine. May 2018: <https://112.international/article/climate-change-how-global-warming-threatens-ukraine-28318.html#:~:text=The%20increase%20in%20the%20average,by%20another%200.2%2D0.5%20degrees.>

²³ 13 selected stations of the meteorological network of the Ukrainian Hydro-meteorological Center http://www.meteo.fr/icuc9/LongAbstracts/poster_3-14-7831638_a.pdf.

²⁴ Indexing of Heatwaves in Ukraine. <https://www.mdpi.com/2073-4441/12/4/962>.

At the beginning of the 20th century, the following changes were observed^{25 26 27}:

- Significant changes occurred in the onset of spring and autumn seasons (transition of air temperature through 0°C);
- Precipitation seemed to be highly variable between seasons and across regions, although there were no changes in overall rainfall levels;
- An increase in the frequency and intensity of drought events over the last 15 years;
- A significant increase in the frequency and intensity of heavy snowfall from 1971 – 2010;
- An increase in the number and intensity of convective weather events (e.g., rain, hail).

Due to the specific features of the underlying surface, building geometry, differences in radiation and wind conditions, as well as a range of other factors, the manifestations of climate change in large cities are more pronounced²⁸. The agro-climatic zones of Ukraine have changed. Between 1986 and 2013, these zones shifted 200 km to the north. The boundaries of forest zones are also changing, and there is a need to introduce other tree species²⁹.

According to the results of climate modelling, the temperature will rise by up to 0.44°C by 2030 for the whole of Ukraine; however, this increase will be higher in the eastern regions – up to 0.5°C – while in western regions it will be somewhat lower – 0.41°C. During the year, changes in temperature will vary for each month, with the biggest temperature rise being in December (1.04°C), followed by June - September (0.64-0.67°C). The temperature in February will not change, while the temperature is set to fall in March (-0.20°C)³⁰.

The scale and direction of the projected changes vary by region and scenario, but may include^{31 32}:

- Increased overall temperatures by 2050 (around 2.5°C by mid-century), with higher increases expected in winter;
- A projected increase of 12.8 hot days and 25 tropical nights by 2040-2059;
- Increased precipitation in winter and spring in the northern and north-eastern regions, and significantly less summer rainfall in the southeast (a fall of 10-15 per cent).
- Possible shifts in the onset and duration of seasons in general;
- More frequent flash floods resulting from extreme events, but fewer early spring floods due to reduced snow coverage;
- Warmer spring and summer months and a likely expansion of the country's subtropical zone.

²⁵ USAID Climate change risk profile Ukraine: <https://www.climatelinks.org/resources/climate-change-risk-profile-ukraine>

²⁶ Balabukh V., Lavrynenko O., Bilaniuk V., Mykhnovych A., Pylypovych O., 2018. extreme-weather-events-in-ukraine-occurrence-and-changes. <https://www.intechopen.com/books/extreme-weather/extreme-weather-events-in-ukraine-occurrence-and-changes>.

²⁷ Shevchenko O., Vlasyuk O., Stavchuk I., Vakolyuk M., Ilyash O., Rozhkova A. Assessment of vulnerability to climate change: Ukraine. — Kyiv, 2014. — 74 p.: https://necu.org.ua/wp-content/uploads/ukraine_cc_vulnerability.pdf

²⁸ Shevchenko O., Vlasyuk O., Stavchuk I., Vakolyuk M., Ilyash O., Rozhkova A. Assessment of vulnerability to climate change: Ukraine. — Kyiv, 2014. — 74 p.: https://necu.org.ua/wp-content/uploads/ukraine_cc_vulnerability.pdf.

²⁹ Т. І. Адаменко Агрокліматичне зонування території України з врахуванням зміни клімату. https://www.gwp.org/globalassets/global/gwp-cee_files/idmp-cee/idmp-agroclimatic.pdf.

³⁰ <https://climateforumeast.org/uploads/other/0/708.pdf>

³¹ USAID Climate change risk profile Ukraine: <https://www.climatelinks.org/resources/climate-change-risk-profile-ukraine>

³² World Bank's Climate Change Knowledge Portal (CCKP): <https://climateknowledgeportal.worldbank.org/country/ukraine/climate-data-projections>.

Climate-related threats and disasters

Climate change has exacerbated the frequency of extreme weather events, especially dangerous rainfall events, floods, intense thaws, early frosts and increased maximum wind speeds. The Crimean Mountains and the Ukrainian Carpathians, in particular, as well as the plain regions, suffer from heavy rains, hail and strong winds³³. The analysis below examines specific types of extreme weather event against the backdrop of climate change. Forecasts and warnings about dangerous natural meteorological and hydrological phenomena are produced and disseminated by the State Emergency Service of Ukraine's Hydrometeorological Centre. The information is provided based on the level of danger to life.

Floods

In Ukraine, almost 27 per cent of the country's territory, or 165 thousand km², home to almost a third of the population, is at risk of being adversely affected by floods³⁴. The following river basins in particular are identified as flood-prone: Pripyat, the tributaries of Desna, Siverskyy Donets, Psel, Vorskla, Sula, Dniester, Prut, Tisza, Lower Danube, Pivdenny Bug and Zahidny Bug³⁵. The population of the mountainous and foothill areas of the Carpathians suffers the most from floods, having experienced flooding in 2008 (with estimated damage of 6 billion UAH), in 2013, in 2019 (with estimated damage of 1.2 billion UAH) and in 2020 (killing 5 people, including 1 child, and flooding 349 settlements, damaging 3.5 thousand farm buildings, and damaging or destroying more than 940km of roads, more than 140km of fortifications, more than 20km of dams and more than 300 bridges)³⁶. Due to their geographical location, Zakarpattya, Ivano-Frankivsk, Lviv and Chernivtsi oblasts are affected by landslides, mudslides and erosion caused by floods³⁷.

According to the interview findings, flooding is the phenomenon most often associated with emergencies. The increase in the frequency/intensity of floods is the result of a combination of factors: deforestation, littering of shores and removal of sand/stone from floodplains, which is exacerbated by climate change. In addition to direct socio-economic damage and hazards, floods often lead to a deterioration in drinking water quality. Ensuring that critical infrastructure is kept in good condition requires the participation of both the state and local communities (following the example of EU countries).

Droughts

Droughts in Ukraine have increased both in frequency and in the scope of the area affected (northern and north-eastern Polissya, the Steppe and the south-east). The most severe droughts were mostly recorded in the south in 2003, 2007 (40-45 rainless days; affecting 100,000 km² of grain crops and killing off 11,000 km² of agricultural crops) and 2020 (40-45 rainless days; 1,311 farms were estimated to have lost 6.6 billion UAH due to the loss of crops over an area of 5,000 km²; the drought covered about 50 per cent of the area set aside for sowing the winter harvest of 2021). Thus, around 111,000 km² of land is at risk from droughts.

³³ National Atlas of Ukraine / Institute of Geography of ANAS of Ukraine. Kyiv, 2014.

³⁴ Petrochenko O. Assessment and forecasting of flood risks in river basins / Ecological safety and nature management, № 1 (33), 2020 <http://es-journal.in.ua/article/view/199700/199899>

³⁵ Avdeenko D. Flood - the most common natural disaster in Ukraine: <http://dspace.pnpu.edu.ua/bitstream/123456789/14834/1/43.pdf>

³⁶ Public report of the Head of the SES on the results of the Civil Service of Ukraine for Emergencies in 2019: <https://www.dsns.gov.ua/files/2020/1/30/%D0%9F%D1%83%D0%B1%D0%BB%D0%B8%D1%87%D0%BD%D0%B8%D0%B9%20%D0%B7%D0%B2%D0%B8%D1%82%20%D0%B7%D0%B0%202019%20%D1%80%D1%96%D0%BA-%D0%BE%D1%81%D1%82-fin.pdf>

³⁷ Petrochenko O. Assessment and forecasting of flood risks in river basins / Ecological safety and nature management, № 1 (33), 2020 <http://es-journal.in.ua/article/view/199700/199899>

In the Steppe, the observed drop in humidity, which is an extremely negative aspect of climate change, threatens to have a disastrous impact on the vast agricultural areas in the south of the country unless irrigation is introduced. A draft National Drought Management Plan has been developed, but is still awaiting implementation.

Desertification and salinization

The problem of desertification remains relevant for the southern Steppe regions of Ukraine, especially with the projected decrease in precipitation due to climate change. The southern Kherson region is home to the one of the largest desert in Europe – 'Oleshkiv pisky'. In 2019, the low-forest Kherson region accounted for 51 per cent of all illegal logging³⁸. While irrigated land creates a solid basis for tackling land desertification, especially as part of agricultural adaptation to climate change in the Steppe, the condition of irrigated land is constantly deteriorating and only 15-20 per cent of the total land area is satisfactory³⁹. There is approximately 100,000 km² of degraded and infertile land, which is the land most vulnerable to desertification⁴⁰.

According to the State Land Cadastre, saline soils in Ukraine cover a relatively small area of 19,200 km², of which 17,100 km² is currently in agricultural use. Around 3,500 km² of irrigated land is saline, some of which contains secondary saline soils. Desertification and salinization processes are caused by land reclamation activities that are now largely unused, obsolete or destroyed.

Sea level rise

Between 1995 and 2015, the level of the Black and Azov Seas rose by about 2-3 mm per year⁴¹. According to different climate change modelling scenarios, sea level in the Black and Azov Seas could rise by 115 cm by 2100. This is expected to have a highly significant impact on the Black Sea beaches (more than 50 per cent are projected to retreat)⁴², and cause degradation to the Dnieper, Danube and Dniester deltas, low-lying areas of the coast, many resort settlements, and estuaries of the Black Sea and the Azov Sea, as well as result in the salinization of thousands of hectares of agricultural land⁴³.

Fires

In 2019, the highest number of fires was recorded in the Kherson (166 cases), Dnipropetrovsk (142), Kharkiv (113), Luhansk (110) and Chernihiv (102) regional departments of forestry and hunting. The largest fire-affected areas are in the Zhytomyr (175 hectares), Kherson (169 hectares), Chernihiv (158 hectares) and Odesa (128 hectares) regions⁴⁴. Fires in Polissya (Zhytomyr and Chernihiv oblasts) pose a potential radioactive contamination risk, as this is the area affected by the Chernobyl accident. Similarly, fires that break out in the Steppe (Kherson, Dnipropetrovsk, Odesa oblasts) have far-reaching implications, including the loss of forest protection windbreak (shelterbelt), spread of

³⁸ Public report of the State Agency of Forest Resources of Ukraine for 2019:

https://mepr.gov.ua/files/images/news_2020/26022020/ПУБЛІЧНИЙ%20ВІТ%20ДАЛРУ%20ЗА%202019%20РІК.pdf

³⁹ National report on the state of the environment in Ukraine in 2018:

https://mepr.gov.ua/files/docs/Zvit/2020/Національна%20доповідь%20про%20стан%20навколишнього%20природног%20середовища%20в%20Україні%20у%202018%20році_.pdf

⁴⁰ Movchan M. The main directions of solving the problems of land degradation and desertification in Ukraine // Land management, cadastre and land monitoring: <http://journals.nubip.edu.ua/index.php/Zemleustriy/article/view/9036/8305>

⁴¹ According to the map SL_cci ECV v2.0 1995 - 2015 / Climate Change Incentive / European Space Agency.

⁴² Allenbach K., I.Garonna, C.Herold, I.Monioudi, G.Giuliani, A.Lehmann, A.F.Velegrakis. Black Sea beaches vulnerability to sea level rise / *Environmental Science & Policy. Volume 46*, February 2015, pages 95-109.

<https://www.sciencedirect.com/science/article/abs/pii/S1462901114001373>,
<https://doi.org/10.1016/j.envsci.2014.07.014>

⁴³ Fifth National Communication of Ukraine on Climate Change / Ministry of Ecology and Nature Protection, 2009.

https://ucn.org.ua/upl/ukr_nc5rev.pdf

⁴⁴ Public report of the State Agency of Forest Resources of Ukraine for 2019:

https://mepr.gov.ua/files/images/news_2020/26022020/ПУБЛІЧНИЙ%20ВІТ%20ДАЛРУ%20ЗА%202019%20РІК.pdf

erosion, and desertification. The economic impact of fires is also significant, with total losses from forest fires amounting to 6.7 million UAH in 2019.

Most recently, in 2020, two huge fires broke out in the Luhansk oblast following a long period of dry weather. The first was in July (50 km² of land affected, and estimated losses of 284 million UAH) and the second was in September (200 km² of land affected and 10 people died)⁴⁵.

As mentioned above, wildfires have occurred in the immediate proximity of the area of the Chernobyl nuclear accident, which poses its own set of environmental risks. There are varying scales and magnitudes of forest fires that spread to the Chernobyl Exclusion Zone almost every year. The most significant fires were observed in the springs of 2015 and 2020; the fires in 2020, in particular, coincided with long periods of dry weather. The above-mentioned threat of radioactive air pollution spreading to nearby settlements also affects the city of Kyiv, which already has a high air pollution index^{46 47 48}. For several days in April 2020, the atmospheric air in Kyiv city and oblast was identified as the most polluted in the world due to massive fires of agricultural waste and forests, including in the Chernobyl Exclusion Zone⁴⁹. One measurement found in the WHO database 2018 mentioned an annual mean measured PM_{2.5} of 22 ug/m³ and PM₁₀ of 35 ug/m³ in Kyiv⁵⁰.

Forest fires have a range of negative effects, including environmental impacts (biodiversity loss, loss of forests as absorbers of GHG, water-regulating components), socio-economic impacts for households (non-timber forest resources are important for certain groups of people in Polissya and the Carpathians), health impacts (air pollution) and direct economic impacts (fire extinguishing costs, reclamation).

Biodiversity loss

There are more than 70,000 species of fauna and flora in Ukraine (more than 27,000 flora and around 45,000 species of fauna). Ukraine occupies 6 per cent of Europe's territory and accounts for at least 35 per cent of European biodiversity. A sign of declining natural diversity is the inclusion of 168 groups in the Green Book of Ukraine (the official list of rare and endangered and typical natural plant communities subject to protection). Around 695 species of animals and 861 species of plants will be included in the fourth edition of the Red Book⁵¹. The causes of loss of biodiversity include the loss of forest area, the excessive use of land for agricultural purposes, the destruction of the Steppe as a natural biome, the construction of lowland hydropower plants and hydro-reservoirs, and intensive drainage of the Polissya during the 1960s⁵². Biodiversity loss impoverishes future generations.

Social issues (climate-induced migration and displacement)

⁴⁵ Information - analytical information on the occurrence of emergencies in Ukraine during 9 months of 2020 <https://www.dsns.gov.ua/ua/Dovidka-za-kvartal/115486.html>.

⁴⁶ Центральна геофізична обсерваторія ім. Бориса Срезневського. Стан забруднення у м. Києві і Київській області (місячні показники) http://cgo-sreznevskiy.kyiv.ua/index.php?fn=k_zabrud&f=kyiv.

⁴⁷ State Emergency Service of Ukraine. Information - analytical information on the occurrence of emergencies in Ukraine in 2020 <https://www.dsns.gov.ua/ua/Dovidka-za-kvartal/44615.html>.

⁴⁸ State Emergency Service of Ukraine. Information - analytical information on the occurrence of emergencies in Ukraine in 2020 <https://www.dsns.gov.ua/ua/Dovidka-za-kvartal/115486.html>.

⁴⁹ Про стан забруднення навколишнього природного середовища у м. Києві і Київській області у квітні 2020 року за даними спостережень ЦГО ім. Бориса Срезневського <http://cgo-sreznevskiy.kyiv.ua/data/viz-kyiv/04-2020-sayt.pdf>.

⁵⁰ Source: https://www.who.int/airpollution/data/aap_air_quality_database_2018_v14.xlsx?ua=1

Measured by O. M. Marzeiev Institute for Public Health of NAMSU. US National Ambient Air Quality Standard: Average annual standard for PM_{2.5}=12ug/m³. For PM₁₀=150 ug/m³.

⁵¹ Red Book of Ukraine: draft list of species of animals listed in the Red Book of Ukraine (fauna); draft list of species of plants and fungi listed in the Red Book of Ukraine (flora): <http://books.menr.gov.ua/Default.aspx?tabid=5>.

⁵² National Report on the State of the Environment in Ukraine in 2018: <https://mepr.gov.ua/files/docs/Zvit/2020/Національна%20доповідь%20про%20стан%20навколишнього%20природног%20середовища%20в%20Україні%20у%202018%20році .pdf>.

The migration and displacement situation in Ukraine has dominated the spotlight recently; however, this is mostly due to the ongoing conflict in eastern Ukraine. Despite the fact that recent natural emergencies, most notably the June 2020 floods in western Ukraine, have wreaked havoc on the areas affected and left hundreds of people homeless, the sheer magnitude of the conflict-related displacement has overshadowed climate-induced migration and displacement in the media and popular discourse, resulting in a dearth of specific research on climate-induced displacement.

The June 2020 floods seriously damaged infrastructure in the affected districts of western Ukraine. While the scale of general disruption to people's livelihoods is discussed under *Floods*, above, and *CEE and disaster risk reduction for children's resilience*, below, it needs to be emphasized that the precise data to evaluate the impact of flood-related displacement on children specifically are lacking. According to the State Emergency Service of Ukraine, over 1,500 people were evacuated due to the 2020 floods; however, at the time of writing this report, it is not clear what share of the evacuees have migrated to other regions or remain without permanent housing, or what proportion of these evacuees are under the age of 18. Similarly, there is no data available on the number of children whose education was disrupted due to damage to the school facilities in their catchment area. The number of students enrolled in damaged schools is an unreliable indicator due to the fact that only some of the families were relocated through government-led efforts, while others sought other solutions (such as being hosted by relatives) and their situation has not been tracked. Anecdotal evidence suggests that emergency relief in Ukraine is largely reactive rather than proactive, and there is insufficient focus placed on advance planning to mitigate the disruption caused by evacuations, despite the fact that flooding in western Ukraine occurs on a regular basis.

The Internal Displacement Monitoring Centre (IDMC; uses information about the probability of future hazard scenarios to model displacement risk based on probable housing destruction) estimated the risk of future displacement for Ukraine as follows⁵³:

Average expected number of displacements per year – for sudden-onset hazards – total: 121,665 (311 earthquakes and 121,354 floods).

It is also important to note that Ukraine is a significant source country of labour migration. A comprehensive survey carried out by the State Statistics Service of Ukraine in 2017 estimated the total migrant stock to be 1.3 million⁵⁴; however, the Ukrainian research community considers this figure to be underestimated. By way of comparison, a study by the Ukrainian Centre for Economic Strategy (2018) estimated the average number of Ukrainians working abroad to be 2.6-2.7 million⁵⁵.

While the drivers of labour migration are presumed to be largely economic rather than CEE-related, no research has been conducted to explore the impact of climate change-related disruption of livelihoods on outward migration, and its indirect impact on children specifically (looking both at purely economic impacts and other impacts such as disruption of education and possible rise in the numbers of children left behind). It is worth noting that most labour migrants from Ukraine (69 per cent) originate from western Ukraine, while each of the other parts of Ukraine (northern, eastern, southern, central) account for 6 to 9 per cent of the total number of migrants⁵⁶. This may simply be the result of western Ukraine's proximity to the EU; however, a study of the impact of natural emergencies would at least provide further insight.

⁵³ <https://www.internal-displacement.org/countries/ukraine#:~:text=According%20to%20the%20Ministry%20of,%2C%20Chernivtsi%2C%20Zakarpattia%20and%20Lviv>.

⁵⁴ State Statistics Service of Ukraine (SSSU 2017), Зовнішня Трудова Міграція Населення (за результатами модульного вибіркового обстеження), Київ, http://ukrstat.gov.ua/druk/publicat/kat_u/publ11_u.htm.

⁵⁵ Center for Economic Strategy (2018), Скільки українців поїхало за кордон і що державі з цим робити, <https://ces.org.ua/wp-content/uploads/2018/04/Migration-note.pdf>.

⁵⁶ State Statistics Service of Ukraine (SSSU 2017), Зовнішня Трудова Міграція Населення (за результатами модульного вибіркового обстеження), Київ, http://ukrstat.gov.ua/druk/publicat/kat_u/publ11_u.htm.

Environmental issues and natural resources

Air quality and pollution in urban areas

Due to Ukraine's economic reliance on mining, quarrying and metallurgy industries, as well as fossil fuel burning for energy, and to the rapid increase in the numbers of automotive vehicles, air pollution is considered a serious – albeit still under-studied – issue. According to the air pollution index, which measures air pollution by five priority pollutants, in 2017-2018, very high levels of pollution were recorded in densely populated cities such as Dnipro and Mariupol, and pollution was also high in Kamyansk, Kherson, Kremenchug, Kramatorsk, Kryvyi Rih, Kyiv, Lutsk, Lviv, Lysychansk, Mykolayiv, Odesa, Rubizhne, Slavyansk and Zaporizhzhya. The high air pollution levels in these cities were mainly due to the high content of specific harmful substances, i.e. formaldehyde, phenol, hydrogen fluoride, ammonia, and the main impurities – suspended solids, nitrogen dioxide and carbon monoxide⁵⁷. In 2019, the emissions of pollutants into the atmosphere exceeded 4 million tons (2.5 million tons from stationary sources and 1.7 million tons from mobile sources) and there were 121 million tons of carbon dioxide emissions⁵⁸.

Urban air pollution in Ukraine is monitored in 39 cities at 129 stationary posts, which measure the content of 22 pollutants in the air, including eight heavy metals. In 2018, in more than half of the cities monitored, the average annual content of pollutants exceeded the *maximum allowable concentration* of formaldehyde (86 per cent of cities) and nitrogen dioxide (56 per cent of cities)⁵⁹. The monitoring data shows that, across Ukraine, the main centres of air pollution are urban areas, which are also the most highly populated areas⁶⁰ (see the map below). This is presumed to be due to cities' high concentrations of industry, transport and energy production.

⁵⁷ National Report on the State of the Environment in Ukraine in 2018: https://mepr.gov.ua/files/docs/Zvit/2020/Національна%20доповідь%20про%20стан%20навколишнього%20природного%20середовища%20в%20Україні%20у%202018%20році_.pdf.

⁵⁸ State Statistics Service of Ukraine: Emissions of pollutants and carbon dioxide in the air: <http://www.ukrstat.gov.ua>

⁵⁹ National Report on the State of the Environment in Ukraine in 2018: https://mepr.gov.ua/files/docs/Zvit/2020/Національна%20доповідь%20про%20стан%20навколишнього%20природного%20середовища%20в%20Україні%20у%202018%20році_.pdf.

⁶⁰ World from Space: http://stories.worldfrom.space/urban_pulse_ua/.

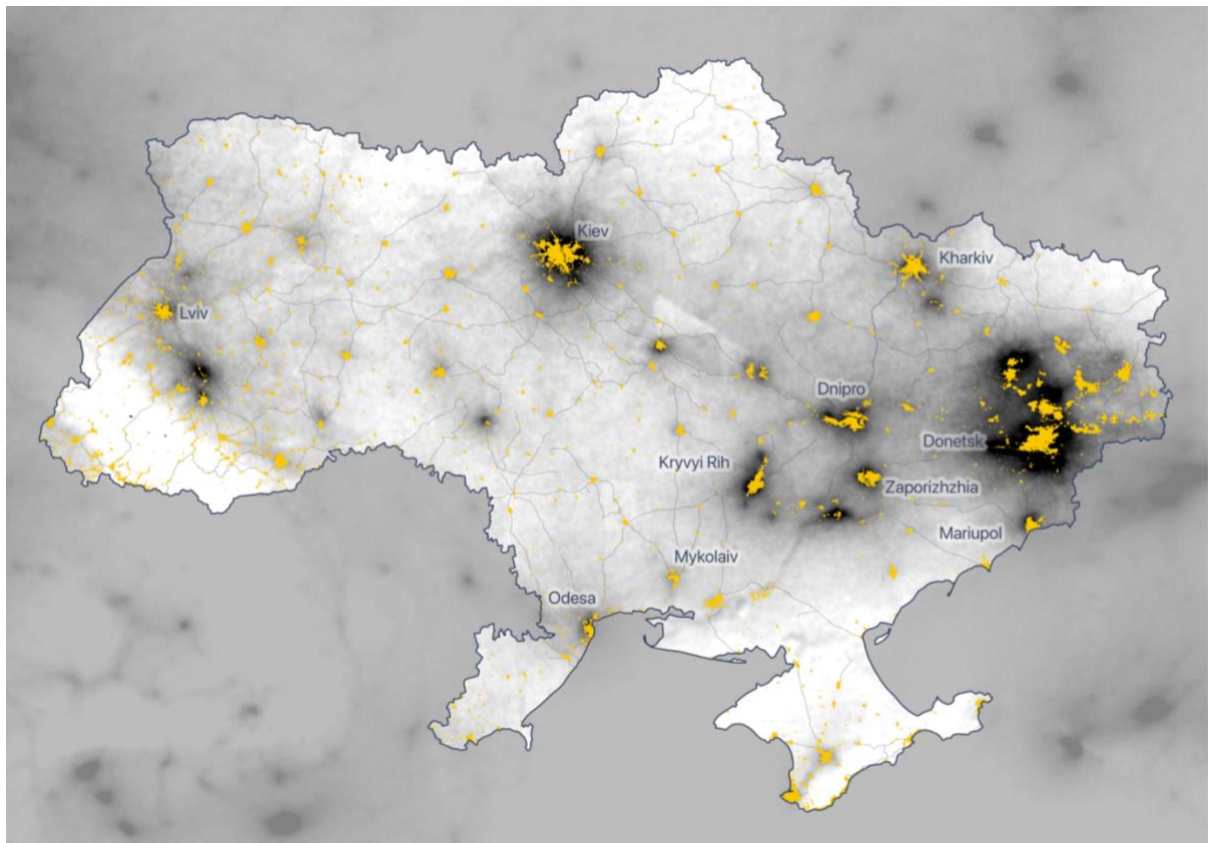


Figure 1:

Air pollution in Ukraine (yellow represents areas with high population density; black represents air pollution).

Source: World from Space, 2020: http://stories.worldfrom.space/urban_pulse_ua/assets/images/ue-population-no2-v2-1-1479x1187.png

Indoor air pollution results from the burning of solid fuels such as wood, charcoal and coal, for cooking and heating in households. Burning these fuels produces particulate matter – a major health risk, particularly for respiratory diseases. When burned in enclosed spaces such as small living quarters, these fuels risk exacerbating these diseases.

On a more positive note, in 2016, almost all of Ukraine’s population (96 per cent) had access to clean fuels and technologies for cooking. Furthermore, the proportion of premature deaths attributed to indoor air pollution in Ukraine decreased from 1.4 per cent in 1990 to 0.6 per cent in 2017⁶¹. Due to their high impact on health, the most studied indoor air pollutants are: formaldehyde, volatile organic compounds, tobacco smoke, nitrogen dioxide, carbon monoxide, particulate matter, radon and biological agents. Exposure to nitrogen dioxide and carbon monoxide comes mainly from cooking, but this exposure can be accentuated by nearby traffic sources⁶².

In addition to official state laboratories, public initiatives are being implemented in Ukraine that provide recommendations for the population, in particular SaveEcoBot (Centre for Environmental Initiatives ‘Ecoaction’), and a stationary post in Kyiv set up by the State Institution O.M. Marzeiev Institute for Public Health of the National Academy of Medical Sciences of Ukraine.

At the local level, separate air quality and air pollution assessments are conducted as part of corporate environmental impact assessments. For instance, more than 2.5 million indicators were processed from a range monitoring bodies in order to determine the chemical composition and levels of air

⁶¹ Hannah Ritchie (2013) - 'Indoor Air Pollution'. Published online at OurWorldInData.org. Retrieved from: <https://ourworldindata.org/indoor-air-pollution>

⁶² Paraschiv S., Paraschiv Lizica S. A review on interactions between energy performance of the buildings, outdoor air pollution and the indoor air quality / [Energy Procedia Volume 128](#), September 2017, Pages 179-186 <https://www.sciencedirect.com/science/article/pii/S187661021733881X> <https://doi.org/10.1016/j.egypro.2017.09.039>

pollution in the city of Kryvyi Rih in 2014-2018. For the entire study area, the cost of treating diseases potentially linked to the impact of negative environmental factors results in total annual losses of 160.9-204.9 million UAH, or 502-639 UAH per person per year⁶³.

Radioactive pollution

The testing of nuclear weapons in the second half of the last century, the Chernobyl accident in 1986 and active processing of radioactive minerals are among the key sources of radioactive pollution in Ukraine. Radioactive elements such as cesium-137 and strontium-90 enter into the atmospheric air with the wind from contaminated land in the Chernobyl area, making the radioactive pollution level of surrounding oblasts (i.e., Zhytomyr, Rivne, Volyn, Chernigiv, Kyiv oblasts) higher than in other territories of Ukraine. These levels are daily monitored, displayed and alerted on the websites of the Ukrainian Hydrometeorological Centre (section 'Radiology'⁶⁴), of the State Emergency Services of Ukraine (the reference by state on May 15, 2021 in the city of Kyiv and Kyiv oblast⁶⁵).

Ukraine, as the country with the largest uranium resources in Europe and ranking among the top ten producers in the world, relies on nuclear power in its energy balance, making radioactive pollution an issue. There are 17 active uranium deposits in the Kirovograd, Mykolayiv and Dnipropetrovsk oblasts, with 21 deposits explored. Tailings damage and leakages of mine water saturated with radionuclides are another serious environmental issue threatening human (children's) health.

Contamination of surface water with radioactive elements is monitored at nine points in major rivers (i.e., Dnieper, Desna, Danube, Southern Bug) where 15 nuclear power plant (NPP) units are in operation (i.e., Zaporizhka, Pivdenoukrayinska, Rivnenska, Khmelnytska). The highest radioactive pollution level is usually observed in the Dnipro and Prypyat rivers during the spring floods, which bring radionuclides from the Chernobyl zone through tributaries. The State Agency of Forest Resources of Ukraine notes the accumulation of radionuclides in wood, berries, medicinal plants, mushrooms and wildlife meat, which causes additional exposure of the population (including children).⁶⁶

Waste

The waste issue in Ukraine and its negative impact on human (children's) health are major concerns for experts and the wider public. In 2019, 15.4 million tons of waste was generated,⁶⁷ of which the biggest percentage came from the Dnipropetrovsk, Kirovograd, Poltava and Donetsk oblasts. These are also the most populated areas.⁶⁸

Waste management requires fundamental improvements. In total, 77 per cent of the population of Ukraine has access to household waste removal services (with lower levels in the Cherkasy [62 per cent] and Odesa [61 per cent] oblasts); Waste separation Across the country, infrastructure is installed in 822 settlements and across Ukraine there are 25 waste sorting lines, one incinerator plant and three incinerator units – far from a sufficient number of waste facilities for a big country like Ukraine. Waste landfills, where much of the municipal solid waste ends up, do not always meet technical and sanitary

⁶³ https://kr.gov.ua/ua/news/pg/60220929982501_s/.

⁶⁴The Ukrainian Hydrometeorological Centre: Level of radioactive pollution in Ukraine: https://meteo.gov.ua/en/33345/racpc/racpc_current_situation/

⁶⁵The State Emergency Services of Ukraine (the reference by state on May 15, 2021: <https://www.dsns.gov.ua/en/Dovidka-za-dobu/124278.html>

⁶⁶The Ministry of Ecology and Natural Resources of Ukraine: The State of Environment Report in 2017: <https://mepr.gov.ua/files/Національна%20доповідь%20про%20стан%20навколишнього%20природного%20середовища%20в%20Україні%20у%202017%20році.pdf>

⁶⁷State Statistical Committee of Ukraine: Waste generation: http://www.ukrstat.gov.ua/operativ/operativ2006/ns_rik/ns_u/opap_rik_u95-19.xlsx

⁶⁸The Ministry of Ecology and Natural Resources of Ukraine: The State of Environment Report in 2017: <https://mepr.gov.ua/files/Національна%20доповідь%20про%20стан%20навколишнього%20природного%20середовища%20в%20Україні%20у%202017%20році.pdf>

expectations, and often require modernisation, thus potentially becoming threats to human (children) health due to leakages, fires, accidents or explosions. Incidents of illegal waste disposal (into forests, riverbanks, lakes, roadsides, and so on) are increasing.

Land and soil degradation

As an agrarian country, Ukraine's land resources are of great importance for the population, with soil resources forming the basis of agricultural activity. Despite the reduction in cultivated areas over recent decades, which is a positive trend for nature protection management, there is still a high proportion of arable land (54 per cent) that is affected by environmentally-unfriendly agricultural production, and land and soil degradation (soil depletion, erosion)⁶⁹. The main types of soil degradation in Ukraine include loss of humus and nutrients, erosion (including wind erosion), changes in acid-base conditions, physical soil degradation, salinization and soil contamination (by atmospheric emissions from industrial enterprises and vehicles, anthropogenic air contamination in industrial areas, radioactive contamination, and contamination by pesticides and strontium)⁷⁰. The decline in humus content in soils has been observed in almost all lands of Ukraine. More than 10,000 km² of degraded, unproductive and contaminated lands are subject to conservation. The regions where the most significant land degradation has been recorded are those that have the largest share of rural population, as well as the highest birth rate and the greatest share of children in the population. Thus, such land degradation increases the risk of loss of household income in these rural areas, including for families with children.

Land and soil degradation are often the result of harmful natural phenomena (dust storms, droughts, floods), the frequency of which is increasing due to climate change. When conducting human activities, in particular agricultural activities, there is a need to improve soil management, as well as address other environmental problems, such as chemical pollution (soil and water) and the handling of pesticides. Agriculture has evolved from being an absorber to a producer of GHG.

Agriculture and food security

Ukraine's agricultural land covers 67.5 per cent of the country's territory⁷¹. In 2016, Ukraine ranked 14th in the world in terms of the share of agricultural land in the country's land structure, and 2nd in the world for the proportion of arable land⁷². Almost half of Ukraine's agricultural land is in areas of chernozem soil (280,000 km²), which is rich and fertile and thus very good for agriculture⁷³.

During the 1990-2019 period, the share of agriculture in GDP fell from 26 per cent to 9 per cent, and the proportion of people employed in the agricultural sector decreased from 20 per cent to 14 per cent. Exports of agricultural products remain the main driving force of the Ukrainian economy and account for almost 30 per cent of the value of exports⁷⁴. According to Forbes data published in October 2020, the biggest agricultural holdings were owned by Kernel, MHP, Epicentr Agro, Nibulon, ADM Trading, Bunge/Suntrade¹, Eridon, Cargill and Glencore Agriculture. Key agriculture products for export include cereals, wheat, corn and technical crops (sunflower, rapeseed, and soybean).

In Ukraine, 4.5 million households in rural areas own or use land plots, and four million of these households have land plots used for 'individual farming' (meaning that farm products are both used

⁶⁹ Pankiv Z., Evolution of land use in Ukraine: <https://geography.lnu.edu.ua/wp-content/uploads/2020/09/evoliutiia-zemlekor-Pankiv2012.pdf>.

⁷⁰ Ecological state of the soils in Ukraine: https://ukrgeojournal.org.ua/sites/default/files/UGJ-2012-2-38_0.pdf.

⁷¹ 2019 Annual Statistical Yearbook of Ukraine: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2020/zb/11/zb_yearbook_2019.pdf

⁷² The World Bank database: <https://data.worldbank.org/indicator/AG.LND.AGRI.ZS?view=chart>; <https://data.worldbank.org/indicator/AG.LND.ARBL.ZS?view=chart>

⁷³ S. Poznyak, Chernozems of Ukraine: geography, genesis and current state.

⁷⁴ State Statistics Service of Ukraine: Commodity structure of foreign trade in 2019: http://www.ukrstat.gov.ua/operativ/operativ2019/zd/toszt/toszt_u/toszt1219_u.htm

to cover the families' own food needs and sold to generate income)⁷⁵. It is to be noted that 72 per cent of this land is of medium quality, 26 per cent is good quality and 2 per cent is bad quality. The self-grown agricultural produce sold by households includes fruits and vegetables, milk, berries, honey, cereals and legumes⁷⁶.

Although Ukraine is a renowned exporter of agricultural and food products, food security does not rank high in international comparisons. The Economist Global Food Security Index placed Ukraine in 73rd place in its list of 113 ranked countries⁷⁷. In 2019, average food consumption per month per person in households (in terms of primary product) was broken down as follows: 5 kg of meat and meat products; 19 kg of milk and dairy products; 20 eggs; 1.5kg of fish and fish products; 2.6 kg of sugar, 1.4 kg of oil and other vegetable fats; 6.2 kg of potatoes, 8.8 kg of vegetables and melons; 4 kg of fruits, berries, nuts, grapes; and 8.1 kg of bread and bread products⁷⁸.

Estimates of the impact of climate change on agricultural productivity are ambiguous. In general, the yield of some crops is expected to increase, in particular corn and sunflower. However, the irrigation system needs to be further developed, as these crops are also at risk of drought.

Water resource scarcity and pollution

Surface water covers 4 per cent of Ukraine's territory. This surface water is found in nine river basins. Most rivers flow into the basins of the Black and Azov Seas, and only 4 per cent flow into the Baltic Sea basin (in particular, the Vistula River). The largest catchment area is the Dnieper (49 per cent of the country), followed by the Southern Bug, Siversky Donets, and Dniester. The highest river network density is in the Carpathians (2km/km²) and in the Crimean Mountains, primarily on the southern coast of Crimea. The lowest river network density is found in the Kherson region, where large areas are drained⁷⁹. Groundwater abstraction levels in Ukraine are just 10 per cent of projected and 45 per cent of operational reserves, which means that groundwater could potentially be used to increase good quality water supply. The Lviv and Volyn regions have the highest proportion of groundwater in freshwater intakes.

In general, the distribution of surface water resources across Ukraine is uneven and does not correspond to the location of water-intensive economic hubs. Climate change will negatively impact annual river run-off, especially in the Dniester, Prut, Tisza river basins. An increase in river flow is predicted for other rivers, but with an uneven distribution of run-off over the seasons⁸⁰.

With regards to pollution, it is important to note that water bodies in Ukraine are mainly polluted by heavy metal compounds, nitrogen compounds (especially the basins of the Poltava and Western Bug rivers, Kyiv and Kaniv reservoirs) and sulphates. In the vast majority of river basins, there are now fewer or no phenols and petroleum products in the water, and the content of nitrogen compounds, nitrite and zinc compounds has stabilised⁸¹. The waters of the rivers of the Black Sea and Azov basins are characterized by high values of saline water components - dry residue, sulphates and chlorides

⁷⁵ State Statistics Service of Ukraine: Individual farming:

http://www.ukrstat.gov.ua/operativ/operativ2020/sg/osg/osg_reg/osg_reg_u/osg_reg_0120_u.html

⁷⁶ State Statistics Service of Ukraine: Individual farming:

http://www.ukrstat.gov.ua/operativ/operativ2018/sg/opsgd/arch_opsgd_u.htm

⁷⁷ The Economist Global Food Security Index: <https://foodsecurityindex.eiu.com/Country/Details#Ukraine>

⁷⁸ State Statistics Service of Ukraine: Consumption of food in households

http://www.ukrstat.gov.ua/operativ/operativ2020/gdvdg/sphd/sphd_19_u.xls

⁷⁹ National Report on the State of the Environment in Ukraine in 2018:

<https://mepr.gov.ua/files/docs/Zvit/2020/Національна%20доповідь%20про%20стан%20навколишнього%20природног%20середовища%20в%20Україні%20у%202018%20році .pdf>

⁸⁰ Climate change and security in Eastern Europe: <https://www.osce.org/secretariat/355496> .

⁸¹ National Report on the State of the Environment in Ukraine in 2018:

<https://mepr.gov.ua/files/docs/Zvit/2020/Національна%20доповідь%20про%20стан%20навколишнього%20природног%20середовища%20в%20Україні%20у%202018%20році .pdf>

(arid regions)⁸². In addition to polluted surface water, experts often emphasize the issue of water quality in artesian waters (waters that are naturally contaminated due to high concentrations of iron and that are technically contaminated due to leakages from septic tanks and cesspools).

During the stakeholder interviews, drinking water quality was identified as a priority issue for Ukraine, and the situation is more acute in rural areas due to their mainly decentralized water supply. At the local level, all communities should have a Safe Water Supply Plan in place; however, this is often undeveloped or not implemented. A number of local-level monitoring activities are carried out by NGOs. Providing good quality drinking water is often an additional burden for households, schools, kindergartens and hospitals (and includes the costs related to supply).

Forests

Forests in Ukraine are state-owned and cover 107,000 km² of the country's surface area⁸³. The geography of the forests in Ukraine is very diverse, ranging from dense forest biomes in the Carpathian Mountains and scattered forests in the Polissya zone to the sparsely forested 'forest steppes' and the nearly treeless Steppe. The greatest forest cover is found in the Carpathian Mountains (30-60 per cent) in the west, followed by Polissya (15-30 per cent) in the northeast. However, this is estimated data – the last inventory of forest resources was conducted in 2011. Ukraine is home to 15 of 78 of the Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe (a natural site on the World Heritage List)⁸⁴.

Ukraine has not experienced deforestation on a large scale to date. Between 1990 and 2017, the recorded loss of tree cover due to the conversion of forest areas into non-forest land was 500 km² (less than 0.5 per cent of the total forest area)⁸⁵. Nevertheless, illegal logging poses a significant problem. Emerging forestry challenges include the unmanaged felling of trees for fuel and small timber to make up for lost incomes and livelihoods, and the direct impact on incomes and livelihoods of those who depend on forest operations⁸⁶.

Forests have significant potential for reducing GHG emissions and contributing to air and water treatment, but the economic value of these services is not taken into account.

The total area of green space of all kinds within the cities and other settlements of Ukraine is approximately 5,000 km². There is 16.3 m² of green areas in Ukraine per 1 city inhabitant⁸⁷.

⁸² Ministry for Communities and Regional Development of Ukraine, 2020. Національна доповідь про якість питної води та стан питного водопостачання в Україні за 2019 рік. - Kyiv, 2020. – 353 p. <https://www.minregion.gov.ua/wp-content/uploads/2020/12/nacjonalna-dopovid-za-2019-rik.pdf>.

⁸³ State Statistics Service of Ukraine: Regions of Ukraine: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/12/zb_ru1ch2019.pdf.

⁸⁴ Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe <https://whc.unesco.org/en/list/1133/>.

⁸⁵ Greenhouse gas inventory in Ukraine 1990-2017. Annual national inventory report for submission under the UNFCCC and the Kyoto Protocol: https://mepr.gov.ua/files/docs/Zmina_klimaty/kadastr2017/Ukraine_NIR_2019_draft.pdf.

⁸⁶ A Note for Forests in Ukraine: Growing Green and Sustainable Opportunities: Europe and Central Asia Sustainable Development Environment, Natural Resources and the Blue Economy, 2020: <https://openknowledge.worldbank.org/bitstream/handle/10986/34097/Ukraine-Country-Forest-Note-Growing-Green-and-Sustainable-Opportunities.pdf?sequence=4&isAllowed=y>.

⁸⁷ National Report on the State of the Environment in Ukraine in 2018: <https://mepr.gov.ua/files/docs/Zvit/2020/Національна%20доповідь%20про%20стан%20навколишнього%20природно%20середовища%20в%20Україні%20у%202018%20році .pdf>

Case study 1

Environmental issues in the conflict zone in eastern Ukraine

In Ukraine, the state of air and surface waters in the regions adjacent to the conflict-affected areas in eastern Ukraine is subject to environmental monitoring, the results of which are available to the public.

Even before the beginning of the hostilities, the territory of eastern Ukraine was under a significant amount of anthropogenic pressure due to the high concentration of mining companies (coal, halite), chemical production, thermal power plants and the area's high population density (over 200 people/km²), especially the urban population. Naturally and geographically, this region is arid and water-deficient, which makes it particularly likely to experience the greatest impacts of climate change. Due to the mining operations carried out in both active and closed mines, a number of negative environmental impacts have been observed, such as an increase in groundwater levels, a decrease in inflows, greater subsidence and more extensive flooding. A number of protected sites have been created to preserve the valuable ecosystems of cultural monuments, including the Holy Mountains National Nature Park, the Provalsky Steppe and the Trohizben Steppe.

The main environmental problems relating to the armed conflict in the Donetsk and Luhansk oblasts are being caused by:

- the large number of industrial facilities in the area, most of which are operating in the coal, metallurgical, coke, chemical and machine-building industries, which are the biggest polluters of the natural environment;
- the presence of a large amount of ammunition and explosives;
- the high concentration of military equipment in the region, which constitute mobile sources of environmental pollution;
- the uncontrolled use of natural resources and environmental pollution.

As a result of the large-scale armed conflict, the eastern part of Ukraine is contaminated with explosives, which endanger the life and health of the local population, including children. The most explosive-contaminated (PNB) settlements are located along the demarcation lines in the Donetsk and Luhansk oblasts. Over 172,000 of the region's inhabitants have lost their homes, as well as access to water, gas and electricity.

Case study 2

Environmental issues in Crimea

Analysis of the ecological situation in Crimea up to 2013 revealed a number of issues to be addressed:

- the high depreciation of fixed assets within the economic hubs, high energy use and resource-intensive production, which runs counter to improving the environment and ensuring the rational use of natural resources;
- the system of environmental measures is still responsive/reactive rather than preventive/proactive;
- society's attitude to environmental problems is characterized by a low level of awareness and action;
- the continuous ecological education system is still at the formation stage.

The most pressing problems in the field of environmental protection are as follows, and with the annexation of Crimea in 2014 these have only been exacerbated:

- the deterioration of water resources, especially natural water surface bodies;
- waste management issues: up to 1.2 million tons of waste are generated each year; only nine of the 29 landfills have sufficient waste storage facilities for 3-5 years. Significant waste disposal issues have specifically been observed in the cities of Yalta, Simferopol, Sudak, Kerch, Evpatoria, and Saki;
- the accumulation of prohibited and unusable chemical products for plant protection (hazardous chemicals containing highly toxic substances). Warehouses and containers do not provide reliable environmentally safe storage and there is a risk of environmental spillage;
- low compliance and violation of the protected regime in the nature protected areas, which leads to violation of environmental legislation and protection;
- the intensification of negative natural and anthropogenic processes, including flooding, which endanger the lives of the population and cause economic damage. The dam on Sasyk-Sivash lake is in a critical condition. Adverse weather conditions (strong winds, etc.) could cause the dam to break and flood the Saki district, its highways and railways, as well as the city of Evpatoria.

Water availability has always been an issue and this has a direct impact on human health. In 2012, Crimea and the city of Sevastopol had the highest share of emergency water supply systems (over 50 per cent) and sewage networks (over 42 per cent) in Ukraine. The area also had the largest number of settlements in which drinking water was rationed. Water losses stood at around 50 per cent, and drinking water did not meet safe drinking standards due to a lack of treatment and disinfection facilities. Crimea was ranked third in the list of Ukraine regions for volume of water supply (11.5 per cent, after the industrial Donetsk and Dnipropetrovsk oblasts). The main source of water supply is the North Crimean Canal, which has not been filled with water from the Dnieper River since Crimea's occupation in 2014.

The chemical industry is the largest air polluter, in particular OJSC 'Titan' (Armyansk), JSC 'Crimean Soda Plant', and JSC 'Brom' (Krasnoperekopsk).

When summarizing Ukraine's climate change and environmental issues, it is worth mentioning an EU and Austrian Development Agency-funded study conducted in 2017 by a number of international organizations (Organization for Security and Cooperation in Europe, United Nations Economic Commission for Europe, United Nations Environment Programme, UNDP and Regional Ecological Centre) entitled 'Climate change and security in Eastern Europe'. This study, which analysed the role of climate change as a security challenge across different sectors and regions, identified the following 'hotspots': Pripjat River, the Carpathian Mountains, Tisza River, Dniester River, Danube Delta, Steppes of Ukraine, eastern Ukraine and Crimea Peninsula.

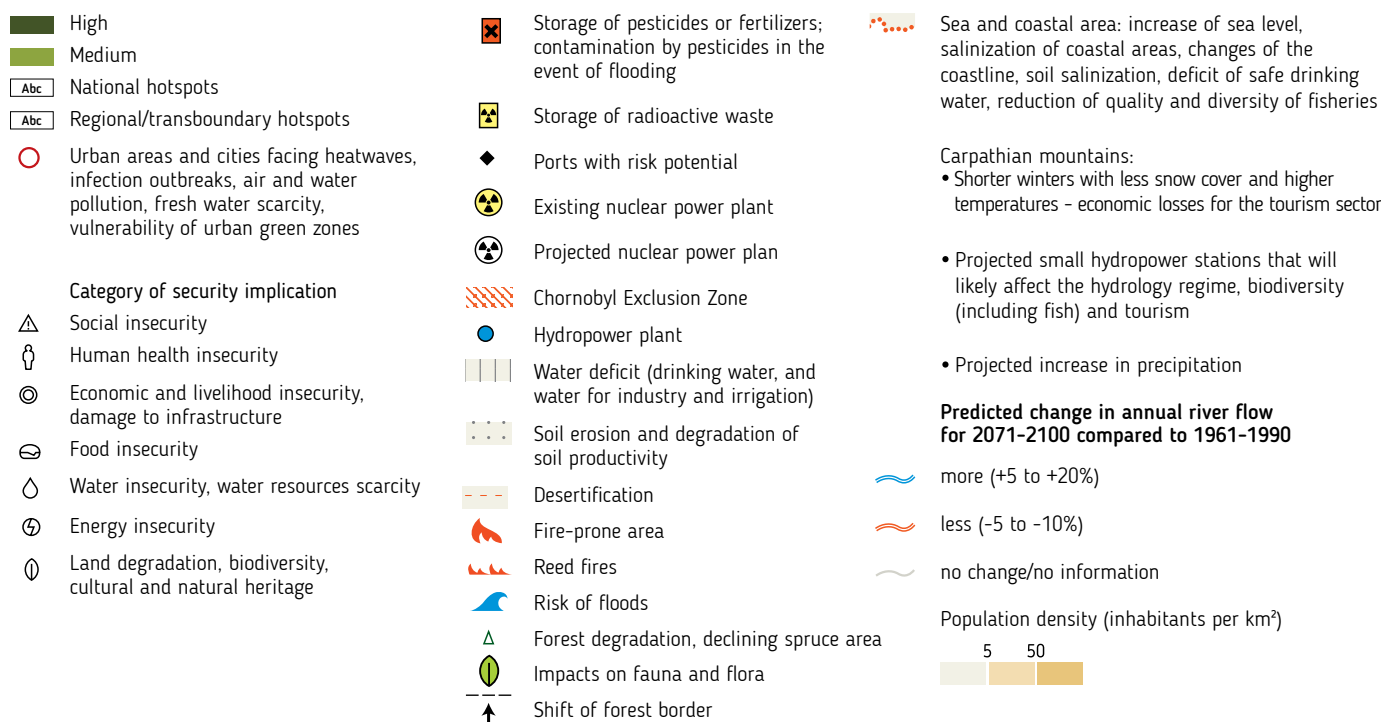
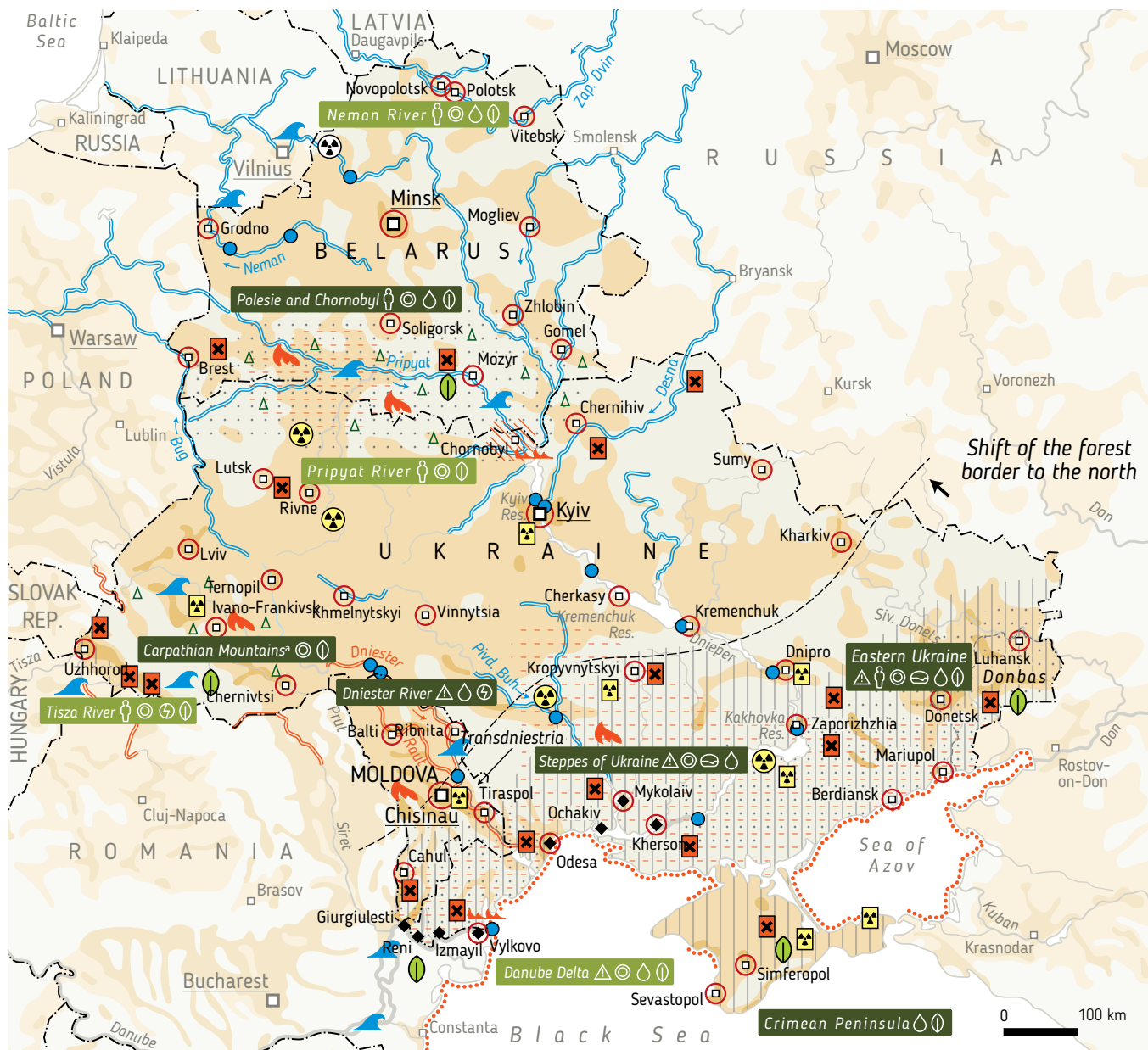
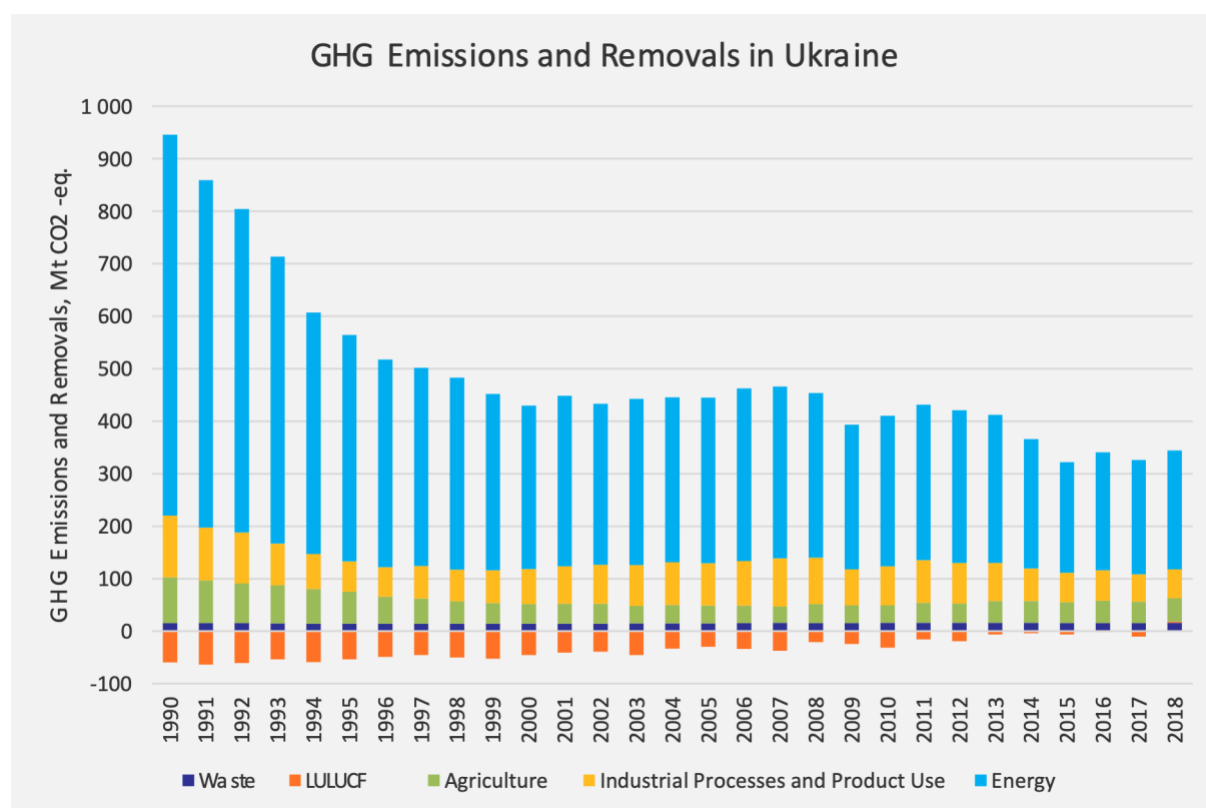


Figure 2: Climate Change and Security in Eastern Europe.

Source: OSCE, UNEP/Zoi Environment Network, 2017, Climate Change and Security in Eastern Europe: <https://www.osce.org/projects/climate-change-and-security>

Greenhouse gas emissions and mitigation

Greenhouse Gas Emissions (GHG) in Ukraine have reduced dramatically compared to the 1990 baseline level. In 2018, GHG amounted to 342 Mt CO₂-eq. excluding Land Use, Land Use Change and Forestry (LULUCF), which is 64 per cent lower than the 1990 baseline. Including the LULUCF sector, emissions in 2018 amounted to 344 Mt CO₂-eq., which was a 61 per cent decrease in comparison with the baseline⁸⁸. This reduction was due to the economic recession (deep crises at the beginning of the early 1990s led to a 10 per cent drop in GHG emissions per year compared with the 1990 baseline) and a fall in industrial production since 2014 due to the armed hostilities in eastern Ukraine, which has had an overall negative impact on the country's economy (and resulted in a 5% per cent per year fall in GHG emissions in 2014-2015 compared with the baseline).



Graph 1: Trends in GHG emissions and removals in 1990-2018 in Ukraine.

Source: Ukraine's Greenhouse Gas Inventory 1990-2018 (draft):

https://mepr.gov.ua/files/docs/Zmina_klimaty/2020/Ukraine_NIR_2020%20draft.pdf

Between 2015 and 2018, the structure of greenhouse gas emissions, excluding LULUCF, remained stable. Energy accounted for approximately 65 per cent (about 80 per cent of emissions in this sector are fuel combustion category emissions), industry made up 17 per cent, agriculture accounted for 13 per cent (the major sources of emissions being agricultural soils and enteric fermentation) and waste made up 5 per cent (CH₄ emissions from municipal solid waste landfills and N₂O emissions from human sewage). The LULUCF sector includes both carbon dioxide emissions and reductions, as well as emissions of CH₄, and N₂O. At 73 per cent, the largest share of GHG emissions is carbon dioxide (including LULUCF). The largest GHG contributors are industrial regions such as Donetsk, Dnipropetrovsk and Zaporizhzhya, as well as Ivano-Frankivsk, where the large Burshtyn NPP is located (there are currently talks of this closing down)⁸⁹.

⁸⁸ Ministry of Ecology and Natural Resources of Ukraine, 2020. Ukraine's Greenhouse gas Inventory 1990-2018 (draft): Annual National Inventory Report for Submission under the United Nations Framework Convention on Climate Change and the Kyoto Protocol https://mepr.gov.ua/files/docs/Zmina_klimaty/2020/Ukraine_NIR_2020%20draft.pdf.

⁸⁹ State Statistics Service of Ukraine: Environment of Ukraine 2019 Statistical Yearbook: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2020/zb/11/Dovk_19.pdf

Ukraine is a State Party to the Paris Agreement signed in 2015 at the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC). In its Intended Nationally Determined Contribution (INDC), Ukraine aimed for a 60 per cent reduction in GHG from the 1990 baseline level. At the same time, according to Annex B of the Doha Amendment to the Kyoto Protocol, Ukraine's permitted amount of GHG in 2020 was 76 per cent of the 1990 level⁹⁰. Currently, with support from the EBRD, Ukraine is in the process of reviewing and updating the second NDC: out of four scenarios modelled, two focus on macroeconomics and are presented as the most realistic. The Business as Usual (BaU) scenario envisages an increase in GHG emissions over the next 30 years of up to 60 per cent of 1990 level (from 310.5 million tons of CO eq. in 2015 to 523.7 million tons of CO eq. in 2050, especially from energy and industrial processes). LULUCF's contribution to GHG absorption will decrease. The second Reference/Current Policy Scenario envisages emission reductions compared to 2015 (up to 267.3 million tons of CO eq. in 2050) an increase of 30 per cent on 1990 levels. Under this scenario, GHG emissions from waste will decrease twofold⁹¹.

The first Ukrainian NDC was submitted to the UNFCCC Secretariat in 2015 and Ukraine is now reviewing (developing) its second NDC. According to the recently-developed second NDC, the following changes (with different scales of measures) should be introduced: (i) an increase in the installed capacity of energy generation from renewable energy sources; (ii) the introduction of the latest technologies, such as hydrogen, carbon capture and disposal; (iii) a significant increase in energy efficiency in buildings; (iv) greater electrification of transportation; (v) improvements to waste management and water use practices; (vi) the cultivation of more organic crops and methane reduction in agriculture; (vii) an increase in the level of absorption through afforestation⁹².

In addition to the direct impact of reducing GHG emissions, changes such as improved air quality, more comfortable living conditions, reduced family spending on heat and electricity bills, and increased recreation are expected to have positive effects on people's quality of life. At the same time, Ukraine's 2050 demographic forecast, which factored in the calculation of GHG emissions, includes the following trends: depopulation; a decrease in the share of the working-age population; an increase in life expectancy; and an ageing population (increase in the proportion of people over 65).

Steps are being taken to increase the use of economic instruments to reduce greenhouse gas emissions and pollutants (although there is still huge potential for introducing economic instruments). In 2019, the tax on greenhouse gas emissions increased four-fold. From 2021, large and medium-sized industrial enterprises identified by the government will be obliged to prepare plans for monitoring greenhouse gas emissions. For example, in 2020, in the Dnipropetrovsk oblast (one of the top three regions in Ukraine with regard to environmental tax) 25,000 tons of the 23.5 million tons of CO₂ emissions produced were taxed, which is considered a significant achievement.

Energy situation and access to energy

Energy production and supply

Any discussion of the energy sector and environmental concerns needs to start with GHG emissions. Ukraine's energy sector accounted for 66 per cent of total GHG emissions in 2018. About 80 per cent of emissions in this sector are fuel combustion category emissions, which include emissions from

⁹⁰ Ministry of Ecology and Natural Resources: Climate policy of Ukraine: <https://mepr.gov.ua/content/klimatichna-politika-ukraini.html>.

⁹¹ Ministry of Ecology and Natural Resources: Support to the Government of Ukraine on Updating Its Nationally Determined Contribution. Report 3. – Kyiv, 2020. - 138 p. https://mepr.gov.ua/files/images/news_2020/22122020/%D0%A0%D0%B5%D0%B7%D1%83%D0%BB%D1%8C%D1%82%D0

⁹² Ministry of Ecology and Natural Resources. Support to the Government of Ukraine on Updating Its Nationally Determined Contribution. Report 3. – Kyiv, 2020. - 138 p. https://mepr.gov.ua/files/images/news_2020/22122020/Результати%20модельовання.pdf.

energy industries, manufacturing industries and construction, transport and other. The remaining 20 per cent are fugitive emissions from fuels (leaks from solid fuels, oil and gas)^{93 94}.

In Ukraine, total primary energy supply during 1990-2019 decreased by 2.8 times, from 252.0 million tons of oil equivalent (toe) to 89.1 million toe⁹⁵. This trend does not so much reflect the greening of production, but the dynamics of production in the country, as the annual GDP growth rate was negative⁹⁶ (in 1990-2000 it was -0.2 to -22.9 per cent, in 2009 it stood at -14.8 per cent, and was also negative in 2013-2015). Between 2010 and 2015, energy use per unit of output decreased slightly from 245 to 198 kg of oil equivalent per 1,000 GDP, but this remains high compared to other European countries.

Compared to 2018, electricity and heat supply decreased in 2019 by 4.8 per cent and 6.9 per cent respectively⁹⁷. The types of generating unit with the most significant installed capacity were as follows: heat power plants (HPPs) and combined heat and power plants (CHPs), accounting for 54.7 per cent of capacity and 36.6 per cent of electricity production⁹⁸, which are often the biggest polluters of the environment. Ukraine's energy sector traditionally has a high share of NPPs, accounting for 26.9 per cent of capacity and 55.2 per cent of electricity production⁹⁹. NPPs make a relatively small environmental contribution to climate change; however, the facilities are potentially dangerous to both the environment and the lives and health of the population, including children (the Chernobyl accident of 1986 is just one very salient example).

In 2019, the largest decrease in electricity production in Ukraine was observed at hydropower plants (a fall of 37.8 per cent compared to the previous year). The reduction in thermal energy production in 2019 can be attributed to the abnormally warm winter of 2018-2019. This is of particular note, as heat production has significant consequences for the environment – more than 10 per cent of the heat generated is lost in the power systems' heating networks (10 million Gcal out of 91 million Gcal in 2019, for instance). There are also economic consequences for the population as heat losses are included in the cost of consumer utilities (up to 20 per cent of heat consumption), particularly in cities with centralized heat supply and water heating.

Ukraine is a country that relies on energy imports¹⁰⁰, but external energy dependence is declining (net imports of 121.4 million toe in 1991, but 33 million toe in 2019). Up to 1997, the volume of fuel and energy imports exceeded production in the country. Since 2013, the country's own energy production, which includes both electricity and heat, is almost twice as high as imports¹⁰¹. Since 2016, imports have predominantly consisted of coal (about 40 per cent; the Ukrainian coal mining companies are located in temporarily occupied territory and the coal is used mainly in industry, including ferrous metallurgy), while it was previously natural gas (in 2018, natural gas accounted for about 30 per cent

⁹³ Climate Policy of Ukrainian: Energy (in Ukrainian):

https://ua.boell.org/sites/default/files/hbs_klimatichna_politika_ukrayini_energetichna_skladova.pdf.

⁹⁴ National Greenhouse Gas Inventory 2020: <https://unfccc.int/documents/228016>.

⁹⁵ State Statistics Service of Ukraine: Statistical information: Energy: Time series of energy balance indicators for 1990-2019, http://www.ukrstat.gov.ua/operativ/operativ2020/energ/drpeb/EBTS_2020_ua.xls.

⁹⁶ The World Bank Data: GDP growth (annual %) in Ukraine:

<https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=UA>.

⁹⁷ State Statistics Service of Ukraine: Statistical information: Energy: Energy supply and consumption:

<http://www.ukrstat.gov.ua>.

⁹⁸ State Statistics Service of Ukraine: Statistical information: Energy: Time series of energy balance indicators for 1990-2019 http://www.ukrstat.gov.ua/operativ/operativ2020/energ/drpeb/EBTS_2020_ua.xls.

⁹⁹ State Statistics Service of Ukraine: Statistical information: Energy: Time series of energy balance indicators for 1990-2019 http://www.ukrstat.gov.ua/operativ/operativ2020/energ/drpeb/EBTS_2020_ua.xls.

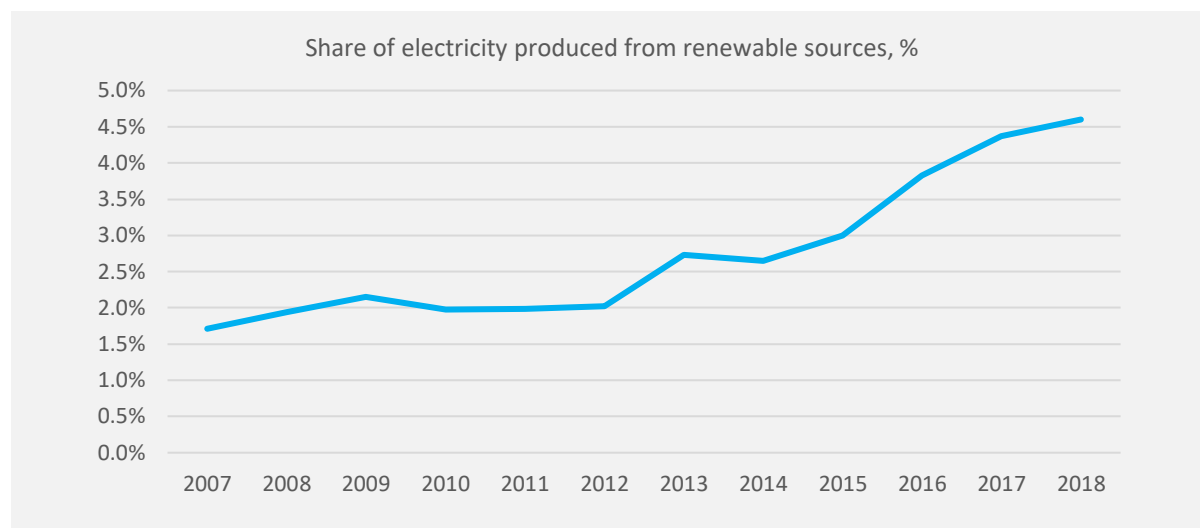
¹⁰⁰ State Statistics Service of Ukraine: Statistical information: Energy: Time series of energy balance indicators for 1990-2019 http://www.ukrstat.gov.ua/operativ/operativ2020/energ/drpeb/EBTS_2020_ua.xls.

¹⁰¹ State Statistics Service of Ukraine: Statistical information: Energy: Time series of energy balance indicators for 1990-2019 http://www.ukrstat.gov.ua/operativ/operativ2020/energ/drpeb/EBTS_2020_ua.xls.

and is used mainly in the household sector). Oil products, which are mainly used in transportation¹⁰², remain a significant imported energy source.

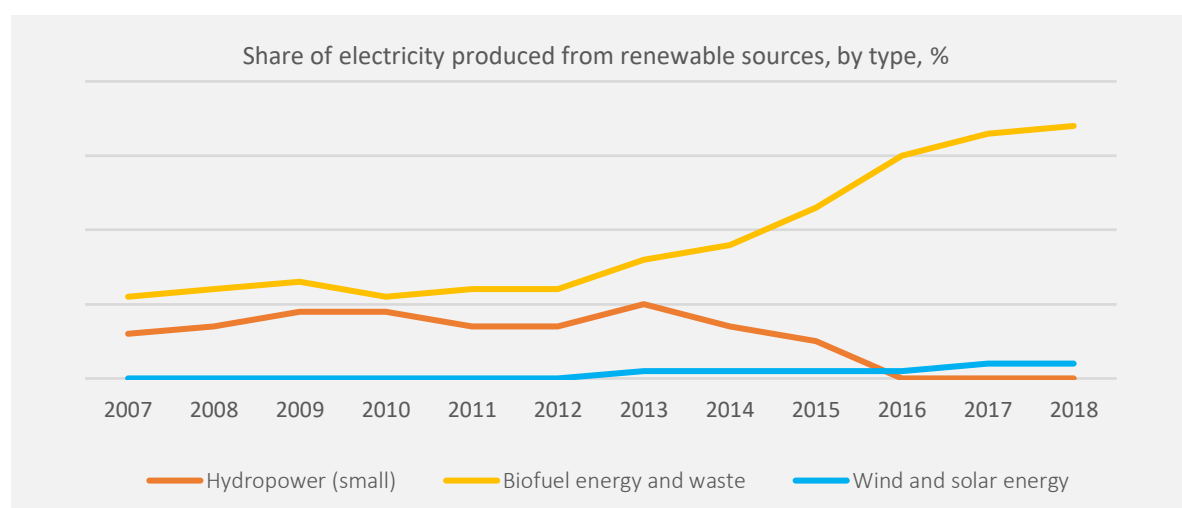
Renewable energy resources

The total supply of energy from renewable sources in Ukraine is growing, which reflects the European and global trend¹⁰³.



Graph 2: Share of electricity produced from renewable sources in Ukraine, in %.

Source: State Statistics Service of Ukraine – Statistical information – Energy – Renewable energy:
http://www.ukrstat.gov.ua/operativ/operativ2016/sg/ekolog/ukr/esp_vg_u.htm



Graph 3: Share of electricity produced from renewable sources in Ukraine, by type, in %.

Source: State Statistics Service of Ukraine – Statistical information – Energy – Renewable energy, 2020.

The largest renewable energy sources in Ukraine are biofuels and waste (around 3 million toe in 2016-2018 were used for energy production). Electricity production from wind and solar is gradually

¹⁰² State Statistics Service of Ukraine: Statistical information: Energy: Time series of energy balance indicators for 1990-2019 http://www.ukrstat.gov.ua/operativ/operativ2020/energ/drpeb/EBTS_2020_ua.xls.

¹⁰³ State Statistics Service of Ukraine: Statistical information: Energy: Renewable energy: http://www.ukrstat.gov.ua/operativ/operativ2016/sg/ekolog/ukr/esp_vg_u.htm

increasing (0.2 per cent in 2017-2018)¹⁰⁴. Large solar power plants are often installed in post-mining areas (for instance, the Pokrovskaya solar power plant in Dnipropetrovsk oblast, and Ternovytska in Lviv oblast).

In Ukraine, there is a special 'green' tariff for the public procurement of electricity generated at power facilities¹⁰⁵. From 2015 to 2019, the capacity of renewable electricity facilities that had a 'green' tariff (excluding facilities in the temporarily occupied territory of the Autonomous Republic of Crimea) increased by 5,965MW (from 967MW to 6,932MW). At the beginning of 2020, 22,000 private domestic solar power plants were registered in Ukraine, which produce 8 per cent of electricity on the 'green' tariff¹⁰⁶. This contributes not only to reducing emissions, but also to increasing the total income of these households. Since 2015, private households have invested about 450 million EUR in the installation of solar power plants. The regions of Ukraine in which the highest number of private households has installed solar power plants are Dnipropetrovsk, Ternopil and Kyiv¹⁰⁷.

Ukraine has stated its intention to complete its transition to 100 per cent renewable energy by 2050. In 2018, four Ukrainian cities (Lviv, Zhytomyr, Kamyanyets-Podilsky and Chortkiv) announced the gradual transition to 100 per cent renewable energy¹⁰⁸.

Availability and safety of energy sources and energy efficiency

Since 2013, the entire population of Ukraine has had access to electricity supply (both in rural areas and in urban settlements)¹⁰⁹. The largest consumer of electricity is industry (43 per cent), followed by the general population, who consumes 29 per cent of the country's electricity. All municipal and household consumers also have access to electricity (about 12.5 per cent of total consumption). In 2019, electricity consumption decreased by 1.6 per cent, in particular among municipal consumers (by 3 per cent) and the general population (by 2 per cent).

Electricity security involves taking technical, economic and political actions to maximize security and address energy transition, cyber events and both short- and long-term climate impacts. A recent example of a major power supply disruption was the 2015-2016 blackouts in Ukraine, which were caused by cyberattacks. These affected over 200,000 people over the course of 1-6 hours¹¹⁰. The reliability of the electricity supply to customers in Ukraine is much lower than in other EU member states¹¹¹.

Energy efficiency has tremendous potential to boost economic growth and minimize GHG, but the global rate of progress is slowing; a trend that has major implications for consumers, businesses and the environment¹¹². In Ukraine, better energy efficiency progress has been made because the initial existing energy efficiency of production and buildings was low. Newly-built residential buildings meet modern energy efficiency standards. There are highly efficient projects in place to implement energy saving measures and energy efficiency in the regions¹¹³.

¹⁰⁴ State Statistics Service of Ukraine: Statistical information: Energy: Renewable energy:

http://www.ukrstat.gov.ua/operativ/operativ2016/sg/ekolog/ukr/esp_vg_u.htm

¹⁰⁵ State Agency for Energy Efficiency and Energy Saving of Ukraine: <https://sae.gov.ua/uk/business/preferentsii/derzh-pidtrymka/green-tariff>

¹⁰⁶ State Agency for Energy Efficiency and Energy Saving of Ukraine: https://sae.gov.ua/sites/default/files/VDE_2019.pdf

¹⁰⁷ State Agency for Energy Efficiency and Energy Saving of Ukraine: https://sae.gov.ua/sites/default/files/VDE_2019.pdf

¹⁰⁸ Climate Policy of Ukrainian: Energy (in Ukrainian):

https://ua.boell.org/sites/default/files/hbs_klimatichna_politika_ukrayini_energetichna_skladova.pdf

¹⁰⁹ World Bank Open Data / World Bank, 2020: <https://data.worldbank.org/>

¹¹⁰ IEA (2020), Power Systems in Transition, IEA, Paris <https://www.iea.org/reports/power-systems-in-transition>

¹¹¹ Report on the results of the NCRECP in 2019 / National Commission for State Regulation of Energy and Utilities:

https://www.nerc.gov.ua/index.php/map_1/data/filearch/Proekty/data/filearch/Catalog3/Richnyi_zvit_NKREKP_2019.pdf

¹¹² IEA (2019), Energy Efficiency 2019, IEA, Paris <https://www.iea.org/reports/energy-efficiency-2019>

¹¹³ [Кращі приклади реалізованих проєктів з впровадження заходів із енергозбереження та підвищення енергоефективності в регіонах / Ministry of Development of Communities and Territories of Ukraine, 2020: <https://www.minregion.gov.ua/napryamki-diyalnosti/energoefektivnist-ta-energozberezhennya/krashhi-praktiki-realizovanih-proektiv-z-vprovadzhennya-zahodiv-iz-energozberezhennya-ta-pidvishchennya-energoefektivnosti-v-regionah/>](https://www.minregion.gov.ua/napryamki-diyalnosti/energoefektivnist-ta-energozberezhennya/krashhi-praktiki-realizovanih-proektiv-z-vprovadzhennya-zahodiv-iz-energozberezhennya-ta-pidvishchennya-energoefektivnosti-v-regionah/)

According to the stakeholder interviews, the aim of energy efficiency in residential/public buildings, which is often promoted and supported through co-financing mechanisms with foreign (GIZ, SDC), state (Energy Efficiency Fund), regional/local authorities and the population, is to reduce the utility costs of households/institutions and institutions that indirectly affect children, meeting their needs and, in particular, creating better living conditions for children. The energy certificate tool helps to increase energy efficiency, especially for public buildings.

In Ukraine (Kyiv), SDC in collaboration with the United Nations Industrial Development Organization (UNIDO) established the Resource Efficient and Cleaner Production Centre (RECP) in 2014. The RECP sees its key role as supporting the green modernization of the Ukrainian economy through the introduction of a resource-efficient and cleaner production concept for industry. RECP fosters economic efficiency, helps reduce industrial risks for people and minimizes the negative footprint on the environment – all through the implementation of technical options. It deals with national priority industries such as the chemical, agro-industrial, metallurgical and metal-processing industries. The RECP uses *circular economy* principles, which include minimizing resource usage, eliminating waste, and increasing recycling¹¹⁴. In alignment to the work of this centre, UNIDO is currently implementing a global eco-industrial park programme, the aim of which is to transform an industrial park into an eco-industrial park.

CEE-relevant disease distribution

This chapter describes the impact on health associated with climate change and environmental contamination in general, and in Ukraine in particular. The potential CEE-related health impacts on children in Ukraine are described in Chapter 4.

Climate change and health

Climate change affects many of the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.

The high population concentration in cities and the increase in Ukraine's urban population (which grew from 33.6 per cent in 1939, to 45.8 per cent in 1959 and to 69.4 per cent in 2019¹¹⁵), coupled with specific local microclimate features that may aggravate the adverse effects of climate change in cities (including air pollution, heavy traffic, the paving of urban surfaces, high-rise buildings, availability of public transport and well-developed infrastructure, which may suffer from the impacts of climate change and cause discomfort to the city's population), make cities much more vulnerable to climate change compared to other settlements¹¹⁶.

At least 10 per cent of Ukraine's housing stock is beyond its usable life span and ill-prepared to withstand extreme weather events¹¹⁷.

As mentioned above with regard to the observed and projected changes in Ukraine's climate, there has been an increase in the number of days with extremely high air temperature, or heatwaves, in Ukraine. Extreme high air temperatures contribute directly to deaths from cardiovascular and respiratory disease, particularly among elderly people. High temperatures also raise the levels of ozone and other pollutants in the air that exacerbate cardiovascular and respiratory disease. Pollen and other aeroallergen levels (which can trigger asthma) are also higher in extreme heat. Ongoing

¹¹⁴ Resource Efficient and Cleaner Production Center: <http://www.recpc.org/en/>

¹¹⁵ State Statistics Service of Ukraine. Statistical Yearbook of 2018. http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf

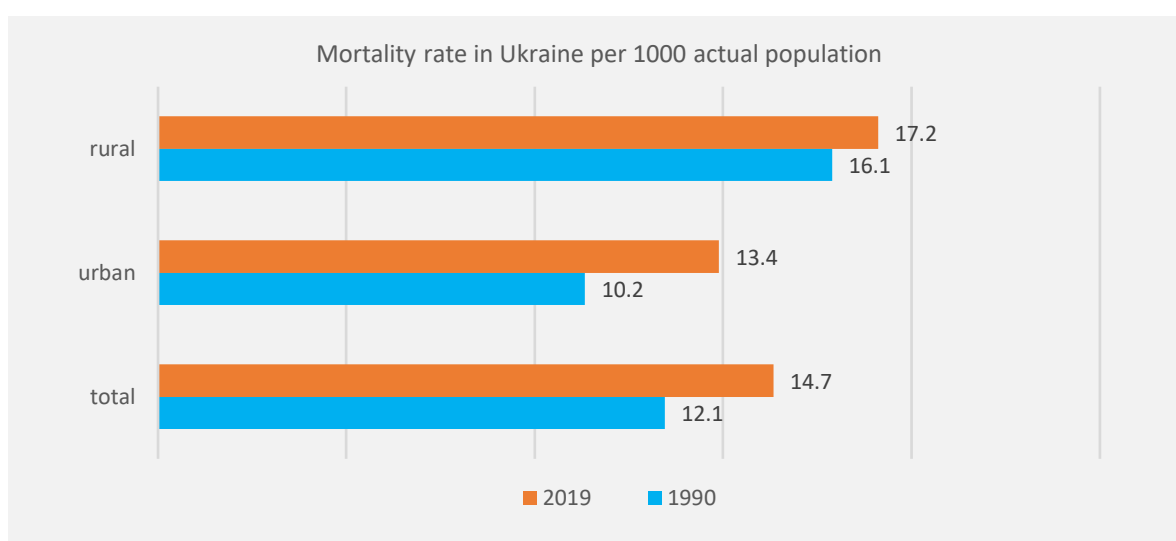
¹¹⁶ http://www.meteo.fr/icuc9/LongAbstracts/poster_3-14-7831638_a.pdf

¹¹⁷ USAID 2016 Fact Sheet. Climate Change Risk Profile of Ukraine. <https://www.climatelinks.org/resources/climate-change-risk-profile-ukraine>

temperature increases are expected to aggravate this burden¹¹⁸. Cardiovascular disease is the leading cause of death in Ukraine, accounting for 63 per cent of total deaths¹¹⁹, and heatwaves add stress to cardiovascular systems. Deaths due to coronary heart disease increased by 2.8 per cent from 2009 to 2019 in Ukraine¹²⁰. However, it is hard to say if heatwaves have contributed to this as there is currently no evidence that there have been an excess number of deaths during heatwaves in Ukraine. More frequent heatwaves will put children at risk of heat stress, renal disease and respiratory illnesses. As in previous years, respiratory diseases per 1,000 population in children aged 0-17 in Ukraine were the most common of all diseases in 2017 (68.2 per cent)¹²¹.

Mediterranean and Eastern European countries will be the most affected by heat. WHO has produced projections¹²² for Ukraine of additional deaths (ACR or Attributable Community Rate) according to RCP 4.5 and RCP 8.5¹²³ scenarios. For RCP 4.5, WHO forecast 4,800 deaths per year for 2036-2064, and 6,100 deaths for the period 2071-2099. For RCP 8.5, WHO forecast 7,500 deaths annually in 2036-2064 and 13,500 deaths for the period 2071-2099.

Warmer temperatures could increase the incidence of diarrhoea and other bacterial diseases, and may also increase the range of vector-borne diseases as listed in Table 1 below.



Graph 4: Mortality rate in Ukraine per 1,000 actual population.

Source: <http://database.ukrcensus.gov.ua/>

The rising mortality rate in Ukraine is already giving cause for concern, although there are many contributing factors to this¹²⁴.

Climatic conditions strongly affect the transmission of waterborne diseases (caused by pathogenic micro-organisms that are transmitted in water and which can be caught while bathing, washing or

¹¹⁸ World Health Organization Fact Sheet. February 2018. Climate change and health. <https://www.who.int/en/news-room/fact-sheets/detail/climate-change-and-health>

¹¹⁹ WHO Ukraine health fact sheet 2018. https://www.who.int/nmh/countries/ukr_en.pdf?ua=1

¹²⁰ <http://www.healthdata.org/ukraine>

¹²¹ Ministry of Health Ukraine. Annual Report 2017: <https://library.gov.ua/shhorichna-dopovid-pro-stan-zdorov-ya-naselennya-sanitarno-epidemichnu-sytuatsiyu-ta-rezultaty-diyalnosti-sistemy-ohorony-zdorov-ya-ukrayiny-2017-rik/>

¹²² Personal communication with WHO. WHO European Centre for Environment and Health; Source: Kendrovski V, Baccini M, Martinez GS, Wolf T, Paunovic E, Menne B. Quantifying Projected Heat Mortality Impacts under 21st-Century Warming Conditions for Selected European Countries. *Int J Environ Res Public Health*. 2017; 14(7): 729. Published 2017 Jul 5. doi:10.3390/ijerph14070729

¹²³ Representative Concentration Pathway (RCP) 4.5 is a scenario that stabilizes radiative forcing at 4.5 Watts per meter squared in the year 2100 without ever exceeding that value and RCP 8.5 refers to the concentration of carbon that delivers global warming at an average of 8.5 watts per square meter across the planet. The RCP 8.5 pathway delivers a temperature increase of about 4.3°C by 2100, relative to pre-industrial temperatures.

¹²⁴ <http://database.ukrcensus.gov.ua/>

drinking unsafe water, or by eating food exposed to contaminated water) and diseases transmitted through insects, snails or other cold-blooded animals. Changes in climate are likely to lengthen the transmission seasons of important vector-borne diseases and to alter their geographic range¹²⁵.

Disease type	Disease	Environmental factors impacting disease dynamics
Mosquito-borne diseases	Malaria	Increased average temperatures, precipitation
	West Nile Virus	Increased average temperatures, drought
	Dengue, Chikungunya fever, Yellow fever	Increased average temperatures
Tick-borne diseases	Lyme borreliosis, Tick-borne encephalitis	Increased daily precipitation, humidity, changed patterns of seasonal precipitation, increased average temperatures, extreme heat
Waterborne diseases	Sewage and sanitation: Vibrio vulnificus and Vibrio cholera, E.Coli, Campylobacter, Salmonella, Cryptosporidium, Giardia, Yersinia, Legionella	Increased rainfall and storm frequency, flooding, landslides, increased average temperatures, extreme heat episodes
Food-borne diseases	Salmonellosis, Campylobacteriosis	Extreme rainfall, flooding, increased average temperatures, increased frequency of extreme heat, changed seasonal patterns

Table 1: Climate-dependent diseases.

Source: Presentation Institute of Public Health Ukraine. 8 February 2021.

One study¹²⁶ used a climatic model to analyse the influence of regional warming on the geographical spread and potential risk of infection of human dirofilariasis (an infection transmitted through a mosquito bite) in Russia, Ukraine and other post-Soviet states from 1981 to 2011, and to provide an estimate for 2030. By 2030, an 18.5 per cent increase in the transmission area and a 10.8 per cent rise in population exposure is expected. These findings strongly suggest that global warming has an influence on the expansion of both the geographical spread and the number of *Dirofilaria* generations.

Pollution and health

Pollution is the largest environmental cause of disease and premature death in the world today. Pollution disproportionately kills the poor and the vulnerable. Children are at high risk of pollution-related disease, and even extremely low-dose exposure to pollutants during windows of vulnerability in utero and in early infancy can result in disease, disability and death in childhood and throughout their lifespan¹²⁷.

¹²⁵ World Health Organization Fact Sheet. February 2018. Climate change and health. <https://www.who.int/en/news-room/fact-sheets/detail/climate-change-and-health>

¹²⁶ Regional Warming and Emerging Vector-Borne Zoonotic *Dirofilaria* in the Russian Federation, Ukraine, and Other Post Soviet States from 1981 to 2011 and Projection by 2030 <https://www.hindawi.com/journals/bmri/2014/858936/#references>

¹²⁷ The Lancet Commission on pollution and health. Article published in the Lancet, October 2017. <https://www.thelancet.com/commissions/pollution-and-health>

According to WHO, the mortality rate in Ukraine attributable to household and ambient air pollution (SDG 3.9.1) was 137 deaths per 100,000 population (or 71 age-standardized deaths per 100,000 of the population) in 2016, with coronary heart disease accounting for the highest number of deaths¹²⁸. For 2016, WHO noted a mortality rate for ambient air pollution (only) for Ukraine of 123.6/100,000, which was the highest of the 183 countries for which figures were reported¹²⁹.

The Industrial Ukraine study, published in 2018, stated that Ukraine is the most energy-intensive country in the world and one of the most polluted countries in the region¹³⁰.

Recent studies suggest that the risk of mortality from the coronavirus (COVID-19) disease that emerged in 2019 is increased by comorbidity from cardiovascular and pulmonary diseases. Air pollution also causes excess mortality from these conditions¹³¹. As of 4 December 2020, there were 14,496 new cases and in total 772,760 confirmed cases of COVID-19 in Ukraine, with 12,960 deaths¹³². This provides extra motivation for combining ambitious policies to reduce air pollution with measures to control the transmission of COVID-19. This is especially important for Ukraine as, at 63 per cent, cardiovascular disease is the leading cause of death in Ukraine¹³³. In Ukraine, children and young people under 20 years of age accounted for 1 in 15 of COVID-19 infections, or 6.7 per cent of the 557,657 thousand infections reported as of November 2020^{134 135}.

¹²⁸ Mortality rate attributed to household and ambient air pollution. Data from World Health Organization, Global Health Observatory Data Repository <http://apps.who.int/ghodata/> <https://apps.who.int/gho/data/view.main.GSWCAH37v>

¹²⁹ [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/ambient-air-pollution-attributable-death-rate-\(per-100-000-population\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/ambient-air-pollution-attributable-death-rate-(per-100-000-population))

¹³⁰ World Health Statistics [online] [cit. 2018-11-15]. Available on: http://www.who.int/gho/publications/world_health_statistics/2018/en. Data WHO 2016.

¹³¹ Article in Cardiovascular research from European Society of Cardiology. Regional and global contributions of air pollution to risk of death from COVID-19. <https://www.escardio.org/The-ESC/Press-Office/Press-releases/study-estimates-exposure-to-air-pollution-increases-covid-19-deaths-by-15-world>.

¹³² WHO. Daily updates. <https://www.who.int/countries/ukr/>.

¹³³ WHO. Ukraine health fact sheet 2018. https://www.who.int/nmh/countries/ukr_en.pdf?ua=1

¹³⁴ UNICEF press release 19 November 2020 on COVID-19. <https://www.unicef.org/ukraine/en/press-releases/unicef-calls-averting-lost-generation-covid-19-threatens-cause-irreversible-harm>.

¹³⁵ This data will need to be updated in accordance with the actual situation.

Case study 3: Chernobyl 30 years on, environmental and health effects (report of 2016).

In the early hours of 26 April 1986, an accident at the Chernobyl nuclear power plant and the explosions it triggered caused a major release of nuclear radioactive material into the atmosphere. Radionuclides were scattered in the vicinity of the plant and over much of Europe. The Chernobyl fallout had a major impact on both agricultural and natural ecosystems in Belarus, Russia and Ukraine, as well as in many other European countries. Radionuclides were taken up by plants and later by animals. In some areas, they were subsequently found in milk, meat, forest food products, freshwater fish and wood. Environmental impacts vary according to location and ecosystem. Forests and fresh water bodies have been among the most affected ecosystems. The impacts on wildlife in the vicinity of the Chernobyl plant are disputed.

The impacts on human health have been extensively studied, although experts are not unanimous in their views. Official assessments by United Nations agencies have been challenged. The major population groups exposed were clean-up workers, evacuees and residents of contaminated areas of Belarus, Russia and Ukraine. There has been no clear evidence of any measurable increase in radiation-induced adverse health effects in other European countries. The immediate and short-term effects resulting from heavy fallout exposure include radiation sickness and cataracts. Late effects are thyroid cancer, especially in children and adolescents, and leukaemia among exposed workers. The accident has also had important psychosocial effects.

A recent article from April 2021 cites immunologist Dimitry Bazyka, director-general of the National Research Centre for Radiation Medicine in Kyiv, Ukraine, mentioning that in a study of more than 200 Chernobyl survivors and their children, the researchers found no evidence of a transgenerational effect.

CHAPTER I: KEY FINDINGS

The current climate, including variability

- Climate indicators in scientific literature were developed between 1960 and 1980 and continue to be used in modern publications (except for specific climate change studies). Climate descriptions should be updated based on indicators from the beginning of the 21st century;
- The complexity and inconsistency of climatic data and indicators across the body of literature make it challenging for readers to understand.

Observed and projected changes in climate

- The climate changes observed are reflected in scientific literature, albeit often with a significant time lag (up to 10 years);
- The impact of climate change on human lives and health is widely recognized. However, empirical studies are limited due to the unavailability of comparable quantitative monitoring indicators;
- Climate change forecasts in Ukraine are based on foreign/international models. The trends coincide with the projected changes, although the quantitative values are somewhat different;
- The average annual air temperature over the past 20 years (1991-2010) has increased by 0.8°C compared to the 1961-1990 average. According to the results of climate modelling, the average temperature will increase by up to 0.44°C by 2030 for the whole of Ukraine;
- The number and frequency of negative natural hazards caused by climate change are on the rise, particularly floods (mainly in western Ukraine), heatwave episodes (in eastern Ukraine), fires in natural ecosystems and water resource depletion (mainly in southern Ukraine).

Greenhouse gas emissions and mitigation

- Statistics on GHG emissions and air pollution are not presented in a user-friendly format;
- The data are presented at national and regional levels only. Reporting at the local level (community) is needed to facilitate correlating this data with the live standards of the population and business activities;
- GHG emissions are considered from an economic activity perspective – a review and assessment of socio-economic consequences need to be developed.

Climate-related threats and disasters

- The impact of the state of the environment on human life and health is generally recognized;
- The available studies are only partially complete due to the lack of comparable quantitative monitoring indicators;
- Climate change is enabling the spread of new diseases and infections;
- The high risk of floods in the Carpathians and desertification processes in the south are both recognized – thus, there is a need for awareness-raising on the manifestations and dangers of these events, as well as on relatively new phenomena for Ukraine (waves of heat and cold).

Environmental issues and natural resources

- Overall, Ukraine is rich with natural resources, although mismanagement and poor protection are causing their deterioration, which is amplified by cross-cutting stressors such as climate change;
- The major environmental challenges for human (child) well-being and health are water and air quality (including radioactive pollution in areas surrounding Chernobyl). Waste issues and the related consequences (i.e., contaminated ground/surface waters, emissions of hazardous substances into the air, fires and explosions on landfills) pose serious risks for the health and security of the population (children);

- Development of a local-level quantitative indicators and efficient monitoring system will improve the sustainable management of natural resources;
- The state of the environment should be considered through the state of the individual components. The assessment of the environmental indicators per region revealed that (for more details see Annex 2): (i) natural ecosystems and nature protected areas/parks help preserve biodiversity and territories, and are under relatively lower anthropogenic pressure; (ii) air pollution reduction measures are required to improve the environment for the city of Kyiv, and Donetsk, Dnipropetrovsk and Ivano-Frankivsk oblasts; (iii) surface water pollution from sewage is a key issue in Sumy and Luhansk oblasts, as well as in the city of Kyiv, and Dnipropetrovsk, Lviv, Mykolayiv, Odesa oblasts; (iv) the largest volumes of hazardous waste are generated in Donetsk, Sumy, Poltava oblasts, as well as in the city of Kyiv; (v) Ivano-Frankivsk, Zakarpattya, Chernivtsi, Volyn and Odesa oblasts experience the most natural emergencies.

Energy situation and access to energy

- Investment for modernizing the energy supply system is essential to absorb the increase in load on the grid during waves of heat and cold, and prevent electricity supply disruption and negative impacts on families' living conditions;
- The relative poverty of the population is an obstacle to the development of solar energy (solar panels and collectors) for individual usage.

CEE-relevant disease distribution

- The high population concentration in cities (especially as Ukraine has an urban population of 69.4 per cent) makes the urban population more vulnerable to climate change. Extreme high air temperatures contribute directly to deaths from cardiovascular and respiratory disease. Cardiovascular disease is the leading cause of death in Ukraine, with 63 per cent of total deaths, and heatwaves add stress to cardiovascular systems. More frequent heatwaves will put children at risk of heat stress, renal disease and respiratory illness;
- Drought and heatwaves increase the risk of wildfires that damage ecosystems. These vegetation fires can release substantial quantities of fine particles (PM_{2.5}) that are harmful to health;
- Pollution is the largest environmental cause of disease and premature death in the world today, and disproportionately kills the poor and vulnerable. With regard to deaths attributable to air pollution in 2016, Ukraine tops the list of 183 countries in the WHO global database;
- Climatic conditions might affect water-, vector- and food-borne diseases;
- The risk of mortality from the coronavirus disease (COVID-19) that emerged in 2019 is increased by comorbidity from cardiovascular and pulmonary diseases. Air pollution also causes excess mortality from these conditions.

2

RESPONSES TO CEE IN UKRAINE AT DIFFERENT LEVELS



Governmental CEE-related policies and strategies

In order to meet its international commitments, Ukraine has already developed a national legislative framework for climate change mitigation and adaptation, including the *State Climate Policy Concept till 2030*¹³⁶ and the *Action Plan to Implement State Climate Policy Concept till 2030*¹³⁷, adopted in December 2016 and 2017, respectively. Both documents include detailed mitigation actions but only basic steps for adaptation. The documents include actions such as monitoring and reducing GHG emissions, achieving the 2030 NDC target of not exceeding 60 per cent of GHG emissions compared with the 1990 baseline, reducing the energy intensity of GDP by 20 per cent, promoting energy savings and efficiency, increasing the proportion of energy produced from renewable energy sources, as well as awareness-raising measures, forums, conferences, seminars and round table discussions on climate change. The documents also promote the development of climate change-related teaching modules (including curricular plans for general secondary schools and higher learning establishments) and professional skill upgrade programmes for civil servants and local authority officials.

The *Ukraine 2050 Low Emission Development Strategy (2018)*¹³⁸ determines national stakeholders' agreed vision for decoupling the country's further economic and social growth and social development from growth in GHG emissions. It is an instrument for use by the public administration and for shaping the climate responsible behaviour of both businesses and citizens. At the international level, it supports the global target of stabilizing GHG concentrations, based on the scenario of holding the increase in the global average temperature to well below 2°C above preindustrial levels¹³⁹. Ukraine submitted its Low Emission Development Strategy to the UNFCCC Secretariat in 2018.

The *National Energy Strategy till 2035 (2017)*¹⁴⁰ emphasizes the need to align Ukrainian legislation with the European norms as part of work to adopt modern approaches to finding solutions in the energy sector. A comprehensive reform of the Ukrainian energy sector is planned to achieve the key strategy goal, which is to remove the dependency on fossil fuel sources, diversify energy sources, modernize energy infrastructure and promote energy efficiency. Two further documents, prepared before the strategy, the National Renewable Energy Action Plan¹⁴¹ (2014) and National Energy Efficiency Action Plan up to 2020¹⁴² (2015), also demonstrate Ukraine's commitment to developing non-fossil fuel energy industries. The *National Energy Efficiency Action Plan for 2030 (draft)* was submitted to the government in December 2020. The Energy Community Secretariat's Experts were involved in developing the project through EU4Energy Governance technical assistance. To achieve the defined goals, the National Energy Efficiency Action Plan identifies a number of sector and inter-sector measures and tools aimed at improving energy efficiency in various sectors of the economy (housing and public sector, transport, industry, energy)¹⁴³.

Ahead of signing the Paris Agreement in 2015, Ukraine submitted its *Nationally Determined Contributions*, committing to achieving the substantiated and fair target of not exceeding 60 per cent of 1990 GHG emissions by 2030. Since 1990, the amount of GHG emissions in Ukraine has dramatically reduced, mainly due to the collapse of the Soviet Union. The Ministry of Ecology and Natural Resources, with assistance from the EBRD and Sweden, is currently developing modelling scenarios

¹³⁶ Concept for the Implementation of the State Climate Change Policy up to 2030:

<https://zakon.rada.gov.ua/laws/show/932-2016-p#Text>

¹³⁷ Action Plan on the Execution of the Concept for the Implementation of the State Climate Change Policy up to 2030:

<https://zakon.rada.gov.ua/laws/show/878-2017-p#Text>

¹³⁸ Ukraine 2050 Low Emission Development Strategy:

https://unfccc.int/sites/default/files/resource/Ukraine_LEDS_en.pdf

¹³⁹ Ministry of Ecology and Natural Resources: <https://mepr.gov.ua/news/31815.html>

¹⁴⁰ National Energy Strategy up to 2035: <https://zakon.rada.gov.ua/laws/file/text/58/f469391n10.pdf>

¹⁴¹ National Renewable Energy Action Plan: <https://zakon.rada.gov.ua/laws/show/902-2014-%D1%80#n10>

¹⁴² National Energy Efficiency Action Plan up to 2020: <https://zakon.rada.gov.ua/laws/show/1228-2015-p#Text>

¹⁴³ National Energy Efficiency Action Plan for 2030 (draft): <https://www.kmu.gov.ua/news/nacionalnij-plan-dij-z-energoefektivnosti-na-period-do-2030-roku-vneseno-na-rozglyad-uryadu>

for the *Second Nationally Determined Contribution of Ukraine to the Paris Agreement*¹⁴⁴ and has already organized several meetings to discuss these¹⁴⁵. Sector developments on GHG emissions are also presented based on the results of modelling for the second NDCs¹⁴⁶.

In the area of adaptation to climate change, towards the end of 2020, the Ministry of Ecology and Natural Resources of Ukraine, the key body responsible for climate change-related policy in Ukraine, initiated development of the *Strategy of Adaptation to Climate Change*.¹⁴⁷ with support from the World Bank. The Ministry held a series of meetings with more than 100 experts from different governmental and non-governmental institutions, which highlighted a need to identify the adaptation activities that are already being implemented but not being reported as 'climate change adaptation' measures. The Strategy aims to cover all sectors, with priority being given to assessing sectors' vulnerability and related risks. The Ministry invites experts and scientists to participate in the strategy development process. Clearly earmarked and sufficient financial resources (both from state/local budgets and international donor support) are key for successful implementation of the strategy. At regional (oblast) level, the Ministry has called upon all stakeholders to include climate change adaptation measures in the oblasts' development strategies for 2021-2027¹⁴⁸.

Sector adaptation plans are also in the early stages of development. The Ministry of Development of the Economy, Trade and Agriculture of Ukraine has developed the *Strategy for Adaptation to Climate Change in Agriculture, Forestry and Fisheries of Ukraine up to 2030* and is currently conducting public consultations on this strategy. The first steps for adapting water resources to climate change have been taken in the Dniester river basin, where the climate change adaptation strategic direction has been developed with support from the OSCE and other international organizations. In the healthcare sector, the MOH has drafted an *Action Plan for Adaptation of the Population to Climate Change by 2022*, which still has to be officially approved. More research is planned to examine trends in mortality and the prevalence of diseases sensitive to climate change, to improve epidemiological surveillance and establish an early warning system. The National Public Health Centre (NPHC) is the technical expert institution and will lead implementation of the national action plan on climate change adaptation for public health. Other climate change adaptation initiatives being developed with international partners include: the *Ecosystem adaptation to climate change and sustainable regional development through the expansion of Ukrainian biosphere reserves* project (Germany); the World Bank study on *Assessing Climate Change Impact, Opportunities and Priorities for Ukraine*; cooperation in German-Ukrainian agro-political dialogue on adaptation to climate change (Germany)¹⁴⁹; and Mayors - East Agreement: climate protection and adaptation to climate change at the local level (EU).

The *Sustainable Development Strategy for Ukraine by 2030* (2017)¹⁵⁰ has been developed with assistance from UNDP and GEF to support Ukraine's long-term development and integration into the global and European political environment. It is aligned with the United Nations 17 SDGs and aims to unlock the full potential of Ukraine's natural and human resources, as well as increase the efficiency of resource and energy use. The seven key strategy goals developed to cover economic, social and political development are as follows: (1) promoting inclusive balance low-carbon economic growth and sustainable infrastructure; (2) ensuring sustainable sector and regional development; (3) overcoming poverty and reducing inequality, including gender; (4) ensuring public health, well-being

¹⁴⁴ Ministry of Ecology and Natural Resources of Ukraine: <https://mepr.gov.ua/news/33080.html>

¹⁴⁵ Results of the modelling for the second NDC:

<https://mepr.gov.ua/files/%D1%96%D0%BD%D1%84%D0%BE%D0%B3%D1%80%D0%B0%D1%84%D1%96%D0%BA%D0%B0%20%D0%9C%D1%96%D0%BD%D0%B4%D0%BE%D0%B2%D0%BA%D1%96%D0%BB%D0%BB%D1%8F%2011.12.2020.PDF>

¹⁴⁶ Sector presentations on modeling: <https://mepr.gov.ua/news/36677.html>

¹⁴⁷ Climate Change Adaptation Strategy: <https://mepr.gov.ua/content/rozroblennya-strategii-adaptacii-do-zmini-klimatu-ukraini-na-period-do-2030-roku.html>

¹⁴⁸ Ministry of Ecology and Natural Resources: <https://mepr.gov.ua/news/34319.html>

¹⁴⁹ Cooperation with the German-Ukrainian agro-political dialogue:

https://mepr.gov.ua/files/docs/Zmina_klimaty/2020/APD%202019%20Climate%20change%20adaptation%20in%20forestr_y_UA.pdf

¹⁵⁰ <https://www.ua.undp.org/content/ukraine/en/home/library/sustainable-development-report/Sustainable-Dev-Strategy-for-Ukraine-by-2030.html>

and quality education in safe and sustainable settlements; (5) ensuring the transition to models of balanced consumption and production, the balanced management of natural resources and strengthened response measures on climate change; (6) preserving land and marine ecosystems and promoting the balanced use of their resources; and (7) ensuring security and access to justice, establishing accountable and inclusive institutions.

The Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the period up to 2030 (2019)¹⁵¹ ¹⁵² defines the activities of state bodies aimed at upholding people's constitutional right to a safe environment for life and health, and compensation for damage caused by the violation of this right. The strategy's goals include: (1) environmental awareness, environmental values, environmental education; (2) sustainable development – rational use of natural resources; (3) environmental requirements in all areas; (4) reducing environmental risks and creating a safe environment; and (5) proper environmental governance.

In September 2020, the National Security Strategy, entitled *Human security - national security*¹⁵³, was adopted. By the same decision¹⁵⁴, the Cabinet of Ministers of Ukraine has been instructed to develop and approve the Energy Security Strategy, the Environmental Security and Climate Change Adaptation Strategy, the Integrated Border Management Strategy, and the Food Security Strategy. Thus, a comprehensive security approach is being introduced into public policy.

The following sector strategies also have a direct or indirect influence on improving the population's environmental, social and health conditions (including children) over the long-term. They include:

- *National Transport Strategy of Ukraine 2030* (2018):¹⁵⁵ based on existing challenges (rapid increase in the number of vehicles, predominant consumers of fuel/petrol and producers of air contamination, obsolete car parks, and so on), it defines the future direction for the development of transport (including sustainable and eco-friendly transport, e-mobility) and related infrastructure. Transport is seen as one of the pillars of rapid economic development.
- *Water Strategy of Ukraine* (draft): the reform and modernization of the water sector is one of Ukraine's key priorities, especially given the need to address climate change impacts and existing water resource issues (its quality and quantity). The existing strategy for 2011-2020 is being implemented and the revised version, supported by the EU, has not yet been adopted by the government.
- *Irrigation and Drainage Strategy of Ukraine for the period up to 2030* (2019)¹⁵⁶: the aim of this strategy is to determine the strategic direction of state policy on irrigation and drainage, and ensure the sustainable and eco-balanced development of agriculture in Ukraine. The issues to be addressed include: the inability of irrigation and drainage systems to help provide the resources and food supply required by the state in years with adverse weather conditions due to the extremely low level of use of available capacity; the gaps and shortcomings of legislation on water resources management and land reclamation; and shortcomings in the water resources management system and land reclamation.
- *National Waste Management Strategy 2030* (2017)¹⁵⁷: the strategic goal is to develop long-term waste treatment solutions in Ukraine and introduce highly efficient and modern waste treatment infrastructure. Issues and risks related to untreated waste and inefficient and outdated waste management approaches need to be resolved. The strategy introduces an

¹⁵¹ Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the period until 2030 (2019): <https://zakon.rada.gov.ua/laws/show/2697-19#Text>

¹⁵² Ministry of Ecology and Natural Resources: <https://mepr.gov.ua/timeline/Nacionalna-ekologichna-politika.html>

¹⁵³ National Security Strategy: <https://zakon.rada.gov.ua/laws/show/392/2020#n12>

¹⁵⁴ Decision of the Council of National Security and Defense of Ukraine: <https://zakon.rada.gov.ua/laws/show/n0005525-20#n2>

¹⁵⁵ National Transport Strategy of Ukraine 2030: <https://zakon.rada.gov.ua/laws/show/430-2018-%D1%80#n13>.

¹⁵⁶ Irrigation and Drainage Strategy of Ukraine for the period up to 2030: <https://zakon.rada.gov.ua/laws/show/688-2019-%D1%80#n10>.

¹⁵⁷ National Waste Management Strategy 2030: <https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80#n8>.

important mechanism – the ‘polluter pays’ principle – into the Ukrainian waste management scheme and stresses the need for cooperation between municipalities and national government. The National Waste Management Plan (2019) seeks to minimize untreated waste’s harmful influence on the environment.

It is also important to note the role of the *EU-Ukraine Association Agreement (2016)*¹⁵⁸ in supporting Ukraine towards integration with the political, economic and social aspects of the EU. According to the Implementation Report (2019)¹⁵⁹, moderate progress has been made within the environmental policy and climate protection sectors since 2014, while the integration of other sectors has progressed more quickly (i.e., national security, human rights, trade and business, public procurement, humanitarian policy). The Association Agreement provides references to EU/EC Directives and Regulations in areas such as air quality and climate change, water resources, waste management, environmental protection, transport, energy supply and energy efficiency. In 2015, the Ministry of Ecology and Natural Resources developed the *National Strategy on the Approximation of Ukrainian Legislation to EU Legislation for Environmental Protection*¹⁶⁰.

In addition to the above-mentioned policy documents and strategies that form part of the national legislative and regulatory framework, the following key Ukrainian laws apply with regard to CEE:

- Law of Ukraine on environmental protection, No. 1264-XII, 1991¹⁶¹;
- Law of Ukraine on environmental impact assessments, No. 2059-VIII, 2017¹⁶²;
- Law of Ukraine on strategic environmental assessments, No. 2354-VIII, 2018¹⁶³;
- Law of Ukraine on energy saving, No.74/94-BP, 1994¹⁶⁴;
- Law of Ukraine on alternative energy sources, No. 555-IV, 2003¹⁶⁵;
- Law of Ukraine on alternative fuel types, No. 1391-XIV, 2003¹⁶⁶;
- Law of Ukraine on the electricity market, 2019-VIII, 2017¹⁶⁷.

Global Sustainable Development Goals (SDGs) and Ukraine’s commitment to the SDGs

The World Health Organization’s 2017 publication, *Inheriting a sustainable world? Atlas on children’s health and the environment*, addresses 12 SDG targets, which are broken down as follows: SDGs 1, 2 and 10 address equity and nutrition; SDG 6 focuses on WASH; SDGs 7 and 13 cover energy, air pollution and climate change; SDGs 3, 6 and 12 look at chemical exposure; and SDGs 8, 9 and 11 focus on infrastructure and settlements. With the SDGs comes a set of targets to guide interventions for children’s environmental health. In addition to SDG 3, which aims to ensure healthy lives and promote well-being for all, the many environment-related SDGs provide a comprehensive multi-sector roadmap for reducing environmental health hazards: improving water, sanitation and hygiene with SDG 6; transitioning to clean energy with SDG 7; better infrastructure with SDG 9; building healthy cities with SDG 11; and reversing climate change with SDG 13. By placing an emphasis on children, the overall benefit to society increases as part of a long-term investment. Commitment to the SDGs means taking responsibility for children’s environmental health, given the potential this holds to improve the lives and futures of so many. The cooperation of children’s environmental health champions across

¹⁵⁸ EU-Ukraine Association Agreement: https://trade.ec.europa.eu/doclib/docs/2016/november/tradoc_155103.pdf.

¹⁵⁹ EU-Ukraine Association Agreement Implementation Report: <http://pulse.eu-ua.org/>.

¹⁶⁰ Ministry of Ecology and Natural Resources: https://mepr.gov.ua/files/docs/draft_NAS_FEB2015.pdf.

¹⁶¹ <https://zakon.rada.gov.ua/laws/show/1264-12#Text>.

¹⁶² <https://zakon.rada.gov.ua/laws/show/2059-19#Text>.

¹⁶³ <https://zakon.rada.gov.ua/laws/show/2354-19#Text>

¹⁶⁴ <https://zakon.rada.gov.ua/laws/show/74/94-bp#Text>.

¹⁶⁵ <https://zakon.rada.gov.ua/laws/show/555-15#Text>.

¹⁶⁶ <https://zakon.rada.gov.ua/laws/show/1391-14#Text> .

¹⁶⁷ <https://zakon.rada.gov.ua/laws/show/2019-19#Text>.

multiple sectors is essential for providing solutions to protect children from environmental hazards that will affect their health for a lifetime¹⁶⁸.

Ukraine is committed to achieving the SDGs. Since 2015, a series of reforms have been launched in Ukraine to implement socio-economic transformation and strengthen its democratic system. The SDGs are integrated into state policy on a 'leave no one behind' basis. An inclusive process to adopt the SDGs, which was tailored to the national development context, resulted in a national SDG system consisting of 86 national targets and 183 monitoring indicators. Ukraine has achieved progress in 15 of the 17 SDGs. A key success is poverty reduction, with poverty levels falling from 58.3 per cent in 2015 to 43.2 per cent in 2018. Major obstacles include the ongoing armed aggression, obsolete infrastructure, inefficient public administration, insufficient resource support and limited financing. The situation is exacerbated by challenges related to COVID-19¹⁶⁹.

Focusing specifically on the SDGs that are particularly relevant to children's environmental health (6, 7, 9, 11 and 13), according to the latest Ukraine SDG VNR report of 2020, only the target for SDG 6 – improving water, sanitation and hygiene – is likely to be reached and only with substantial effort. For SDG 7 – the transitioning to clean energy – more resources and commitment are needed, while the following SDG targets may not be achieved by 2930: 9 – better infrastructure, 11 – building healthy cities, and 13 – reversing climate change.

Ratification of international treaties and other international instruments

Ukraine is a state party to a number of international instruments that cover climate change, environment, energy, biodiversity protection and other areas of relevance to this report. Implementing the action plans and achieving the commitments set out under these agreements will, inter alia, help Ukraine to improve the state of the environment, strengthen its adaptation and resilience capacities, and promote sustainable and inclusive green development.

Ukraine submitted its instrument of ratification of the Paris Agreement to the United Nations on 19 September 2016. It is also a state party to the Vienna Convention for the Protection of the Ozone Layer and its related protocol (Montreal Protocol on Substances that Deplete the Ozone Layer). Ukraine has ratified four of the five amendments to the Montreal Protocol (all except the Kigali Amendment). In addition, Ukraine is a state party to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, as well as to the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) and to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention).

With regard to energy-related issues, Ukraine is a party to the Treaty Establishing the Energy Community, which extends the EU internal energy market to south-east Europe, and counts improving the environmental situation among its objectives. It has also ratified the Energy Charter Treaty, as well as the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects. This protocol supplements the Energy Charter Treaty and establishes an international framework for encouraging cooperation in energy efficiency that is compatible with sustainable development. It also offers producers and consumers incentives to save energy and use energy in an environmentally-friendly way.

Ukraine has also ratified the Convention on Biological Diversity and its Cartagena and Nagoya Protocols, as well as a number of other instruments on sustainable development and biodiversity, such as the Carpathian Convention and its Protocol on Biodiversity, the Protocol on Sustainable Forest

¹⁶⁸ World Health Organization 2017. Inheriting a sustainable world? Atlas on children's health and the environment. <https://www.who.int/ceh/publications/inheriting-a-sustainable-world/en/>.

¹⁶⁹ Voluntary National Review of SDGs in Ukraine 2020. Sustainable Development Goals Knowledge Platform. <https://sustainabledevelopment.un.org/memberstates/ukraine>.

Management, the Protocol on Sustainable Tourism, the Protocol on Sustainable Transport and the Protocol on Sustainable Agriculture and Rural Development.

Ukraine is a state party to the Convention on Long-Range Transboundary Air Pollution and notably played a role in the adoption of the Kyiv Protocol on Pollutant Release and Transfer Registers.

Other selected CEE-related international instruments to which Ukraine is a state party are listed below¹⁷⁰:

- Commission of the Convention on the Protection of the Black Sea Against Pollution;
- Convention on Wetlands of International Importance especially as Waterfowl Habitat;
- Basel Convention;
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa;
- Convention on the Conservation of Migratory Species of Wild Animals (CMS);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Rotterdam Convention;
- Stockholm Convention;
- Convention on Cooperation for the Protection and Sustainable Use of the Danube River;
- The Convention on the Protection and Use of Transboundary Watercourses and International Lakes;
- Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA);
- Agreement on the Conservation of Populations of European Bats (EUROBATS);
- Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean and Contiguous Atlantic Area (ACCOBAMS);
- Convention on the Conservation of European Wildlife and Natural Habitats;
- European Landscape Convention.

Recent and ongoing national and international CEE initiatives and partners

The EU¹⁷¹ financial and technical cooperation programme supports Ukraine's ambitious reform agenda. More than 250 projects are currently being carried out across a wide range of sectors, regions and cities in Ukraine. These include energy projects such as the Strengthening the Capacity of the State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE) project to develop energy production from renewable energy sources, and produce and use alternative fuels. They also include environment and climate projects, such as the Assistance to Ukrainian Authorities in Implementation of the National Waste Management Strategy project. Other projects include the municipal infrastructure investments programme, urban road safety projects and assistance with Dnipro transport development.

¹⁷⁰ https://mepr.gov.ua/files/docs/%D0%86%D0%BD%D1%84%D0%BE%D1%80%D0%BC%D0%B0%D1%86%D1%96%D1%8F%20%D0%BF%D1%80%D0%BE%20%D1%87%D0%BB%D0%B5%D0%BD%D1%81%D1%82%D0%B2%D0%BE%20%D0%B2%20%D0%BC%D1%96%D0%B6%D0%BD%D0%B0%D1%80%D0%BE%D0%B4%D0%BD%D0%B8%D1%85%20%D0%BE%D1%80%D0%B3%D0%B0%D0%BD%D1%96%D0%B7%D0%B0%D1%86%D1%96%D1%8F%D1%85_web.doc .

¹⁷¹ https://eeas.europa.eu/delegations/ukraine/area/projects_en.

The EU4Climate project¹⁷² is a new regional initiative that aims to address the direct and existential threat of climate change. Launched by the EU in 2019, it seeks to help the six Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine) to develop and implement climate-related policies. This project has an estimated end date of 31 December 2022. Under the Paris Agreement, Ukraine has committed to develop and regularly submit its National Adaptation Communication to the United Nations Framework Convention on Climate Change (UNFCCC), and to set and implement its national adaptation goals within the NDC framework. As recently as November 2020, Ukraine began to develop its National Adaptation Strategy up to 2030. The Ukrainian government will be supported in this process by the European Union's EU4Climate project, which is being implemented by UNDP in Ukraine.

The EU4Energy Programme¹⁷³ aims to improve the quality of energy data and statistics, shape regional policymaking discussions, strengthen legislative and regulatory frameworks, and improve access to information in the partner countries. The current 2017-2022 project consists of an injection of EU funds and expert investment advice to improve the energy efficiency of a number of top universities across Ukraine. Both initiatives will cut CO2 emissions, while an enhanced learning experience is on the horizon for both teachers and students in Chernihiv, Kharkiv, Kyiv, Lviv, Poltava, Sumy and Vinnytsia universities¹⁷⁴.

The EU4Environment Programme¹⁷⁵ is helping Ukraine develop green economy policies, implement Resource Efficient and Cleaner Production (RECP) for SME activities, promote green products, promote public procurement and eco-labelling, reinforce compliance assurance, assess and reinforce administrative capacity, and develop Green Growth Indicators (GGIs).

The European Green Deal¹⁷⁶ provides a roadmap with actions to boost the efficient use of resources by moving to a clean, circular economy and halt climate change, reverse biodiversity loss and cut pollution. It outlines the investments needed and financing tools available, and explains how to ensure a just and inclusive transition. The European Green Deal covers all sectors of the economy, notably transport, energy, agriculture, buildings, and industries such as steel, cement, ICT, textiles and chemicals. On 24 January 2020, the government of Ukraine established an inter-institutional group to coordinate the effects of climate change as part of the European Green Deal. The Deputy Prime Minister for European and Euro-Atlantic Integration chairs the work of this group. In August 2020, Ukraine submitted a position paper to the European Commission on Ukraine's vision for implementing the European Green Deal.

EBRD¹⁷⁷, through its *NDC Support Programme*, intends to support the development and implementation of the Paris Agreement and Nationally Determined Contributions in the countries of the EBRD region, including Ukraine. The EBRD will also strengthen energy security through effective regulation, market liberalization, diversified and increased production, and energy efficiency. This is reflected in the government's priorities set out in a wide range of cross-cutting and sector-specific strategic documents, and is also anchored in the EU-Ukraine Association Agreement and the Memorandum of Economic and Financial Policies with the International Monetary Fund (IMF).

UNDP¹⁷⁸ published the Human Development Report in 2020¹⁷⁹ with data from 2019. This is the latest in the series of global Human Development Reports that have been produced since 1990, containing independent, analytically and empirically grounded discussions of major development

¹⁷² UNDP press release 12 November 2020. UNDP, EU support Ukrainian government in development of National Adaptation Strategy. <https://www.ua.undp.org/content/ukraine/en/home/presscenter/pressreleases/2020/undp--eu-support-ukrainian-government-in-development-of-national.html>.

¹⁷³ <https://www.euneighbours.eu/en/east/stay-informed/projects/eu4energy-programme>

¹⁷⁴ <https://www.euneighbours.eu/en/east/stay-informed/projects/eu4energy-lower-emissions-higher-grades>

¹⁷⁵ <https://www.eu4environment.org/where-we-work/ukraine/>

¹⁷⁶ https://ec.europa.eu/commission/presscorner/detail/e%20n/ip_19_6691.

¹⁷⁷ EBRD Ukraine Country Strategy 2018-2023. <https://www.ebrd.com/ukraine.html>.

¹⁷⁸ UNDP in Ukraine: <https://www.ua.undp.org/content/ukraine/en/home.html>.

¹⁷⁹ <http://hdr.undp.org/en/countries/profiles/UKR>.

issues, trends and policies. Ukraine ranked 74 on the Human Development Index (HDI) out of 189 countries.

In addition to the above-mentioned EU4Climate project, other ongoing and completed CEE-related UNDP projects in 2020¹⁸⁰ include:

- Local Plastic Waste Management project, which has two components: developing a business case for using plastics as a secondary material in Ukraine; and an awareness-raising campaign for waste management behaviour change. The project end date is April 2021.
- Support to the Parliament of Ukraine on sustainable energy and the environment. The estimated end date was December 2020.
- EU/UNDP *Home Owners of Ukraine for Sustainable Energy Solutions (HOUSES)* project. The project end date was September 2020.

The United Nations Environment Programme (UNEP)¹⁸¹ was a partner in finalizing the 2019-2022 EU4Environment work plan and implementation plan in Ukraine in 2020. UNEP's two-year project in Ukraine¹⁸², which was launched in 2017, sought to improve chemical safety in Ukraine by strengthening national institutions and legislation for effectively implementing the Rotterdam Convention. It also sought to build capacities to detect and prevent illegal trafficking and counterfeit chemicals, with a focus on pesticides that are subject to the provisions of the Rotterdam Convention, and pesticides for fumigation.

UNIDO¹⁸³ currently has six ongoing projects in Ukraine, five of which relate to safeguarding the environment. UNIDO was also involved in work to finalize the EU4Environment work plan.

The United Nations Economic Commission for Europe (UNECE)¹⁸⁴, under the EU4Environment programme, helps countries to fully align their national legislation with the UNECE Protocol on Strategic Environmental Assessment (Protocol on SEA) and the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention). Furthermore, countries are being supported to build their capacities for applying environmental assessments more effectively and systematically. UNECE also took part in work to finalize the EU4Environment work plan.

The United Nations Institute for Training and Research (UNITAR)¹⁸⁵ works to bring a positive spin to the challenge of safeguarding our planet by building human capacities for the green economy, climate change, chemicals and waste management, and sustainable consumption and production through on-the-ground interventions, as well as distance learning and support. UNITAR works with government departments, NGOs, and education and training institutions and individuals in more than 50 partner countries through knowledge, networking and content development aligned with the 2030 SDG Agenda. In collaboration with other UN agencies, UNITAR organized two regional workshops in 2020 on e-waste monitoring/statistics in the Commonwealth of Independent States (CIS), plus Georgia, Turkmenistan, and Ukraine¹⁸⁶.

The United Nations Educational, Scientific and Cultural Organization (UNESCO)¹⁸⁷ supports eight Biosphere Reserves in Ukraine, providing conservation, development and logistical support.

¹⁸⁰ <https://www.ua.undp.org/content/ukraine/en/home.html>.

¹⁸¹ <http://www.oecd.org/environment/outreach/EU4Environment-final-work-plan-Ukraine-2020.pdf>

¹⁸² <https://www.unenvironment.org/explore-topics/chemicals-waste/what-we-do/special-programme/special-programme-projects-database-3>

¹⁸³ <https://open.unido.org/projects/UA/projects/120321>.

¹⁸⁴ <https://unece.org/environment/news/unece-helps-armenia-azerbaijan-belarus-georgia-republic-moldova-and-ukraine>.

¹⁸⁵ <https://www.unitar.org/sustainable-development-goals/planet>.

¹⁸⁶ <https://www.scycle.info/event/regional-training-workshop-on-e-waste-statistics-in-the-cis-plus-georgia-turkmenistan-and-ukraine-moscow-russia/>.

¹⁸⁷ <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/europe-north-america/ukraine/>.

The WHO¹⁸⁸ Europe Office considers global initiatives on regional level. The WHO Europe's policy on climate change and health is defined by the Parma Declaration on Environment and Health (2010), the World Health Assembly resolution on climate change and health (2008), and by the WHO global strategy on health, environment and climate change (2019). The WHO Ukraine provides technical expertise and builds national capacity on health-related matters. The WHO supported Ukraine with developing the multi-sector draft National Climate Change Adaptation Action Plan and provided technical assistance on public health issues. As a follow up, with UNDP support, this national action plan will be transformed into an on-line course for regional officers/representatives of local institutions. The WHO also works with Ministries other than the MOH in Ukraine, providing food safety training materials to the Ministry of Agriculture, for example, and gives advice to local authorities on assessing the vulnerabilities of urban and rural areas, mitigation, infrastructure, waste management and water supply modernization.

The World Bank¹⁸⁹, until 25 November 2020, supported the Gas Supply Security Facility Project for Ukraine to enhance Naftogaz's ability to increase Ukraine's security of gas supply by facilitating access to cost-effective financing and improving the terms of the gas supply contracts supported under the project. Current projects include knowledge exchange programmes on preparing for energy transformation in Ukraine and, on 6 November 2020, the World Bank approved a project to improve transport connectivity and promote agricultural sector recovery in project areas with the active engagement of conflict-affected communities.

The United Nations Office for the Coordination of Humanitarian Affairs (OCHA)¹⁹⁰ and its partners contribute to principled and effective humanitarian responses through coordination, advocacy, policy, information management, and humanitarian financing tools and services. In its effort to help alleviate the suffering of the affected population in eastern Ukraine and address to some of the long-term impacts, OCHA established a presence in Kyiv shortly after the outbreak of the crisis in 2014. Today, OCHA's 40 plus staff in Kyiv and in its four project support hubs in Kramatorsk and Siverodonetsk (in government controlled areas) and Donetsk and Luhansk (in non-government controlled areas) work together to support the coordination of international and national organizations' humanitarian assistance.

The GEF¹⁹¹ serves as a financial mechanism for several environmental conventions. Both developed and developing countries are donors to the GEF Trust Fund. Ukraine's focal areas funded by the GEF 6 Trust Fund include land degradation, climate change and biodiversity.

The North-Atlantic Treaty Organization (NATO)¹⁹². Consultations and cooperation between NATO and Ukraine cover a wide range of areas, including science and the environment and supporting the destruction of Ukraine's stockpiles of anti-personnel mines, munitions and small arms, and light weapons through Partnership Trust Fund projects. There is also another German-led trust fund that supports the disposal of radioactive waste from former Soviet military sites in Ukraine.

The OSCE¹⁹³ addresses environmental issues as an integral part of the comprehensive security concept under its Economic and Environmental Dimension (one of the three OSCE dimensions, alongside the Politico-Military Dimension and the Human Dimension). The OSCE implements a wide portfolio of projects aimed at improving Ukraine's preparedness to meet challenges to chemical and biological security. These projects include efforts to strengthen the regulatory system and build capacities to identify controlled and toxic agents; improve control over the cross-boundary movement of dangerous substances; and enhance Ukraine's emergency response capacity, and the safety of its

¹⁸⁸ <https://www.who.int/countries/ukr/> and personal communication

¹⁸⁹ World Bank. <https://www.worldbank.org/en/country/ukraine> .

¹⁹⁰ <https://www.osce.org/project-coordinator-in-ukraine/362566> .

¹⁹¹ <https://www.thegef.org/country/ukraine> .

¹⁹² https://www.nato.int/cps/en/natolive/topics_37750.htm .

¹⁹³ <https://www.osce.org/project-coordinator-in-ukraine/362566> .

laboratories. The OSCE published *The Environmental Assessment and Recovery Priorities for Eastern Ukraine* in December 2017¹⁹⁴.

USAID's¹⁹⁵ strategic approach is consistent with the strategic plans of the government of Ukraine and civil society, including the President's National Sustainable Development Strategy and the Reanimation Package of Reforms' (RPR's) Roadmap of Reforms. At present, USAID does not fund projects related to climate change adaptation and mitigation, though this might change under the new Biden administration. Current USAID CEE-related projects include:

- Energy Security Project (ESP). Project Period: July 1, 2018 – June 30, 2023¹⁹⁶;
- Energy Sector Transparency. Project period: February 1, 2019 – December 31, 2023¹⁹⁷.

GIZ¹⁹⁸ helps Ukraine meet its climate goals for reducing its consumption of resources and CO₂ output. GIZ promotes sustainable building practices and the environmentally-friendly renovation of both public and private buildings. Modern technologies are applied to improve energy efficiency, which in turn can reduce costs. Regionally, GIZ supports the municipal adaptation plans. A recent GIZ research paper, *Climate (in) justice: climate change impact on vulnerable groups in the cities of Ukraine* (2020), stated that climate change exacerbates social inequalities between different population groups and has the greatest impact on the lives of vulnerable groups, poor people, the elderly and children under 14 – creating climate injustice. GIZ has been supporting Ukraine on behalf of the German Federal Government since 1993. It has had an office in Kyiv since 2009.

The SDC¹⁹⁹ support to Ukraine in 2020-2023 focuses on four areas: (1) Peace, Protection and Democratic Institutions; (2) Sustainable Cities; (3) Small and Medium-Sized Enterprises and Competitiveness; and (4) Health. The main objectives of the CEE-related projects supported by SDC are to reduce GHG emissions, improve quality of life, especially in urban areas, and improve the health of the population. In regard to children, SDC has implemented two projects in Vinnytsya and Zhytomyr on improving district heating in residential apartment buildings, schools, kindergartens and hospitals. In addition to having economic benefits, these projects also improved people's living conditions. Another interesting project is the bike project for cities that includes teaching children to ride a bicycle. There are plans to incorporate this into some schools' curricula. In Vinnytsya, eco-lessons have been introduced into several schools, with waste sorting bins being placed in schools to encourage behaviour change. SDC has also supported integrated urban development with a focus on pedestrian mobility – parks, public spaces and public transport. SDC has provided small grants to NGOs, two of which were related to eco-education: (1) Encouraging youth involvement in Slobojansky national natural park (Kharkiv oblast), which included an eco-camp, tourist route marking and eco-education, resulting in infrastructure at the park becoming more environmentally-friendly for visitors; (2) Promoting teenagers' involvement throughout Ukraine, eco-education for selected children and helping children to develop and implement projects in their communities (such as planting trees and waste sorting).

Main CEE state actors

The Ministry of Ecology and Natural Resources of Ukraine²⁰⁰ formulates and implements state policy on environmental protection, the environment and radiation, biological and genetic safety, fisheries and the fishing industry, the protection, use and reproduction of aquatic bio-resources, forestry and hunting, water resources management, geological research, the control and use of subsoils, and management of the Chernobyl Exclusion Zone. The Ministry's mandate includes state supervision

¹⁹⁴ <https://www.osce.org/project-coordinator-in-ukraine/environmental-activities> .

¹⁹⁵ USAID Country Development Cooperation Strategy 2019-2024.
https://www.usaid.gov/sites/default/files/documents/1863/Ukraine_USAID_CDCCS_2019-2024_Public_EN_12.pdf .

¹⁹⁶ <https://energysecurityua.org/>.

¹⁹⁷ <https://ua-energy.org/en> .

¹⁹⁸ <https://www.giz.de/en/worldwide/302.html> .

¹⁹⁹ <https://www.eda.admin.ch/countries/ukraine/en/home/representations/embassy-in-kiiev/cooperation-office.html>

²⁰⁰ <https://mepr.gov.ua> .

(control) of environmental protection, and the rational use, reproduction and protection of natural resources. The Ministry is one of the key bodies responsible for ozone layer conservation policy, regulating the negative anthropogenic impacts of climate change and climate change adaptation, and compliance with the UNFCCC and its Kyoto Protocol, and the Paris Agreement. It leads 24 Multilateral Environmental Agreements (MEA).

The Ministry of Energy of Ukraine²⁰¹ formulates and implements state policy in the electricity, nuclear, coal, peat and oil and gas sectors. It is responsible for implementing the Energy Strategy of Ukraine for the period up to 2035, entitled *Security, Energy Efficiency, Competitiveness*, as well as a number of climate change and energy efficiency-related programmes and projects, such as the National GHG Emissions Reduction Plan. The Ministry is developing a new energy independency policy. The Ministry is responsible for setting policy for the electricity, nuclear energy, oil and gas and coal industries. The **State Agency for Energy Efficiency and Energy Saving of Ukraine**²⁰², which reports to the Ministry, leads the renewable energy resources policy. As a key body responsible for energy policy, it also raises public awareness on energy reform, efficiency and savings.

The State Service of Emergency Situations of Ukraine²⁰³ is a government agency that reports directly to the Minister of Interior Affairs and holds a comprehensive mandate that covers emergency response (including fire and anthropogenic safety, and disaster search and rescue), disaster risk reduction and radioactive waste management. It issues expert opinions on the level of the emergency situation, implements measures to evacuate the population and keeps records of the emergencies that have occurred. It also ensures the implementation of measures to minimize and eliminate the consequences of emergencies, conducts educational and practical-educational work to prepare the population for action in emergencies, and develops and approves organizational and methodological recommendations and programmes for training the population.

The Ministry of Social Policy of Ukraine²⁰⁴ is responsible for social security and social welfare, labour relations, children and families, people living with disabilities, women and gender, and humanitarian aid. It coordinates a number of social programmes to promote children's rights and well-being, including financial support and subsidies to assist low-income families with paying for housing and utilities. It also covers child adoption and alternative care, supporting people with disabilities (including children), preventing and tackling domestic violence and child abuse. The reform package on alternative care includes a strong de-institutionalization component, which has been implemented since 2017 to promote the closure of children's residential institutions and replace them with family-based care. Since the start of the ongoing conflict in the East in 2014, the Ministry has implemented a support programme for internally displaced people (including children).

The Ministry of Communities and Regional Development of Ukraine²⁰⁵ is in charge of regional development and housing policy. Children's well-being relating to CEE issues is indirectly covered within the Ministry's programmes, which include developing local self-government, regional development and policy (development of rural areas, including the healthcare system, and mountainous areas), energy efficiency and savings in housing.

The Ministry of Education and Science of Ukraine²⁰⁶ is responsible for developing and implementing state policies on education and science. The Ministry is in charge of pre-school education, general secondary education, vocational education and training, higher education and the national qualifications framework. It is the flagship government ministry for issues concerning the concept of the New Ukrainian School. Therefore, the Ministry may play a key role in introducing topics such as

²⁰¹ <http://mpe.kmu.gov.ua/minugol>.

²⁰² <https://sae.gov.ua/en>

²⁰³ <https://www.dsns.gov.ua/en/>.

²⁰⁴ <https://www.msp.gov.ua/en/>.

²⁰⁵ <https://www.minregion.gov.ua/en/ministry-for-development-of-communities-and-territories-of-ukraine/>.

²⁰⁶ <https://mon.gov.ua/eng>.

climate change, environmental protection, rational use of natural resources, energy efficiency and savings into both formal and non-formal educational frameworks at different levels.

The National Student Youth Centre for Environment and Nature²⁰⁷, known under its Ukrainian acronym NENC, is a capacity-building hub established under the auspices of the Ministry of Education and Science to promote the development of environmental education in the nation. It acts both as a clearinghouse for innovative educational methodologies and as a direct provider of capacity-building services, including refresher training for teachers.

The Ministry of Health of Ukraine²⁰⁸ develops and implements state policy for health, including protection against infectious diseases, HIV infection/AIDS and other socially dangerous diseases, and the prevention and prophylaxis of non-communicable diseases. In addition to epidemiological surveillance, the Ministry also collects and analyses health data and reports on the health status of the population through its Centre for Medical Statistics. The Ministry is responsible for environmental and hygiene regulations, and for responding to health hazards and health emergencies, which includes responses to climate change. Following an order from the Cabinet of Ministers, the Ministry has developed an Action Plan for Adaptation of the Population to Climate Change by 2022, which is currently undergoing an expert evaluation. Both the O.M. Marzieiev Institute for Public Health of the National Academy of Medical Sciences and the National Centre of Public Health were involved in preparing this action plan.

The State Agency of Water Resources²⁰⁹ implements state policy on water resource management, use and reproduction, on developing water management and land reclamation and on operating multi-use state water facilities, inter-farm irrigation and drainage systems. It monitors surface water resources for water supply. The Agency conducts educational and learning activities for children, highlighting the need to take care of natural resources, including water. Awareness-raising on the rational use of water resources is especially important for addressing climate change and shrinking water resources.

The State Agency of Forestry²¹⁰ is the central executive body of Ukraine for forestry, hunting and hunting dog breeding. It maintains the state forest cadastre and forest accounts, and monitors soils in order to grow productive forest plantations and forest vegetation, as well as overseeing the hunting of animals. In order to prevent forest fires, the number of which is growing due to climate change, forest management teams working under the Agency create fire breaks and barriers, and mineralized strips. The Agency's key task is the preservation of forests, which is very important in the context of climate change for absorbing GHG emissions, cleaning atmospheric air, preventing floods and mudslides, maintaining agricultural adaptation, and providing recreational services to help people adapt to rising temperatures.

The State Agency of Land Resources²¹¹ implements state policy on the regulation of land relations, and on the use, reproduction, protection and monitoring of lands. It maintains the state land cadastre, oversees topographic and geodetic and cartographic activities, and is responsible for inter-sector coordination and state regulation for establishing oblast, rayon, city, city rayon, village and settlement boundaries. It conducts state controls on the use and protection of land. Since 2013, it has been responsible for transferring state-owned agricultural land to private ownership or use. In light of CEE, land resources are vulnerable to changes, but also have strong adaptation potential if properly managed.

²⁰⁷ <https://nenc.gov.ua/> .

²⁰⁸ <https://en.moz.gov.ua/> and personal communication

²⁰⁹ <https://www.davr.gov.ua> .

²¹⁰ <http://dklg.kmu.gov.ua/forest/control/uk/index> .

²¹¹ <https://land.gov.ua> .

The State Ecological Academy of Postgraduate Education and Management²¹² is the leading organization for methodology development and the continuous professional education of civil servants working for the Ministry of Ecology and Natural Resources of Ukraine. It directly manages CEE education, training and awareness-raising at different levels (schools, higher education, post-graduate and vocational training). The **Aarhus Centre** has operated in Ukraine since 2002. Hosted by the Ministry of Ecology and Natural Resources, the Centre supports and promotes the implementation of the Aarhus Convention in Ukraine. The Aarhus Centre is a key player in environmental education and capacity-building for teachers on environment-related issues. The Centre operates as a structural unit of the State Ecological Academy of Postgraduate Education and Management, where they support the activities of the Education for Sustainable Development Centre.

The Institute of Educational Content Modernization²¹³ was established by the Cabinet of Ministers of Ukraine Resolution No. 687 of 26 November 2014 on Establishment of the Institute of Educational Content Modernization and the Institute of Education Analytics, and is based on the State Scientific Institution's Institute of Innovative Technologies and Educational Content. It reports to the Ministry of Education and Science. The Institute is tasked with providing methodological support to educational reform, in particular with developing educational content and introducing innovative instructional technologies.

The departments of ecology and natural resources within regional state administrations fall under the authority of the regional (oblast) state administrations and report to the Minister of Ecology and Natural Resources. At the regional level, they manage and implement state policy on: environmental protection; the rational use, reproduction and protection of natural resources; waste management; the formation and preservation of the ecological network and biodiversity; preservation of the ozone layer; regulations on climate change adaptation and the negative anthropogenic impacts of climate change; environmental impact assessments and strategic environmental assessments in the region; and providing environment-related information to the public through the media. Departments conduct educational lectures and awareness-raising events for children, and organize clean-up operations.

Local self-government bodies. Chapter XI of the Constitution of Ukraine sets out the principles of local self-government. It defines local self-government as the right of a territorial community to independently address local-level issues within the limits of the constitution and the law. According to Article 140 of the Constitution, local self-government is exercised through local councils in villages, towns and cities, and their executive bodies. The local exclusive competences are governed by the Constitution of Ukraine (Article 143) and the Law on Local Self-Government. They stipulate that local governments, inter alia: approve socio-economic and cultural development programmes and supervise their implementation; approve the budgets of the respective administrative units and oversee their implementation; manage housing and communal services, trade services, transport and communications; manage building and construction; manage education, health, culture, physical culture and sport; and regulate land relations and the sphere of environmental protection.

National initiatives and NGOs

The Ukrainian Red Cross Society²¹⁴, which was first established in 1918, is one of the oldest non-governmental organizations in the country and a member of the International Federation of Red Cross and Red Crescent Societies. In Ukraine, it focuses on providing humanitarian aid, including to children, first aid training, health and educational activities, assistance to emergency-affected people (including children), assistance to internally displaced people (IDP) due to the armed conflict in eastern Ukraine, and psychosocial support to the affected populations. One of the Ukrainian Red Cross Society's top priorities is developing the youth movement, with a focus on vulnerable populations (IDPs, people living with disabilities, orphans), healthcare (promoting healthy lifestyles, prevention of infectious

²¹² <http://en.dea.edu.ua>.

²¹³ <https://en.imzo.gov.ua/>.

²¹⁴ <http://www.redcross.org.ua>.

diseases) and emergency response services (first aid and mine safety training, encouraging young people to join emergency response teams). At present, it operates as a four-tiered network of offices across Ukraine, at the national, regional, municipal and community levels.

Caritas Ukraine²¹⁵ has worked in Ukraine since 1992, providing humanitarian assistance to hundreds of people a week, mostly in cities in the eastern part of Ukraine, and in rural areas in the western part of the country. Their priority areas are orphanages, institutions and families with poor conditions at home. The focus is on improving health, social skills and self-care through non-formal education. Caritas runs 15 youth centres and works with local communities to encourage children/young people to be active within their communities. Caritas also supported many families affected by the floods in western Ukraine in June 2020.

The National Ecological Centre of Ukraine (NECU)²¹⁶ is a non-profit NGO that was established in 1991. NECU members include scientists, journalists, artists, students and other people interested in joining the environmental protection effort. The organization has branches in a dozen Ukrainian cities. NECU's main focus areas include biodiversity, energy, global climate change and transport.

Mama-86 (in operation between 1990 and 2020)²¹⁷ was a national environmental network established in 1990 by mothers concerned about the effects of the Chernobyl disaster on the environment and health. The organization conducted a number of activities to highlight environmental contamination and the impact on human health (including that of children) and water supply quality (working on WASH projects, including UNICEF projects), as well as conducting effective awareness-raising campaigns and events for and with children and young people.

NGO Working Group on Climate²¹⁸ is a network of 16 non-governmental and non-profit environmental organizations all over Ukraine. They advocate for the transparent use of Kyoto Protocol mechanisms and the introduction of emission reduction policies. They also raise public awareness of climate change and mobilize civil society for action. The **Centre for Environmental Initiatives 'Ecoaction'**²¹⁹ is one of the members of this working group and advocates for energy efficiency, renewable energy, climate change impact monitoring, air quality monitoring, and support for sustainable transport and agriculture development in Ukraine. It seeks to influence decision-makers and encourage them to introduce more environmentally-friendly government policy.

Ecoclub Green Wave²²⁰ is an ecological non-profit organization of students and alumni of the National University of Kyiv-Mohyla Academy whose goal is to preserve the environment through research, educational and social activities. Ecoclub is a combination of an NGO and student organization. Ecoclub implements and participates in various initiatives on climate change and climate change adaptation, environmental education and environmental protection.

Environment. People. Law²²¹ is a non-profit organization whose main aims include: improving Ukrainian environmental protection legislation; providing education for environmental lawyers as key drivers of positive change; environmental rights protection at the national level; providing legal aid to individuals alleging violations of their environmental rights; public awareness-raising; building litigation capacity in environmental cases for the legal profession and environmental law awareness-raising for judges and lawyers; organizing international conferences and seminars aimed at global improvement of the environment; and protecting nature from reckless and irresponsible interference from the industrial sector.

²¹⁵ <https://www.caritas.org/where-caritas-work/europe/ukraine/>.

²¹⁶ <https://necu.org.ua>.

²¹⁷ www.mama-86.org.ua.

²¹⁸ https://ucn.org.ua/?page_id=73.

²¹⁹ <https://en.ecoaction.org.ua/>.

²²⁰ <https://ecoclubua.com/en/green-wave-ecoclub/>.

²²¹ <http://epl.org.ua>.

The Ukrainian Youth Climate Association²²² is a dynamic platform for the development and interaction of sustainability change agents. It implements projects to unleash the potential of young activists as community leaders, 'green' professionals, and future officials. It facilitates multi-stakeholder cooperation over pressing environmental issues and creates opportunities for active young people nationwide to kick-start their own sustainability projects. In 2012, Ukrainian Youth Climate Association partners enlisted the support of more than 500 people from all over Ukraine. It set up independent teams in Kyiv, Lviv and Rivne that jointly and independently implemented more than 20 practical climate change projects and campaigns.

Plast²²³ is a Ukrainian scouting organization. As a non-political and non-religious organization established in 1911, Plast's mission is to promote the comprehensive, patriotic education and self-education of Ukraine's youth. Plast teaches young people to become conscious, responsible and fully-fledged citizens of the local, national and world community, and society leaders. It has more than 150 divisions and 10,000 members nationwide.

The Association of Ukrainian Cities is a nationwide association of local self-government bodies. Founded in 1992 as a network of 35 member municipalities, it has since grown into an association that spans areas across the entire nation, covering over 95 per cent of Ukraine's total population. The Association is active in community development and local self-government reform. In particular, it provides capacity-building for municipal civil servants. It plays an important role in promoting the child-friendly city concept and sustainable urban development.

The above-listed NGOs have been selected based on their relative prominence, and with a view to showcasing different types of organization and areas of engagement. These NGOs also feature on the list of stakeholders interviewed. However, they are not the only NGOs working on CEE-related areas. Annex 3 provides a list of organizations that sit on the Public Council of the Ministry of Ecology and Natural Resources of Ukraine²²⁴.

These organizations can be roughly grouped into the following clusters:

- Pan-Ukrainian environmental NGOs for whom working with young people is an important part of their activities;
- Professional associations working in the area of environmental advocacy and environmental rights;
- NGOs that work on waste management/utilization/recycling;
- Organizations representing industry sectors that have a significant environmental impact;
- Others (including regional- and city-level organizations).

At least one of these organizations (the Kyiv City Innovative Association of Industry Employers 'Centre for Resource-Effective and Clean Production'/ Київська міська інноваційна галузева організація роботодавців 'Центр ресурсоефективного та чистого виробництва') was mentioned in an interview with another stakeholder, which may serve as an indirect positive assessment of their role.

Coordination mechanisms

The World Bank's 2016 Ukraine Country Environmental Analysis noted general weakness in coordination as a limiting factor as far as the effectiveness of environmental management is

²²² <https://world.350.org/ukraine/uyca/>.

²²³ <https://www.plast.org.ua>

²²⁴ The Public Council consists of non-profit stakeholders and acts a consultative and advisory body to the Ministry of Ecology and Natural Resources in the area of its mandate.

concerned²²⁵. This finding is echoed by other opinions, which, in addition, stress the inadequacy of the coordination between economic and environmental policies. According to the Pulse of the Agreement project (2019), the Cabinet of Ministers of Ukraine, the Verkhovna Rada of Ukraine and stakeholders have completed 37 per cent of the planned annual volume of tasks required for implementation of the Association Agreement with the EU; and only 28 per cent of the planned environment-related tasks have been carried out. An opinion²²⁶ presented to representatives of the EBA Committee on Industrial Ecology and Sustainable Development during an open committee hearing on Ukraine's participation in the European Green Deal (EGD) explained the above mismatch as being due to inadequate coordination between economic and environmental policies, pointing out that unless proper coordination is introduced, it will be impossible to implement the provisions of the EGD.

This is recognized by Ukraine's authorities, which have consistently prioritized improving coordination for environmental protection. In particular, the Law on the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the period up to 2030²²⁷ expressly provides for the development of cross-sector coordination and stakeholder participation. The Plan of Measures to Implement the Association Agreement between Ukraine and the EU in the context of the tasks of the Ministry of Ecology and Nature Protection, approved by the Cabinet of Ministers of Ukraine Resolution No. 1106 of 25 October 2017 (published in March 2018), also emphasizes the need for appropriate coordination with the government bodies concerned.

At the interagency and ministerial level, coordination initiatives have been launched in the form of focal points, working groups and expert councils. The Cabinet of Ministers of Ukraine has established an interagency working group to tackle climate change as part of the EGD, which has the declared key target of protecting the health and well-being of the population from the risks and consequences of climate change, as well as to ensuring the coherence of actions of all branches of the executive power in fulfilling the set goals of Ukraine's sustainable development. A National Focal Point under UNFCCC has also been set up, with the Ministry of Ecology and Natural Resources of Ukraine assigned to act in this capacity. To ensure achievement of the SDG environmental targets, an Interagency Working Group on Achieving the SDGs has been set up under the Cabinet of Ministers²²⁸. To date, the ministries' responsibilities for the SDG targets have been defined, the President of Ukraine has issued a decree setting the SDGs as a benchmark for programming and forecasting documents, the SDG monitoring system has been developed, and an assessment on mainstreaming the SDGs into national and subnational planning has been produced. Moreover, pending the adoption of the National Energy and Climate Plan (NECP), it is expected that the composition of the NECP technical working group will soon be updated and the group revived. Up to now, NECP-related questions have been considered by an Expert Council supporting the Ministry of Energy created in May 2020²²⁹.

The related documents, however, do not specifically address the effects that CEE issues have on children. It is, therefore, desirable that a coordination mechanism be established specifically to address the issues of CEE and children. This mechanism could take the form of a standing task force, and should promote, inter alia, impact assessments of draft policies, legislation and regulations on the situation of children in Ukraine. In addition, a mechanism should be created to promote children's participation as part of wider stakeholder participation. A development that gives hope in this regard is the fact that, in 2020, when Ukraine was reviewing its Paris Agreement NDC, a working group was set up to explore the possibility of greater youth participation in the process²³⁰. It remains unclear, however, if any concrete steps have been taken in this regard.

²²⁵ Ukraine Country Environmental Analysis 2016, The International Bank for Reconstruction and Development / The World Bank.

²²⁶ <https://eba.com.ua/en/ukrayini-brakuye-koordinatsiyi-mizh-ekonomichnoyu-ta-ekologichnoyu-politykoju/>.

²²⁷ Про Основні засади (стратегію) державної екологічної політики України на період до 2030 року Документ 2697-VIII. <https://zakon.rada.gov.ua/laws/show/2697-19>

²²⁸ <https://sustainabledevelopment.un.org/memberstates/ukraine>.

²²⁹ <https://www.energy-community.org/implementation/Ukraine/CLIM.html>.

²³⁰ <https://www.climatecard.org/2020/02/ukraine-government-puts-forward-new-climate-change-policies-at-cop-25/>

As far as donor coordination is concerned, there are a number of humanitarian coordination clusters active in Ukraine under the OCHA umbrella²³¹, one of which is a child protection cluster. It is understood that environmental issues are treated as a cross-cutting topic, being mainstreamed into the agenda and activities of individual thematic clusters, such as child protection, health and nutrition, food security and livelihoods, and WASH.

²³¹ <https://www.humanitarianresponse.info/en/operations/ukraine>.

CHAPTER II: KEY FINDINGS

Governmental CEE-related policies and strategies

- CEE-related policies and strategies in Ukraine are developed based on needs and recent challenges. Environmental legislation was created independently using the experience of foreign countries. Government priorities cover such areas as energy independency and diversification, energy efficiency, GHG emissions reduction and waste management, as these are considered to be potentially economically-profitable sectors.
- Ukraine develops climate change policy and participates in global climate change processes. It is a state party to the UNFCCC and its Kyoto Protocol (under Annex I, countries with targets) and has used Kyoto Protocol financial mechanisms for GHG emissions. It has also signed the Paris Agreement on climate change, and has developed and submitted its NDCs. Ukraine's second NDCs are currently undergoing review.
- Ukraine has a developed national legislative framework on climate change mitigation (i.e., State Climate Policy Concept until 2030, Action Plan to Implement State Climate Policy Concept till 2030, Strategy of Low Carbon Development of Ukraine by 2050, National Energy Strategy till 2035) and sector strategies that will help to mitigate negative impacts (i.e., Sustainable Development Strategy of Ukraine by 2030, Basic Principles [Strategy] of the State Environmental Policy of Ukraine for the period up to 2030, National Security Strategy, National Transport Strategy of Ukraine 2030, Water Strategy of Ukraine [draft], Irrigation and Drainage Strategy of Ukraine for the period up to 2030, National Waste Management Strategy 2030).
- Ukraine is currently developing a Climate Change Adaptation Strategy and some sector strategies are either already being developed (Strategy for Adaptation to Climate Change in Agriculture, Forestry and Fisheries of Ukraine up to 2030; Action plan for Adaptation of the Population to Climate Change by 2022) or their development is just about to get underway (adaptation of selected water basins, such as the Dniester River Basin). Clearly earmarked and sufficient financial resources are key for successful implementation of the adaptation measures.
- The EU-Ukraine Association Agreement is an efficient instrument for supporting Ukraine's integration with the political, economic and social aspects of the EU, and building its capacities for managing CEE impacts. The 2019 Report on Implementation of the EU-Ukraine Association Agreement indicated that moderate progress has been made on environmental policy and climate protection since 2014.
- Ukraine is committed to achieving the SDGs and has achieved progress in 15 of the 17 SDGs since 2015. Of the SDGs relevant to children's environmental health (6, 7, 9, 11 and 13), only the SDG 6 target on improving WASH is likely to be reached, and only with substantial effort.

Ratification of international treaties and other international instruments

- Ukraine is a state party to a number of international instruments on climate change, the environment, energy, biodiversity protection, and other areas of relevance to this report. Implementing the action plans and achieving the commitments set out under these agreements will help Ukraine to improve the state of the environment, strengthen its adaptation and resilience capacities, and promote sustainable and inclusive green development.

Recent and ongoing national and international CEE initiatives and partners

- Ukraine receives support from numerous international partners and development agencies, including the EU, EBRD, NATO, UNDP, UNECE, UNEP, UNESCO, UNIDO, UNITAR, UNICEF, OCHA, WHO, World Bank, USAID, GIZ, and SDC.
- Donor coordination has resulted in horizontal synergies. For example, under the European Union's EU4Environment programme, UNECE helps Ukraine fully align its national legislation with the UNECE Protocol on Strategic Environmental Assessment. Similarly, the Ukrainian authorities' efforts to develop the National Adaptation Strategy up to 2030 are to receive support from the EU's EU4Climate project, which is being implemented by UNDP in Ukraine.
- National, regional and local, non-profit and non-governmental, environmental and youth organizations work mainly on environmental education and awareness-raising.
- Some state-hosted centres, such as the National Student Youth Centre for the Environment and Nature and the Aarhus Centre, serve as nationwide hubs for methodological support and environmental educational content development.

Main CEE state actors

- The Ministry of Ecology and Natural Resources of Ukraine is the key governmental body responsible for climate change-related policy and environmental protection. It is the focal point for implementation of the UNFCCC in Ukraine.
- The Ministry of Energy of Ukraine is responsible for developing a new energy independency policy. It is also responsible for implementing the Energy Strategy of Ukraine up to 2035, entitled '*Security, Energy Efficiency, Competitiveness*', and promotes the development of renewable energy resources.
- Other governmental institutions that deal with CEE issues as part of their mandates include ministries (such as regional development, health, social policy, education), state agencies (such as water, forests, land, energy efficiency), the State Service of Emergency Situations, the Hydrometeorological Centre, and research institutions (e.g., the State Ecological Academy).
- Regional (oblast) administrations (including their Departments of Ecology and Natural Resources) and local authorities play an important role in promoting nature protection activities and sustainable development.

Coordination mechanisms

- General weakness in coordination has been noted as a limiting factor as far as the effectiveness of environmental management is concerned. In particular, poor coordination has been noted as a potential obstacle to implementation of the provisions of the EGD.
- The need to improve coordination is recognized by Ukraine's authorities. In particular, the Law on the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the period up to 2030 expressly provides for the development of cross-sector coordination and stakeholder participation.
- At the interagency and ministerial level, coordination initiatives have been launched in the form of focal points, working groups and expert councils. In particular, the Cabinet of Ministers of Ukraine has established an interagency working group to tackle climate change as part of the EGD.
- None of the public sector coordination documents, however, specifically address the effects that CEE issues have on children. It is, therefore, desirable that a coordination mechanism be established specifically to address the issues of CEE and children. This mechanism could take the form of a standing task force, and should promote, inter alia, impact assessments of draft policies, legislation and regulations on the situation of children in Ukraine.
- As far as donor coordination is concerned, a number of humanitarian coordination clusters are active in Ukraine under the OCHA umbrella, one of which is a child protection cluster – environmental issues are treated as a cross-cutting topic.

3

ARE CHILDREN BENEFITING FROM CEE INVESTMENTS AND PROGRAMMES?



Child-targeted programmes, projects and activities

To date, children's issues have not been factored into CEE investment as a specific priority. While there is doubtless a clear connection between child protection, health and well-being, and CEE factors, the prospective impact on children is not specifically considered in CEE policy- or law-making.

This is not to say that CEE investments and programming have ignored children's issues. Environmental education and eco-friendly urban planning have included major components that have targeted children or primarily focused on children. Some examples include a focus on mainstreaming environmental education into school curricula, and the promotion of child participation and youth entrepreneurship by eco-centred startup incubator initiatives. However, these activities have been implemented in a piecemeal manner, rather than as part of a consistent strategic approach to mainstreaming children's issues into CEE strategy development and decision-making.

It is to Ukraine's authorities' credit that the state has consistently committed to improving the environmental situation, developing a green economy and promoting sustainable development (specific commitments are discussed in Chapter II *Responses to CEE in Ukraine at different levels*). This process is aided by the fact that Ukraine has ratified most key international legal instruments on the environment and developed a legislative and policy framework. The consistent pursuit of integration with the political, economic and social aspects of the EU serves as a powerful driver for promoting environmental reform.

Nevertheless, relatively weak interagency coordination, combined with the above-mentioned lack of child-centred impact assessments when implementing policy change, have translated into poorer outcomes for children than otherwise would be expected given the scale of Ukraine's commitment to environmental reform. Improving coordination and mainstreaming children's issues into national and regional level coordination mechanisms could help improve this situation.

Another factor hampering the incorporation of children's issues into CEE investments and programming is the general absence of child-sensitive statistical indicators across relevant areas. Since meaningful policymaking and programme development should be evidence-led, solid statistical data on CEE and children is required. In this context, the above-mentioned recommendation to consistently conduct impact assessments on the situation of children during CEE-related policymaking needs to be reiterated.

Moreover, relevant stakeholders should promote proactive research on specific, currently under-researched areas of interplay between CEE and children's situations. Some examples include the impact of natural emergencies, and the effectiveness and efficiency of disaster reduction measures on child protection, early childhood development and mental health, since it is in these areas that the evidence gap is particularly apparent.

In summary, benefits to children from current and prospective CEE investments and programming can be maximized through the adoption of a child-centred approach to climate change adaptation. This approach should not be restrictively interpreted as being child-targeted (although child-targeted programming and policies, which specifically address children's needs, form a large part of the approach). It should also incorporate child-led adaptation, i.e., programming that involves children in its design and delivery, and possibly also implementation.

It should be noted that the stakeholder interviews appear to have had a positive effect on raising stakeholders' awareness of the linkages between CEE and their respective mandates, boosting potential interest in addressing child-specific issues in CEE investments and programming.

CHAPTER III: KEY FINDINGS

- To date, children's issues have not been factored into CEE investment as a specific priority. While CEE investments and programming have not ignored children's issues, child-related activities have been implemented in a piecemeal manner rather than as part of a consistent strategic approach to mainstreaming children's issues into CEE strategy development and decision-making.
- The general absence of child-sensitive statistical indicators across relevant areas is hampering the incorporation of children's perspectives into CEE investments and programming. In this context, impact assessments on the situation of children need to be consistently conducted during CEE-related policymaking.
- Currently under-researched areas of interplay between CEE and children's situations where the evidence gap is particularly apparent include the impact of natural emergencies, and the effectiveness and efficiency of disaster reduction on child protection, education and early childhood development, and mental health.

4

THE IMPACT OF CLIMATE, ENVIRONMENT AND ENERGY ISSUES ON CHILDREN



Child population

As of 1 January 2019, children and young people up to 24 years accounted for 25 per cent (10.5 million) of Ukraine's total population of 42 million, with the 15-19 age group being the smallest (1.8 million), and the 5-9 age group the largest (2.4 million)²³². However, according to projected estimates, the number of children and young people is set to fall by 2030 (to 9.1 million, equivalent to a decline of about 15 per cent). Ukraine is the 89th most urbanized country in the world with an urban population share of 69.4 per cent. Two-thirds of Ukrainian children (66.1 per cent) live in cities, and a third (33.9 per cent) live in rural areas²³³.

Number of children in Ukraine, by region in 2011 and 2017, thousands

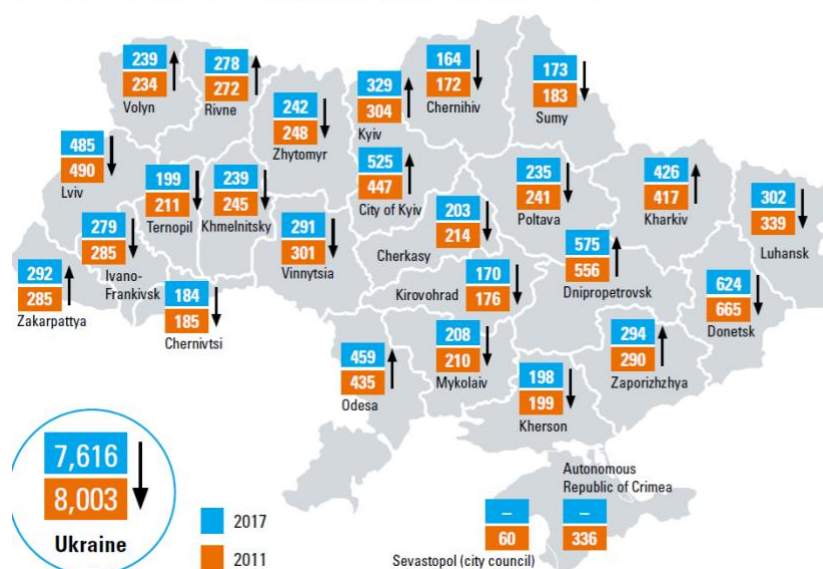


Figure 3: Number of children in Ukraine, by oblast in 2011 and 2017 (thousands)

Source: State Statistics Service of Ukraine²³⁴

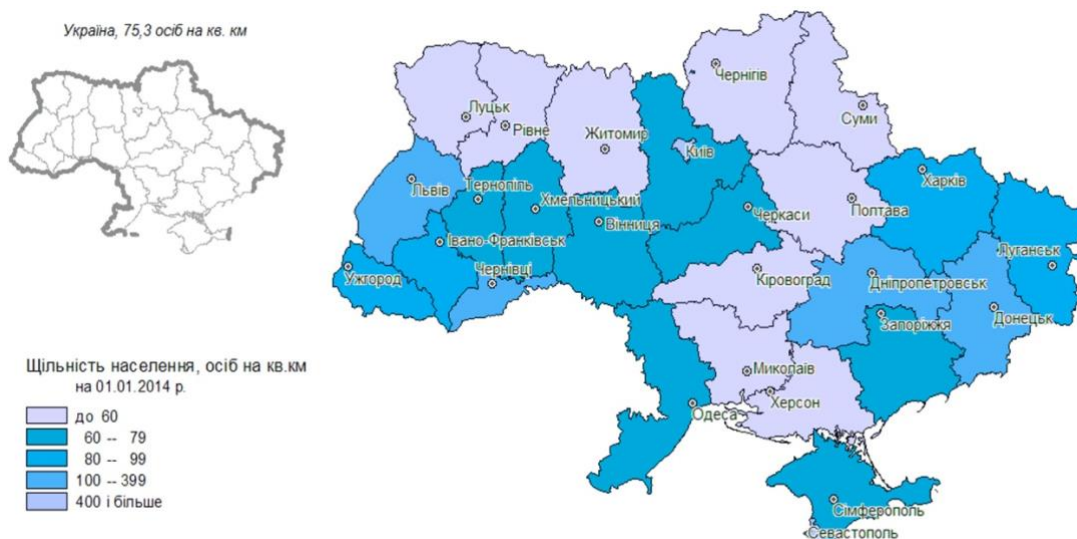


Figure 4: Population density in Ukraine (2014)

Source: <http://database.ukrcensus.gov.ua/MULT/Map/2013/m0102.htm>

²³² State Statistics Service of Ukraine Statistical Yearbook of 2018.

http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf.

²³³ The Ministry of Economic Development and Trade of Ukraine, Ministry of Social Policy in Ukraine and State Statistics Service of Ukraine National Report on the 'Sustainable Development Goals for the Children of Ukraine'. Data 2014-2017. Supported by UNICEF. <https://www.unicef.org/ukraine/en/reports/sustainable-development-goals-children-ukraine>.

²³⁴ From UNICEF: SDGs for Children in Ukraine.

With regard to the projected 15 per cent fall in the number of children and young people by 2030, the findings of demographic research have revealed that the decline to very low fertility in Ukraine has been a complex process with no single explanation. Macro-level social and economic change has clearly led to a new form of childbearing decision-making, but the specific causes of these new practices are still unknown. No study has found a direct relationship between fertility and economic indicators such as unemployment or income. Thus, economic uncertainty and ideational change are probable explanations, but require further research²³⁵.

Yet will climate change also affect population growth? So far, relatively little is known about whether and how reproductive goals and behaviours of women and their partners may be influenced by a changing climate. However, a number of recent empirical studies offer evidence of such effects, underscoring the multidimensional ways in which households modify their structure and activities in response to changing environmental conditions. The effects also highlight the complex and interactive linkages between population growth rates and climate change. Changes in temperature and precipitation may influence reproductive goals (e.g., the desire for another child, ideal family size) and behaviours (e.g., contraceptive use, childbearing) through multiple pathways. For example, climate-induced changes in household resources may lead to intentional decisions to increase or decrease family size. If children are viewed as net consumers of resources then climate-induced resource constraints, such as diminished agricultural output or income, may lead to a reduction in family size. The opposite may occur if children are viewed as net producers (e.g., a source of labour). Climatic changes may also cause shifts in fertility by decreasing children's health and survival, which may drive women to have additional children in anticipation of increased mortality risks ('insurance effects') or in response to an actual child death ('replacement effects')²³⁶.

Social protection and child protection

Social protection and poverty

Climate change increases the risk of weather shocks and similar adverse events, which, in turn, raise the risk of additional deprivations for individual households. These deprivations can either be quantified monetarily (which, from a certain point, implies poverty) or be in the form of limitations on access to services. Climate change-induced shocks, in particular, are likely to primarily affect food security and cause disruptions in access to basic services due to shock-provoked displacement. Either way, efficiently and effectively addressing the impact that climate change can have on standards of living requires shock-responsive²³⁷ and adaptive²³⁸ social protection policies. It is worth reiterating that, as outlined in *Agriculture and Food Security* above, despite Ukraine being a renowned exporter of agricultural and food products, the country does not place highly for food security in international rankings such as the Economist Global Food Security Index (where Ukraine is currently 73rd on a list of 113 ranked countries).

Recent research shows that remuneration in Ukraine by types of economic activity (within the agro-food sector) ranges from 64 per cent of the national level in agriculture to 114 per cent in industry. In agriculture, average salaries equate to 81 per cent of the national level salary; in industry, they amount to 109 per cent; in the food industry, specifically, salaries equate to 94 per cent of the national level; and they equate to 106 per cent in the wholesale and retail trade²³⁹.

²³⁵ Demographic research. Ukraine: On the border between old and new in uncertain times. <http://www.demographic-research.org/Volumes/Vol19/29/>

²³⁶ Climate Change Will Likely Influence Fertility Rates <https://www.newsecuritybeat.org/2019/09/climate-change-influence-fertility-rates/>

²³⁷ Oxford Policy Management 2016, Shock-Responsive Social Protection Systems Literature Review, available at http://www.opml.co.uk/sites/default/files/Shock_responsive_social_protection_Literature%20review_EN.pdf.

²³⁸ <http://www.ids.ac.uk/project/adaptive-social-protection>.

²³⁹ Olha Kravchenko, Anatolii Kucher, Maria Hełdak, Lesia Kucher and Joanna Wyszumłek, Socio-Economic Transformations in Ukraine towards the Sustainable Development of Agriculture (2020).

Absolute Poverty: Distribution by income assessment in 2019

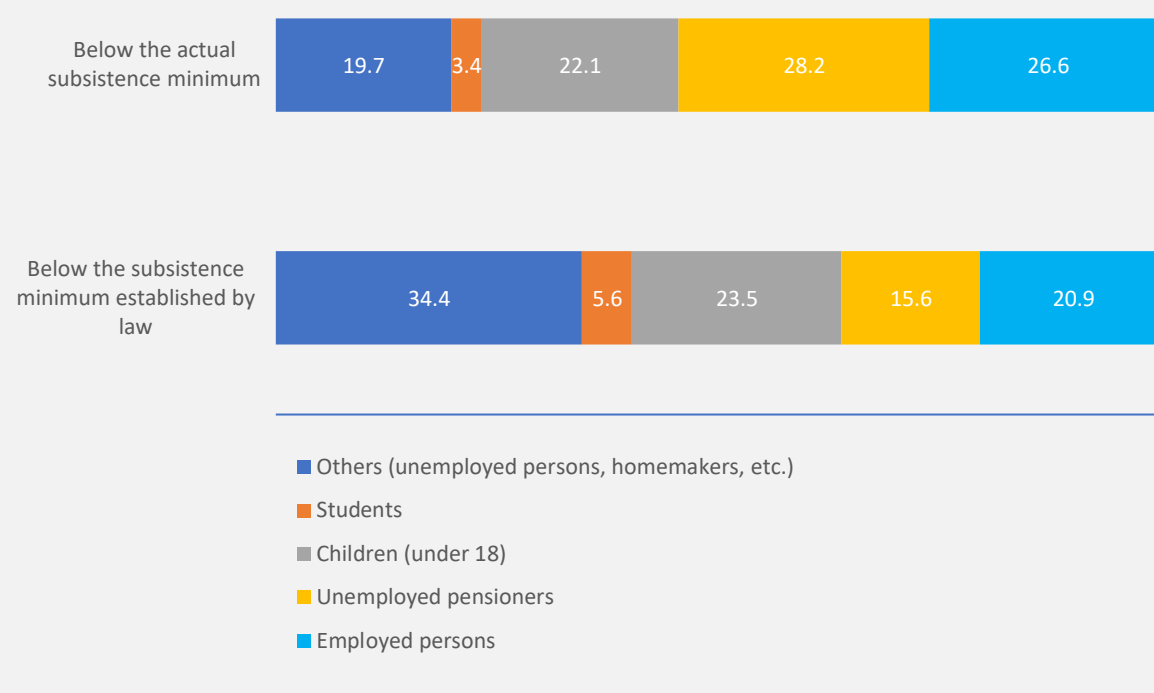


Table 4: Absolute poverty: distribution by income assessment in 2019.

Source: Socio-economic situation of Ukrainian households for 2019 (Соціально-економічне становище домогосподарств України у 2019 році), http://www.ukrstat.gov.ua/operativ/operativ2018/gdvvg/Arh_soc_ek_stan_dom.htm.

The proportion of the population with a median per capita income below the actual subsistence level per month fell by 1.2 per cent in 2019 compared with 2018, with that of the poor urban population shrinking at a higher rate. Meanwhile, the median actual subsistence minimum increased by 12 per cent to UAH 3,661. However, children under 18 are one of the groups most likely to be living at below-minimum levels, as 22 per cent of all persons in poverty according to this criterion are aged under 18. Large households and households with children where there is at least one unemployed person (61-46 per cent) are at greatest risks of poverty²⁴⁰. According to UNICEF data, almost one in three children live in poverty, and almost one in seven (14 per cent) live in absolute poverty, i.e., below the national relative poverty line²⁴¹.

The Ministry of Social Policy provides general policy coordination for social protection in Ukraine. Maternity and child support is dominated by the Universal Child Birth Grant (UCBG), which is a quasi-universal cash benefit paid to children up to the age of three years. In 2018, it accounted for 44 per cent of combined expenditure on social protection for children and families. In 2018, with the assistance of UNICEF, the government of Ukraine adopted a new package of child-oriented universal and quasi-universal programming, which bucked the general trend of fiscal consolidation. The package includes a universal in-kind benefit for all newborns, reimbursement of childcare costs for young parents, and financial incentives for municipalities that qualify for 'Child and Youth Friendly Municipality' status²⁴².

²⁴⁰ Socio-economic situation of Ukrainian households for 2019 (Соціально-економічне становище домогосподарств України у 2019 році), at http://www.ukrstat.gov.ua/operativ/operativ2018/gdvvg/Arh_soc_ek_stan_dom.htm.

²⁴¹ <https://www.unicef.org/ukraine/media/4946/file/SP%20Analytical%20note,%20short,%20English.pdf>.

²⁴² <https://www.unicef.org/media/70481/file/UKR-case-study-2020.pdf>.

In connection with the above-discussed UCBG – which, being a benefit package, has a cash transfer scheme at its core – a wider discussion of cash transfers in social support in Ukraine merits attention. Cash transfers, in particular, play a prominent role in the humanitarian response strategy in Ukraine. Notably, in the aftermath of the 2020 floods in western Ukraine, the Ukrainian Red Cross Society conducted a closer assessment of the most-affected rural households in order to provide multi-purpose cash grants (MPCG) to the most vulnerable. The cash-transfer approach extends to other types of emergency as well. However, as a recent study found, the country’s complex bureaucracy is a major factor hindering cash transfer programming.²⁴³

Given the challenges posed by the difficult-to-navigate government procedures, universal child benefits offer a distinct advantage to their relatively straightforward and broad categorical targeting. Still, natural emergencies may necessitate the launch of supplementary, narrowly targeted cash transfer schemes to address the specific needs of children affected by the emergency. The adaptability and flexibility of such cash transfers in addressing the risks and vulnerabilities induced by emergency situations is crucial. Flexibility also implies that conditional cash transfers do not necessarily have to target children specifically. Cash transfers schemes that benefit emergency-affected caregivers are also likely to improve the situation of children. Yet again, this underscores the importance of research to identify the needs of children induced by the emergency and the best ways to address these.

A reform of the social services system is currently underway in Ukraine. Occurring against the backdrop of decentralization of power, and as per the Strategy for the Development of Social Services in Ukraine up to 2020, its central pillars include the introduction of an integrated social services provision model. However, expert opinions attest to there being a number of challenges to making it work²⁴⁴. In particular, a recent study was unable to find examples of the approach having integrated key areas of social work aimed at providing targeted assistance to families and children for overcoming difficult life circumstances²⁴⁵.

The sectors of Ukraine’s economy most vulnerable to climate change include agriculture²⁴⁶, with the southern regions being particularly vulnerable to climate change-induced hazards²⁴⁷. There is therefore a need for social adaptation strategies that specifically target these regions. Studies are also required on the role that social protection could play to alleviate the impact of CEE shocks, and which focus on regions that have the highest share of the population employed in agriculture, and the highest share of households with children receiving social benefits.

In connection to agriculture, it bears note that the problem of landmine contamination in eastern Ukraine (see Case Study 1 under *Environmental issues and natural resources* for more information) poses enormous risks for family livelihoods beyond immediate risks for human health and safety. As landmines and unexploded ordnance render arable land unusable, pockets of land that were once self-sufficient become heavily dependent on the national social protection system, both in terms on immediate sustenance and mid- to long-term adaptation. Damage to irrigation infrastructure makes it challenging to farm even the land that is not mine-infested. Landmine contamination also heavily affects the general living standard. One of the factors here is due to interruptions in transportation and supply logistics as a result of damage to the road infrastructure, which in turn deals a heavy blow to local businesses. The higher-than-average relative poverty rates, based on expenditure in the east of Ukraine (see Annex 2), correlate with landmine contamination (although more research is needed to establish a cause-and-effect relationship).

²⁴³Bailey, Sarah, and Aggiss, Ruth, *The politics of cash: A case study on humanitarian cash transfers in Ukraine* (2016), <https://www.calpnetwork.org/wp-content/uploads/2020/03/the-politics-of-cash-ukraine-1.pdf>. The study in question looked at the areas affected by the conflict in eastern Ukraine. In particular, it estimated that during the period of the 18 months between the start of 2015 and mid-2016 14 per cent of international humanitarian funding ended up directly in the hands of Ukrainians as cash.

²⁴⁴Horishna, N. (2019). *The nature and peculiarities of integrated social services implementation in Ukraine*, *Social Work and Education*, Vol. 6, No. 2, pp. 133-143. DOI: 10.25128/2520-6230.19.2.2.

²⁴⁵Id., at p. 138.

²⁴⁶<https://climateknowledgeportal.worldbank.org/country/ukraine/vulnerability>.

²⁴⁷<https://climateknowledgeportal.worldbank.org/country/ukraine/impacts-agriculture>.

Moreover, contamination by mines and unexploded ordnance tends to exacerbate existing inequalities. As noted in the Danish Refugee Council-Danish Demining Group and UNICEF *Mine Victim Assistance Needs Assessment Report*, mine accidents “more commonly take place in rural areas where access to government services tends to be more limited, as does the socio-economic standing of the victims, meaning that mines/ERW [explosive remnants of war] have a tendency to disproportionately affect those who are already marginalized relative to those living in urban centres.”²⁴⁸

State and local budget reserve funds in Ukraine could be used to address shocks that occur due to climate, energy and natural disasters. However, a significant proportion of state reserve funds is earmarked for disaster response. At the same time, when developing regional social and economic development policies, there is a need to consider extreme weather events, not only in terms of their immediate impact (i.e., through relief efforts) but also as potential social stressors, paying special attention to children’s social well-being. For instance, while floods have featured prominently in national disaster reduction discourse due to their immediate devastating impact, there is currently no hard data available about the impact of droughts – another climate change risk in Ukraine – on the population’s and, specifically, children’s well-being in Ukraine. Droughts are known to exacerbate existing social challenges, including human security-related challenges, especially when they affect densely populated areas already suffering from marginalization²⁴⁹. There is thus a need to place CEE-related social stressors within a wider context of policymaking on social issues.

Early identification of vulnerable families with children is conducted by local authorities, who report to the national-level competent body (the Ministry of Social Policy) to ensure that the data is used to inform relevant policies and state budget planning. However, there is currently no national comprehensive registry of vulnerable families with children. The Ministry of Social Policy and the Ministry of Digital Transformation are prioritizing the creation of a registry of beneficiaries, with a Strategy Note and Action Plan set to be finalized by the end of 2020. In addition, the Ministry of Social Policy is currently working on developing an online platform (E-Social), which would include data on vulnerable families with children. However, it is not immediately clear when this tool will be completed and rolled out.

With respect to reskilling and livelihood diversification schemes for families with children in CEE shock-prone regions, the Ministry of Regional Development has recently unveiled a blueprint of a Concept Paper for restructuring regions dependent on fossil fuels (coal mining)²⁵⁰. The Concept covers the period up to 2027. Its geographical coverage includes both Donbas (Donetsk and Luhansk oblasts) and western Ukraine (specifically, Lviv and Volyn oblasts).

Another example of a diversification initiative is 'Hand of Help', jointly developed by Ukraine’s Ministry of Social Policy and the World Bank, which has been implementing a Social Safety Nets Modernization Project since 2017²⁵¹. This project supports reskilling and microfinancing to help low-income families start businesses. While its main target group is IDPs from the conflict-affected zone in eastern Ukraine, the project is not limited solely to this beneficiary group and targets poor Ukrainians generally. In principle, should a CEE shock occur that results in loss of livelihoods for families with children in the affected area, project funds may be used for reskilling and livelihood diversification.

Air and water quality, and environmental pollution in general, pose a separate set of challenges when viewed from the perspective of social protection and equity. As can be seen in Annex 2, some (although not all) of the regions with the worst indicators for air emissions from stationary pollution sources and carbon dioxide emissions also rank near the bottom for relative poverty based on

²⁴⁸ Danish Refugee Council-Danish Demining Group and UNICEF, *Mine Victim Assistance Needs Assessment Report* (2019), <https://www.unicef.org/eca/media/8181/file/2019-mine-victim-ukraine.pdf>, p. 47.

²⁴⁹ ENVSEC, *Climate Change and Security in Eastern Europe: Republic of Belarus, Republic of Moldova, Ukraine*. Regional Assessment Report, p. 18.

²⁵⁰ https://www.minregion.gov.ua/wp-content/uploads/2020/10/coalindustry_transformation_blue.pdf.

²⁵¹ <http://pubdocs.worldbank.org/en/927541538997812113/Ukraine-Snapshot-Fall2018.pdf>.

expenditure and/or disposable income indicators, in correlation with higher-than-national-average unemployment rates. The Dnipropetrovsk and Donetsk oblasts, with their coal mining-dependent regional economies, are the most salient examples.

While there is no official statistical data available on the concentrations of socially vulnerable households in relation to local air and water pollution indicators, it is reasonable to assume that lower-income households are more likely to be concentrated in major industrialized urban areas with poorer air quality. International studies underpin this hypothesis, as illustrated by this quote: “Urban air pollution has surfaced as a significant international environmental justice concern because of the large concentration of minority and low-income residents living in urban environments with unhealthy air quality.”²⁵²

The combined challenge of large pockets of poverty being concentrated in more polluted areas and the more deprived segments of the population’s greater susceptibility to environmental risks due to their underlying health status calls for a two-pronged approach that would address environmental concerns in areas with higher concentrations of poverty, while at the same time improving access to quality healthcare for vulnerable families with children. This analysis has been unable to identify evidence of initiatives in Ukraine that address these two issues as part of a coordinated strategy. However, the initiatives discussed under *Climate change and child-friendly environments*, while not specifically geared to tackling environmental justice concerns, have some certain potential to address existing inequities. They might therefore benefit from an added environmental justice angle.

Energy poverty

Energy poverty – defined by the World Economic Forum in 2010 as “the lack of access to sustainable modern energy services and products” – constitutes a distinct form of poverty that has potentially far-reaching consequences for children. A study has shown, in particular, that “access to modern forms of energy greatly improves the quality and availability of educational services and increases the likelihood that children will attend and complete schooling,” adding that “rural electrification helps retain good teachers in rural areas – a key lever for enhancing the quality of rural education”²⁵³. Moreover, access to modern and affordable forms of energy is essential for enhancing the food security of the poor, as well as for creating employment.

In Ukraine, recent market reforms have involved the rapid adjustment of energy prices without an accompanying improvement in the population’s living standards. This has predictably resulted in energy deprivation for a considerable share of the population²⁵⁴. Nevertheless, the government has managed to keep the average share of household utilities expenditure at roughly the same level for a number of years now by increasing the number of subsidized households (as of the beginning of 2019, approximately 65 per cent of households were subsidized²⁵⁵) after having decided to lower the eligibility threshold for these social benefits²⁵⁶. Notably, as of 2017, some of energy poverty indicators, such as being able to afford winter heating, were the lowest for the regions most affected by CEE factors, such as Zakarpattya, Ivano-Frankivka and Kherson oblasts (from 50 per cent to 89 per cent of all households)²⁵⁷.

²⁵² American Lung Association. Urban air pollution and health inequities: a workshop report. *Environ Health Perspect* 2001;109 (suppl 3):357–74, as cited in Samet JM, White RH, Urban air pollution, health, and equity, *Journal of Epidemiology & Community Health* 2004;58:3-5.

²⁵³ Karekezi, S., McDade, S., Boardman, B., Kimani, J., & Lustig, N. (2012). Energy, Poverty, and Development. In Global Energy Assessment Writing Team (Author), *Global Energy Assessment: Toward a Sustainable Future* (pp. 151-190). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511793677.008.

²⁵⁴ Energy Poverty – Guidance for State Policy and Public Discourse in the Time of Reforms: Georgia, Moldova, Ukraine, Romania. World Experience for Georgia (2019).

²⁵⁵ Енергетична бідність: Проблеми та підходи в ЄС та Україні, at <http://enref.org/books/analitychna-zapyska-enerhetychna-bidnist-problemy-ta-pidhody-v-es-ta-ukrajini/>.

²⁵⁶ Energy Poverty – Guidance for State Policy and Public Discourse in the Time of Reforms: Georgia, Moldova, Ukraine, Romania. World Experience for Georgia (2019), at p. 33.

²⁵⁷ http://www.ukrstat.gov.ua/operativ/operativ2018/gdvdg/Arh_sdg_dtp_u.htm.

However, while the policy to subsidize vulnerable consumers through lower electricity rates has successfully mitigated the brunt of energy price adjustment, it is still perceived as flawed due to its lack of sustainability. In particular, some experts doubt the long-term benefits of the government's current approach of focusing exclusively on direct subsidies to compensate for natural gas, electricity and heating consumption without duly considering the complexity of energy poverty²⁵⁸. Some of the stakeholders interviewed for this analysis criticized the policy of introducing lower rates for vulnerable consumers, as it reportedly results in the state accruing debt, since revenues are not sufficient to cover operating expenses. It was suggested that direct subsidies to vulnerable households, for which vulnerability criteria are based on household income, would be a better alternative.

It is important to note that one of the key factors in energy poverty is considered to be the low standard of energy efficiency within the housing stock and buildings in general²⁵⁹. Researchers argue that the EU experience shows that reducing energy poverty should be primarily based on supporting vulnerable consumers to improve the energy efficiency of buildings, including through an increased use of renewable energy sources²⁶⁰. Notably, direct subsidies to consumers fail to address the issue of low energy efficiency in schools and pre-school facilities, which is one of the issues that have a direct impact on children.

Nevertheless, as part of the EU4Energy Initiative, through its Covenant of Mayors Demonstration Projects, Ukraine is positively contributing to addressing the energy efficiency challenges facing the country. In particular, the Covenant of Mayors Demonstration Projects have financed projects to renovate schools and make them energy efficient. One example is the Hola Prystan school and its adjacent kindergarten, which were renovated and converted to use green energy and a biomass heating system²⁶¹. As part of the strategy to reduce energy poverty, there is a pronounced need to prioritize improving the energy efficiency of buildings, including both housing stock and facilities serving children.

Climate change and mental health outcomes

Climate change and related disasters are linked to a variety of internalizing and externalizing mental health problems, including anxiety, depression, aggression and substance abuse. A UNICEF study notes that children and adolescents in eastern Ukraine are at risk of developing negative stress management strategies, including alcohol and substance abuse²⁶². While the study in question focused on conflict-affected areas only, its findings can be extrapolated beyond conflict-induced stress to cover the entire range of environmental stress factors, including those resulting from extreme weather events and disasters.

While Ukraine does not disaggregate mental health statistics by type of disorder or condition, grouping all 'psychiatric and behavioural disorders' together for statistical purposes, the existing data for 2017 show the annual incidence of 'psychiatric and behavioural disorders' in children (0-17 age group) as being 29,008, or 381 new cases per 100,000 children²⁶³. This said, the lack of available data disaggregated by region and type of disorder makes it difficult to assess the impact that CEE factors have on children's mental health. Reviewing the statistical indicators for better disaggregation of mental health data by region, gender and type of diagnosis would help to more effectively determine the impact of CEE factors on children's mental health.

²⁵⁸ Id., at p. 31.

²⁵⁹ Завгородня С. П. Пріоритетні напрями подолання енергетичної бідності в Україні / С. П. Завгородня // Стратегічна панорама. - 2017. - № 2, at pp. 97-105, at http://nbuv.gov.ua/UJRN/Stpa_2017_2_14.

²⁶⁰ Id.

²⁶¹ <https://www.euneighbours.eu/en/east/stay-informed/news/ukraine-children-back-energy-efficient-school-hola-prystan>.

²⁶² An evidence-based analysis of the psychosocial adaptability of conflict-exposed adolescents and the role of the education system as a protective environment. Kyiv: UNICEF Ukraine; 2019, <http://www.un.org.ua/images/documents/4639/School%20Connectedness%20ukr.pdf>

²⁶³ Ukraine, 2017 Statistical Yearbook, https://ukrstat.org/uk/druk/publicat/kat_u/2018/zb/06/zb_zoz_17.pdf.

Considering that a parent's (or other adult caregiver's) mental illness and substance abuse constitute adverse childhood experiences, the mental health statistics for the general population are also relevant for assessing the impact (including the indirect impact) of CEE factors on children's mental health. According to the WHO Mental Health ATLAS for 2017, disability-adjusted life years per 100,000 population in Ukraine stood at 3,416.26, while the suicide mortality rate per 100,000 population was 22.4²⁶⁴. Please refer to Annex 1 for more information on mental health statistics for 2017, as recorded in the Ukraine Statistical Yearbook.

A study on IDPs, specifically mothers and children, in Ukraine found significant deterioration in the self-reported mental health of mothers²⁶⁵. The same study found reliance on social and community support to be one of the coping mechanisms used by Ukrainian IDP mothers. While, here again, this study focused on only conflict-induced displacement, its coping mechanism findings are consistent with those reported in other post-emergency settings²⁶⁶. It is therefore vital that investment be made in community-based mental health services, both those available through healthcare providers and those provided by civil society organizations.

It is important to highlight that, as discussed under *CEE and disaster risk reduction for children's resilience*, some of the stakeholders interviewed have flagged gaps in the existing evacuation-related standard operating procedures, in particular insofar as communication with children and families is concerned. The stakeholders stressed that poor communication during evacuations results in a lack of predictability, which in turn raises anxiety. While there are no studies documenting the impact of disasters on child abuse, the stakeholders interviewed consider the link to be plausible and, at the very least, to warrant further research.

Health

For this section, children's health indicators that have a possible association with CEE and related disease distribution in Ukraine were selected. Available health data has been analysed to identify health risks for children in Ukraine who might be affected by climate change (heatwaves, floods, fires, and air and water pollution). Many cities and regions affected by CEE, as described in Chapter 1, also appeared to have poor child health indicators (see Annex 2. *Quantitative Indicators of Environment, Social Protection, Child Protection and Health by Region of Ukraine*). However, other factors such as poverty, poor housing, smoking adults or living in disaster affected areas/informal settlements can also have an impact on children's health. Therefore, climate change and environment-related diseases are likely to contribute to children's vulnerability.

Yet the available annual statistics from the Ukraine MOH and State Statistics Service do not show excess death or morbidity during heatwaves, floods, fires and periods of high air pollution levels²⁶⁷. The World Bank concluded that, for Ukraine, climate and health monitoring and surveillance systems are not being implemented at the correct geographical and temporal scales to enable observations of trends and make advance forecasts to target interventions against climate-sensitive diseases²⁶⁸.

²⁶⁴ WHO Mental Health ATLAS 2017 Member State Profile for Ukraine, at:

https://www.who.int/mental_health/evidence/atlas/profiles-2017/UA.pdf?ua=1

²⁶⁵ Nidzvetska S, Rodriguez-Llanes JM, Aujoulat I, et al. Maternal and Child Health of Internally Displaced Persons in Ukraine: A Qualitative Study. *Int J Environ Res Public Health*. 2017; 14(1): 54. Published 2017 Jan 9. doi:10.3390/ijerph14010054.

²⁶⁶ For comparison, see the data analysed in the aftermath of extreme weather events in the Asia-Pacific region: Gursky EA, Burkle FM Jr, Hamon DW, Walker P, Benjamin GC. The changing face of crises and aid in the Asia-Pacific. *Biosecurity Bioterror*. 2014; 12(6): 310-317. doi:10.1089/bsp.2014.0025.

²⁶⁷ As confirmed by Ukraine MOH-Public Health (PH) Department and NCPH. A new national electronic system for medical emergencies under the MOH was due to be installed, but has been delayed due to the COVID-19 crisis, according to NCPH. The MOH PH department stated that the analysis of morbidity among children did not show significant structural changes due to climate change.

²⁶⁸ <https://climateknowledgeportal.worldbank.org/country/ukraine/adaptation> - Health

Therefore, it will be difficult to establish links between periodic occurrences and health outcomes. It would be worthwhile routinely collecting these data and conducting surveys (e.g., adding a few indicators to MICS, DHS or STEPS) or research. This would help provide a better understanding of the effect on the population's health of events related to climate change and environmental hazards, and of the extent to which health has been improved as a result of climate change adaptation/mitigation and improved environmental conditions, once measurements have been taken.

Indicators to monitor children's environmental health

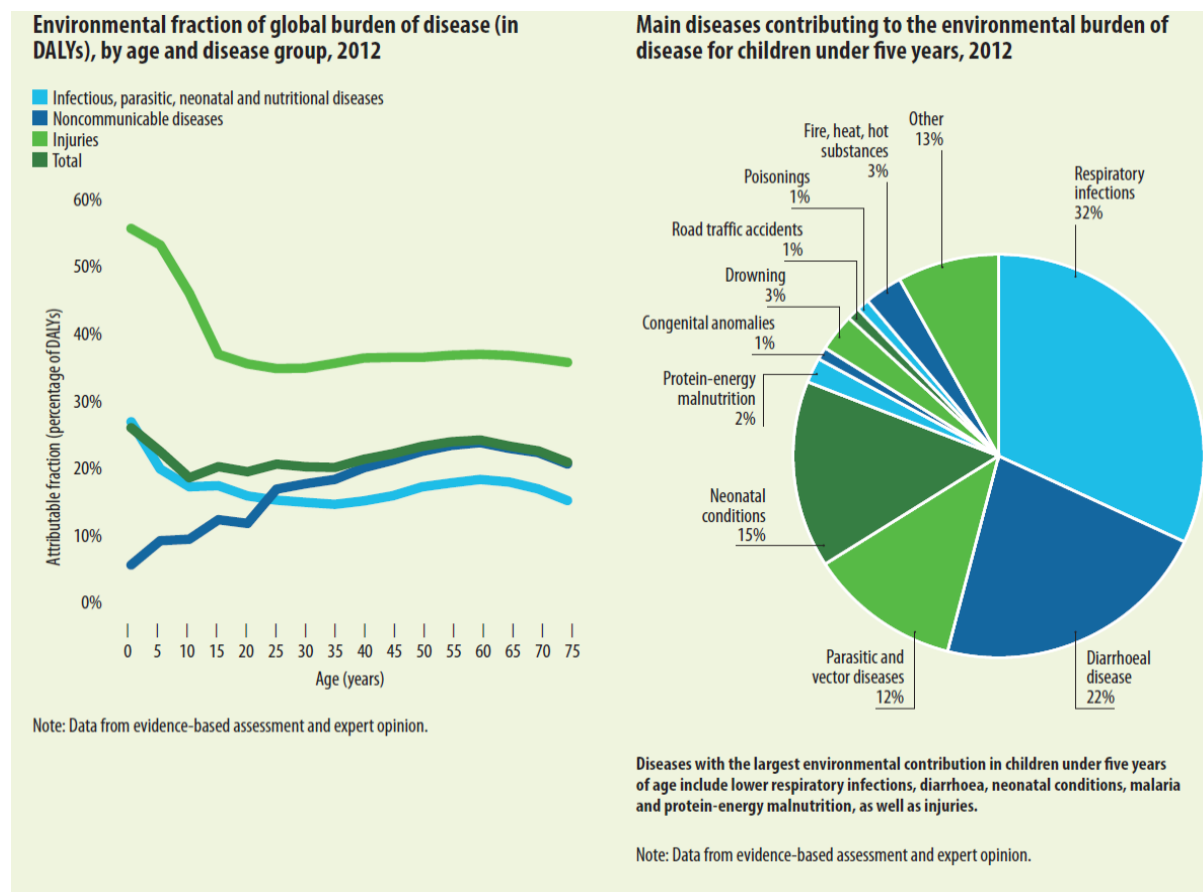


Figure 5: Environmental fraction of global burden of disease (in DALYs), by age and disease group, 2012. Main diseases contributing to the environmental burden of disease for children under five years, 2012.

Source: WHO (2017). Inheriting a sustainable world? Atlas on children's health and the environment

The main diseases contributing to the environmental burden of diseases for children under five years globally are by and large respiratory infections and diarrhoeal diseases, followed by neonatal conditions and parasitic and vector-borne diseases.²⁶⁹ The WHO global database states that the DALYs attributable to the environment for noncommunicable diseases (NCDs), injuries, infectious, parasitic, neonatal and nutritional diseases totalled 18 per cent for Ukraine in 2012.²⁷⁰

²⁶⁹ <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/158>

Mortality does not give a complete picture of the burden of disease borne by individuals in different populations. The overall burden of disease is assessed using the disability-adjusted life year (DALY), a time-based measure that combines years of life lost due to premature mortality (YLLs) and years of life lost due to time lived in states of less than full health, or years of healthy life lost due to disability (YLDs). One DALY represents the loss of the equivalent of one year of full health. Using DALYs, the burden of diseases that cause premature death but little disability (such as drowning or measles) can be compared to that of diseases that do not cause death but do cause disability (such as cataract causing blindness). Definition: One DALY represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost to due to premature mortality (YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population.

²⁷⁰ <https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/burden-of-disease-attributable-to-the-environment>

The main indicators for monitoring the environmental health risks liable to increase the environmental burden of diseases for children under five years²⁷¹ are perinatal-, respiratory-, diarrhoeal- and vector-borne²⁷² diseases and injuries. Children's ill health is also related to poverty, poor housing (including using biomass for cooking and heating and at least one adult smoking), poor basic water, sanitation and hygiene services, living in the vicinity of heavy traffic, and living in disaster affected areas/informal settlements²⁷³.

The main environmental interventions for improving child health include ensuring there is clean air inside and outside households, ensuring there is adequate water, sanitation and hygiene (including in birth settings), protecting pregnant women from second-hand tobacco smoke, and providing safe built environments (at household and community levels)²⁷⁴.

Poverty is strongly related to children's environmental health. Although Ukraine has made great progress in addressing poverty²⁷⁵, with poverty levels falling from 58.3 per cent in 2015 to 43.2 per cent in 2018 (SDG 1.1.), little progress has been made in reducing the proportion of households with children living in poverty, which is 1.5 times higher than those without children (SDG 1.3)²⁷⁶.

Information on poverty levels per region could not be obtained. Instead, Disposable Income (DI)²⁷⁷ is used as an indicator. DI in Ukraine was 69,140 UAH²⁷⁸ in 2019 (or US\$2,684 according to the average conversion rate for 2019). The lowest DI was recorded in Luhansk oblast (US\$970), followed by the oblasts of Donetsk, Zakarpattya, Chernivtsi and Ternopil (<US\$2,000).

According to 2018 Ukrainian State Statistics, 4.6 per cent of the housing stock in Ukraine is considered to be old, with Odesa (11 per cent), Vinnytsya (9 per cent) and Kharkiv (9 per cent) having the highest rates of old housing stock. Nearly 2 per cent is considered to be emergency housing stock, with the highest proportion of emergency housing stock being located in Vinnytsya (9 per cent), Donetsk (10 per cent), Odesa (12 per cent), Poltava (9 per cent) and Cherkasy (7 per cent)²⁷⁹.

In addition to the risks posed by living in poor housing, children are also vulnerable to indoor air pollution. As mentioned in Chapter 1, 96 per cent of households in Ukraine in 2016 had access to clean fuels and technologies for cooking. However, in 2019, nearly 34 per cent of the adult population still smoked²⁸⁰.

²⁷¹ WHO 2017. Inheriting a sustainable world? Atlas on children's health and the environment. <https://www.who.int/ceh/publications/Inheriting-A-Sustainable-World/En>.

²⁷² Vector-borne diseases result from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks and fleas. Examples of vector-borne diseases include Dengue fever, West Nile Virus, Lyme disease, and malaria.

²⁷³ WHO 2003. Making a Difference: Indicators to Improve Children's Environmental Health. <https://www.who.int/phe/children/en/cehindicum.pdf?ua=1>.

²⁷⁴ World Health Organization 2017. Inheriting a sustainable world? Atlas on children's health and the environment. <https://www.who.int/ceh/publications/inheriting-a-sustainable-world/en/>.

²⁷⁵ Defined as the population whose average per capita equivalent total expenditure is lower than the actual (estimated) subsistence minimum, per cent. According to the World Bank database's poverty headcount ratio at national poverty lines (percentage of population) in Ukraine, 1.3 per cent of the population was living below the national poverty line in Ukraine in 2018. <https://data.worldbank.org/indicator/SI.POV.NAHC?locations=UA>.

²⁷⁶ SDG Ukraine. Voluntary national review.

https://sustainabledevelopment.un.org/content/documents/26295VNR_2020_Ukraine_Report.pdf.

²⁷⁷ Disposable income is defined as income remaining after deduction of taxes and social security charges, available to be spent or saved as desired.

²⁷⁸ http://www.ukrstat.gov.ua/operativ/operativ2008/gdn/dvn_ric/dvn_ric_u/dn_reg2019_u_e.xlsx

²⁷⁹ State Statistics Service of Ukraine. Statistical Yearbook of 2018.

http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdfhttp://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf

²⁸⁰ WHO 2020. STEPS survey. Prevalence of NCD risk factors in Ukraine 2019.

<https://apps.who.int/iris/bitstream/handle/10665/336642/WHO-EURO-2020-1468-41218-56060-eng.pdf>

Children's health will be affected by heavy traffic in urban areas, and especially if living in large cities. This increases the risk of respiratory infections and injuries due to car accidents. The road traffic fatality rate per 100,000 of the population in Ukraine increased from 8 in 2018 to 8.3 in 2019²⁸¹. Over the previous 12 months (2019 data), 7 per cent of the population had been involved in a road traffic accident, either as a driver, passenger, pedestrian or cyclist, and one-third (35.4 per cent) of these had injuries that required medical attention²⁸².

Children also need a safe environment in which to grow up. According to recorded cases²⁸³, 537 children died in 2019 from external causes, including from transport accidents and accidental injuries such as falls, drownings, accidental poisoning – 219 of these children were under five years (11.2/100,000 corresponding population), 140 were aged between five and nine (5.9/100.000) and 178 were between 10 and 14 years (8.3/100.000).

Health risks due to air pollutions

Air pollution is associated with an increased risk of high Infant Mortality Rates (IMR), preterm birth/perinatal diseases, low birth weight and respiratory infections in children.

The Lancet Commission on Pollution and Health²⁸⁴ found that pollution is inequitably distributed, and that the overwhelming majority of pollution-related deaths in children occurred in low- and middle-income countries (LMICs). Most were due to respiratory and gastrointestinal diseases caused by polluted air and water. Pollution is also linked to multiple NCDs in children, including low birth weight, asthma, cancer and neurodevelopmental disorders, and these diseases are on the rise. This article also states that poverty is strongly correlated with exposure to air pollution. Poverty also limits people's capacity to improve the environment in which they raise their children. Air pollution is often a chronic problem in poor-quality housing areas and temporary settlements.

According to WHO data²⁸⁵, there were 58 ambient air pollution attributable deaths in children under five years-in 2016 in Ukraine (M27, F31) and 5,379 attributable DALYs (M2515, F5379). For household air pollution, there were 15 (M7, F8) attributable deaths due to Lower Respiratory Infections (LRI) in children under five years and 1,408 (M658, F750) attributable DALYs²⁸⁶.

The O.M. Marzeiev Institute for Public Health of the National Academy of Medical Sciences of Ukraine was involved in the SEARCH II project (2011-2013)²⁸⁷ that was implemented as part of the international framework of the EU Action Plan on the Environment and Health and the WHO Children's Environment and Health Action Plan for Europe, the main goal of which was to improve the school environment and respiratory health of children (SEARCH)²⁸⁸. The main health-related findings for Ukraine were that: (1) one of the asthma-related symptoms (wheezing after exercise) was significantly associated with the concentrations of CO₂ measured in classrooms; and (2) waking up wheezing and doctor-diagnosed allergies were significantly associated with indoor benzene and xylene concentrations. The study also gave recommendations for energy savings, which included heat insulation for walls and roofs, replacing windows and modernizing the heating system, as well as using the building envelope index and energy consumption index to optimize children's comfort and energy consumption.

²⁸¹ World Health Organization. 2018/2019 Road-traffic fatality data for WHO European Region.

https://www.euro.who.int/data/assets/pdf_file/0006/440763/2018-2019-road-traffic-fatality-data.pdf.

²⁸² WHO 2020. STEPS survey. Prevalence of NCD risk factors in Ukraine 2019.

<https://apps.who.int/iris/bitstream/handle/10665/336642/WHO-EURO-2020-1468-41218-56060-eng.pdf>

²⁸³ MOH and state statistics databases.

²⁸⁵ <https://apps.who.int/gho/data/view.main.36100> .

²⁸⁶ <https://apps.who.int/gho/data/node.main.HOUSEHOLDIAIRCHILDURDEN?lang=en>.

²⁸⁷ Personal communication and presentation.

²⁸⁸ Report on http://search.rec.org/outcomes/uploads/documents/SearchMakingSchoolsHealthy_Web_Dec2013.pdf .

Country	Regular morning cough	Regular day/night cough	Chronic cough >3 months	Regular cough with phlegm	Any regular/chronic cough
Albania (n=1,019)	18.7	20.8	7.7	41.6	53.6
Belarus (n=625)	9.1	5.8	1.0	2.2	12.6
Bosnia and Herzegovina (n=865)	10.9	10.6	3.2	10.8	24.3
Hungary (n=704)	8.4	6.5	3.3	3.6	13.4
Italy (n=915)	13.2	11.8	3.5	8.5	22.8
Kazakhstan (n=602)	17.3	10.6	1.3	5.5	25.4
Serbia (n=735)	10.5	9.9	3.1	9.4	21.5
Slovakia (n=825)	14.7	10.7	2.6	4.9	24.1
Tajikistan (n=888)	22.1	15.5	1.6	4.4	29.6
Ukraine (n=682)	16.3	16.6	18.6	16.7	41.1
Total (n=7,860) average	14.4	12.3	4.6	11.8	27.9

Table 2: Prevalence of coughs among countries; Ukraine ranks second for both regular and chronic coughs.

Source: Making Schools Healthy: Meeting Environment and Health Challenge, SEARCH II Initiative Outcomes: http://search.rec.org/outcomes/uploads/documents/SearchMakingSchoolsHealthy_Web_Dec2013.pdf.

A life in health: The effects of environmental hazards

Children are exposed to a variety of hazards from the environments in which they live, learn, work and play. Children are especially vulnerable to these exposures because of their developing systems and behaviours. Environmental exposures in early life can have immediate effects or build over time to increase disease risk later in life. Exposure starts early – in the womb, and can have effects throughout life.

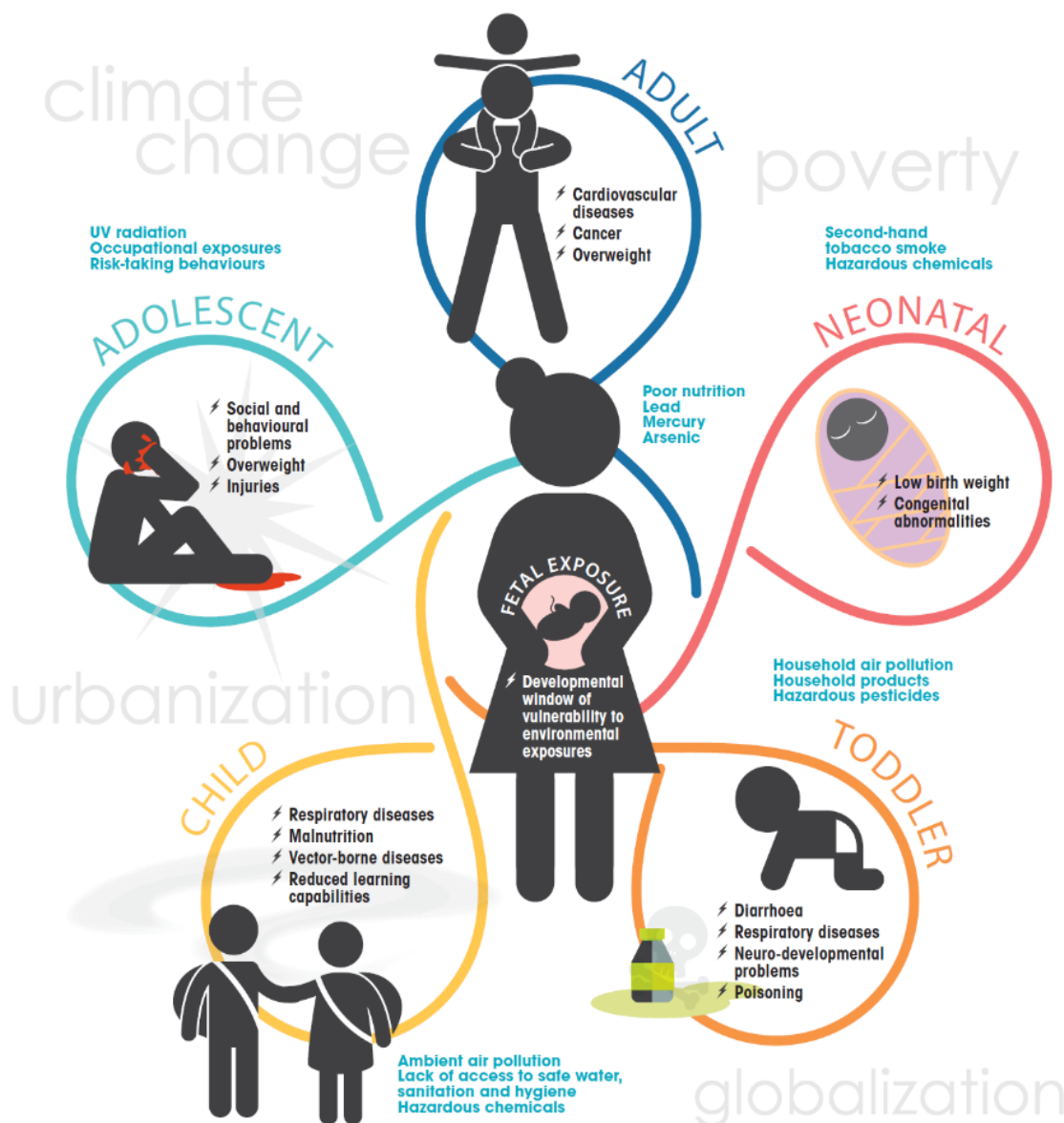


Figure 6: The lifelong effects of environmental hazards

Source: WHO (2017). Inheriting a sustainable world? Atlas on children's health and the environment

Children's CEE-related health indicators in Ukraine

The Infant Mortality Rate (IMR) in Ukraine was 7 per 1,000 live births (LB) in 2018, standing at 7.7 per 1,000 LB for male and 6.4 for female infants, a decline from 11.9 in 2000. Higher rates above the 2018 national figure were found in the oblasts of Volyn (7.6), Dnipropetrovsk (9), Donetsk (7.2) Zakarpattia (10.4), Zaporizhzhya (8.2), Kirovohrad (7.9) Mykolayiv (7.9), Odesa (7.6), Kherson (8.4), Cherkasy (9.1), Chernivtsi (8.1) and Chernihiv (7.6)²⁸⁹. According to the UN database, the IMR was 7.4/1,000 LB in 2018 and the estimated IMR for 2019 was 7.2/1,000 LB, broken down as 6.4/1,000 LB for females and

²⁸⁹ State Statistics Service of Ukraine. Statistical Yearbook of 2018.

http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf.

7.9 for male infants²⁹⁰. In their 2017 annual report²⁹¹, the MOH in Ukraine reported an IMR of 7.7/1,000 LB in 2017, with a higher rate in rural areas (8.7) than urban areas (7.1), as well as for male infants (urban areas: males 8, females 6.1; rural areas: males 9.5, females 7.8)²⁹².

The under-five mortality (U5M) rate is also steadily declining in Ukraine and was 8.4 per 1,000 live births in 2019²⁹³, with a higher U5M for male children of 9.2/1,000 LB compared to 7.5/1,000 LB for females²⁹⁴. According to MOH child mortality data and state statistics on live births per oblast for 2019, the U5M rate was 8.6 per 1,000 live births, with rates higher than the national average in the oblasts of Vinnytsya (9.8), Volyn (9.1) Dnipropetrovsk (9.6), Donetsk (9.5) Zakarpattya (13.4), Kirovohrad (9.8), Mykolayiv (8.9), Odesa (8.7), Rivne (9.4), Kharkiv (9.1), Kherson (9), Khmelnytskyi (8.9), Cherkasy (10), Chernivtsi (8.8) and Chernihiv (9.6)²⁹⁵.

The perinatal mortality rate (PMR) in Ukraine²⁹⁶ is also decreasing, falling from 9.1 in 2015 to 8.8 in 2019, though some regions recorded higher rates.



Graph 5: Number of perinatal deaths in Ukraine

Source: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2020/zb/06/zb_prn_2019.xlsx and 2018, 2017, F2016, 2015

²⁹⁰ World Bank database. <https://data.worldbank.org/indicator>. Estimates developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division).

²⁹¹ <https://library.gov.ua/shhorichna-dopovid-pro-stan-zdorov-ya-naselennya-sanitarno-epidemichnu-sytuatsiyu-ta-rezultaty-diyalnosti-systemy-ohorony-zdorov-ya-ukrayiny-2017-rik/>

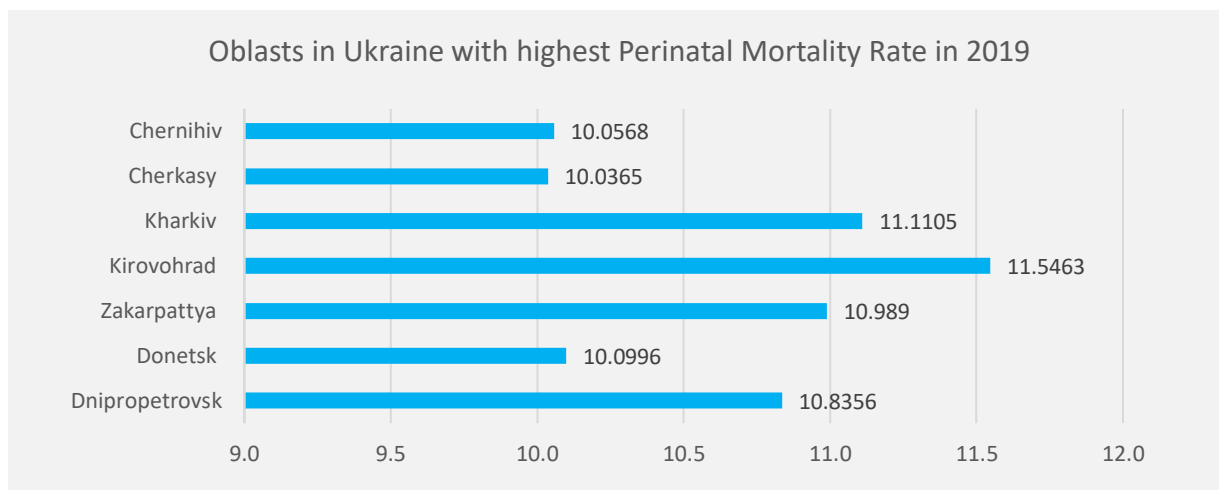
²⁹² Ministry of Health Ukraine. 2017 Annual report.

²⁹³ UNICEF global database Ukraine. <https://data.unicef.org/country/ukr/>.

²⁹⁴ World Bank database. <https://data.worldbank.org/indicator>. Estimates developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division).

²⁹⁵ State Statistics Service of Ukraine. Statistical Yearbook of 2018. Data for under 5 mortality not provided. http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf.

²⁹⁶ http://database.ukrcensus.gov.ua/PXWEB2007/ukr/publ_new1/2016/naselen_2015.pdf

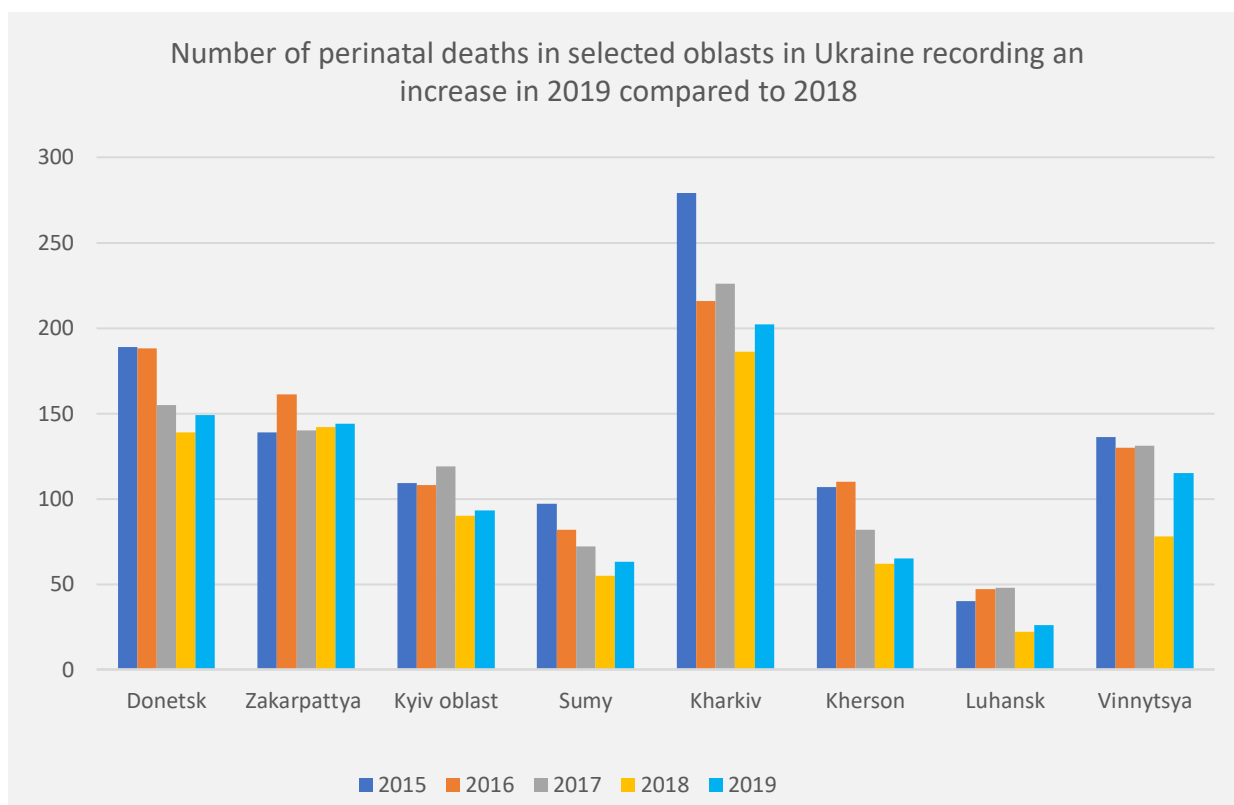


Graph 6: Ukraine oblasts with the highest perinatal mortality rates

Source: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2020/zb/06/zb_prn_2019.xlsx and 2018, 2017, 2016, 2015.

In 2019, the highest PMR was observed in Dnipropetrovsk, Donetsk, Zakarpattya, Kirovohrad, Kharkiv, Cherkasy and Chernihiv, as shown in Graph 6 above.

In some regions, there was a (slight) increase in number of perinatal deaths in 2019 compared to 2018. However, the reasons for this remain unknown, unless data capture is increased.



Graph 7: Oblasts in Ukraine that recorded an increase in perinatal deaths in 2019 compared to 2018

Source: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2020/zb/06/zb_prn_2019.xlsx and 2018, 2017, 2016, 2015.

Six percent of live births were born underweight in Ukraine in 2017. Higher rates of 7 per cent were recorded for the oblasts of Dnipropetrovsk, Zaporizhzhya, Kyiv, Kirovohrad, Luhansk, Odesa and

Kherson, and 8 per cent for Zakarpattya²⁹⁷. According to the UN database²⁹⁸, the percentage of low-birth-weight babies as a percentage of births increased by 0.5 per cent between 2006 and 2015 (rising from 5.1 per cent in 2006 to 5.6 in 2015, the year of the most recent available data).

For infants under one year of age^{299 300}, the following disease incidence rates with a possible association to CEE were recorded in 2019 as a percentage of the total incidence in Ukraine (in order of frequency): diseases of the respiratory system (ICD 10 code J00-J99) 58.1 per cent; certain conditions originating in the perinatal period (P05-P96) 9.1 per cent; diseases of the nervous system (G00-G99) 4.1 per cent; congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) 2.7 per cent; endocrine, nutritional and metabolic diseases (E00-E90) 2 per cent; intestinal infectious diseases (A00-A09) 1.1 per cent; neoplasms 0.7 per cent, 1.7 per cent of which were malignant; and injury, poisoning and certain other consequences of external causes (S00-T98) 0.3 per cent.

Household and ambient air pollution, second-hand tobacco smoke and poor housing are the main contributing factors to respiratory diseases. Respiratory diseases (including infections) (ICD 10 code J00-J99) accounted for 58 per cent of the total disease incidence for children under one year in Ukraine in 2019, which is an increase from 53 per cent in 2010 and 55 per cent in 2015.

The respiratory disease incidence rate for infants under one year of age was 873/1,000 new-borns in Ukraine in 2019, with the following regions recording incidence rates above the national figure: Vinnytsya (957/1,000 corresponding newborns), Zhytomyr (1,198), Zakarpattya (880), Zaporizhzhya (1,188), Ivano-Frankivsk (1,195), Kyiv oblast (919), Odesa (914), Rivne (1,044), Khmelnytskyi (1,051), Chernihiv (1,070) and Kyiv City (1,086).

As in previous years, the first place in disease was occupied by respiratory diseases (68.2 per cent) among children 0 to 17 years in 2017, although this decreased by 5 per cent from 2013 to 2017 per 1000 corresponding population. Other diseases included: diseases of the skin and subcutaneous tissue (5.1 per cent); infectious and parasitic diseases (3.6 per cent); diseases of the digestive system (3.5 per cent); diseases of the eye and its appendages (3.2 per cent)³⁰¹.

In 2019, nearly 1 per cent of all children aged 0 to 17 years were hospitalized for asthma and status asthmaticus (ICD 10 J45-J46), which is 1.9/1,000 of the 0 to 17 year population; a slight increase of 27 cases (14 per cent) compared to 2018. Higher rates per 1,000 corresponding population were recorded in Dnipropetrovsk (2.2), Zakarpattya (3.2), Zaporizhzhya (2.2), Ivano-Frankivsk (3.2), Lviv (3.1), Ternopil (4.1), Kharkiv (3.5), Khmelnytskyi (2.6), Chernivtsi (2.7) and Kyiv city (2.0)³⁰². A 2016 study showed a relatively low prevalence of asthma and allergic diseases in children aged 7 to 13 in western Belarus and Ukraine; however, there is evidence that asthma is under-diagnosed in these regions³⁰³.

²⁹⁷ Ukrainian Base Medical Statistical Information 'Health for Everyone' / Centre for Medical Statistics of Ministry of Health of Ukraine, http://medstat.gov.ua/file/HFAUA_2017.rar. Note: percentages of normal weight are presented (2,500g and over) for both urban and rural areas.

²⁹⁸ World Bank database. <https://data.worldbank.org/indicator>. Data provided by UNICEF.

²⁹⁹ All mortality and disease data from MOH <http://medstat.gov.ua/im/upload> and mortality/disease/population data from State Statistics in Ukraine <https://ukrstat.org/en>. Data of more age groups will be included once available.

³⁰⁰ Comparable data from other age groups was not available from MOH and State Statistics in Ukraine. Under five statistics are available for hospital admissions only.

³⁰¹ Ukrainian Institute for Strategic Studies of the Ministry of Health of Ukraine. Statistical Report 2017. *Note: Excluding the temporarily occupied territory of the Autonomous Republic of Crimea and the city of Sevastopol.* Data for Under 5 Mortality not provided. *Children in orphanages and boarding schools excluded.*

³⁰² Medical Statistics Centre of Ministry of Health of Ukraine, 2020-data 2019: <http://medstat.gov.ua/ukr/main.html> and population data from State Statistics (per oblast only available as of 1 January 2020).

³⁰³ [BMC Pulm Med](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4712510/) article. Childhood asthma prevalence and risk factors in three Eastern European countries - Belarus, Ukraine, Poland Asthma Study (BUPAS): an international prevalence study. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4712510/>.

For perinatal conditions, incidence rates above the national average of 136/1,000 newborns were recorded in Vinnytsya (138), Volyn (179), Donetsk (176), Zhytomyr (185), Zaporizhzhya (198), Kyiv oblast (146), Kirovohrad (137), Luhansk (138), Odesa (208), Rivne (167), Kharkiv (247), Kerson (144) and Khmelnytskyi (144). For diseases of the nervous system, incidence rates above the national average of 62/1,000 newborns were recorded in Dnipropetrovsk (72), Donetsk (65), Zhytomyr (93) Zakarpattia (92) Zaporizhzhya (139), Mykolayiv (83), Odesa (112), Sumy (97), Kharkiv (63) and Kherson (70).

Finally, for congenital malformations, deformations and chromosomal abnormalities, incidence rates above the national average of 41/1,000 newborns were recorded in Vinnytsya (78), Volyn (48), Zhytomyr (43), Zaporizhzhya (73), Rivne (50), Kharkiv (61), Kerson (42) and Kyiv city (50).

Health risks due to poor quality drinking water, sanitation and hygiene practices

The main diseases associated with water quality, sanitation and hygiene are diarrhoeal-, parasitic and vector-borne diseases, as well as neonatal and nutrition conditions (including in birth settings).

Practically all surface water sources and groundwater are polluted in Ukraine, containing the main substances that cause pollution, including compounds of nitrogen and phosphorus, as well as organic substances that are exposed to light oxidation, pesticides, oil products, heavy metals and phenols. Intensive eutrophication of inland water bodies is exacerbating the status of the Black and Azov Seas.

Pollution of water with nitrates and phosphorus as a cause of various diseases

As defined by the United States Environmental Protection Agency (EPA)³⁰⁴, nutrient pollution is caused by introducing excess nitrogen and phosphorus into the air and water. Nitrogen and phosphorus exist naturally in aquatic ecosystems, but human activities such as the use of fertilizers, wastewater management, fossil fuel burning, and runoff from soap and detergents introduce excess nutrient pollution into ecosystems faster than ecosystems are able to adapt. This influx of nutrients causes harmful algal blooms (HABs), where excessive algae growth leads to the production of toxins that are harmful to humans and ecosystems. There are a number of ways that humans can become exposed to HABs, including exposure from eating fish, swimming, drinking affected water or breathing in contaminated air. Exposure to HABs can cause a host of health problems, including skin rashes, liver and kidney damage, neurological issues and respiratory problems. In addition, nitrate, a form of nitrogen commonly found in fertilizers, can enter drinking water sources in high concentrations, especially in areas of agricultural production, and can cause serious health problems, particularly for infants³⁰⁵.

Many infectious and non-infectious diseases are spread through drinking water that fails to meet the regulatory requirements³⁰⁶.

The mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (per 100,000 population) stood at 0.3 in Ukraine in 2016³⁰⁷.

The proportion of the total incidence of intestinal infectious diseases (ICD 10 A00-A09) in Ukraine decreased among children under one year between 2013 and 2019, falling from 1.4 per cent in 2013

³⁰⁴ <https://www.ncei.net/2020/02/19/nutrient-pollution-how-excess-nitrogen-and-phosphorus-are-shaping-health-outcomes>.

³⁰⁵ Consuming too much nitrate can affect the oxygen-carrying capacity of the blood and cause methemoglobinemia (also known as blue baby syndrome). Bottle-fed babies under six months old are at the highest risk of getting methemoglobinemia. This illness can cause the skin to turn a bluish colour and can result in serious illness or death. Other symptoms connected to methemoglobinemia include decreased blood pressure, increased heart rate, headaches, stomach cramps and vomiting. Agency for Toxic Substances and Disease Registry (ATSDR). 2015: ToxFAQs™ for Nitrate and Nitrite <https://www.atsdr.cdc.gov/ToxProfiles/tp204.pdf>.

³⁰⁶ Strategy of National Ecological Policy of Ukraine until 2020: <https://mepr.gov.ua/en/content/misiya-ta-strategiya.html>.

³⁰⁷ World Bank/UN database. <https://data.worldbank.org/indicator>.

to 1.1 per cent in 2019 (17/1,000 new-borns). Among children aged 0-17, there was a reduction in the incidence of infection and parasitic diseases between 2013 and 2017, with the incidence rate falling from 56.52/1,000 corresponding population in 2013 to 46.3/1,000 in 2017³⁰⁸.

Despite a decrease in infection and parasitic diseases among children aged 0-17 years since 2013, outbreaks are still being recorded in Ukraine, with 434 acute outbreaks (ALL) being registered across the population between 2014 and 2017. At present, salmonella is the major cause of diarrhoeal infection outbreaks in Ukraine. The most frequent Salmonellosis outbreaks were recorded in Lviv (11.1 per cent of the total outbreak number) and in the Kyiv and Kharkiv oblasts (16.0 per cent and 8.5 per cent, respectively). The highest number of outbreaks (44) occurred in Kyiv and Kyiv oblasts (40.9 per cent of these were in Kyiv City). Of all the outbreaks recorded, the most common were Rotaviral enteritis outbreaks, particularly in Cherkasy (11.5 per cent), Chernihiv (9.2 per cent), Donetsk (6.9 per cent), Zaporizhzhya (6.9 per cent) and Dnipropetrovsk (6.2 per cent) oblasts, either through which Ukraine's largest rivers, the Dnipro and Desna, flow, or are washed by the Black or Azov Seas. According to the published results of research performed in Ukraine, diarrhoeal infection incidence rates are higher among children than adults. However, the majority of diarrhoeal infection is transmitted by food. Most diarrhoeal infection outbreaks are linked to catering facilities and children's pre-school institutions, as well as to household gatherings and festive occasions arranged at home³⁰⁹. Generally, people most commonly become infected through contaminated food. People can catch diarrhoeal infection through even slight contact with and the transfer of germs contained in faeces. The likelihood of contamination can increase as a result of floodwaters, septic fields, water runoff from landfills and sewer pipes. Although more recent studies and data on outbreaks are required, the recorded outbreaks listed above demonstrate the need to improve water quality, sanitation and hygiene practices in Ukraine, especially for catering facilities, at pre-school institutions and during festive occasions.

Health risks due to waste and chemicals

Another threat to children's health is emerging environmental hazards, including chemicals, electronic waste and climate change. The toxicity of many chemicals in common use is not fully understood. The regulatory requirements for chemicals, where safety testing must be conducted by manufacturers and the results assessed by regulators, may be limited for some types and uses of chemicals. Chemicals from pesticides, plastics and other manufactured goods, as well as from environmental contamination, eventually find their way into the food chain. These include arsenic, fluoride, lead, mercury, polybrominated diphenyl ethers, polychlorinated biphenyls and persistent organic pollutants. Endocrine Disrupting Chemicals (EDCs) are of particular concern as these may leach into food from certain kinds of packaging and have been linked to liver, thyroid and neurodevelopmental problems. Their effects may be especially harmful to children, whose bodies are still developing. The WHO Regional Office implemented a two-country project on EDCs in Belarus and Ukraine under which a situational analysis was carried out on endocrine diseases, including malformations. As part of the project, the WHO developed an educational poster and factsheet, written in Ukrainian, for pregnant women on how to minimize exposure to EDCs³¹⁰.

Electronic waste, or e-waste, is another growing concern, as unsafely discarded e-waste handled by children exposes them to a myriad of chemicals and toxicants, many of which are associated with reduced intelligence, attention deficits, lung damage and cancer.

Used electrical and electronic equipment in Ukraine accounts for a significant proportion of solid waste as, due to the lack of electronic waste legislation in the country, it is defined as solid waste and

³⁰⁸ MOH database and MOH annual report 2017.

³⁰⁹ Bangladesh Journal of Medical Science Vol. 18 No. 01 January'19. Epidemiological characteristics of acute intestinal infection outbreaks in Ukraine under the current conditions. Article by MOH Ukraine <https://www.researchgate.net/publication/330284085>.

³¹⁰ Personal communication WHO.

falls under solid waste management (SWM) operations. Electronic waste accounts for 5 per cent of all solid waste and is one of the most dangerous of all solid waste components (2013)³¹¹.

More research is needed in Ukraine on the health risks relating to waste and chemicals.

Health risks due to land contamination, fires, floods

Floods contaminate freshwater supplies, heighten the risk of waterborne diseases and create breeding grounds for disease-carrying insects such as mosquitoes. They also cause drownings and physical injuries, damage homes, and disrupt the supply of medical and health services. Vegetation and forest fires, which are becoming more extensive and more frequent in Ukraine, can release substantial quantities of fine particles (PM_{2.5}), which are harmful to health³¹². PM_{2.5} pose the greatest health risk. These fine particles can get deep into the lungs and can even enter the bloodstream. Exposure to these particles can affect a person's lungs and heart. Coarse particles (PM_{10-2.5}) are of lesser concern, although they can still irritate a person's eyes, nose, and throat³¹³.

It is difficult to establish a causal link between diseases and floods and fires using MOH annual disease data without data being specifically collected during these flood/fire events. The areas most exposed to fires and floods, as mentioned in Chapter 1, do, however, have some poor health indicators.

Health issues in conflict zones in eastern Ukraine

The population is particularly vulnerable in the eastern part of Ukraine, where the armed conflict has resulted in regrettable damage to the region's lands and terrain, its surface water and groundwater systems, as well as its vegetation and wildlife. Hostilities also pose a greater risk of incidents at industrial and infrastructure facilities. Under conflict conditions, the main threat is the risk of environmental pollution resulting from major operational disruptions and related incidents at industrial and other large-scale facilities.

The continued large-scale flooding of the area's mines will inevitably result in both surface flooding and subsidence of the surrounding area, rendering buildings unusable, engineering and communication infrastructure (gas lines, sewage and water supply systems) inoperative, and polluting surface and groundwater with iron, chlorides, sulphates, other mineral salts and heavy metals. During the course of the conflict, repeated disruptions of water supply and water disposal systems and facilities have been reported, as well as some cases of pollutants being discharged directly into water sources. The conflict has rendered the management of household waste problematic, particularly for communities located along the contact line³¹⁴.

The conflict has increased the risk of industrial and chemical hazards with the potential to create an environmental disaster. Donetsk and Luhansk oblasts are Ukraine's industrial heartland and are dominated by coal mining, chemical processing, metallurgy and manufacturing. Prior to the conflict, these two oblasts were home to some 4,500 potentially environmentally hazardous sites, mainly located in densely populated cities like Mariupol, Donetsk and Horlivka. According to the WHO³¹⁵, two million people were living in mine contaminated areas along the contact line in Ukraine in 2018.

³¹¹ Current state of e-waste policy in Ukraine and the European Union: steps towards convergence: https://www.irf.ua/files/ukr/programs/euro/survey_final.pdf.

³¹² <https://ehp.niehs.nih.gov/doi/full/10.1289/EHP194>.

³¹³ <https://www3.epa.gov/region1/airquality/pm-human-health.html>.

³¹⁴ OSCE 2017. Environmental Assessment and Recovery Priorities for Eastern Ukraine. <https://www.osce.org/project-coordinator-in-ukraine/362566>.

³¹⁵ World Health Organization. Health Emergency Response in Ukraine Annual Report 2018. https://www.euro.who.int/data/assets/pdf_file/0006/415419/WHE_Report_2018_Ukraine.pdf.

The overall situation for children and families living in those two regions remains challenging. Over 430,000 boys, girls and their families living on both sides of the contact line still require humanitarian assistance to access basic services, including psychosocial and protection support³¹⁶.

Agricultural opportunities have been significantly reduced in Luhansk and Donetsk oblasts, which particularly affects people in rural areas where employment opportunities are low.

The protracted conflict in the Donetsk and Luhansk oblasts of eastern Ukraine has had a devastating impact on the health and well-being of all affected communities, and the signs of long-term repercussions are slowly manifesting themselves. The ongoing conflict has made children and women more prone to developing health problems, ranging from traumatic injuries to mental health issues. These often result from stress and chronic conditions and are exacerbated by the limited access to healthcare services³¹⁷.

Nutrition

Climate change exacerbates the risks of hunger and undernutrition. As a result of climate change, the frequency and intensity of disasters such as droughts, floods and storms are likely to increase, having an adverse impact on livelihoods and food security. Climate-related disasters have the potential to destroy crops, critical infrastructure and key community assets, thereby deteriorating livelihoods and exacerbating poverty. Long-term and gradual climate change will result in a rise in sea levels that will affect livelihoods in coastal areas and river deltas. Climate change could increase the prices of major crops in some regions. For the most vulnerable people, lower agricultural output would also mean lower income. Under these conditions, the poorest people — who already spend most of their income on food — would have to sacrifice additional income to meet their nutritional requirements. Climate-related risks affect calorie intake, particularly in areas where chronic food insecurity is already a significant problem. Changing climatic conditions could also create a vicious cycle of disease and hunger. Nutrition is also likely to be affected by climate change through related impacts on food security, dietary diversity, care practices and health³¹⁸.

At the same time, increasing ambient temperatures and precipitation due to climate change could contribute to a higher obesity rate due to reductions in physical activity^{319 320}.

Spending on food is unreasonably high in Ukraine, amounting to 54.6 per cent of total cumulative spending, which was between three and five times higher than in EU countries in 2015. Moreover, for households with the lowest incomes, 63 per cent of their total expenditure went on food, compared with the national average of 60 per cent. Providing an affordable and balanced diet for the population of Ukraine, especially for its poorest groups, has to be a policy priority for the next 15 years³²¹.

However, according to the latest available data, there is a high rate of child obesity in Ukraine. Being overweight seems to be more of a problem among children than stunting and wasting. As of 2000 (there is no data available on the current malnutrition status of children in Ukraine), 26.5 per cent of children under five were overweight. The national prevalence of under-five stunting was 22.9 per cent,

³¹⁶ UNICEF. Country Office Report 2019 Ukraine. [https://www.unicef.org/about/annualreport/files/Ukraine-2019-COAR\(1\).pdf](https://www.unicef.org/about/annualreport/files/Ukraine-2019-COAR(1).pdf).

³¹⁷ OCHA. Humanitarian Needs Overview Ukraine 2020. https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/ukraine_2020_humanitarian_needs_overview_en.pdf.

³¹⁸ World Food Programme. Climate impacts on food security and nutrition. <https://documents.wfp.org/stellent/groups/public/documents/communications/wfp258981.pdf>.

³¹⁹ https://earth.org/data_visualization/the-common-drivers-of-obesity-and-climate-change/#:~:text=With%20climate%20change%2C%20increasing%20ambient,to%20reductions%20in%20physical%20activity.&text=The%20major%20correlation%20between%20overeating,obesity%2Dinducing%2Fmaintaining%20diet.

³²⁰ <https://pubmed.ncbi.nlm.nih.gov/28977817/>

³²¹ Ministry of Economic Development and Trade of Ukraine. Sustainable Development Goals Ukraine. 2017 Baseline Report. http://www.un.org.ua/images/SDGs_NationalReportEN_Web.pdf.

which is less than the developing country average of 25 per cent. Ukraine's under-five wasting prevalence of 8.2 per cent is also less than the developing country average of 8.9 per cent³²².

After a scoping mission conducted in 2015, the Information Management Officer with the Global Nutrition Cluster Rapid Response Team from UNICEF concluded that strong coordination and technical capacity to plan, steer and implement programming is necessary for mounting a nutrition response in emergencies. The resulting report also revealed that nutrition was not a priority among donors due to the absence of acute malnutrition and that a costed activity plan remained largely unfunded. It further recommended that dedicated coordination and information management support for nutrition is crucial, regardless of where this nutrition coordination sits, and should be prioritized in UNICEF recruitment and funding processes³²³.

Unhealthy dietary patterns are also common. Two-thirds (66.4 per cent) of the population do not consume the recommended quantity of fruit and vegetables (five portions a day). Nearly half the population (44.9 per cent) always or often add salt or salty sauce to their food before or during eating, two-thirds (66.7 per cent) always or often add salt to food when cooking at home, and a quarter (26.9 per cent) always or often ate processed food with a high salt content. Average salt intake was 12.6g per day – more than twice the maximum recommended level of 5g per day. Only 13 per cent of the population had a salt intake of less than 5g per day³²⁴. Ukraine also has the lowest overall consumption of iodized salt in the Europe and Central Asia (ECA) region. The lack of updated evidence has slowed down advocacy efforts for the adoption of mandatory Universal Salt Iodization legislation³²⁵.

Education, early childhood development and CEE

When viewed through the lens of CEE, education needs to be analysed both in terms of it being an element of the response to climate change, and in terms of the impact CEE may have on access to and the quality of education.

Education as an element of the response to climate change

Education forms a critical element of the response to climate change. As such, it includes environmental education and awareness raising, both through formal and non-formal education and training and at all levels, from pre-school to tertiary education for teachers.

Elements of environmental education have been integrated into Ukrainian secondary school curricula since 2001, when the Ministry of Education and Science of Ukraine adopted the Concept of Environmental Education (protocol No. 13/6-19 of 20 December 2001). Article 6³²⁶ of the existing Law on Education specifies the “promotion of a healthy lifestyle and environmental culture” as being one of the founding principles of Ukraine’s educational system. Moreover, at the United Nations Conference on Sustainable Development, Rio+20, Ukraine’s domestic implementation partners committed to cooperating with the Ministry of Education to expand the greening of education concept nationwide and introduce relevant programmes throughout Ukraine by 2014, when the Decade of Education for Sustainable Development ended³²⁷.

³²² Global Nutrition Report Ukraine. <https://globalnutritionreport.org/resources/nutrition-profiles/europe/eastern-europe/ukraine/>.

³²³ <https://www.enonline.net/fe/52/nutritioncoordinationukraine>.

³²⁴ WHO 2020. STEPS survey. Prevalence of NCD risk factors in Ukraine 2019.

<https://apps.who.int/iris/bitstream/handle/10665/336642/WHO-EURO-2020-1468-41218-56060-eng.pdf>

³²⁵ UNICEF. Country Office Report 2019 Ukraine. [https://www.unicef.org/about/annualreport/files/Ukraine-2019-COAR\(1\).pdf](https://www.unicef.org/about/annualreport/files/Ukraine-2019-COAR(1).pdf).

³²⁶ <https://zakon.rada.gov.ua/laws/show/2145-19#Text>.

³²⁷ <https://sustainabledevelopment.un.org/partnership/?p=77>.

At the secondary school level, environmental content has been incorporated into the curricula for a number of subjects, including 'I and Ukraine' for Grades 1-4, 'Nature Study' for Grades 1-6, and 'Foundations of Health' for all grades. At Grade 10-11 levels, schools offer an elective 'Introduction to Environmental Studies' course.

Importantly, in 2018, as part of the Concept of New Ukrainian School³²⁸, Ukraine adopted the State Standards of Primary Education³²⁹. These State Standards, which are loosely based on the European Reference Framework set out in the Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning³³⁰, notably add environmental competences (Key Competence 6) to the national key competences framework. The Ministry of Education has developed a Teacher's Manual³³¹ to provide methodological guidance on the implementation of the State Standards. The Ministry of Education has also produced model curricula for individual subjects. For instance, the model curriculum for 'Foundations of Health' in Grades 5-9³³² promotes the use of simulated environments to study the effects of environmental factors on human health. The practice-oriented initiatives introduced by government agencies that work to promote Key Competence 6 include a joint project by the Ministries of Education and of Ecology (COMPOLA), which promotes sustainable consumption and waste management at community level, including in schools.

Key Competence 6 has been integrated into regional educational and social development policies. For instance, the Donetsk regional administration is currently developing a region-wide social development programme for 2021-2025 called 'Donetsk Youth' (Молодь Донеччини). The draft programme includes a component on "young people's civic competences," which prioritizes environmental competences and responsible consumption.

Under the Ministry of Education, a specialized institution has been created – the National Student Youth Centre for Environment and Nature (known by its Ukrainian acronym NENC)³³³ – which is tasked with promoting environmental education and awareness among children and young people. The Centre maintains a web-based repository of methodological guidance and teacher best practice³³⁴ that is available to all educators within Ukraine. There is also a network of NENC centres throughout Ukraine, at least some of which have started to prioritize climate change-related issues in their student outreach. NENC also acts as a de facto innovation hub for environmental education in Ukraine. In particular, it has successfully adapted experiential learning methodologies to environmental education and, according to interviews with NENC management, it is currently developing applications for artificial intelligence in environmental education.

In addition, the Ministry of Education's EcoMON platform³³⁵ serves as a vehicle for disseminating educational content and lesson plans nationwide for educators' use. The State Ecological Academy of Postgraduate Education and Management of Ukraine's Aarhus Centre, which works with the platform, plays an important role in both teacher capacity-building and direct work with students, particularly by raising children's awareness of environmental issues through assignments such as monitoring environmental indicators (e.g., electricity consumption, use of environmentally friendly products) at household level. In their capacity-building activities for teachers, the Aarhus Centre targets not only educators who work in environment-related subjects, but also those who work in other areas. This is expected to promote the integration/mainstreaming of environmental knowledge in secondary school curricula, as opposed to merely incorporating environment-related subjects as standalone

³²⁸ <https://mon.gov.ua/ua/tag/nova-ukrainska-shkola>.

³²⁹ <https://www.kmu.gov.ua/npas/pro-zatverdzhennya-derzhavnogo-standartu-pochatkovoyi-osviti>.

³³⁰ <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:en:PDF>.

³³¹ <https://mon.gov.ua/storage/app/media/news/%D0%9D%D0%BE%D0%B2%D0%B8%D0%BD%D0%B8/2018/12/12/11/20-11-2018rekviz.pdf>.

³³² <https://mon.gov.ua/ua/osvita/zagalna-serednya-osvita/navchalni-programi/navchalni-programi-5-9-klas>.

³³³ <https://nenc.gov.ua>.

³³⁴ <https://nenc.gov.ua/?p=708>.

³³⁵ <http://www.e-comon.org.ua/>.

educational modules. There is a need to further promote the integration/mainstreaming of environmental content across secondary school curricula.

While the Aarhus Centre does not directly work with pre-schools, they disseminate educational content developed for pre-schoolers (from age four) by various environmental NGOs. On-demand pre-school teacher training workshops are also held at the Aarhus Centre. In general, the Aarhus Centre appears involved in organizing capacity-building for professionals, including civil servants and local self-government bodies.

As part of its teacher capacity-building component, the Aarhus Centre works with the nationwide Critical Thinking platform, where they seek to promote e-learning in environmental education. The Centre also operates as a structural unit of the State Ecological Academy of Postgraduate Education and Management (a state-run provider of continuous professional education), where they support the activities of the Education for Sustainable Development Centre, working with both secondary school teachers and environmental studies experts to develop state-of-the-art environmental education practices for incorporation in schools.

There is a range of extracurricular activities involving secondary school students and/or capacity-building activities for teachers that focus on environmental awareness, and on climate change specifically. Notably, Presidential Decree No. 855/98 of 6 August 1998, pertaining to the Day of the Environment, supports the Ministry of Ecology and Natural Resources and the domestic civil society sector in conducting regular environmental awareness-raising events on the Day of the Environment, celebrated annually on the third Saturday of April. Most activities involve water reservoir clean-ups, protected area conservation and awareness raising³³⁶. The component that targets children is supported by the Ministry of Education and Science through NENC, which has issued methodological guidelines for secondary schools, extracurricular education providers and civil society organizations to facilitate school-age children's participation in environmental activities for the Day of the Environment³³⁷.

Similarly, since 2016, the Ukrainian Climate Network has organized annual Environmental Education Forums³³⁸, which bring together secondary school teachers, environmental activists, extracurricular and non-formal education and training providers, and organizations working in environmental protection and conservation (including conservation areas such as national parks and nature reserves). The 2018 edition of the forum emphasized the role of environmental education in the New Ukrainian School concept.

Ukraine's largest scouting organization, the Plast National Scout Organization of Ukraine, set up an environmental structural unit in 2018³³⁹, which works to raise awareness of a number of issues including climate change. With financial support from the International Renaissance Foundation, Plast conducted a review of the organizational educational content for scouts aged 6-11 in order to identify and address environment and climate change-related gaps. It is currently conducting a similar review of content targeting older scouts (aged 12-17).

There have been examples of businesses partnering with schools to raise environmental awareness. These include the contest organized by KT-Energy³⁴⁰, which aims to reduce carbon emissions. In 2018, the contest saw 55 school districts across the nation use a mobile application, Klimatychni Krapli (Climate Drops), to track actions that help reduce carbon emissions. The contest participants also organized awareness-raising events, with the winners presenting the outcomes at Youth and Future Generations Day held during UNFCCC COP24 in Katowice, Poland. Another example involves the

³³⁶ <https://www.ecoleague.net/forumy-konferentsii-kruhli-stoly-seminary/ekolohichniy-kalendar/kviten/item/334-vseukrainskyi-den-dovkillia>.

³³⁷ https://nenc.gov.ua/doc/vidd_ecol/env_day/dz-2012.pdf.

³³⁸ <https://ucn.org.ua/?p=3911>.

³³⁹ <https://www.plast.org.ua/eco-page/#>.

³⁴⁰ <https://kt-energy.com.ua/projects/klimatychni-krapli/>.

Ukrainian pharmaceutical company, JSC Farmak, which has openly championed sustainable development values, and which implemented an educational project, Eco-School, in 2017, that it took online in 2019 to expand the project's geographical reach to cover the entire nation³⁴¹. In 2018, the Eco-School project was ranked among the top 20 social projects in Ukraine. The Eco-School online platform, launched by Farmak, provides students and teachers with ready access to up-to-date information on environmental friendliness. Moreover, the project supports individual schools with setting up their own eco-team and with competing for mini-grants (also funded by JSC Farmak) for projects to improve the environmental situation in a particular educational institution based on the knowledge obtained through the eco-platform. Notably, in 2019, JSC Farmak supported the development of an environmental manual for students, which has been approved by the Ministry of Education of Ukraine.

Finally, there have been examples of international organizations spearheading environmental education initiatives. One particular example is the UNITAR/UNEP Green Economy course, which introduces the basic concepts, policy instruments and international frameworks of inclusive green economies. While it does not specifically target children or teachers, in principle, it is accessible to high schoolers and teachers alike. The course advertisement on the Ministry of Ecology and Natural Resources website³⁴² specifically mentions the value of the course to teachers, students and environmental NGOs.

Overall, environmental education appears to be one of the areas where Ukraine demonstrates good practices insofar as children and climate change issues are concerned. The focus on innovation and experiential learning in environmental education is particularly laudable. In particular, support to nationwide methodological clearing houses and innovation hubs such as NENC and the Aarhus Centre may help ensure sustainable progress in this area.

Impact of CEE on access to and the quality of education

As mentioned at the beginning of this subchapter, the impact of CEE on access to and the quality of education is another area that merits attention. While quantitative and qualitative data on the effects of CEE on education in Ukraine are extremely scarce, the following threats may be identified based on the country's CEE profile:

- Disruptions in access to education due to direct damage to educational infrastructure caused by natural disasters such as floods (see also *CEE and disaster risk reduction for children's resilience*);
- Educational deprivations in the form of limited access to educational resources and online learning environments due to damage to the telecommunications infrastructure caused by natural emergencies;
- Reduction in educational attainment, and higher absenteeism due to the impacts of CEE on children's health (see also *Health*);
- Decrease in the safety and supportiveness of learning environments due to climate change-related displacement and evacuations and, in general, the impacts of CEE on the overall well-being and mental health of children and their caregivers.

As indicated under *CEE and disaster risk reduction for children's resilience*, based on initial reports from the National State Emergency Service of Ukraine, the 2020 floods in western Ukraine destroyed 13 social infrastructure assets, including schools. While it has not been possible to obtain figures on the exact number of schools destroyed or seriously damaged, or the numbers of enrolled students affected, the very fact that there have been school facilities damaged so seriously as to render them unusable is sufficiently concerning to warrant attention. Presidential Decree No. 195/2020 approving

³⁴¹ <https://farmak.ua/en/news/eco-school-will-become-national-project-will-cover-whole-ukraine-september-1/>.

³⁴² <https://mepr.gov.ua/news/36088.html>; see also <https://www.eu4environment.org/news/launch-of-green-economy-course-in-ukraine/>.

the National Strategy of the Development of Safe and Healthy Educational Environment of the New Ukrainian School recognizes the need to further strengthen environmental safety as a component of school safety. One of the solutions may include developing the concept of resilient school infrastructure.

Disruptions in access to education in the aftermath of natural emergencies may also be caused by displacement and the resulting need to transfer affected children to other catchment areas. Again, as discussed under *Climate-related threats and disasters – social issues (climate-induced migration and displacement)*, the extent of climate-induced displacement in Ukraine forms a salient evidence gap. Nevertheless, the stakeholders interviewed acknowledged that large-scale evacuations have taken place due to floods. Therefore, it may be safely assumed that the logistical complexities of ensuring uninterrupted access to education of evacuated children/children in temporary accommodations at least merit attention.

Infrastructural damage may also indirectly cause educational deprivations should internet access be disrupted as a result of damage to telecommunications infrastructure. Ukraine is an increasingly digitalized society; digital competences are prioritized by the New School Concept and play a prominent role in the upper grades of secondary school, as well as in vocational training and education³⁴³. Therefore, even short-term damage to the telecommunications infrastructure has potentially serious consequences as it could limit school connectivity and access to online educational resources (both from school and from home). The added stress of limited interpersonal/intra-family communications in disasters that affect large segments of the population – due to congestion failures, for instance – puts additional strain on children’s mental health, which in turn affects their learning (see the further discussion of mental health factors in education below).

While a high risk for Ukraine, flooding is not the only type of natural emergency that may disrupt internet access. High winds, torrential rains and other extreme weather events are also known to cause telecommunications outages. It is worth noting that satellite internet, which offers a set of distinct advantages such as cost-effectiveness and high internet speed, is a popular school connectivity solution in Ukraine³⁴⁴. While this is no doubt useful, a key disadvantage of satellite connections is their vulnerability to extreme weather, which should be considered when devising school connectivity policies. The internet’s vulnerability to extreme weather acquires an additional dimension in the times of the COVID-19 pandemic, which has resulted in greater dependency on online learning environments as school connectivity alone is no longer sufficient and there is a need to ensure that individual students do not experience internet disruption at home.

The impacts of CEE on children’s health are analysed in detail in the section on *Health*. Nearly all of the negative impacts that CEE factors have on health also affect education and/or early childhood development to a greater or lesser extent. Any disease attributable to environmental causes has the potential of impacting school attendance, causing an increase in absenteeism. Moreover, inadequate school infrastructure may amplify the adverse effects of certain weather events, such as heatwaves (if the school lacks proper heatwave-resilient ventilation and air conditioning, for instance). Non-heatwave-resilient public/school transportation could be an additional negative factor for children who have to travel long distances to school, and has the potential to exacerbate social inequalities (for example, children from more affluent households with access to family-owned air-conditioned vehicles would be more likely to attend school during heatwaves than children who rely on public or school transportation).

It is to be noted that Ukraine adopted a new construction standard for educational facilities in 2018, DBN B.2.2-3:2018 (ДБН В.2.2-3:2018)³⁴⁵, which sets out the heating and ventilation norms that

³⁴³ https://www.etf.europa.eu/sites/default/files/2020-06/digital_factsheet_ukraine.pdf.

³⁴⁴ For example, the Ukrainian corporation, Datagroup, has helped address the urban/rural digital divide in Ukrainian schools by deploying satellite connection solutions (see <https://www.datagroup.ua/en/novyny/seo-datagrup-zapropnuvav-ocifruvati-vsi-silski-shkoli-za-pi-2>).

³⁴⁵ https://dbn.co.ua/load/normativy/dbn/v_2_2_3/1-1-0-1804.

educational facilities across Ukraine must meet. However, the standard does not require schools to be fitted with air conditioning. There is also no official data available on the number of schools that comply with the standard as far as heating and ventilation systems are concerned. Anecdotal evidence suggests that full compliance has not yet been reached. However, it remains unclear what remedial action is being taken to ensure schools and pre-school facilities replace their outdated heating and ventilation systems.

The pan-European SEARCH II project (see *Health* for more details), the second phase of the SEARCH initiative implemented by the Regional Environmental Centre for Central and Eastern Europe, examined environmental factors in schools in a number of Central and Eastern European countries (including Ukraine), as well as in Central Asian countries. Its findings on ventilation detected a link between ventilation quality and the prevalence of coughing in school students³⁴⁶.

Finally, natural emergencies are likely to put a strain on the mental health of children and their caregivers (see also *Climate change and mental health outcomes*), which in turn may result in a reduction in the safety and supportiveness of learning environments. International studies have detected a tendency for floods to have more harmful effects on children's education than droughts, frosts and hailstorms³⁴⁷. While no research into this has been conducted in Ukraine, western Ukraine's particular vulnerability to flooding means attention needs to be paid to this issue. It is to be noted that the above-mentioned SEARCH II Initiative specifically looked into the prevalence of psychological symptoms in schoolchildren (see the table below). Compared to the other countries covered, its findings for Ukraine show significantly higher rates of fatigue, irritability, anxiety and other symptoms. The correlation to climate change and other CEE factors has not been explored; however, the existing situation is already cause for concern.

Country	Sleep disorder	Fatigue	Attention deficit disorder	Irritability	Anxiety	Social withdrawal (reserve)	Any of the 3 depression symptoms*
Albania (n=1,019)	9.0	21.8	2.1	19.0	6.3	9.1	29.7
Belarus (n=625)	5.3	25.8	9.4	21.3	7.8	3.5	28.5
Bosnia and Herzegovina (n=865)	3.9	12.4	9.3	11.3	8.6	4.9	15.7
Hungary (n=704)	4.1	13.2	9.8	15.8	6.8	6.4	18.6
Italy (n=915)	6.7	26.9	14.9	18.1	18.0	7.7	30.7
Kazakhstan (n=602)	4.8	24.6	15.3	17.4	8.5	2.7	26.1
Serbia (n=735)	5.7	14.0	10.2	12.4	7.9	5.2	18.6
Slovakia (n=825)	3.3	16.6	13.0	12.9	6.7	4.9	19.6
Tajikistan (n=888)	5.9	11.0	8.7	10.8	9.4	4.3	15.7

³⁴⁶ Making Schools Healthy: Meeting Environment and Health Challenge, SEARCH II Initiative Outcomes, http://search.rec.org/outcomes/uploads/documents/SearchMakingSchoolsHealthy_Web_Dec2013.pdf .

³⁴⁷ Nguyen, CV, Pham, NM. The impact of natural disasters on children's education: Comparative evidence from Ethiopia, India, Peru and Vietnam. *Rev Dev Econ.* 2018; 22: 1561– 1589. <https://doi.org/10.1111/rode.12406> .

Ukraine (n=682)	8.2	32.7	21.7	30.5	23.9	23.5	46.5
Total (n=7,860) average	5.8	19.6	11.0	16.6	10.3	7.2	24.7

* (sleep disorder, fatigue, social withdrawal)

Table 3: Prevalence (%) of schoolchildren with psychological symptoms in selected countries in Central and Eastern Europe and Central Asia, by country.

Source: Making Schools Healthy: Meeting Environment and Health Challenge, SEARCH II Initiative Outcomes. http://search.rec.org/outcomes/uploads/documents/SearchMakingSchoolsHealthy_Web_Dec2013.pdf.

Water, Sanitation and Hygiene (WASH)

Chapter 1 examined water resource scarcity in relation to climate change and included some information on pollution. The health impact on children was discussed in the *Health* section of Chapter 4; therefore, this section will focus on the main WASH problems and challenges in Ukraine.

The main climate change impacts related to water resources are increases in temperature, shifts in precipitation patterns and snow cover, and a likely increase in the frequency of flooding and droughts³⁴⁸. Increased flooding could destroy water points and sanitation facilities, and contaminate water sources. Droughts are exacerbating water scarcity, and thereby negatively impacting people's health and productivity. Higher temperatures and more extreme, less predictable weather conditions are expected to affect the availability and distribution of rainfall, snowmelt, river flows and groundwater, and further deteriorate water quality³⁴⁹.

Key actions to reduce climate risks include integrating climate resilience measures into water safety plans, as well as improving water resource management and accounting. Policy prescriptions on technologies for service delivery and changes in management models have the potential to reduce risks, particularly in low-income settings. Water and sanitation services contribute to GHG emissions. These emissions can be reduced by carefully selecting wastewater treatment technologies, improving pumping efficiency, using renewable sources of energy and implementing within-system energy generation. Overall, more attention and research are required to understand, plan for and adapt to climate change in water and sanitation services³⁵⁰.

The key challenges for ensuring water security for people in Ukraine, as stated in 2016³⁵¹, are as follows:

1. Water availability challenges:

- Due to natural water scarcity and the expected deterioration in water quality:
 - i. During droughts – through evaporation and increases in concentrations of undesirable substances in water sources, lack of surface water resources and particularly low river flow for diluting wastewater discharge from wastewater treatment plants (WWTP) or directly from sewers;

³⁴⁸ <https://www.eea.europa.eu/archived/archived-content-water-topic/water-resources/climate-impacts-on-water-resources#:~:text=The%20main%20climate%20change%20consequences,frequency%20of%20flooding%20and%20droughts.&text=Higher%20temperatures%20will%20generally%20intensify%20the%20global%20hydrological%20cycle>.

³⁴⁹ <https://www.unwater.org/water-facts/climate-change/>.

³⁵⁰ Climate change and Water and Sanitation: Likely Impacts and Emerging Trends for Action <https://www.annualreviews.org/doi/full/10.1146/annurev-enviro-110615-085856>.

³⁵¹ Ukraine water partnership. Global water partnership Central and Eastern Europe. Rethinking of Water Security for Ukraine based on results of National Policy Dialogue. 2016 https://www.gwp.org/globalassets/global/gwp-cee_files/regional/rethinking-water-security-ukraine-2016.pdf.

- ii. During floods or flash-floods due to flooding of drinking water supply sources and the washing out of contaminants from flooded areas.
2. Problems of equal access to drinking water and sanitation. There are growing geographical and social inequalities in access to improved sources of drinking water and sanitation.
3. Problems regarding the quality of drinking water due to:
 - Poor water quality in the water sources. Surface water, and in particular the Dnipro River, is a source of drinking water for 80 per cent of Ukraine's population. The river's flow is regulated by dams, which are contaminated by organic compounds, nutrients and pollutants, sediments and eutrophication.
 - Outdated water treatment and wastewater treatment technology.
 - The poor technical state of the infrastructure and networks, water distribution facilities/tanks and small water supply systems. All steps of the water supply chain pose a significant risk to the safety of the drinking water that consumers receive 'at the tap'.

The main challenge regarding climate change effects on WASH for Ukraine will be to first ensure the adherence to the Ukrainian legislation, aligned to 4 EU water directives and 21 associated regulations, which provide tools for implementing European water quality and water resource management standards. No substantial progress towards achieving the current National Targets was observed during the 2016-2018 period. The main obstacles identified include: incomplete water sector reforms; the little attention being paid by the government to improving access to safe water and sanitation, and the low priority given to this issue by local authorities; the lack of state budget financing for the State Target Programmes and the lack of new financial mechanisms to support development of the water supply and (particularly) sanitation sectors; the complexity of the transition to implementing European standards on water quality and water resources management; the reduction in monitoring programmes and collection of state statistics on access to water and sanitation; incomplete institutional reforms for sanitation supervision; the critical state of the water supply and sanitation sectors; and the conflict in eastern Ukraine³⁵².

Climate change will exacerbate the current water and sanitation situation. Therefore, priority should be given to improving this currently poor water and sanitation situation, and to mitigating the impacts of climate change in the most polluted regions where water resources are not properly managed, used or protected, paying special attention to drought- and flood-prone regions. This will include placing more emphasis on protecting water points and sewage facilities, and improving the balance of the water resources used for the country and for each settlement. Proper water resource planning, management and protection is required in urban areas to ensure sufficient water supply. Public hygiene education becomes increasingly important during extreme weather events, which might lead to water contamination. Given the little attention by the government to these issues, more advocacy is needed, as well as technical and donor funding support.

Water resources, wastewater treatment and pollution

Ukraine's total renewable water resources are estimated to be 139.6 million cubic kilometres per year, and 3,106 cubic meters per capita per year. While this means that Ukraine is considered to have no water stress (defined as below 1,700 cubic meters per capita per year), there is disparity in distribution of the water resources between different regions. The National Environment Strategy (NES) 2020 notes that practically all surface water and groundwater resources are polluted. Key pollutants include

³⁵² Department of Land and Water Resources Protection, Ministry of Ecology and Natural Resources of Ukraine, Summary report in accordance with article 7 of the Protocol on Water and Health, 2019. https://unece.org/fileadmin/DAM/env/water/Protocol_reports/reports_pdf_web/2019_reports/Ukraine_Protocol_report_4th_cycle_24Apr19.pdf.

nitrogen and phosphorus, organic substances, which are exposed to light oxidation, pesticides, oil products, heavy metals and phenols (NES 2020) (Government of Ukraine 2010)³⁵³.

The main causes of surface water pollution are: direct discharge of contaminated municipal and industrial wastewater into water bodies or through the sewage system; polluted runoff water from built-up areas and farmland; and soil erosion in water recharge areas. Donetsk, Dnipropetrovsk, Luhansk, and Odesa oblasts account for approximately 75% of all discharge into surface water resources. Key sectors contributing to polluted water discharge are industry (894 million cubic meters), housing and the municipal sector (538 million cubic meters), and the agricultural sector (71 million cubic meters). Due to the low quality of wastewater treatment, wastewater flow in contaminated surface reservoirs is not reduced³⁵⁴.

There were no improvements in average river nitrate and phosphate concentrations in Ukrainian rivers in the 2000-2017 period. Of all the Ukrainian rivers, Siverskyy Donets has the highest concentrations of nitrates and phosphate. The Pivdenni Bug river has high phosphate and moderate nitrate pollution. The Desna river also has high concentrations of phosphate, and the Tisa river has low nitrate levels but moderate concentrations of phosphate³⁵⁵.

Nitrate pollution

Nitrate is used mainly in inorganic fertilizers. It is also used as an oxidizing agent and in the production of explosives. Purified potassium nitrate is used for glass-making. Sodium nitrite is used as a food preservative, especially in cured meats. Nitrate is sometimes also added to food to serve as a reservoir for nitrite. Nitrate can enter both surface water and groundwater as a result of agricultural activity (including the excess application of inorganic nitrogenous fertilizers and manures), as well as from wastewater treatment and from the oxidation of nitrogenous waste products in human and animal excreta, including septic tanks. Nitrite can also be formed chemically in distribution pipes by *Nitrosomonas* bacteria during the stagnation of nitrate-containing and oxygen-poor drinking water in galvanized steel pipes or if chloramination is used to provide a residual disinfectant and the process is not sufficiently controlled³⁵⁶.

³⁵³ World Bank. Ukraine Country Environmental Analysis, January 2016
<https://openknowledge.worldbank.org/bitstream/handle/10986/24971/Ukraine000Coun0ironmental0analysis.pdf?sequence=4&isAllowed=y>.

³⁵⁴ World Bank. Ukraine Country Environmental Analysis, January 2016
<https://openknowledge.worldbank.org/bitstream/handle/10986/24971/Ukraine000Coun0ironmental0analysis.pdf?sequence=4&isAllowed=y>.

³⁵⁵ European Environment Agency. Nutrients in fresh water in Ukraine. <https://eniseis.eionet.europa.eu/east/indicators/c11-2013-nutrients-in-freshwater-2013-rivers-of-ukraine>

³⁵⁶ WHO Nitrate and nitrite in drinking-water Background document for development of WHO Guidelines for Drinking-water Quality 2011. https://www.who.int/water_sanitation_health/dwq/chemicals/nitratenitrite2ndadd.pdf

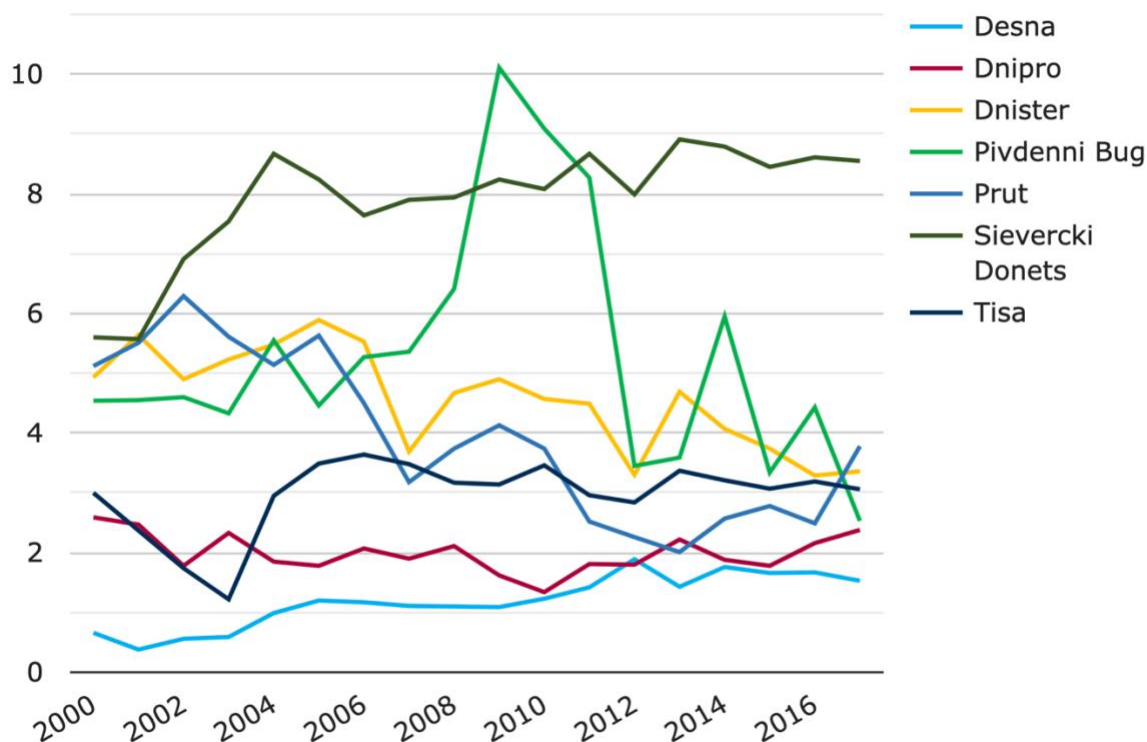


Figure 7: Changes in nitrate concentrations in the rivers of Ukraine (2000-2017)³⁵⁷

Data sources: Data was provided by the Ministry of Ecology and Natural Resources of Ukraine under the ENI SEIS II East project activities.

Note: The data series are calculated as the averages of the annual mean concentrations of nitrate (mg NO₃/l) for seven rivers in Ukraine for the period 2000-2017. The total number of river sites with full data sets from 2000 onwards is 82.

According to the MOH results of monitoring the content of nitrates in water from decentralized water supply sources in 2017 and 2018 (in particular, shallow wells and catchments, water from which is used for children under the age of three, with monitoring focusing on the prevention of water-nitrate methemoglobinemia in children), an increasing number of water samples returned results that deviated from the norms. A total of 40.2 per cent of drinking water samples from public wells in 2018 (33.1 per cent in 2017) did not meet the nitrate content standard, and 28.7 per cent of samples in 2018 (29.9 per cent in 2017) from individual wells did not meet the nitrate norms³⁵⁸.

There was one case of non-infectious diseases (water nitrate methemoglobinemia) recorded in 2015 in Dnipropetrovsk. Five cases were recorded in 2017 (one in Zhytomyr, one in Kharkiv, two in Kyiv oblast, one in Poltava and one in Karlovyky), and three cases were recorded in 2018 (one in Rivne and two in Poltava)³⁵⁹.

Phosphorus pollution

High concentrations of phosphorus may result from poor agricultural practices, runoff from urban areas and lawns, leaking septic systems or discharge from sewage treatment plants. Too much phosphorus can cause increased growth of algae and large aquatic plants, which can result in

³⁵⁷ European Environment Agency. Nutrients in fresh water in Ukraine. <https://eni-seis.eionet.europa.eu/east/indicators/c11-2013-nutrients-in-freshwater-2013-rivers-of-ukraine>

³⁵⁸ Department of Land and Water Resources Protection Ministry of Ecology and Natural Resources of Ukraine, Summary report in accordance with Article 7 of the Protocol on Water and Health, 2019. https://unece.org/fileadmin/DAM/env/water/Protocol_reports/reports_pdf_web/2019_reports/Ukraine_Protocol_report_4th_cycle_24Apr19.pdf. Location was not mentioned.

³⁵⁹ https://unece.org/fileadmin/DAM/env/water/Protocol_reports/reports_pdf_web/2019_reports/Ukraine_Protocol_report_4th_cycle_24Apr19.pdf.

decreased levels of dissolved oxygen – a process called eutrophication. High levels of phosphorus can also lead to algae blooms that produce algal toxins that can be harmful to human and animal health³⁶⁰.

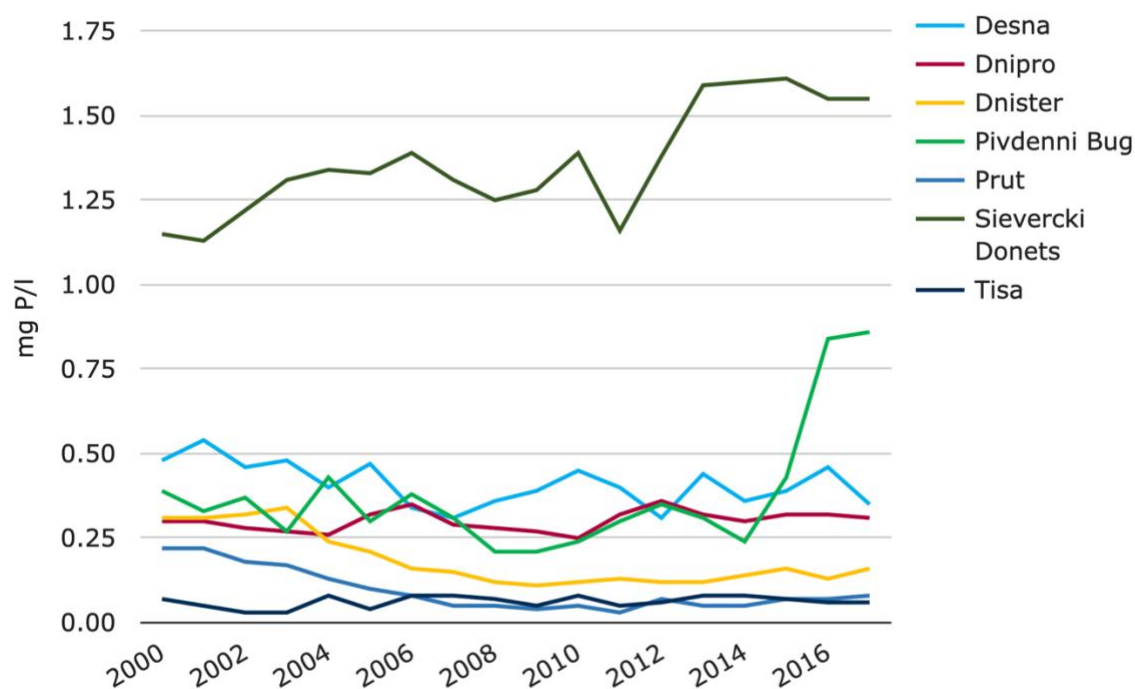


Figure 8: Changes in phosphate (P) concentrations in rivers in Ukraine (2000-2017)³⁶¹

Data sources: Data was provided by the Ministry of Ecology and Natural Resources of Ukraine under the ENI SEIS II East project activities.

Note: The data series are calculated as the averages of the annual mean concentrations of phosphate (mg P/l) for seven rivers in Ukraine for the period 2000-2017. The total number of river sites is 83.

Drinking water quality

Ukraine has adopted the Protocol on Water and Health. A report on drinking water quality is published annually by the Ministry of Regional Development. Pollutant screening is conducted in four river basins: Don, Dniester, Dnieper, and Danube (with support from international projects, OSCE and the International Commission for the Protection of the Danube River). The results (targeted screening – 2.5 thousand indicators, non-targeted screening – more than 65,000 indicators) show that water in Ukraine is contaminated with pesticides, pharmaceuticals and heavy metals.

Ukraine is switching to a new monitoring system that is used in the EU and regulations have been developed for this purpose. There are plans to also start monitoring pesticides and thus four new regional monitoring laboratories have been installed (in Odesa, Ivano-Frankivsk, Vyshhorod and Slovyansk), which will be able to carry out research previously not performed in state laboratories³⁶².

The summary report on the Protocol on Water and Health noted that, in 2018, based on sanitary-chemical parameters, the worst quality drinking water from centralized water supply systems was found in Luhansk, Mykolaiv, Poltava, Rivne, Zhytomyr and Zaporizhzhya oblasts, and based on microbiological parameters, water quality was poorest in Rivne, Zakarpatska, Ternopil, Vinnitsa,

³⁶⁰ US. National Aquatic Resource Surveys. <https://www.epa.gov/national-aquatic-resource-surveys/indicators-phosphorus#:~:text=Too%20much%20phosphorus%20can%20cause,to%20human%20and%20animal%20health> .

³⁶¹ European Environment Agency. Nutrients in fresh water in Ukraine. <https://eni-seis.eionet.europa.eu/east/indicators/c11-2013-nutrients-in-freshwater-2013-rivers-of-ukraine> .

³⁶² Personal communication with State Agency on Water Resources

Khmelnysky, Mykolaiv, Odesa and Ivano-Frankivsk oblasts, where indicators were 1.5 times higher than the national average³⁶³.

The State Institution O.M. Marzeiev Institute of Public Health of the National Academy of Medical Sciences of Ukraine has participated in the working group on the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS), which is a UN-Water initiative implemented by the WHO to monitor the delivery of sanitation and drinking water services at the global level, and which complements the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP).

In Ukraine, GLAAS seeks to complement sector review processes and to assist with assessing the enabling environment, including financial and human resources inputs into sanitation, water and hygiene, whilst identifying barriers and enablers. Whereas GLAAS monitors inputs into the water and sanitation sector, JMP monitors sector outcomes, i.e., progress in access to improved drinking water sources and improved sanitation. According to GLAAS 2014, the main conclusions regarding children's health are that neglecting water, sanitation and hygiene issues in schools and health facilities undermines the country's capacity to prevent and respond to outbreaks, and that WASH has received little attention in schools, despite the fact that these services affect children's health and school attendance (especially for girls), and contribute to the development of lifelong healthy hygiene habits^{364 365}.

Water supply and sewage

In Ukraine, access to a centralized water supply and sewage is on a downward trend. Geographical inequality is observed even in Kyiv. The situation is also critical with regard to access to sanitation in schools in Ukraine. In 2014, 5,132 (42 per cent) pre-school institutions used pit latrines and 281 (2.3 per cent) pre-schools had no sanitation facilities at all. There were 8,479 (44 per cent) schools that used pit latrines and 791 (4.6 per cent) schools were not canalized at all according to a 2016 report³⁶⁶.

In 2018, 78.1 per cent of urban dwellings were connected to the water supply system and 76.9 per cent to the sewage system. In rural areas, 37.4 per cent of dwellings had water supply and 33.8 per cent had sewage facilities³⁶⁷.

In Ukraine, as of 1 January 2020, 62 per cent of apartments in residential buildings and non-residential buildings had a water supply connection, and 59.9 per cent were connected to sewage facilities. The regions with the lowest water supply and sanitation coverage are Zhytomyr (less than 40 per cent), the northern and central regions of Ukraine (Poltava, Cherkasy, Kirovohrad, Khmelnytsky, Vinnytsia, Sumy, and Chernihiv) (less than 50 per cent), and the Chernivtsi oblast³⁶⁸. These regions have a high rural population.

According to the National Focal Point of the Water Convention in Ukraine³⁶⁹, during the 2016-2018 reporting period, access to drinking water in schools and pre-schools deteriorated compared with

³⁶³ Department on Land and Water Resources Protection Ministry of Ecology and Natural Resources of Ukraine, Summary report in accordance with article 7 of the Protocol on Water and Health, 2019. https://unece.org/fileadmin/DAM/env/water/Protocol_reports/reports_pdf_web/2019_reports/Ukraine_Protocol_report_4th_cycle_24Apr19.pdf.

³⁶⁴ Personal communication with the Institute of Public Health and their presentation.

³⁶⁵ Latest GLAAS report https://www.unwater.org/publication_categories/glaas/.

³⁶⁶ Ukraine water partnership. Global water partnership Central and Eastern Europe. Rethinking Water Security for Ukraine based on results of National Policy Dialogue. 2016 https://www.gwp.org/globalassets/global/gwp-cee_files/regional/rethinking-water-security-ukraine-2016.pdf.

³⁶⁷ State Statistics Service of Ukraine. Statistical Year Book of 2018:

http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf

³⁶⁸ State Statistics Service of Ukraine. Housing for regions in 2019 /Житловий фонд за регіонами у 2019 році / http://www.ukrstat.gov.ua/operativ/operativ2020/zf/zf_reg/zf_reg19_eu.xls.

³⁶⁹ Department of Land and Water Resources Protection, Ministry of Ecology and Natural Resources of Ukraine, Summary report in accordance with Article 7 of the Protocol on Water and Health, 2019.

2015. The number of kindergartens not connected to centralized and local water supply systems doubled from 797 (5.3 per cent) in 2015 to 1,434 (11.6 per cent) in 2018), and the number of pre-schools using water trucking increased by 57 per cent from 258 (1.7 per cent) in 2015 to 370 (3 per cent) in 2018). The situation in schools substantially deteriorated in 2016, when the number of schools not connected to centralized water supply increased to 3,121 (19.5 per cent). By 2018, the number of schools with no centralized water supply had fallen to 2,580 (16 per cent) but remained below the previous period indicator (15.1 per cent). Despite some progress in 2016, the number of schools using water trucking remained at the 2015 level (504, or 3.1 per cent) in 2018.

Climate change will induce the risk of droughts and floods. The number of schools in the drought- and flood-prone regions of Ukraine are shown in Table 5, below³⁷⁰. More information is needed to determine the type of water sources being used by these schools.

Region (oblast)	Number of pre-school educational institutions, 2018	Number of general secondary educational institutions, 2018/2019	Total
Drought-prone oblasts*			
Part of Ternopil (data for the whole oblast)	597	726	1,323
Zhytomir	675	667	1,342
Donetsk	549	521	1,070
Luhansk	250	280	530
Kherson	467	428	895
Dnipropetrovsk	981	906	1,887
Flood-prone oblasts*			
Ivano-Frankivsk	453	705	1,158
Lviv	840	1208	2,048
Chernivitsi	378	406	784
Zakapattya	592	665	1,257
Kyiv oblast	764	706	1,470
Drought- and flood-prone oblasts*			
Volyn	485	629	1,114
Rivne	524	608	1,132
Odesa	738	809	1,547

Table 5: Number of schools in drought- and flood-prone oblasts.

Source: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf

*The oblasts most vulnerable to climate change impacts according to expert opinion; however, this list of oblasts could be subject to expansion.

According to the SDG voluntary national review report of 2020, substantial progress has been made towards achieving the indicators for SDG 6 on water and sanitation since 2015. However, this remains insufficient because of under-financing at both the national and local levels.

https://unece.org/fileadmin/DAM/env/water/Protocol_reports/reports_pdf_web/2019_reports/Ukraine_Protocol_report_4th_cycle_24Apr19.pdf

³⁷⁰ http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf

In 2019, water-related issues in eastern Ukraine attracted both government and development partners' interest, and larger recovery projects were planned. However, as when reforming the energy sector, the specific features of eastern Ukraine and the unique situation of the Donbas water companies were not considered. Advocacy efforts were required to avoid jeopardizing the provision of uninterrupted water supply to more than four million people and prevent outbreaks of water-borne disease, such as the reported cases of diarrhoea in April 2019. This highlighted just how fragile the Donbas region remains, even six years after the outbreak of conflict³⁷¹.

The government's capacity to formulate, finance, manage and maintain the water and sanitation sector remains weak. At the national level, there is a need for an effective and concise water and sanitation policy that is in line with the SDGs and Ukraine's national development agenda. Water and sanitation facilities in schools and health institutions need to be improved³⁷².

CEE and disaster risk reduction for children's resilience

Under the Hyogo Framework for Action 2005-2015, the Ukrainian government approved the Risk Management Concept for Technogenic and Natural Emergency Situations in January 2014. Its Implementation Plan for 2015-2020 includes developing a new safety management system based on a risk-based approach. In January 2017, the Cabinet of Ministers of Ukraine approved the Strategy of Reforming the State Emergency Service of Ukraine, which includes plans for a comprehensive state emergency system reform and for improving its ability to combat natural and man-made threats.

Within Ukraine, the hazard level for river and urban floods and wildfires is classed as high, with medium-level hazards being water scarcity and extreme heat. One recent example of a major natural emergency is the heavy rainfalls and flooding in western Ukraine in June 2020. The most affected areas were the western parts of the Ivano-Frankivsk, Chernivtsi, Zakarpattya, Ternopil and Lviv oblasts. In order to address the consequences of the disaster, teams from the Ministry of the Interior, the National Guard and the State Emergency Service (SESU) were sent to the Ivano-Frankivsk oblast³⁷³.

³⁷¹ UNICEF. Country Office Report 2019 Ukraine: [https://www.unicef.org/about/annualreport/files/Ukraine-2019-COAR\(1\).pdf](https://www.unicef.org/about/annualreport/files/Ukraine-2019-COAR(1).pdf).

³⁷² UNICEF in Ukraine Programme Strategy Note 2018-2022: <http://files.unicef.org/transparency/documents/Strategy%20Note%20Ukraine.pdf>.

³⁷³ https://www.nato.int/nato_static_fl2014/assets/pdf/2020/7/pdf/200703-EADRCC-ukr-floods-sitrep1.PDF.

Case study 4

National-level response to the 2020 floods in western Ukraine and international assistance

The European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations reported that, as of 22 June 2020, the western regions of Ukraine – Ivano-Frankivsk, Chernivtsi, Zakarpattya, Lviv and Ternopil – had been affected by floods. The State Emergency Service of Ukraine (SESU, which is the agency primarily responsible for DRR policy in Ukraine) reported that there had been three fatalities in Ivano-Frankivsk, more than 2,500 people evacuated and approximately 14,450 houses damaged. Based on initial reports from the SESU, up to 30,000 people were directly affected by the 2020 floods. Thirteen social infrastructure assets were destroyed, including schools and hospitals. A total of 277 settlements were flooded, many of which were left without electricity (the data on the number of settlements without electricity and clean water supply were not readily available), and 9,994 dwellings were also flooded.

On 25 June, Ukraine submitted a request for assistance to the EU's Union Civil Protection Mechanism (UCPM). Four member states (Sweden, Italy, Denmark and Slovakia) offered and delivered assistance under the UCPM. This assistance included flood barriers, motor pumps, chainsaws, tents, drones, water pumps, generators, lighting sets, hoses, headlamps, rescue ropes and life vests. On the same day, the Emergency Response Coordination Centre (ERCC) activated the EMS Copernicus to produce satellite maps and, as of the report date, provided seven maps of the affected areas that were shared with the Ukrainian authorities to support rescue operations.

The significant threat to human life and the damage sustained to critical infrastructure prompted Ukraine to file a request for international assistance with the Euro-Atlantic Disaster Response Coordination Centre (EADRCC).

Overall, the UCPM's response fulfilled almost 50 per cent of the Ukrainian request for assistance. On 6 July, Ukraine stated that the situation was improving and there was no further need for international assistance.

While data on the number of children affected is unavailable, unofficial sources indicate that in Ivano-Frankivsk, the worst-affected of the flooded regions, over 13,000 families in 263 settlements were identified as in need of help. This suggests that rather a large number of children was affected, even though the family composition/presence of children in the household was not specified by the source and it was not possible to obtain precise data on the children affected. While family reunification was prioritized, there is no evidence to suggest that the situation of children was specifically monitored or that children's needs and interests were specifically taken into account beyond family reunification.

In connection to this, it is important to note that there are generally more dwellings with inadequate living space for households with children in western Ukraine, with the highest proportion of children with less than adequate living space per child being registered in Ivano-Frankivsk (78 per cent), Volyn (78.1 per cent), and Lviv (76 per cent)³⁷⁴, thereby highlighting the importance of resilient housing (as well as resilient infrastructure for children in general). This is all the more vital considering that this is not the first time in recent decades that western Ukraine has been affected by a natural emergency. The 2009 floods affected practically all of western Ukraine, with 38 people declared dead or missing,

³⁷⁴ Social and Demographic Characteristics of Ukraine Households for 2019 (соціально-демографічні характеристики домогосподарств України у 2019 році), at https://ukrstat.org/uk/druk/publicat/kat_u/2019/zb/07/zb_sdhdu2019.pdf

including eight children, in Ivano-Frankivsk. There were 24 people reported dead or missing, including seven children, in Chernivtsi; and 12, including one child, in Vinnytsya. The total number of victims was 498, and 2,088 people were hospitalized, including 172 children³⁷⁵.

Children who live with disabilities are rendered especially vulnerable by natural disasters. A 2020 report from the Office of the United Nations High Commissioner for Human Rights on the promotion and protection of the rights of persons with disabilities in the context of climate change noted that: “[C]limate affects the rights of persons with disabilities to adequate housing [...] During emergencies, environmental barriers may prevent persons with disabilities from accessing shelters and safe spaces.”³⁷⁶

The child’s right to grow in a family environment may also be impacted by CEE-related factors, disproportionately so in the case of children living with disabilities, who may experience a higher risk of institutionalization in the aftermath of a disaster. This is one of the issues where additional research would help to promote a more evidence-led approach to child disability-related policymaking in Ukraine.

Note that in 2018, at the level of building codes and standards, a new building standard, DBN V.2.2-40:2018 (Inclusive Buildings and Structures), was adopted, which replaces the older DBN V.2.2-17:2006 standard on accessibility. It is important that this standard is considered in the context of safe school and resilient construction.

Aware of the high risk for natural disasters such as floods in Ukraine, and in western Ukraine specifically, the authorities have welcomed international cooperation in DRR governance and public risk awareness. One such example is the EU-funded ImProDiReT project³⁷⁷, which is working to create new approaches and methods to jointly develop DRR strategies with multiple stakeholders, focusing on a specific case in the Zakarpattia oblast. Building on the Sendai framework, specifically ‘strengthening disaster risk governance’, the ImProDiReT project uses a participatory approach to disaster risk governance.

Regional authorities in disaster-prone regions have treated DRR as a priority. Some good practices have started to emerge in this respect. For instance, the Zakarpattia regional administration has sought to incorporate elements of a proactive disaster-preparedness approach by introducing training for schools on preparation for extreme weather events. At the same time, some of the stakeholders interviewed stressed that the existing emergency response system remains more reactive than proactive, and is thus an area for potential improvement. There is therefore a need for the emergency response system to incorporate a more proactive approach, focusing on comprehensive disaster preparedness (including not only training but also monitoring of the state of vital infrastructure and residential buildings) as a key element of DRR. As such, a greater emphasis should be placed on child-friendly disaster preparedness training at school and in the community.

Environmental concerns form part of the Ukrainian authorities’ vision of school safety. This is illustrated by the recent Presidential Decree No. 195/2020, approving the National Strategy of the Development of Safe and Healthy Educational Environment of the New Ukrainian School. The Presidential Decree highlights that one of the challenges is “inadequate attention to the establishment in educational institutions of conditions that promote physical safety and accessibility of the educational environment to all students, including those with special educational needs ([including] compliance with the requirements of [...] environmental safety”. There is therefore a recognized need to further improve the inclusion of environmental safety as a component of school safety. This should

³⁷⁵ WHO, Floods in the WHO European Region: Health effects and their prevention, at https://www.euro.who.int/data/assets/pdf_file/0020/189020/e96853.pdf.

³⁷⁶ Analytical study on the promotion and protection of the rights of persons with disabilities in the context of climate change, Report of the Office of the United Nations High Commissioner for Human Rights, A/HRC/44/30, 22 April 2020, <https://undocs.org/A/HRC/44/30>.

³⁷⁷ https://ec.europa.eu/echo/funding-evaluations/financing-civil-protection-europe/selected-projects/improving-disaster-risk_en.

ideally incorporate the concept of resilient school infrastructure (possibly including a model design for school/pre-school buildings and related structures).

In connection with the above, it bears note that the Zakarpattya regional administration has collaborated with the police to launch a search and reunite scheme for children missing in emergencies. Since the risk of child separation is particularly high during evacuation or sheltering processes, the scheme works to reunite unaccompanied children found during emergencies with their caregivers. This could prove to be a good practice that deserves support. It could be recommended as a basis for developing a multi-stakeholder mechanism for family reunification in emergencies, which would include the mandatory development of school emergency plans with reunification standard operating procedures (SOP) for schools in disaster-prone regions as part of the school safety policy.

To address outstanding gaps, a model reunification SOP could be developed that schools nationwide could then adapt and adopt. In addition, there is need to ensure that DRR awareness-raising for children, families and communities includes the promotion of individual family emergency plans (that contain information such as emergency contacts, family contacts and multiple meeting points). This would also have the collateral advantage of promoting a more efficient police response in non-climate-related critical incidents as, if trained to rely on family emergency plans, even young children would be able to more effectively relay critical information to police and emergency service dispatchers. This could also be of critical importance for other regions, as some of the stakeholders interviewed flagged gaps in the existing evacuation-related standard operating procedures, which do not include safeguards to protect infants and young children specifically. In particular, poor communication during evacuations was highlighted as being an issue.

Non-profit stakeholders play a significant role in DRR for children's and community resilience. The Ukrainian Red Cross Society works with local communities to boost community and family emergency planning capacity. With support from the Austrian Red Cross, the Ukrainian Red Cross Society has embarked on an initiative to design and distribute hazard-specific, disability-sensitive Information, Education and Communications (IEC) materials to increase awareness of risks and basic preparedness measures. Emergency equipment will be provided to segments of the population exposed to natural, environmental, industrial and conflict-related hazards, and part of the approach focuses on equipping child-friendly safe spaces at community level.

An ongoing 18-month project in eastern Ukraine, implemented by ACTED in a consortium with a number of international and domestic organizations, aims to improve understanding of, and promote and take measures towards, preparedness with regard to industrial/ecological risks (including those exacerbated by the conflict) in government-controlled areas along the contact line.

Overall, it appears that, while the general capacity to respond to rapid onset emergencies is improving, progress is being marred by systemic gaps insofar as the impact of disasters on child protection and education is concerned. The existing approach to DRR for children's resilience is somewhat fragmented and the concept of child-centred DRR is missing from the agenda. UNICEF may wish to explore how Ukraine can better harness children's potential in effecting change. If authorities demonstrate interest, UNICEF could assist the government in developing a long-term strategy to prepare children, families and communities for natural emergencies and effective recovery based on participation and increased capacities.

Climate change and a child-friendly environment

A child-friendly environment is understood as being an educational and community environment that is supportive and empowering, rights-based, healthy and inclusive. In particular, a child-friendly environment should promote the individual dignity of each child, as well as equality and non-discrimination, and gender-sensitivity.

In terms of the impacts that CEE may have on the situation of children, related threats may pose risks to child-friendly environments in a number of ways. Due to the lack of data on issues such as internal migration and climate change (see *Climate-related threats and disasters – social issues (climate-induced migration and displacement)*), the risks outlined below are discussed in terms of probable scenarios given the situation in Ukraine, rather than as actual challenges. A brief outline of these risks, accompanied by possible solutions to mitigate impacts, is provided below:

- As discussed under *Social protection and poverty*, the higher concentrations of poverty in more polluted areas, and the vulnerable segments of the population's greater susceptibility to environmental concerns due to their underlying health status, poses a unique challenge in terms of environmental justice. It may be advisable for child- and eco-friendly initiatives to incorporate environmental justice concerns in order to promote targeted solutions to existing socio-environmental inequalities.
- Migration from CEE shock-prone areas (including possibly also rural-to-urban migration, especially where spurred by climate change-related events such as droughts and other events that trigger migration from agrarian-dependent areas) may put a strain on cities' ability to accommodate the influx of domestic migrants. This, in turn, may result in the exacerbation of inequalities (e.g., with migrants settling in less desirable, less child- and eco-friendly areas of the city, or with the city finding itself unable to provide access to quality services to newcomers in the wake of an extreme weather event that has provoked the mass migration). The adoption of a risk-based approach to planning could help address this issue, especially if it is adopted both in shock-prone rural areas (where it may help curb migration/displacement by improving resilience) and in urban settlements likely to receive migrants following a natural emergency or other shock (where it may help cities to cope more effectively with an influx of migrants and ensure that children and families do not find themselves at a disadvantage as a result of moving).

The following weather events predicted as a result of climate change need to be accounted for when planning for resilience in child-friendly environments:

- Heatwaves are likely to result in poorer urban air and water quality, as well as water shortages. It is therefore important to have air/water quality monitoring systems in place to ensure timely action and pre-empt the negative effects on children.
- Droughts put additional strain on water resources, cause land degradation and may precipitate rural-to-urban migration due to the loss of livelihoods in agriculture-dependent areas.
- Torrential rains may adversely affect public transportation, water supply and sewage systems, as well as the quality of satellite internet connections (thereby negatively affecting children's access to education). They also increase the risk of floods.
- Floods may result in serious damage to housing and public infrastructure, resulting in disruption to the quality of children's life. Floods are also likely to cause rural-to-urban migration.

In light of the above, it is important to consider the adaptive capacity of cities as Ukraine strives to develop child-friendly environments. According to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2014)³⁷⁸, the adaptive capacity of any city provides a foundation for building city resilience. Technical Paper 7 of the UNFCCC Adaptation Policy Framework Technical Paper series³⁷⁹ defines adaptive capacity as "the property of a system to adjust its characteristics or behaviour, in order to expand its coping range under existing climate variability, or future climate conditions. In practical terms, adaptive capacity is the ability to design and implement effective adaptation strategies, or to react to evolving hazards and stresses so as to reduce the likelihood of the occurrence and/or the magnitude of harmful outcomes resulting from climate-related hazards". Developing the adaptive capacity of child-friendly environments, especially urban environments, involves analysing the potential impacts of climate change-related risks on the city

³⁷⁸ <https://www.ipcc.ch/assessment-report/ar5/>.

³⁷⁹ <https://www4.unfccc.int/sites/NAPC/Country%20Documents/General/apf%20technical%20paper07.pdf>.

itself and its surrounding areas, integrating the findings in urban planning, and applying a child-rights perspective to ensure that any adaptation solutions (such as those focusing on monitoring, early warning mechanisms and proactive strategies to minimize shock-related harms, as well as post-shock relief and recovery) maximize the gains for children, while preventing any negative effects. The application of a child-rights perspective also underscores the importance of child participation in developing the adaptive capacity of child-friendly environments (see also *Child and youth participation in CEE*). It should be noted that, overall, urban areas have better adaptive capacity due to their greater financial resources, concentration of knowledge and human capital, as well as their ready availability of technological solutions. However, proactive child-centred planning is yet to be implemented in Ukraine and so needs to be introduced.

Ukraine has made significant strides in its quest to build child-friendly environments since 2009-2010, when the Child-Friendly Cities Initiative was first piloted in Ukraine by UNICEF. As of July 2020, 35 municipalities had signed a Memorandum of Understanding with UNICEF Ukraine to implement the initiative, with 23 of these municipalities having achieved candidate status, which involves having approved an Action Plan and implemented specific actions to promote child-friendliness. Furthermore, the city of Vinnytsya was awarded a prize at the International Child Friendly Cities Inspire Awards. When viewed in conjunction with Vinnytsya's commitment to the Global Covenant of Mayors and its resulting pledges to reduce greenhouse gas emissions and track relevant progress, this points to a willingness to develop environments that are both child-friendly and potentially able to adapt to and mitigate the consequences of climate change in at least some of Ukraine's cities and regions.

Vinnytsya's case study may merit closer examination by UNICEF, the Ministry of Communities and Regional Development, the Ministry of Social Policy and the Ministry of Ecology and Natural Resources. The Ministry of Ecology and Natural Resources is apparently not part of the Child-Friendly Cities Initiative in Ukraine at the moment³⁸⁰, and it may therefore be useful to promote closer engagement with this ministry given the impact of climate change on the child-friendliness of local environments.

In addition to the concept of Child-Friendly Cities, Ukraine has joined the international Cities for Life initiative³⁸¹, which focuses heavily on eco-friendliness and has a large climate strategy component. Cities for Life – which so far has only been launched in Kyiv and is at the inception stage – aims to provide a participatory platform for citizens to provide input into urban development strategies for better eco-friendliness. The Kyiv project includes the following activities, all of which are relevant to children's well-being:

- Monitoring the state of air pollution and greenhouse gas emissions in the city, with the output data made publicly accessible;
- Introduction of energy-saving technologies and equipment in order to reduce the use of fossil fuels and facilitate the transition to alternative energy sources;
- Introduction of an efficient and eco-friendly mass transit system, with a network of bike paths;
- Increasing the green area;
- Public awareness and outreach;
- Introduction of a contemporary waste management system, with garbage sorting in place, which is set to rely on public-private partnerships;
- Comprehensive rehabilitation and purification of the city's water reservoirs;
- Adaptation of city buildings and structures to climate change;

³⁸⁰ The working group that supports UNICEF in this endeavour consists of: the Ministry of Regional Development, Construction, Housing and Communal Services; Ministry of Social Policy; Ministry of Youth and Sports; the Association of Ukrainian Cities; the Association of Consolidated Territorial Communities; the UNFPA; and the National Youth Council of Ukraine.

³⁸¹ <https://cityforlife.org/>.

- Improving environmental safety;
- Promoting the introduction and development of the 'green building' concept³⁸².

It is understood, however, that Cities for Life in Ukraine is still in the early stages of development. As such, a definitive assessment of its impact on children would be premature at this stage.

Moreover, in 2019, Kyiv joined the EBRD Green Cities programme³⁸³. Lviv was the first city to join the programme, and Khmelnytskyi, Krivyi Rih and Mariupol followed soon after. Overall, EBRD's plan is to support the preparation of Green Action Plans for 100 cities of Ukraine.

The EBRD region-wide, EUR 1 billion Green Cities programme focuses on cities with a population of at least 100,000, that are willing to produce a Green City Action Plan and initiate an investment trigger project in a number of CEE areas, including district energy, low-carbon and climate-resilient buildings. It brings benefits to cities where obsolete urban infrastructure is degrading the quality of life of the population, increasing greenhouse gas emissions and preventing communities from adapting to climate change. Participating cities sign Memorandums of Understanding to formalize their commitment to formulating tailor-made Green City Action Plans that will shape each city's unique response to its environmental needs and build a better and more sustainable future for residents.

³⁸² <https://mistosite.org.ua/uk/articles/mista-dlia-zhyttia-iak-kyievu-adaptuvatysia-do-zmin-klimatu?fbclid=IwAR2sQsBDauW5LbNleDBELaa899ZSaLyWFhpmDWW9eyBloOrVudq4-ri99zA> , <https://mistosite.org.ua/ru/articles/kyievu-klimatychnu-stratehiiu-manifest-kampanii-mista-dlia-zhyttia?fbclid=IwAR2-h6IX78fC87svUienLdO5-GYFt5HGAI2f5fsj9KTmzqVpDYEmnVj3vAc>.

³⁸³ <https://www.ebrd.com/news/2019/kyiv-joins-innovative-ebrd-green-cities-programme-.html>; see also <https://www.ebrdgreencities.com/>.

Case study 5

Kyiv as a member city of the EBRD Green Cities programme: status and expected outcomes for children

In February 2021, the Kyiv city authorities set up a Coordination Council to develop a Green City Action Plan for the capital. The Coordination Council included: the First Deputy Head of Kyiv City Council; Deputy Heads responsible for housing and communal services, transport and communications, urban planning and architecture; the Director of the Department of the Economy and Investment; the Department of Finance; and the Heads of Standing Commissions of Kyiv City Council. By 1 October 2021, the Coordination Council, in conjunction with the consulting team, US Atkins International Ltd., is expected to submit a draft Action Plan to the Department of the Economy and Investment for further approval by Kyiv City Council.

While it does not expressly address children's issues or assess the impact of planned actions on children, the Green City Action Plan under development is expected to benefit children as part of the general population by assessing the negative impacts of CEE issues and suggesting actions to create a safer and healthier environment. The publicly available workshop document appears to focus more on sustainable energy, water supply and eco-friendly public transportation. While these are doubtless important factors in ensuring children's health and well-being, they are not child-specific.

The expert assessment for the Green Cities project noted that, while the electricity network is well maintained, the level of wear on the heating network is significant and needs investment. With regard to the water sector, the main challenge was seen as being the condition of the water supply and sewage networks. The assessment also highlighted the importance of solid waste management and of building a compost plant for green waste and a new landfill. It was also noted that, while strong protection and the expansion of green spaces suggests good environmental performance, low density and high population growth results in the inefficient use of all functional zones. This results in significant volumes of road traffic, which contributes to congestion in the city and significantly affects air quality and GHG emissions. This said, based on the CEE issues previously identified by experts and the wider public (through a public survey of more than 1,000 participants), the Action Plan will focus on the following key priorities: air pollution and the reduction of GHG emissions; water quality; climate change resilience; and recommendations to all sectors on how to reduce the negative impacts of their processes.

Consultations with NGO stakeholders, communities and citizens form an important part of the work to prepare the Action Plan, increasing the likelihood that children and young people may be consulted during the Action Plan development process. In addition, focus on the monitoring of environmental indicators (such as air, water and soil pollution) may ultimately provide valuable evidence to inform the development of child-centred policies and practices.

In relation to Kyiv's adaptive capacity, adaptation and resilience were specifically highlighted as a high-priority topic. This potentially opens a window of opportunity for the city to apply a child-centred approach.

In summary, Ukraine's existing initiatives to promote child-friendly and eco-friendly environments are laudable and as such should be continued. Implementing an impact assessment on children's rights and well-being at the development stage of each project, followed by rigorous monitoring, in particular emerges as a need.

CHAPTER IV: KEY FINDINGS

Health

- Urban areas are more prone to air pollution due to their high concentrations of industry, thermal power plants, road transport and the use of poor-quality fuel. People living in cities also suffer more from heatwaves. More frequent heatwaves in Ukraine will put children at risk of heat stress, renal disease and respiratory illness. As two-thirds of children live in cities, these issues will affect a large proportion of the child population.
- The WHO global database showed the DALYs attributable to the environment for NCDs, injuries, infectious, parasitic, neonatal and nutritional diseases to be 18 per cent for Ukraine for 2012.
- The main diseases contributing to the environmental burden of diseases for children under five years globally are by and large respiratory infections and diarrhoeal diseases, followed by neonatal conditions and parasitic and vector-borne diseases.
- A number of regions have poor indicators (above average) on nearly all indicators that contribute to the environmental burden of diseases for children aged under five in Ukraine, including IMR, U5M, low birth weight, respiratory diseases (including asthma), diarrhoeal- and vector-borne diseases, and injuries. For further information, please refer to the indicators in Annex 2.
- Many cities and regions affected by CEE, as described in Chapter 1, also appear to have poor child health indicators, although other factors such as poverty, poor housing, smoking adults, and living in disaster affected areas/informal settlements have an impact on children's health as well. Therefore, climate change and environmental contamination are expected to contribute to children's vulnerability.
- The annual available statistics from Ukraine MOH and State Statistics Service do not show excess death or morbidity during heatwaves, floods, fires and periods of high air pollution. It would be useful to routinely collect this data, whether through surveys (e.g., add the relevant indicators to MICS, DHS or STEPS) or research. The MOH's installation of a new national electronic system for medical emergencies has been delayed.
- The desk review was unable to determine poverty levels at regional level due to a lack of available data, thus the DI indicator is used instead.
- Regional CEE issues that may impact children's well-being and health were identified through the evaluation of environmental and health indicators per region (for more information, please refer to Annex 2):
 - Although Luhansk is the poorest region with regard to DI, it does not seem to have many poor health indicators for children, which could be due to limited access to health services and/or underreporting;
 - For the drought-prone oblasts (Rivne, Volyn, part of Ternopil oblast, Zhytomyr, Donetsk, Luhansk, Kherson, Dnipropetrovsk and Odesa), there was a correlation with a relatively low DI (as a measurement for poverty) in Volyn, Donetsk, Luhansk, Rivne, Ternopil and Kherson;
 - Kyiv is one of the most polluted cities in Ukraine, but has low mortality rates (IMR/U5M and perinatal mortality) and an average low birth weight, which may be due to better and more accessible health services, although it still has a high incidence of respiratory diseases;
 - Air pollution reduction measures are required to improve the environment for the city of Kyiv, Donetsk, Dnipropetrovsk and Ivano-Frankivsk oblasts; these regions also have a high incidence of respiratory diseases (with the exception of Donetsk, which could be due to limited access to health services and/or underreporting);
 - Capital invested in environmental protection measures reveals that the areas where ongoing and further measures are most urgently required are the city of Kyiv and Kyiv oblast, and industrial Donetsk, Dnipropetrovsk and Zaporizhzhya oblast. These regions also have

poor health indicators, except for the city of Kyiv (but high incidence of respiratory diseases) and Kyiv oblast (which may be due to Kyiv's better and more accessible health services).

Nutrition

- Nutrition is also likely to be affected by climate change through related impacts on food security, dietary diversity, care practices and health. The rural population will be more vulnerable due to food/agriculture insecurity following extreme weather events, as well as to loss of income, and may have lower adaptive capacities and/or less access to technological solutions.
- Spending on food is unreasonably high in Ukraine, amounting to 54.6 per cent of total cumulative spending, which was between three and five times higher than in European Union countries in 2015.
- Little information is available on the current status of malnutrition in Ukraine, though the latest data suggests that being overweight seems to be more of a problem among children than stunting and wasting. Unhealthy dietary patterns are also common.

Climate change and mental health outcomes

- No studies have been carried out in Ukraine to specifically examine the impact of climate change on mental health outcomes for children.
- A review of statistical indicators to ensure better disaggregation of mental health data by region, gender and type of diagnosis would enable better assessment of the impact of CEE factors on children's mental health.
- Investment in community-based mental health services is essential for improving mental health outcomes for children, including children affected by climate change-induced displacement.

Education, early childhood development and CEE

- Elements of environmental education have been integrated into Ukrainian secondary school curricula for a number of years and at all levels of general education.
- The State Standards of Primary Education notably include environmental competences (Key Competence 6) as part of the national key competences framework.
- There is a sustained and policy-driven effort to build teachers' environmental education capacities.
- Ukraine's civil society and private sector play a considerable role in promoting environmental awareness and extracurricular educational activities that focus on the environment and climate change for children.
- The focus on innovation and experiential learning in environmental education is particularly laudable. Nationwide methodological clearing houses and innovation hubs such as NENC and the Aarhus Centre play a significant role in this respect.
- While quantitative and qualitative data on the effects of CEE on education in Ukraine are extremely scarce, the following threats may be identified based on the country's CEE profile:
 - Disruptions in access to education due to direct damage to the educational infrastructure caused by natural disasters, such as floods;
 - Educational deprivations in the form of limited access to educational resources and online learning environments due to damage to the telecommunications infrastructure, caused by natural emergencies (especially relevant during the COVID-19 pandemic);

- Reduction in educational attainment and higher absenteeism due to the impacts of CEE on children's health;
- Decrease in safety and supportiveness of learning environments due to climate change-related displacement and evacuations and, in general, the impacts of CEE on the overall well-being and mental health of children and their caregivers.

Social protection and poverty

- Climate change increases the risk of weather shocks and similar adverse events, which in turn create additional deprivations for individual households, with households with children being at particular risk.
- When developing regional social and economic development policies, there is need to consider extreme weather events, not only in terms of their immediate impact (i.e., through relief efforts) but also as potential social stressors, paying special attention to children's social well-being.
- Social adaptation strategies insufficiently target the economic sectors and geographical regions that are most vulnerable to climate change-induced hazards. Early identification of vulnerable families with children is essential.
- Reskilling and livelihood diversification schemes for families with children in CEE shock-prone regions form a key part of social protection.
- The combined challenge of higher concentrations of poverty in more polluted areas and the more deprived segments of the population's greater susceptibility to environmental concerns due to their underlying health status calls for a two-pronged approach that addresses environmental concerns in areas with higher concentrations of poverty, while at the same time improving access to quality healthcare for vulnerable families with children. This analysis has been unable to identify evidence of initiatives in Ukraine that address these two issues as part of a coordinated strategy.

Energy poverty

- In Ukraine, the market reforms of recent years have involved the rapid adjustment of energy prices without an accompanying improvement in the population's living standards. This has resulted in energy deprivation for a considerable share of the population.
- The government has pursued a policy of directly subsidizing vulnerable consumers, which has helped maintain the average share of household utilities expenditure at roughly the same level for a number of years now. However, this policy does not take into account the multifaceted nature of energy poverty.
- One of the key factors of energy poverty is considered to be the low standard of energy efficiency within the housing stock and buildings in general.

WASH

- The main cause of surface water pollution is the direct discharge of contaminated municipal and industrial wastewater into bodies of water or through the sewage system. There is poor water quality in the rivers, which are contaminated by organic compounds, nutrients and pollutants, sediments and eutrophication. Average river nitrate and phosphate concentrations in Ukrainian rivers are too high and showed no improvement over the 2000-2017 period.
- Water availability and quality will be affected by droughts and floods.

- Additionally, Ukraine is using outdated water treatment and wastewater treatment technology, and the infrastructure and networks, water distribution facilities/tanks and small water supply systems are in poor technical condition.
- In 2018, 78.1 per cent of urban dwellings had a water supply connection and 76.9 per cent had sewage services. In rural areas, only 37.4 per cent of dwellings had water supply and 33.8 per cent had sewage facilities.
- Access to drinking water in schools and pre-schools deteriorated during the 2016-2018 period compared with 2015.
- There has been substantial progress towards achieving the indicators for SDG 6 on water and sanitation since 2015. However, this progress remains insufficient due to under-financing at both the national and local levels.

Climate change and disaster risk reduction for children's resilience

- In Ukraine, the hazard level for river and urban floods and wildfires is classed as high, with medium-level hazards being water scarcity and extreme heat. It is important to note that there are generally more dwellings with inadequate living space for households with children in flood-prone western Ukraine, which highlights the importance of resilient housing.
- Children who live with disabilities are rendered especially vulnerable by natural disasters. The risks extend to the child's right to grow in a family environment, which may be disproportionately impacted by CEE-related factors in the case of children living with disabilities, who may experience higher risk of institutionalization in the aftermath of a disaster.
- Environmental concerns form part of the Ukrainian authorities' vision of school safety. At the same time, there is a recognized need to further improve the inclusion of environmental safety as a component of school safety.
- The current approach to DRR is overwhelmingly reactive, and proactive elements are still in the early stages of development and very limited.
- While the general capacity to respond to rapid onset emergencies is increasing, progress is marred by systemic gaps insofar as the impact of disasters on child protection and education is concerned. The existing approach to DRR for children's resilience is somewhat fragmented and the concept of child-centred DRR is missing from the agenda.

Climate change and a child-friendly environment

- Ukraine has made significant strides in its quest to build child-friendly environments since 2009-2010, when the Child-Friendly Cities Initiative was first piloted in Ukraine by UNICEF.
- In addition to the concept of Child-Friendly Cities, Ukraine has joined the international Cities for Life initiative, which focuses heavily on eco-friendliness and has a large climate strategy component. Cities for Life has so far only been launched in Kyiv, where all of the activities included under the initiative are relevant to children's well-being.
- Child- and eco-friendly initiatives would benefit from incorporating environmental justice concerns in order to promote targeted solutions to existing socio-environmental inequalities.
- Migration from CEE shock-prone areas (including possibly also rural-to-urban migration, especially where spurred by climate change-related events, such as droughts and other events that trigger migration from agrarian-dependent areas) may put a strain on cities' ability to accommodate the influx of domestic migrants. This, in turn, may result in the exacerbation of inequalities. The adoption of a risk-based approach to planning is likely to help address this issue, especially if it is adopted both in shock-prone rural areas and in urban settlements likely to receive migrants following a natural emergency or other shock.

- It is important to consider the adaptive capacity of cities as Ukraine strives to develop child-friendly environments. Developing the adaptive capacity of child-friendly environments, especially urban environments, involves analysing the potential impacts of climate change-related risks on the city itself and its surrounding areas, integrating the findings in urban planning and applying a child-rights perspective to ensure that any adaptation solutions maximize the gains for children, while preventing any negative effects.

5

CHILD AND YOUTH PARTICIPATION IN CEE



UNICEF defines child participation as girls and boys (individually and/or collectively) forming and expressing their views, and influencing matters that concern them both directly and indirectly³⁸⁴. Over past decades, it has become clear that children can become successfully involved in a range of processes including: research; monitoring and making decisions regarding their health; managing their own institutions, such as schools; evaluating services intended for younger people; peer representation; advocacy; project design, management, monitoring and evaluation; campaigning and lobbying; analysis and policy development; publicity and use of the media; and conference participation³⁸⁵.

Child and youth participation in CEE in Ukraine is promoted using both bottom-up and top-down approaches, i.e., in addition to grassroots initiatives, there exist projects promoted at the central and local government levels that are aimed specifically at encouraging children to participate in environment-related decision-making. One example is the above-mentioned prize that the city of Vinnytsya – nominated in the Meaningful Child Participation category – won at the 2019 International Child Friendly Cities Inspire Awards. Vinnytsya was propelled to the top by its funding projects involving local schoolchildren, backing projects amounting to 1 million UAH. The Aarhus Centre Ukraine has also sought to promote elements of child participation in family and community-based decision-making on environmental issues.

In addition, there have been some examples of child and youth activists involved in advocacy for legislative change. One such example is Plast’s involvement in lobbying for a bill to introduce a ban on single-use plastics by 2023 (Plast is a scouting organization; see the subchapter on *Education, early childhood development and CEE* for more information on their activities). However, these examples of bottom-up approaches and activism remain somewhat fragmented. This analysis did not uncover any evidence of a concerted top-down effort to involve children and young people in legislative public hearings on environmental issues.

International donors have sought to tap into children’s and young people’s potential for environmental innovation by launching schemes to support community development and innovation projects, such as those supported under the UPSHIFT Youth Innovation Programme (funded by UNICEF and the EU). Some examples of the projects supported include a youth-led environmental monitoring laboratory known as EcoLab and a recycling project (both in Mariupol)³⁸⁶. The private sector has also promoted child-led environmental innovation through mini-grants, with the Eco-School project implemented by JSC Farmak (discussed in more detail under *Education, early childhood development and CEE*) being just one salient example.

Ukrainian children and young people have also joined initiatives started by international child eco-activists, such as the Fridays for Future movement and climate strikes on Fridays that were inspired by Greta Thunberg. In May 2019, in addition to Kyiv, hundreds attended strikes in Lviv, Mykolaiv, Rivne, Kryvyi Rih, Odesa, Bakhmut, Kharkiv and Zaporizhzhya, petitioning the government to meet five demands:

1. Recognize tackling the climate crisis as a national priority;
2. Implement and prioritize high-quality climate education;
3. Reduce greenhouse gas emissions;
4. Prioritize the development of renewable energy sources in Ukraine;
5. Enforce systematic and transparent environmental inspections in Ukraine.

The same year, on 21 September, the #EUBeachCleanup challenge took place in Kyiv. Organized by EUWI+ in cooperation with the EU Delegation to Ukraine and the State Agency for Water Resources

³⁸⁴ Lansdown, Gerison, UNICEF Conceptual Framework for Measuring Outcomes of Adolescent Participation, March 2018, at <https://www.unicef.org/media/59006/file>.

of Ukraine, the clean-up campaign on the Dnipro River beach brought together a range of participants, including Young European Ambassadors.

Overall, however, child and youth participation in climate action remains fragmented, rather than interconnected. The actual impact of child and youth participation on climate mitigation and adaptation policies remains unclear, as does the extent to which it translates into concrete results for children. Relevant stakeholders could explore the option of conducting research to improve their understanding of children's and youth role in climate action, and to propose actionable recommendations on putting mechanisms in place for child and youth participation in climate action design, decision-making, planning and implementation at the national and regional levels.

CHAPTER V: KEY FINDINGS

- Child and youth participation in CEE in Ukraine is promoted using both bottom-up and top-down approaches, i.e., in addition to grassroots initiatives, there are projects that are aimed specifically at encouraging children to participate in environment-related decision-making.
- There have been some examples of child and youth activists involved in advocacy for legislative change.
- Overall, however, child and youth participation in climate action remains fragmented, rather than interconnected. This analysis did not uncover any evidence of a concerted top-down effort to involve children and youth in legislative public hearings on environmental issues.
- There is a need to better understand children's and youth role in climate action, and to propose actionable recommendations on putting mechanisms in place for child and youth participation in climate action design, decision-making, planning and implementation at the national and regional levels.

6

RECOMMENDATIONS



Climate action provides an exceptional opportunity to unlock the massive economic and social potential for helping achieve the SDGs. Addressing environmental sustainability challenges is imperative for UNICEF to fulfil its mandate and protect the world's most vulnerable children. UNICEF's global aim for the environment and climate change is to work with partners at the global and local levels to ensure that children can live in a safe and clean environment.

UNICEF's actions are structured around four approaches:

1. Making children the centre of climate change strategies and response plans;
2. Recognizing children as agents of change;
3. Protecting children from the impact of climate change and environmental degradation;
4. Reducing emissions and pollution.

Yet, climate change, poor local and national governance, unplanned urbanization and insufficient awareness of the dangers posed by environmental risks (including inadequate water and sanitation systems) expose millions of children to potential harm.

Every child has a right to live in an environment that is conducive to his or her growth and safety, including being protected from pollutants and other hazards.

UNICEF Global Strategic Plan 2018-2021

<p>Establish a coordination mechanism to mainstream children’s interests and needs, and consider them a target group, when developing and implementing CEE-related policies.</p>		<p>Authorities demonstrate a narrow vision of CEE and mainly associate CEE with the activities and competences of the Ministry of Ecology and Natural Resources and the Ministry of Energy only. At the same time, these ministries do not consider children/youth as a separate population group in need of special attention. A comprehensive and inclusive approach is required to promote children’s CEE-related needs.</p>	
Recommendation	Justification	Timeframe	Key Partners
<p>Promote the consistent mainstreaming of children’s issues into CEE strategy development and decision-making at different levels. Develop a standard methodology to promote this mainstreaming that covers climate change, DRR, child participation in environmental protection, the rational use of resources, sustainable consumption and production, and sustainable development.</p>	<p>Children’s CEE-related issues are currently being addressed in a piecemeal manner. The concept of child-centred climate change adaptation has not yet taken root. Moreover, there is a need for a standardized, clear methodology to help policy-makers understand how to best integrate children’s issues in CEE decision-making.</p>	<p>Medium to long-term</p>	<p>Government agencies/policymakers, including: the Ministry of Ecology and Natural Resources; Ministry of Energy; Ministry of Social Policy; State Ecological Academy; Ministry of Health; other partners</p>
<p>Consistently conduct impact assessments on the situation of children when developing CEE-related policies and adjust policies accordingly, as and when required.</p>	<p>Since children’s issues are not mainstreamed into or routinely considered in CEE policymaking, CEE policies risk having unexpected outcomes for children, including negative outcomes. Consistently conducting impact assessments would address this risk.</p>	<p>Medium-term</p>	<p>Government agencies/policymakers</p>
<p>Support domestic stakeholders, including line ministries, regional administrations and local self-government bodies, to continue with existing initiatives to promote child-friendly and eco-friendly environments, including by conducting impact assessments on children’s rights and well-being at the development stage of each project, followed by rigorous monitoring.</p>	<p>Ukraine has made some progress towards creating child-friendly and eco-friendly environments, but the magnitude of its impact on the situation of children remains unclear. Applying the project cycle management approach to this area would help assess the impact of such initiatives on children, as well as dynamically identify strengths and weaknesses, and highlight good practices for dissemination nationwide and potentially across the wider region.</p>	<p>Short-term</p>	<p>Government agencies/national, regional and local authorities</p>

<p>Promote the concept of budgeting for climate risk mitigation and response as cross-cutting area</p>	<p>There is a lack of needs-based and shock-responsive budgeting approaches to address children’s needs in the context of climate change.</p>	<p>Medium to long-term</p>	<p>Government agencies/policymakers</p>
	<p>Currently, budgeting for climate risk mitigation is not done in a comprehensive manner. Climate risks are not consistently identified, while climate expenditures are not clearly demarcated. This results in longer-term priorities being underfunded in favor of shorter-term expenditures meeting immediate needs.</p>		
<p>Support the creation of a comprehensive vision of child and youth participation in climate action. In particular, it is recommended that UNICEF explore how Ukraine can better harness children’s potential to effect change. This could be achieved through a scoping study as a starting point, followed by more targeted interventions.</p>	<p>As of today, child and youth participation in climate action is somewhat fragmented. Policy-makers have not considered harnessing children’s potential in effecting change.</p>	<p>Medium to long-term</p>	<p>Government agencies/national, regional and local authorities</p>
<p>Ensure that children’s and youth's role in climate action is comprehensively analysed, and that actionable recommendations are developed for putting mechanisms in place for child and youth participation in climate action design, decision-making, planning and implementation at the national and regional levels.</p>	<p>Existing child and youth participation initiatives have not been comprehensively analysed to identify any lessons learned. Such an analysis would help improve the coherence of participation efforts, generating synergies at the regional and national levels.</p>	<p>Medium to long-term</p>	<p>Government agencies/national, regional and local authorities</p>

<p>Promote the development of regional social and economic development policies that include due consideration of CEE issues and climate change-related risks (such as extreme weather events) as potential stressors in terms of children’s health, well-being and social protection.</p>	<p>When developing regional social and economic development policies, extreme weather events are currently almost exclusively considered in terms of their immediate impact (i.e., through relief efforts) rather than as potential social stressors. The impact of extreme weather events on children’s social well-being is missing from the overall picture.</p>	<p>Short to medium-term</p>	<p>Ministry of Ecology and Natural Resources, Ministry of Social Policy, regional administrations</p>
<p>Form a regional-level interagency structure/network to ensure that children’s interests and agenda are also considered in regional (oblast) level policies and action plans.</p>	<p>Child-related issues are mainly considered in social policy and education. It is important to take into account children’s CEE-related needs and risks in broader sectoral planning at regional (oblast) level.</p>	<p>Short to medium-term</p>	<p>Regional administrations</p>
<p>Work with the local authorities to increase their understanding of CEE issues and impact on children, and ensure they reflect children’s CEE needs in local strategies and plans.</p>	<p>With decentralization, community, strategic and tactical plans and socio-economic development plans will mainly be produced at local/community level. There is a need to ensure that CEE and children’s issues are well presented in these documents.</p>	<p>Short to medium-term</p>	<p>Local authorities, NGOs</p>

Promote a system of child-sensitive indicators across the CEE area in Ukraine

Lack of data on children's health (at oblast/temporal levels);
 Lack of discussion and information sharing among stakeholders;
 There are inconsistencies between the indicators used in Ukrainian and international statistics;
 There are not enough analytical studies/research available for the wider public (usually, such studies/research have a narrow target audience).

Recommendation	Justification	Timeframe	Key Partners
<p>Review current indicators to ensure better disaggregation of health and social data by region, gender and other factors as applicable, and to facilitate better assessment of the impact of CEE factors on the various aspects of children's health, well-being and social protection.</p>	<p>The general absence of child-sensitive statistical indicators across relevant areas significantly hampers the incorporation of children's perspective into CEE investments and programming. Some examples include the extreme paucity of multidimensional poverty indicators, the lack of disaggregated-by-region child poverty data, and the fact that crime statistics are only disaggregated by age with respect to children in conflict with the law, while data on child victimization and on violence against children generally remain unavailable (which makes it impossible to assess if extreme weather events affect violence against children). In the context of climate change, data paucity means it is not possible to establish cause-and-effect relationships between the situation of children and CEE factors.</p>	<p>Medium to long-term</p>	<p>Ministry of Health, State Statistics Service, WHO</p>
<p>Promote proactive research by relevant stakeholders (including joint research) on the CEE and children nexus to address evidence gaps created by emerging phenomena (in areas such as natural emergencies and disaster reduction, impact on child protection, education and early childhood development, and health, including mental health) for use as a basis for further policy development.</p>	<p>Some of the areas where CEE factors are likely to affect the situation of children are under-researched. Some examples include CEE and mental health, the impact of extreme weather events on violence against children, climate-induced migration and displacement, and the impact of CEE factors on education quality. The paucity of evidence prevents the development of evidence-based policymaking.</p>	<p>Short to medium-term</p>	<p>All partners</p>

<p>Engage with the MOH and WHO to: support greater data capture, availability and analysis of information relating to the linkages between environmental and human health, with a strong focus on air pollution; ensure child morbidity and mortality rate data is specifically included and disaggregated by age and sex; and promote research.</p>	<p>As acknowledged by the Institute of Public Health, NPHC and the WHO, there is a lack of data being collected on environmental health risks for children and more research is needed.</p> <p>The World Bank concluded that, for Ukraine:</p> <ul style="list-style-type: none"> • Climate and health monitoring and surveillance systems are not being implemented at the right geographical and temporal scales to enable observations of trends and make advance forecasts to direct interventions against climate sensitive diseases. • Investment in targeted climate-health-adaptation research can support the identification and analysis of trends, and help develop indicators to improve the health sector’s capacity to react. <p>One of the activities mentioned in the Action Plan for Adaptation of the Population to Climate Change by 2022 is a comprehensive assessment of climate change and its impact on public health: prevalence and mortality from cardiovascular diseases, chronic diseases of the upper respiratory tract, mental disorders, injuries and trauma, vector and diarrhoeal infectious diseases, and so on.</p>	<p>Short to medium-term</p>	<p>Ministry of Health/Institute of Public Health, Public Health Centre, WHO Office in Ukraine</p>
<p>In collaboration with WHO, consider supporting the Ministry of Health’s national electronic medical emergencies system, and also include excess child mortality and morbidity in the data collected during episodes of floods, fires, drought and heatwaves.</p>	<p>As acknowledged by NPHC and the WHO, annual health statistics do not currently enable the health impacts during periods of floods, fires, drought and heatwaves to be measured.</p>	<p>Short to medium-term</p>	<p>Ministry of Health and WHO Office in Ukraine</p>

<p>Consider including exposure indicators related to childhood respiratory diseases in upcoming national surveys (e.g., MICS, DHS, STEPS) and collecting data on health outcomes, such as intrauterine growth retardation in new-born children, child morbidity and mortality due to acute respiratory infections and the prevalence of chronic respiratory diseases.</p>	<p>Previous national surveys did not contain climate and environmental sensitive indicators. These indicators could include exposure indicators on childhood diseases for children 0-14 years (disaggregated by age groups 0-4, 5-9, 10-14) such as: children living in unsafe, unhealthy, hazardous housing/overcrowding; children living near heavily congested roads; mean annual exposure of children to atmospheric particular pollution; and children living in households in which at least one adult smokes on a regular basis.</p>	<p>Medium to long term</p>	<p>MICS - State Statistics Service of Ukraine Ukrainian Institute for Social Reforms, and donors DHS - Ukrainian Centre for Social Reforms, Ukraine State Statistical Committee, Ukraine Ministry of Health and donors STEPS-MOH / NPHC, Ukraine Institute of Social Research and others</p> <p>WHO Office in Ukraine, World Bank</p>
<p>Consider conducting a national nutritional survey, along with regular updates, to ensure that the linkages and impact of CEE issues on nutrition (including that of children) are properly studied and constantly monitored.</p>	<p>There is no recent data available on the nutritional status of children and regional distribution.</p> <p>UNICEF's potential intervention could include measures to tackle and prevent malnutrition in the conflict-affected regions and in regions affected by floods and droughts. It could also promote healthy diets in regions/cities with high rates of obesity among children.</p> <p>UNICEF might benefit from having the Nutritional Cluster Coordination to focus on this field.</p>	<p>Medium to long term</p>	<p>Ministry of Health/Mother & Child Health Department, donors</p>
<p>Support the introduction of an early warning system for floods, fires and heatwaves, which includes children's needs and child protection.</p>	<p>Several WHO/Europe member states have introduced heatwave early warning systems and heat health action plans in order to reduce the human health consequences of heatwaves. In Ukraine, this could be extended to additional environmental hazards, such as floods and fires.</p>	<p>Short to medium-term</p>	<p>State Emergency Service, Ministry of Health, WHO Office in Ukraine</p>

Improve child, family and community resilience to ensure children are better protected from CEE-related shocks

CEE-related shocks have a negative impact on children’s social protection and healthcare. In most instances, the impact is indirect (due to loss of family income or service disruption, for example) and cannot be addressed successfully without a concerted effort to improve family and community adaptation capacities.

Recommendation	Justification	Timeframe	Key Partners
<p>Consider prioritizing health interventions in oblasts/cities that have poor health indicators linked to climate change and environmental contamination, in order to reduce children’s vulnerability.</p>	<p>Regions with poor health indicators are mentioned both in the report and in the indicator table below. Children's ill-health is also related to poverty, poor housing (and at least one adult smoking), poor basic water, sanitation and hygiene services, living near heavy traffic and living in disaster-affected areas and/or informal settlements.</p> <p>More research is needed to establish the cause of above average mortality rates mentioned in this report – however, the regions affected by climate change and environmental contamination have already been identified.</p> <p>UNICEF could be involved in promoting green cities, with a focus on children’s needs, in conjunction with partners/donors involved in these activities.</p> <p>UNICEF could also:</p> <ul style="list-style-type: none"> • Focus on poor regions; • Promote data collection on poverty levels at regional/city level and on children living in poverty. 	<p>Short to medium-term</p>	<p>Inter-sector collaboration with state agencies, and national and international partners/ donors</p>
<p>While continuous WASH support to conflict-affected areas remains necessary, consider providing support to kindergartens and (pre-) schools that are not yet connected to a centralized water supply or local water supply network.</p>	<p>According to the National Focal Point of Water Convention in Ukraine, during the 2016-2018 reporting period, access to drinking water in schools and pre-schools deteriorated compared with 2015.</p>	<p>Medium to long-term</p>	<p>State Agency of Water Resources, Ministry of Ecology and Natural Resources</p>

<p>Ensure that social adaptation strategies target the economic sectors and geographical regions that are most vulnerable to climate change-induced hazards, ideally based on the early identification of vulnerable families with children.</p>	<p>The existing system used to identify vulnerable households is in need of substantial improvement. Most importantly, family vulnerability is not considered through the lens of climate change and related hazards, which makes it especially challenging to promptly identify and support families most in need of assistance as a result of an extreme weather event. See Annex 3 for quantitative indicators on the regions (oblasts) per social vulnerability.</p>	<p>Short to medium-term</p>	<p>Ministry of Social Policy, regional administrations</p>
<p>At the national and regional levels, support the development of reskilling and livelihood diversification schemes for families with children in CEE shock-prone regions to ensure that they form an integral part of social protection policy.</p>	<p>Reskilling and livelihood diversification schemes are still nascent, and do not specifically focus on families with children and/or climate change. There is a need to support them and ensure a link to CEE and children's social well-being.</p>	<p>Short to medium-term</p>	<p>Ministry of Social Policy, regional administrations, private sector partners</p>
<p>Support and promote a radical review of the existing policy of mitigating the impact of a rapid adjustment of energy prices on vulnerable consumers (including families with children) to take into account the multifaceted nature of energy poverty.</p>	<p>Energy poverty in Ukraine is mainly seen as a monetary poverty issue that may be fully mitigated solely through subsidies. Its multifaceted nature is rarely considered, if at all.</p>	<p>Short-term</p>	<p>Ministry of Energy, Ministry of Social Policy</p>

<p>Promote and support programming to improve the energy efficiency of buildings, including both housing stock and facilities serving children, as part of the strategy to reduce energy poverty.</p>	<p>The above-mentioned need to consider the multifaceted nature of energy poverty implies also taking the energy efficiency of buildings into account. With respect to children’s well-being, it is important that both housing stock and facilities serving children (such as schools, pre-schools, healthcare providers) are covered.</p>	<p>Short to medium-term</p>	<p>Ministry of Energy, Ministry of Communities and Regional Development, regional administrations</p>
<p>Promote and support investment in community-based mental health services, with a specific emphasis on the nexus between natural emergencies, mental health and violence against children. A pilot project in an area that is especially prone to natural emergencies may serve as an entry point.</p>	<p>While the impact of climate change on children in Ukraine has not been researched, there is a solid body of evidence from countries that have experienced climate change-induced disasters that indicates that they cause both direct harm to children’s mental health and indirect harm (which in turn may lead to increased incidence of violence against children). Discussions with domestic stakeholders also lend credence to these findings. Children’s mental health is particularly at risk during evacuations, due both to the heightened risk of family separation and the extended periods of time spent living in shared temporary accommodation.</p>	<p>Short to medium-term</p>	<p>Ministry of Health, regional administrations</p>
<p>Build stakeholder capacities to implement needs-based and shock-responsive budgeting</p>	<p>There is a lack of needs-based and shock-responsive budgeting approaches to address children’s needs in the context of climate change.</p> <p>The introduction of needs-based and shock-responsive budgeting requires a significant capacity-building effort, including the development of guidelines and training on climate risk, need identification and evidence-based budgeting.</p>	<p>Medium to long-term</p>	<p>Government agencies/policymakers</p>

Strengthen CEE and sustainable development-related education, civil society training and child participation

Currently, children have a limited voice in CEE-related decision-making. Children need to be given more consistent opportunities for participation to enable them to voice their concerns. This is related to CEE awareness-raising, as better education and training means that children will be able to better understand the relationship between CEE factors and their situation.

Recommendation	Justification	Timeframe	Key Partners
<p>Consider supporting the training of health staff on climate and environmental health impacts, with a focus on children.</p>	<p>As stated by the World Bank, Ukraine's healthcare system staff are not fully aware of the relationship between climate change and environmental health impacts.</p> <p>This was also mentioned as an activity in the Action Plan for Adaptation of the Population to Climate Change.</p> <p>While the Ministry of Education already includes environmental education in the curriculum, UNICEF could lend support to training health staff in collaboration with MOH and the WHO – if applicable, in conjunction with those state agencies that have already developed material for educators.</p>	<p>Medium to long-term</p>	<p>Ministry of Health, Public Health Centre, WHO Office in Ukraine, State Ecological Academy of Postgraduate Education and Management</p>
<p>Lend support to ensuring the sustainability of national, regional and local level methodological clearing houses and innovation hubs for environmental education and CEE awareness-raising.</p>	<p>To date, Ukraine has made significant strides in developing home-grown good practices in environmental education. The methodological clearing houses and innovation hubs, such as NENC and the Aarhus Centre, already play an important role in disseminating these good practices. Short-term support to such activities would foster their long-term sustainability.</p>	<p>Short-term</p>	<p>Ministry of Education, NENC, State Ecological Academy of Postgraduate Education and Management, local NGOs</p>
<p>Further promote the infusion/mainstreaming of environmental content into secondary school and pre-school curricula, as well as into teacher training curricula regardless of the subject, including through the provision of expert assistance and the promotion of national and international sharing of good practice.</p>	<p>Ukraine's secondary school curricula already include a number of subjects that focus on the environment. Some domestic stakeholders, however, have taken environmental education a step further by seeking to mainstream environmental knowledge into other subjects. This approach deserves support as it is in line with the concept of sustainable development.</p>	<p>Short to medium-term</p>	<p>Ministry of Education, NENC, State Ecological Academy of Postgraduate Education and Management, Institute for Education Content Modernization</p>

Reform the DRR to make it child-sensitive and child-centred

The current DRR approach does not take children's unique needs into consideration. Moreover, it is insufficiently focused on preparedness, and functions almost exclusively as a disaster response and relief system.

Recommendation	Justification	Timeframe	Key Partners
<p>Promote and help ensure that DRR awareness-raising for children, families and communities at the regional level includes content to increase child resilience, and promotes the use of individual family emergency plans (including information such as emergency contacts, family contacts and multiple meeting points).</p>	<p>To date, there have been few DRR awareness-raising activities that have specifically targeted families and children. At the same time, the return on investment in this area is expected to be high, since a relatively simple tool such as the family emergency plan would both promote better disaster preparedness and have the knock-on effect of assisting other services that provide critical incident response (such as the police). Awareness-raising is specifically important in those regions that are the most vulnerable to CEE (for instance, the regions in the Carpathians, in Polissya, in the south of Ukraine that suffer from desertification, and regions neighbouring the Chornobyl Exclusion Zone due to numerous forest fires).</p>	<p>Short to medium-term</p>	<p>National Police, State Service of Emergency Situations, regional administrations</p>
<p>Prioritize environmental safety as a component of school safety. This should encompass the concept of resilient school infrastructure (possibly including a model design for school/pre-school buildings and related structures), as well as life-skills training for children (e.g., action to take during emergencies, first aid).</p>	<p>The concept of school safety largely focuses on safety in the context of the armed conflict. There is therefore a need to ensure that environmental safety is not overlooked.</p>	<p>Short-term</p>	<p>Ministry of Education, State Service of Emergency Situations, Ministry of Communities and Regional Development</p>

<p>Ensure that the emergency response system incorporates a more proactive approach and focuses on disaster preparedness as a key element of resilience, and that this is also included in the Safe School concept and in child-friendly disaster preparedness training at the school and community levels.</p>	<p>Lack of focus on disaster preparedness both exacerbates the effects of climate change-related disasters on children and raises related disaster relief costs. The promotion of disaster preparedness would therefore help to mitigate the toll such disasters have on children and cut budgetary expenditure. There is a need to consider this recommendation together with the above recommendations to prioritize building resilient housing as a key component of DRR and to prioritize environmental safety as a component of school safety.</p>	<p>Medium to long-term</p>	<p>Ministry of Education, State Service of Emergency Situations</p>
<p>Develop a multi-stakeholder mechanism for family reunification in emergencies using existing good practices, and which would include the mandatory development of school emergency plans, containing a built-in standard operating procedure (SOP) for family reunification that is based on a model SOP for schools in disaster-prone regions, as part of the wider school safety policy.</p>	<p>Some good practices relating to stakeholder coordination for family reunification in emergencies have already started to emerge. These need to be further disseminated and expanded, formalized in the relevant SOPs and integrated into school safety policies.</p>	<p>Short to medium-term</p>	<p>National Police, Ministry of Education, State Service of Emergency Situations, regional administrations</p>
<p>With national, regional, and local stakeholders, jointly prioritize building resilient housing in CEE-prone areas as a key component of DRR, followed by recommendations for further improving construction policies and standards.</p>	<p>The DRR approach remains largely reactive. There is a need for a more pronounced disaster preparedness component, of which resilient housing plays an integral part. This is all the more important considering that disaster-prone areas are also areas with higher proportion of children in their population and the greatest amount of old housing stock.</p>	<p>Medium to long-term</p>	<p>Ministry of Communities and Regional Development, regional administrations</p>
<p>Promote the child-centred DRR concept as an essential component of the national DRR agenda, ensuring that the needs of children who live with disabilities are mainstreamed into it.</p>	<p>Currently, child-centred DRR does not exist as a concept. Incorporating this into the national DRR agenda would also help to promote the concept of child-centred climate change adaptation.</p>	<p>Medium to long-term</p>	<p>State Service of Emergency Situations, other government and non-governmental stakeholders as appropriate</p>

ANNEXES

Annex 1. Mental disorders and alcohol abuse

Mental disorders: Incidence

	Total new cases	New cases per 100,000 population
Ukraine	74,143	175.2
Region (Oblast)/City		
Crimea Autonomous Republic	—	—
Vinnitsya region	3,119	197.9
Volyn region	1,574	151.8
Dnipropetrovsk region	5,024	155.7
Donetsk region	4,204	—
Zhytomyr region	4,299	347.6
Zakarpattia region	1,945	154.9
Zaporizhzhya region	3,325	192.1
Ivano-Frankivsk region	1,635	118.8
Kyiv region	6,154	354.0
Kirovohrad region	2,234	234.0
Luhansk region	1,431	—
Lviv region	3,691	146.9
Mykolaiv region	1,266	110.6
Odesa region	4,305	181.4
Poltava region	2,488	176.1
Rivne region	1,625	140.0
Sumy region	2,068	188.5
Ternopil region	2,004	190.4
Kharkiv region	6,319	235.6
Kherson region	2,713	258.4
Khmelnyskiy region	2,516	197.1
Cherkasy region	3,058	250.2
Chernivtsi region	1,177	130.1
Chernihiv region	2,989	293.6
Kyiv	2,980	103.2
Sevastopol	—	—

Alcohol abuse: Treatment and prevention

	Total new patients enrolled in treatment and/or rehabilitation programmes per 100,000 population	Female patients out of total patients per 100,000 population	Total new patients enrolled in preventive care
Ukraine	66.9	19.1	155.6
Region (Oblast)/City			
Crimea Autonomous Republic	—	—	—
Vinnitsya region	90.7	19.7	365.9
Volyn region	85.6	25.7	73.8
Dnipropetrovsk region	66.1	16.0	108.1
Donetsk region	—	—	—
Zhytomyr region	158.7	45.5	113.5
Zakarpattia region	101.8	45.4	86.0
Zaporizhzhya region	46.6	17.7	108.4
Ivano-Frankivsk region	88.9	19.3	86.0
Kyiv region	153.2	32.1	702.8
Kirovohrad region	78.5	26.2	118.3
Luhansk region	—	—	—
Lviv region	63.6	16.3	94.1
Mykolaiv region	106.5	37.6	81.0
Odesa region	51.0	19.5	55.3
Poltava region	66.6	19.8	123.5
Rivne region	79.4	17.9	195.2
Sumy region	74.1	28.4	321.8
Ternopil region	84.8	13.0	56.5
Kharkiv region	22.4	8.3	383.4
Kherson region	65.4	27.0	25.4
Khmelnyskiy region	123.0	25.7	140.4
Cherkasy region	76.7	25.4	407.9
Chernivtsi region	61.0	11.3	301.9
Chernihiv region	98.8	33.5	204.4
Kyiv	20.5	6.5	4.5
Sevastopol	—	—	—

Source: State Statistics Service of Ukraine: Healthcare institutions and population morbidity in 2017 (Державна служба статистики України: Заклади охорони здоров'я та захворюваність населення України у 2017 році).

Annex 2. Quantitative environment, social protection, child protection and health indicators by oblast of Ukraine

Quantitative environment indicators by oblast of Ukraine

	Land area of the natural reserves and national nature parks	Forest areas, %	Air emissions from stationary pollution sources, t per square kilometre	Carbon dioxide emissions, t per square kilometre	Contaminated water (without cleaning and insufficiently cleaned), % from reset water discharged into surface water bodies	Waste generation of I-III classes of dangerous waste, t per square kilometre	Waste generation of class IV dangerous waste, kg per capita	Share of utilized waste in the total volume of generated waste	Number of fires (in natural ecosystems and in settlements)	Number of natural emergency situations	Energy consumption, thousand kWh per square kilometre	Capital investment for environment protection, thousand UAH per square kilometre	Environmental status (expert opinion based on the indicators)
Ukraine	2,063,865.4	17.6	4.3	212.0	13.7	1.0	10.5	24.5	95,915	81	154.0	26.9	
<i>Vinnysya</i>	20,203.4	14.3	3.8	204.1	1.7	0.0	1.7	7.7	3,313	4	71.1	2.3	
<i>Volyn</i>	124,743.6	34.6	0.3	26.5	0.0	0.0	0.6	5.4	1,589	6	39.6	1.8	
<i>Dnipropetrovsk</i>	3,766.2	6.0	18.1	737.2	29.6	1.0	79.0	35.9	8,849	3	715.7	80.3	
<i>Donetsk</i>	64,359.7	7.7	29.2	888.2	3.9	5.6	6.3	20.5	4,171	3	343.3	97.6	
<i>Zhytomyr</i>	50,976.8	37.5	0.4	21.8	2.8	0.0	0.4	11.2	4,676	4	41.7	0.2	
<i>Zakarpattia</i>	157,716.3	56.8	0.3	21.3	7.5	0.1	0.1	0.1	2,788	5	39.9	1.1	
<i>Zaporizhzhya</i>	94,982.9	4.4	6.4	504.3	1.3	0.6	3.2	70.1	6,177	1	319.3	39.9	
<i>Ivano-Frankivsk</i>	125,683.9	45.7	14.7	924.9	1.6	0.4	2.2	29.1	3,836	6	205.9	17.8	
<i>Kyiv</i>	244,171.4	23.1	3.0	170.1	0.4	0.1	0.8	0.7	9,859	4	112.9	247.0	
<i>Kropyvnytskyi</i>	–	7.5	0.5	36.1	8.8	0.2	39.8	4.5	2,234	3	97.1	3.1	
<i>Luhansk</i>	12,672.0	13.3	1.4	90.0	40.0	0.2	0.2	9.5	2,139	4	45.6	0.7	

Lviv	72,675.0	31.8	4.1	156.9	28.8	0.2	0.8	16.0	3,903	3	116.3	10.1	
Mykolayiv	47,249.1	5.0	0.5	88.8	26.7	0.8	2.1	2.6	2,667	2	125.8	5.1	
Odesa	100,724.0	6.7	1.0	35.9	23.4	0.1	0.3	1.4	7,289	6	77.6	2.0	
Poltava	22,792.6	9.9	1.8	69.5	2.9	2.8	24.8	3.1	2,761	3	138.5	10.3	
Rivne	77,813.9	40.1	0.5	105.4	9.6	0.0	0.4	7.6	1,439	4	140.4	1.8	
Sumy	40,458.1	19.3	0.9	65.8	48.8	5.9	0.7	18.2	1,569	1	53.1	1.0	
Ternopil	28,198.2	14.5	0.7	50.1	5.1	0.9	1.0	26.1	2,488	2	33.4	1.8	
Kharkiv	22,690.0	13.3	3.4	242.5	5.2	1.6	0.6	11.1	7,585	2	128.7	15.0	
Kherson	306,514.2	5.3	0.6	10.5	1.2	0.7	0.3	7.5	2,822	3	39.4	0.3	
Khmelnyskiy	270,078.7	13.9	1.0	110.5	2.2	0.1	0.7	44.5	1,324	1	77.5	3.4	
Cherkasy	19,862.1	16.2	2.5	126.3	3.4	0.0	1.0	55.4	2,023	1	93.9	1.6	
Chernivtsi	27,801.6	31.9	0.3	17.8	2.6	0.0	0.4	36.7	1,290	5	207.8	3.7	
Chernihiv	41,988.5	23.2	0.9	50.5	20.3	0.0	0.7	9.9	3246	2	26.7	1.6	
Kyiv city	10988.1	42.2	26.7	6,340.5	39.7	5.5	0.3	0.1	5,878	3	7,279.3	1,382.8	

Sources of information

State Statistics Service, data for 2019: <http://www.ukrstat.gov.ua/>

State Emergency Service, data for 2019: <https://www.dsns.gov.ua/files/2020/1/30/Публичний%20звум%20за%202019%20рік-оцм-філ.pdf>

Key and summary

Environmental status (based on expert opinion)



Summary of Environmental Status

(expert opinion based on the indicators)

Environmental status should be considered by examining the status of the individual components:

- Natural ecosystems and nature protected areas/parks help preserve biodiversity and territories, and have relatively lower anthropogenic pressure;
- Air pollution is a priority, with measures required to improve the environment for the **city of Kyiv, Donetsk, Dnipropetrovsk** and **Ivano-Frankivsk** oblasts;
- Surface water pollution from sewage is a serious issue in **Sumy** and **Luhansk** oblasts, as well as in the **city of Kyiv, and Dnipropetrovsk, Lviv, Mykolayiv, and Odesa** oblasts;
- The largest volumes of hazardous waste are generated in **Donetsk, Sumy, Poltava** oblasts, as well as in the **city of Kyiv**;
- **Ivano-Frankivsk, Zakarpattya, Chernivtsi, Volyn** and **Odesa** oblasts have the most natural emergencies;
- Capital invested in environmental protection measures shows which regions are the highest priority for ongoing and further measures: **city of Kyiv** and **Kyiv** oblast, as well as industrial **Donetsk, Dnipropetrovsk** and **Zaporizhzhya** oblasts.

Quantitative social protection and child protection indicators by oblast of Ukraine

	Share of children aged 0-14 in total population	Relative poverty rate based on expenditure	Disposable income per capita, UAH	Unemployment (% of economically active population aged 15-70)	Consumer price index (% of previous year)	Consumer price index (foodstuffs and non-alcoholic beverages; % of previous year)	Consumer price index (clothes and footwear; % of previous year)	Consumer price index (housing, water, electricity, gas and other types of fuel; % of previous year)	Subsidies to compensate for housing and utility service expenses (number of households in thousands)	Old housing stock (number of units)	Emergency housing stock (number of units)	Number of residential buildings made available in 2017	Migration increase/decrease	Social and environmental status (expert opinion based on the indicators)
Ukraine	15.5	24.1	69,140	9.5	114.4	117.7	100.9	110.6	8,809.4	44,859	16,505	10,206	11,997	
<i>Vinnitsya</i>	15.6	18.5	65,503	10.7	112.3	119.0	102.7	110.0	378.3	4288	1,408	338	-4,625	
<i>Volyn</i>	19.8	30.9	53,990	12.5	114.1	118.1	101.7	110.3	258.0	981	175	336	-823	
<i>Dnipropetrovsk</i>	15.6	16.3	89,042	8.5	114.1	117.7	103.1	107.9	600.9	1,977	831	365	24,131	
<i>Donetsk</i>	12.3	32.9	39,843	14.6	115.7	117.5	112.2	111.9	440.7	3,198	1,601	55	-23,868	
<i>Zhytomyr</i>	16.7	32.5	62,571	10.8	113.8	115.8	99.5	110.1	298.7	3,174	795	163	-888	
<i>Zakarpattia</i>	20.0	24.7	47,852	10.5	113.3	116.5	105.9	110.6	191.9	391	97	420	-97	
<i>Zaporizhzhya</i>	14.7	15.7	76,062	10.7	114.7	118.3	98.6	107.8	453.6	577	363	103	-2,714	
<i>Ivano-Frankivsk</i>	17.2	15.4	56,514	8.5	113.5	115.9	92.9	112.9	338.1	1,031	415	625	1,461	
<i>Kyiv</i>	16.9	32.7	76,232	6.5	114.0	117.4	103.0	112.4	377.6	2,774	776	1,825	30,677	
<i>Kirovohrad</i>	15.2	26.8	58,461	12.2	115.0	116.8	97.7	114.4	293.7	95	4	51	-1,657	
<i>Luhansk</i>	11.3	32.9	24,975	16.6	114.1	119.3	100.9	120.4	202.1	411	144	21	-19,147	
<i>Lviv</i>	16.5	18.2	67,353	7.5	112.4	116.2	99.9	112.0	509.6	1,101	579	959	2,666	
<i>Mykolayiv</i>	15.7	22.2	64,700	10.3	115.1	117.3	98.0	113.7	241.9	473	183	74	-1,890	
<i>Odesa</i>	17.0	29.5	75,288	7.3	115.6	118.6	103.9	113.4	306.0	4,633	2,004	720	4725	

<i>Poltava</i>	14.2	28.2	72,843	12	115.0	118.1	99.0	107.9	495.5	2,756	1,330	235	-655
<i>Rivne</i>	20.6	58.7	55,917	11.6	114.6	118.9	103.3	109.5	232.1	1,703	406	394	-1,827
<i>Sumy</i>	13.4	24.7	65,932	9.1	115.0	118.3	100.7	106.6	371.9	3,264	899	106	-731
<i>Ternopil</i>	16.0	26.2	50,536	11.9	114.0	115.8	100.9	110.1	271.9	927	789	293	-1,355
<i>Kharkiv</i>	13.8	20.8	66,547	6.1	115.5	119.2	101.8	107.5	607.7	3,913	757	470	12,069
<i>Kherson</i>	16.2	42.3	58,129	11.1	116.8	119.0	97.8	109.9	232.2	888	448	75	-2,747
<i>Khmelnyskiy</i>	15.9	21.2	58,934	8.9	113.4	117.2	102.3	111.7	355.3	1,838	508	361	-2,782
<i>Cherkasy</i>	14.1	27.1	59,626	10.2	115.0	118.6	99.1	113.5	400.1	3,218	1,164	153	-450
<i>Chernivtsi</i>	17.4	16.1	49,142	8.4	112.4	115.8	104.3	107.1	219.9	194	435	202	364
<i>Chernihiv</i>	13.7	13.7	59,972	11.2	114.5	117.4	104.2	108.7	339.7	1,208	371	128	-2,051
<i>Kyiv city</i>	16.4	11.3	173,677	6.9	116.4	119.7	90.6	108.0	392.0	194	23	1,734	4,211

Sources of information:

Аналітична записка 'Комплексна оцінка бідності та соціального відчуження в Україні за 2016-2018 роки': https://idss.org.ua/arhiv/Year_2018_Pov.pdf
 State Statistics Service, data for 2019: http://www.ukrstat.gov.ua/operativ/operativ2008/gdn/dvn_ric/dvn_ric_u/dn_reg2019_u_e.xlsx
 Statistical Yearbook 2017.

Key and summary

Social and child protection status (based on expert opinion)



Summary of social and child protection status

(expert opinion based on the indicators)

The assessment below cannot be regarded as definitive due to the lack of official statistical data on child poverty. In particular, there is no disaggregated-by-region child poverty data available, and no data on multidimensional poverty, nor is there any data on violence against children, which significantly hampers the analysis. The tentative assessment given in this summary is primarily based on generic social indicators that consider the proportion of children in the population of each region. Moreover, the lack of data means it is not possible to establish cause-and-effect relationships with CEE factors in each region.

The following oblasts have been identified as requiring priority action in social protection/child protection:

- **Donetsk:** Low per-capita disposable income combined with a higher-than-national-average unemployment rate, a spike in the consumer price index for foodstuffs and dilapidated housing stock render the region's children vulnerable, despite the relatively low proportion of children in the population.
- **Luhansk:** The situation is largely similar to that in Donetsk above, although there is comparably less dilapidated housing stock.
- **Kherson:** Some of the highest relative poverty rates in the nation, combined with rapidly growing prices and a slightly higher than national average share of children in the population, create social vulnerabilities for the region's children.
- **Rivne:** This region has the highest relative poverty rate and the highest share of children under-14 in the population in the country. A comparably large number of households receive subsidies to help with housing and utility expenses.

Quantitative health and environment indicators by oblast of Ukraine

	IMR 2018/U5MR 2019	Perinatal mortality/disorders per 1,000 newborns 2019 (latter if above nat. average)	Low birth weight 2017	Congenital mal-deformations /1,000 newborns 2019 (above nat. average)	Nervous system diseases < 1 y/1,000 newborns 2019 (above nat. average)	Respiratory diseases < 1 y/1,000 newborns/Asthma(per 1,000 0-17 years hospitalized) 2019	Intestinal Infectious diseases <1 Y /1,000 newborns 2019 (0-17 Y/1,000 2017 = 46.3)	Poverty, defined as disposable income per capita 2019 UHA (marked <60,000 UHA)	Housing highest rates % Old /emergency housing 2018	Health and environmental status (expert opinion based on the 13 indicators) 6 or more indicators = negative
Ukraine	7/8.6	8.8/136	6	41	62	873/1.9	< 1Y 17 y17/1000 0-17 46.3 0	69140 2684,36	4.6/2	
Vinnitsya	6/9.8	9.6/138	6	78		957/1.5	15	65,503	9/9	7
Volyn	7.6/9.1	7.3/179	5	48		535/0.7	34	53,990		6
Dnipropetrovsk	9/9.6	10.8/	7		72	754/2.2	8	89,042		6
Donetsk	7.2/9.5	10.1/176	6		65	686/0.4	21	39,843	/10	6
Zhytomyr	6,9/7.8	8.3/185	6	43	93	1,198/1.1 880 3.2	27	62,571		6
Zakarpattya	10.4/13.4	11/	8		92	880/3.2	11	47,852		8
Zaporizhzhya	8.2/6.8	8.9/198	7	73	139	1,188/2.2	40	76,062		9
Ivano-Frankivsk	6.2/7.8	7.1/	6			1,195/3.2	12	56,514		3
Kyiv Oblast	4.7/6.3	6.5/146	7			919/1.0	14	76,232		3
Kirovohrad	7.9/9.8	11.5/137	7			852/1.4	25	58,461		7
Luhansk	6.2/6.6	5.2/138	7			864/0.5	12	24,975		3
Lviv	7/7.7	8.7/	6			872/3.1	17	67,353		1
Mykolayiv	7.9/8.9	8.5/	6		83	672/1.3	29	64,700		4

Odesa	7.6/8.7	9.6/208	7		112	914/1.4	33	75,288	11/12	10
Poltava	5/8.6	9	6			756/1.1	20	72,843	/9	2
Rivne	6.4/9.4	8.2/167	5	50		1,044/0.9	3	55,917		5
Sumy	4.5/7.6	9.7/	6		97	613/1.8	1	65,932		2
Ternopil	6.3/7.7	8.8/	6			470/4.1	7	50,536		2
Kharkiv	7/9.1	11.1/247	6	61	63	641/3.5	24	66,547	9	8
Kherson	8.4/9	7.7/144	7	42	70	627/1.0	16	58,129		7
Khmelnyskiy	6.4/8.9	8.2/144	6			1051/2.6	10	58,934		5
Cherkasy	9.1/10	10/	6			836/1.9	6	59,626	/7	5
Chernivtsi	8.1/8.8	7.1/	6			702/2.7	16	49,142		4
Chernihiv	7.6/9.6	10.1	6			1070/1.1	6	59,972		5
Kyiv city	5.3/6.6	6.4	6	50		1086/2.0	6	173,677		3

Sources of information: Ministry of Health databases and annual statistics, State Statistics Service (reliability of health data depends on proper data recording and there may be differences between regional data recording and/or interpretation. Reliability will also depend on the availability of/accessibility to appropriate medical services).

Key and summary

Health and environment status (based on expert opinion)



Summary of the health and environment status

(expert opinion based on the indicators)

- The regions of **Vinnitsya** (7 poor health indicators), **Zakarpattya** (8), **Zaporizhzhya** (9), **Kirovohrad** (7), **Odesa** (10), **Kharkiv** (8) and **Kherson** (7) have the highest number (7 or more out of 13) poor health indicators associated with environmental health risks in children. The regions of **Volyn**, **Dnipropetrovsk**, **Donetsk** and **Zhytomyr** also have relatively poor health indicators (6 out of 13).
- Further analyses revealed that the regions with highest levels of air and/or CO₂ emissions and the highest rates of respiratory diseases are **Dnipropetrovsk**, **Zaporizhzhya**, **Ivano-Frankivsk**, **Kharkiv** (lower levels and asthma only) and **city of Kyiv**. **Donetsk** oblast has a relatively low rate of respiratory diseases, which could be due to limited access to health services and/or underreporting.
- The link between the high number of fires recorded in 2019 and respiratory diseases in 2019 is less clear, except for **Dnipropetrovsk**, **Kharkiv** and **Chernihiv** that score high on both. Surprisingly, **Kherson** had the highest number of fires in 2019 but had few respiratory diseases, unless these have been under-recorded. However, it must be noted that annual statistics do not reflect the health problems encountered during fires.
- For the flood-prone **Ivano-Frankivsk**, **Lviv**, **Chernivtsi**, **Zakarpattya**, **Odesa**, **Volyn**, **Rivne** and **Kyiv** oblasts, a link was observed between flood-prone areas and intestinal infectious diseases in the regions of **Volyn** and **Odesa** only.
- For the drought-prone oblasts (**Rivne**, **Volyn**, part of **Ternopil oblast**, **Zhytomyr**, **Donetsk**, **Luhansk**, **Kherson**, **Dnipropetrovsk**, and **Odesa**), there was an observed link between relatively low DI (as a measurement for poverty) and the drought-prone oblasts of **Volyn**, **Donetsk**, **Luhansk**, **Rivne**, **Ternopil** and **Kherson**.
- Although **Luhansk** is the poorest region with regard to DI, it does not seem to have many poor health indicators for children. This might be due to limited access to health services and/or underreporting.
- The **city of Kyiv** is one of the most polluted cities in Ukraine, but has low mortality rates (IMR/U5M and perinatal mortality) and an average low birth weight, which might be due to better and more accessible health services; however, there was still a high incidence of respiratory diseases.
- As only annual data was available, and data for regions as a whole, the situation might be different for polluted cities.
- As mentioned in the environmental status summary: *air pollution reduction measures are required to improve the environment for the **city of Kyiv**, and **Donetsk**, **Dnipropetrovsk** and **Ivano-Frankivsk** oblasts*; these regions also have high rates of respiratory diseases, (with the exception of **Donetsk**, although this might be due to limited access to health services and/or underreporting).
- As mentioned in the environmental status summary: *capital invested in environmental protection measures reveals that the areas where ongoing and further measures are most urgently required are the **city of Kyiv** and **Kyiv oblast**, as well as the industrial **Donetsk**, **Dnipropetrovsk** and **Zaporizhzhya** oblasts*. These regions also have poor health indicators, except for the **city of Kyiv** (but high incidence of respiratory diseases) and **Kyiv** oblast, which may be due to Kyiv's better and more accessible health services.
- As mentioned in the environmental status summary: *Surface water pollution from sewage is the greatest issue in **Sumy** and **Luhansk** oblasts, as well as in the **city of Kyiv**, and **Dnipropetrovsk**, **Lviv**, **Mykolayiv**, and **Odesa** oblasts*; only the oblasts of **Mykolayiv** and **Odesa** had an above average rate of intestinal infectious diseases.

Annex 3. List of NGOs on the Public Council of the Ministry of Ecology and Natural Resources of Ukraine

Pan-Ukrainian environmental NGOs for whom working with young people is an important component of their activities

Українське Товариство охорони природи <http://www.ukrpryroda.org>
Всеукраїнська громадська організація «Жива планета» <https://www.zhiva-planeta.org.ua>
ГО «Зелений світ - Друзі Землі» <http://zsfoe.org>

Professional associations working on environmental advocacy and environmental rights

Всеукраїнська громадська організація «Асоціація агроекологів України» <https://agroeco.org.ua/asotsiatsiia-ahroekolohiv/>
Всеукраїнська громадська організація «Спілка екологічних аудиторів України»
Громадська спілка «Інститут екологічного управління та збалансованого природокористування» <https://iem.org.ua/pro-nas>
ГО «Асоціація експертів із оцінки впливу на навколишнє природне середовище» <http://eia.org.ua/phone/>
Громадська спілка «Професійна асоціація екологів України» <https://paeu.com.ua/en/main/>
ГО «Центр сучасних інновацій» https://www.facebook.com/pg/ГО-Центр-сучасних-інновацій-2315427605190652/about/?ref=page_internal
Адвокатське об'єднання «Екобезпека» <https://ecolog-ua.com/news/pershe-advokatske-obyednannya-ekobezpeka-vykorystovuyuchy-pravovi-metody-ta-advokatskyv>, <https://www.facebook.com/aecobezpeka/>
ГО «Цифрова агенція Е-екологія» <https://e-ecology.digital>

NGOs that work on waste management/utilization/recycling

Громадська спілка «Асоціація підприємств у сфері поводження з небезпечними відходами» <https://ecoteam.org.ua>
Асоціація компаній поводження з відходами «Український екологічний альянс» <http://ukrecoalliance.com.ua>
Українське виробничо-екологічне об'єднання по заготівлі та використанню вторинних матеріальних ресурсів «Укрвторма» <http://ukrvtorma.com.ua>
Асоціація «Спеціалізоване об'єднання в сфері поводження з матеріалами тари та пакування «Вторма»

Organizations representing industry sectors that have a significant environmental impact

Всеукраїнське об'єднання обласних організацій роботодавців підприємств металургійного комплексу «Федерація металургів України» <http://fedmet.org>
Конфедерація будівельників України <http://kbu.org.ua>
Асоціація «Національна асоціація добувної промисловості України» <http://neiau.org>
Об'єднання підприємств «Укрметалургпром» <https://www.ukrmetprom.org>

Other organizations represented on the Public Council (including regional- and city-level organizations)

Київська міська інноваційна галузева організація роботодавців «Центр ресурсоефективного та чистого виробництва» <http://www.recpc.org/mission-en/>
Громадська організація «Харків Еко Сіті»
ГО «Центр сталого розвитку громад»
Громадська спілка «Українська асоціація досконалості та якості» <https://uaq.org.ua/index.php/en/>
Екологічна асоціація «Західне Полісся – заболочений край»
Непідприємницьке товариство «Товариство лісової сертифікації в Україні»
Дніпропетровська обласна громадська організація «Дніпровська природна інспекція» <https://www.facebook.com/Громадське-формування-з-ОГП-Дніпровська-природна-інспекція-213345929215366/>
Громадське формування з охорони громадського порядку «Екологічний патруль» <https://www.ecopatrol.com.ua>, <https://www.facebook.com/ecopatroll/>
ГО «Поліський край»
ГО «Товариство лісівників України» <https://tlu.kiev.ua>, <https://www.facebook.com/TLUkr/>
Всеукраїнська громадська організація «Громада Рибалок України» <https://www.facebook.com/ribakiua/>
ГО «Екологічний досвід»
ГО «Екологічний стандарт»
ГО «Агенція з хімічної безпеки»

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