

**Informal inter-agency coordination group on  
environmental assessments for Ukraine**



# **Comprehensive Report**

## **Ukraine Environmental Damage Assessments**

### **December 2023**



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*The **United Nations Economic Commission for Europe (UNECE)** was set up in 1947 by ECOSOC. Its major aim is to promote pan-European economic integration. To do so, UNECE brings together 56 countries located in the European Union, non-EU Western and Eastern Europe, South-East Europe and Commonwealth of Independent States and North America. All these countries dialogue and cooperate under the aegis of the UNECE on economic and sectoral issues.*

*The **United Nations Environment Programme (UNEP)** is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system and serves as an authoritative advocate for the global environment.*

*The **Organisation for Economic Co-operation and Development (OECD)** is an international organisation that works to build better policies for better lives. Our goal is to shape policies that foster prosperity, equality, opportunity and well-being for all. We draw on our experience and insights to better prepare the world of tomorrow. Together with governments, policy makers and citizens, we work on establishing evidence-based international standards and finding solutions to a range of social, economic and environmental challenges.*

*The **Ministry of Environmental Protection and Natural Resources (MEPR)** of Ukraine is the main authority in the system of central government of Ukraine responsible for ecological monitoring and development of the country.*

## Executive Summary

Since the onset of the full-scale war in Ukraine, which escalated in February 2022, numerous actors have undertaken, or are undertaking, assessments to understand its environmental consequences.

In response to requests received from Ukraine and the stakeholders of an informal interagency coordination group on environmental assessments for Ukraine, the Inter-agency coordination group on environmental assessments for Ukraine agreed to prepare a mapping of these assessments.

The objectives of this report are to provide a comprehensive overview of environmental assessments in Ukraine, identify gaps and overlaps in the assessments, recommend means to support coordination between actors and recovery and remediation measures, and guide future multi-stakeholder efforts to address environmental damage caused by the war in Ukraine.

The main findings of the mapping exercise indicate that a significant number of stakeholders (>100) have been involved in assessments of environmental damage caused by the war in Ukraine, mainly impact assessments of potential damage using secondary data sources. The key findings of the assessments and data indicate that over 1,000 incidents of potential environmental damage have been recorded by different stakeholders, with certain environmental elements (air, land and soil, water, forests, nature reserves) and high-risk hotspots of potential impacts identified and prioritized for further assessment. This suggests an overlap in the collection of such secondary data, and a gap in primary data collection and analysis, including implementation of environmental assessments and investigations to systematically verify damage of potential impacts.

Although additional assessment and/or investigation is needed to properly identify and prioritize critical areas for remediation, initial screening criteria could be used to determine if: a site could be considered for immediate remediation; more information must be collected before a site could be prioritized; or other hazards exist at the site that must be addressed first (e.g., unexploded ordnance).

Ukraine's National Recovery Plan (NRP) and other recovery and remediation processes and plans were reviewed to identify possible follow-up support by UNEP and its partners. Based on the assessments and plans, geographic or thematic areas were identified and prioritized for urgent remediation or risk management (or additional assessment and/or investigation), including areas posing immediate and significant risks to human health, locations of so-called high-risk hotspots, and regions in need of military or other waste clearance.

The following recommendations are provided as next steps on the possible ways forward and for improving the effectiveness and coordination of environmental damage assessments in Ukraine:

- **Coordination** – Under the leadership of national and regional authorities, coordination will be key to ensure that resources and capacities to address impacts are prioritized, and duplication of effort is avoided. At the national level, coordination is needed among government agencies – especially MEPR and SEI – for strategic and policy development, approval of laws and regulations, and leadership of initiatives communicated to regional levels (oblasts, raions, hromadas, etc.) for implementation. Coordination among government authorities, UNEP and its partners, as well as other national and international stakeholders, is needed to promote efficient and effective collaboration on damage assessment and subsequent recovery and remediation efforts. Informal environmental working groups already exist, and could be leveraged to formalize coordination mechanisms, such as an effective network of stakeholders, a global platform on assessment of environmental damage, and unified instruments to assess damage.
- **Governance** – In the long term, it will be important that the necessary equipment, expertise and funding be restored to address environmental issues and enforce environmental regulatory compliance to prevent and minimize environmental risks. In the short term, support from stakeholders, including international organizations, academia and civil society, could complement ongoing monitoring and further assessment work, such as on-site investigations

of contaminated areas and health surveillance, which are crucial to address current and future environmental and related public health issues.

- **Legislative Reform and Methodologies** – Legislative reform, including the development and approval of methodologies and standards on environmental damage assessment, to serve as the legal basis for further assessments and to support appeals to international stakeholders, should be prioritized. However, as reform can be a timely process, support could include the identification of, and agreement on, best international practices to conduct further assessments in the interim, such as those already adopted by the European Union and aligned with Ukraine’s integration plans and agreements. Methods for assessment, investigation and remediation should be transparent, robust and aligned with scientifically appropriate standards, in agreement with government authorities, UNEP and its partners, Assessing such impacts may require complex methods to establish damage due to delayed access to sites, the presence of legacy pollution, and limited baseline data. Identification and characterization of potential impacts based on approved, or agreed upon, sampling and analytical methods are recommended to verify damage.
- **Consolidation of Monitoring Data** – The extensive amount of environmental data being collected should be unified, evaluated and used to jointly target priority assessments and investigations, and support recovery and remediation plans. Consolidated monitoring data could assist in selecting high-risk locations for further assessment, either by conducting more in-depth secondary analysis (if access is limited) or collecting primary data (if accessible).
- **Analytical Capacity Development** – Laboratory analysis of media and parameters (e.g., explosive substances) in Ukraine related to potential impacts caused by the war should be evaluated for potential capacity development support, as needed.
- **Cross-Cutting Support to Sectors** – Support to other sectors may be required if relevant cross-cutting issues have not been factored into sectoral recovery plans.
- **Recovery and Remediation** – Based on capacities and mandates of UNEP and its partners, support could be provided to MEPR and SEI in relation to certain tasks of the directives (D2 to D5) of the NRP:
  - Adoption of key legislative acts to improve environmental safety, and ensure environmental safety of damaged waste management objects (D2)
  - Organization of the process of inventory and classification of degraded lands, and implementation of measures for clean-up of areas affected by the war (D3)
  - Inventory of losses and development of guidelines to restore nature conservation areas and ecosystems, and preserve biodiversity (D4)
  - Audit of damages and losses to systems of environmental monitoring (D5).

## List of Abbreviations, Acronyms and Glossary of Terms

<b>CER</b>	Centre of Economic Recovery
<b>CEOBS</b>	Conflict and Environment Observatory
<b>Ecoaction</b>	Center for Environmental Initiatives
<b>EPL</b>	Environment-People-Law
<b>EPR</b>	Environmental Performance Review
<b>EU</b>	European Union
<b>EWG</b>	Environment Working Group
<b>FAO</b>	Food and Agricultural Organization
<b>FEAT</b>	Flash Environmental Assessment Tool
<b>GIS</b>	Geographic Information System
<b>HPP</b>	Hydroelectric Power Plant
<b>IACG</b>	Inter-Agency Coordination Group
<b>KSE</b>	Kyiv School of Economics
<b>MCEP</b>	Ministry of Climate and Environment of Poland, Department of Nature Conservation
<b>MEPR</b>	Ministry of Environmental Protection and Natural Resources of Ukraine
<b>MTU</b>	Ministry for Communities, Territories and Infrastructure Development of Ukraine
<b>NDC2</b>	2 <sup>nd</sup> Nationally Determined Contribution of Ukraine
<b>NGO</b>	Non-Governmental Organization
<b>NPP</b>	Nuclear Power Plant
<b>NRP</b>	National Recovery Plan of Ukraine
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OSCE</b>	Organization for Security and Co-operation in Europe
<b>PCEA</b>	Post-Crisis Environmental Assessment
<b>PDNA</b>	Post-Disaster Needs Assessment
<b>REA</b>	Rapid Environmental Assessment
<b>SEI</b>	State Environmental Inspectorate of Ukraine
<b>UBA</b>	German Environment Agency
<b>UESG</b>	Ukraine Environment Study Group
<b>UNCG</b>	Ukraine Nature Conservation Group
<b>URC</b>	Ukraine Recovery Conference
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UXO</b>	Unexploded Ordnance
<b>Zoï</b>	Zoï Environment Network

## 1. Background

Since the onset of the full-scale war in Ukraine, which escalated in February 2022, numerous actors have undertaken, or are undertaking, assessments to understand its environmental consequences. In response to requests received from Ukraine and other stakeholders, the United Nations Environment Programme (UNEP) and its partners in the Inter-agency coordination group on environmental assessments for Ukraine have agreed to prepare a mapping of these assessments.

### 1.1 Context

The Ninth Environment for Europe Ministerial Conference (Nicosia, 5–7 October 2022) saw the adoption of a declaration in which “[Ministers] recognize[d] the need to assess the environmental consequences of the [war in] Ukraine for both the country and the surrounding region, and affirm support to Ukraine in its reconstruction, including for providing subsequent assistance for restoration. [They] invite[d] the United Nations Economic Commission for Europe (UNECE) secretariat, in cooperation with UNEP, the Organisation for Economic Co-operation and Development (OECD), and others, to prioritize assessing the most urgent environmental needs in Ukraine based upon the methodology of the UNECE Environmental Performance Review (EPR) Programme and on the results of ongoing and planned impacts assessments, and to make recommendations to advance a sustainable recovery of the country.”

Following the deliberations at the Ministerial Conference, it was agreed that, before the EPR-like process is launched, a review of ongoing and planned assessments is arranged to see the methodologies applied and their functions. Consequently, an informal inter-agency group was established by UNECE, UNEP and OECD, and joined by others. UNEP is a member of this informal inter-agency coordination group (IACG) on environmental assessments for Ukraine. The group’s objectives include enhancing coherence between the assessments with a focus on the substantive results and methodological approaches applied in carrying them out, and advising on how to use them to inform the post-war green reconstruction and recovery of Ukraine.

### 1.2 Purpose and Scope

Although numerous actors at international and local levels are, or have been, involved in conducting different types of assessments in Ukraine to gather information on the environmental effects of the war in Ukraine, there was no comprehensive mapping of these assessments, which could hinder coordination of efforts and identification of gaps and priorities, as well as informed decision-making by relevant stakeholders.

In response to requests received from Ukraine and the stakeholders of the informal IACG on environmental assessments for Ukraine, UNEP and its partners agreed to map the assessments and their scopes and methods, and to identify gaps that would need to be addressed to maximize their usefulness. To support this work, UNEP engaged a consultant to provide an overview of the existing, ongoing and planned assessments on environmental damage in Ukraine, and a preliminary identification of critical areas for remediation.

The scope of work of the consultant was to collect and analyse information on assessments undertaken, underway and planned (to the extent information was available) to assess environmental damage caused by the war in Ukraine. The scope included assessments by international organizations, government agencies of different countries, non-governmental organizations (NGOs), academic institutions, and other stakeholders. The consultant was also to identify planned environmental recovery and remediation processes and plans, with a view to identify possible UNEP follow-up support.

### 1.3 Objectives

The objectives of this report are to provide a comprehensive overview of environmental assessments in Ukraine, identify gaps and overlaps in the assessments, recommend means to support coordination



between actors and remediation measures, and guide future multi-stakeholder efforts to address environmental damage caused by the war in Ukraine.

## 2. Key Activities and Findings

This section of the report presents the findings of the three key activities of the work, as follows:

1. Preliminary mapping of assessments of environmental damage in Ukraine either undertaken, underway or planned by international organizations, government agencies of different countries, NGOs, academic institutions, and other stakeholders
2. Preliminary identification of gaps and overlaps in the assessments, identifying areas where further assessments may be required
3. Preliminary identification of planned environmental recovery and remediation processes and plans with a view to identifying possible follow-up support by UNEP and its partners.

These findings are discussed in detail in the following subsections.

### 2.1 Preliminary Mapping of Assessments of Environmental Damage in Ukraine

The mapping exercise involved three tasks, as follows:

1. Identification of relevant stakeholders involved in conducting assessments of environmental damage caused by the war in Ukraine, including international organizations, government agencies, NGOs, academic institutions, and other stakeholders, with a specific focus on assessments led by Ukrainian counterparts
2. Based on, but not limited to, the existing inventory of assessments made by IACG<sup>1</sup>, collection and categorization of data on different types of assessments
3. Review and analysis of the scope, methodologies, and findings of the assessments.

The findings of each of these tasks are presented in the following subsections.

#### 2.1.1 Identification of Relevant Stakeholders

With support from the UNEP office in Ukraine, various stakeholders were identified through meetings and interviews with key contacts of the following agencies or organizations:

- UNEP
- UNECE
- United Nations Development Programme (UNDP)
- Organization for Security and Co-operation in Europe (OSCE)
- Center for Environmental Initiatives (Ecoaction)
- State Environmental Inspectorate (SEI) of Ukraine
- Ministry of Environmental Protection and Natural Resources (MEPR) of Ukraine

In addition to meetings with key contacts, a questionnaire was prepared and members of known environmental groups currently active in Ukraine or internationally (with a focus on Ukraine) were surveyed, as follows:

- IACG
- UNEP's Environment Working Group (EWG) in Ukraine
- Ukraine Environment Study Group (UESG).

Based on these interviews and surveys, as well as the existing inventory of assessments made by IACG, existing databases, and general data searches, 86 stakeholders were preliminarily identified; however,

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<sup>1</sup> <https://unece.org/environment/documents/2023/03/working-documents/inventory-assessments-environmental-damage>

throughout the duration of the assignment, which was conducted between July and November 2023, a total of **129 stakeholders** were identified, with the increase mainly attributed to the addition of donors that were identified in support of the assessments. Of the 129 stakeholders identified, 50 (38%) were based in Ukraine.

The identified stakeholders were categorised by type, as shown in **Table 1** and on **Figure 1**.

Table 1: Stakeholders by Type

Stakeholder	Number (#/129)
Government agency (Government)	33
Non-government organization (NGO)	34
Academic institution (Institution)	22
International organization (IO)	14
Business	12
Project	7
Association	1
Publication	1
Think Tank	1
Program	2
Foundation	2

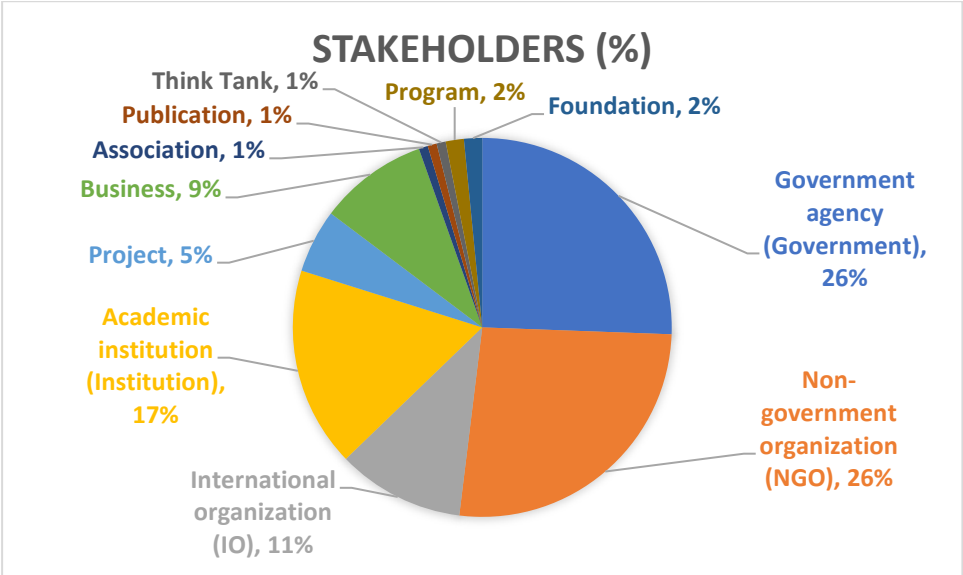


Figure 1. Stakeholders by type.

The stakeholders were also analysed by sub-category, as shown in **Table 2**.

Table 2: Sub-Categories of Stakeholders

Stakeholder Sub-Category	Percent (%)
Implementer	40%
Partner	29%
Donor	26%
Think Tank	2%
Publisher	2%
Media	1%
Project	1%

It is noted that some of the stakeholders were considered to be more than one type of sub-category (e.g., implementer and donor), which is why the percent of all sub-categories of stakeholders did not total 100%, as some stakeholders were counted more than once (out of 129 stakeholders) per sub-category. Each stakeholder, including full name, acronym, location, type, and sub-type, has been listed in the preliminary mapping database of Ukraine environmental damage assessments (a separate Excel file provided with this report) and provided as **Annex 1**. It is noted that only stakeholders associated with an environmental assessment or data (as described in Section 2.1.2) are included in the database.

### 2.1.2 Collection and Categorization of Assessments

Through the stakeholder analysis, 81 assessments and data were preliminarily identified, collected and categorized; however, throughout the duration of the assignment (July to November 2023), a total of **88 assessments and data** were identified through feedback and additional information.

The assessments and data were categorised by type, as shown on **Figure 2**.

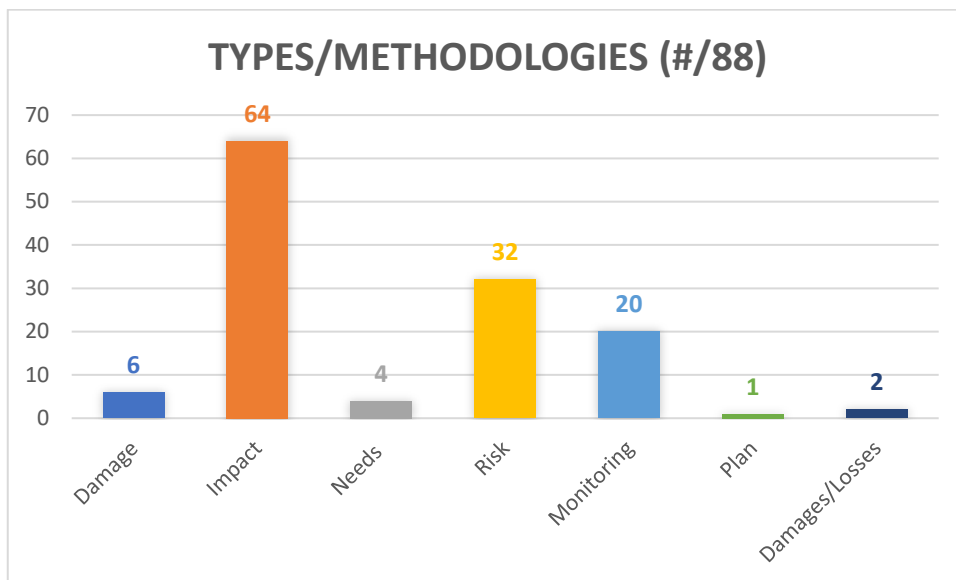


Figure 2. Assessments and data by type.

The assessments and data were also sub-categorized as follows:

- Database (2)
- Map (17).

The types of the assessments are indicative of the methodologies, and defined as follows:

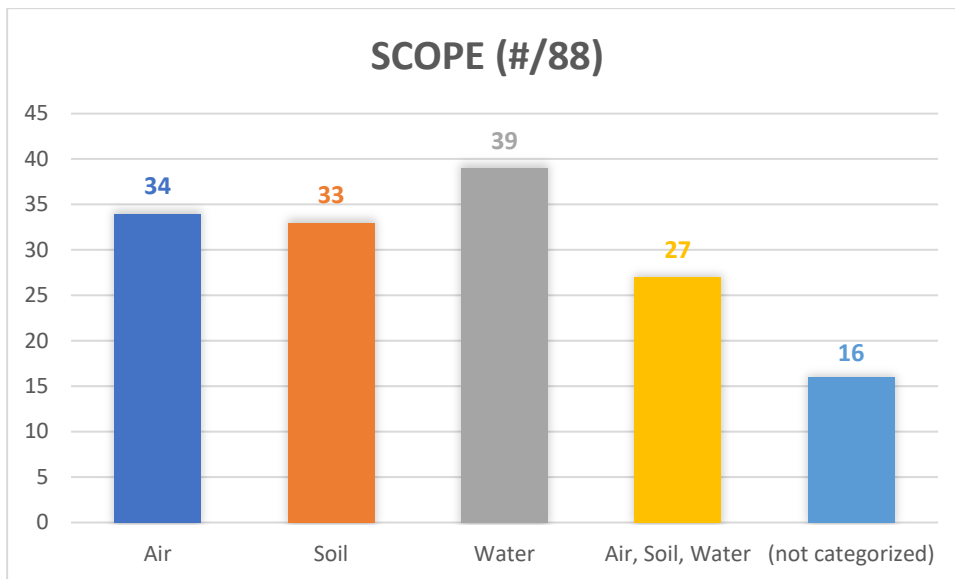
- Damage assessment – primary data collection and analysis (7%)

- Impact assessment – secondary data analysis of potential impacts due to incidents or events (73%)
- Needs assessment – assessment to inform recovery and reconstruction planning (5%)
- Risk assessment – assessment of likelihood of causing harm (consequence) by potential hazards and impacts before mitigation (36%)
- Monitoring program – ongoing record of incidents or events, or periodic measurements of data (23%)
- Plan – proposed actions to support additional work (1%)
- Damages/losses assessment – total economic impact that consists of direct economic loss (physical damage) and indirect economic loss (2%).

Similar to the sub-categories of stakeholders, some of the assessments and data were considered to be more than one type of assessment (e.g., monitoring and damage), which is why the percent of all types of assessments did not total 100%, as some of the assessments and data were counted more than once (out of 88 assessments and data) for the different types of assessments. Detailed methodologies of each assessment are described in the preliminary mapping database (**Annex 2**).

### 2.1.3 Review and Analysis of Scope, Methodologies and Findings

The scope of the assessments and data were reviewed and analysed for assessing the main elements of the environment: air, soil, and water. Of the 88 assessments and data, 27 assessments (31%) included all of these three elements, as shown on **Figure 3**.



**Figure 3. Scope of assessments (environment).**

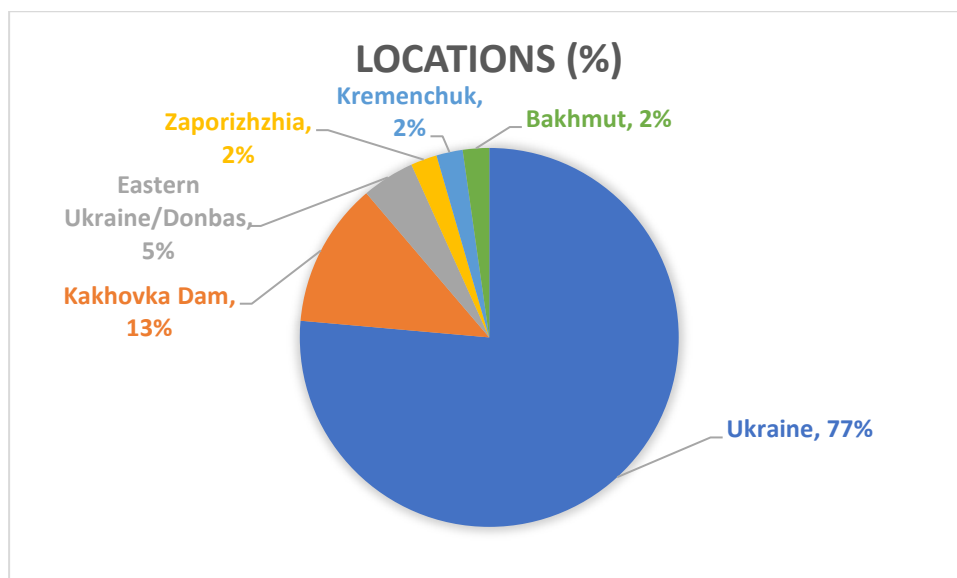
The scope of the assessments and data were also reviewed and analysed for sub-categories of the environment, as shown in **Table 3**.

Table 3: Sub-Categories of Scope (Environment)

Environment	Number (#/88)	Percent (%/88)
Air, atmospheric	34	39%
Soil, surface	33	38%
Water, surface	29	33%

Environment	Number (#/88)	Percent (%/88)
Water, groundwater	21	24%
Water, sea	14	16%
Marine	15	17%
Sediment	3	3%
Wetlands	7	8%
Land	6	7%
Forests	18	20%
Nature Reserves/Protected Areas	28	32%
Agricultural	23	26%
Ecosystems/Ecosystem Services	18	20%
Biodiversity	12	14%
Steppe/Grasslands	6	7%
Wildlife/Species At Risk	4	5%

The majority of the assessments and data (68 out of 88) involved all of Ukraine (77%), whereas a minor number of assessments also (or only) focused on a particular area (1 to 13%). Those locations that were assessed more than once (greater than 1%) are shown on **Figure 4**.



**Figure 4. Scope of assessments (location).**

Similar to the types of assessments, some of the assessments and data included more than one location (e.g., Ukraine and Kakhovka Dam), which is why the percent of all locations did not total 100%, as some assessments and data were counted more than once for the different locations.

In addition to the locations assessed more than once, the following locations were assessed once (1%): Dnipropetrovsk, Kharkiv, Chernobyl, Seredyna-Buda District (Sumy), Kyiv, Trostianets District (Sumy), Mykolaiv Region, Kremenchuk, Odessa, Poltava, Luhansk, Severodonetsk, Mayaki, Carpathian Region, the Autonomous Republic of Crimea, Donetsk, and Mariupol City.

Included in this analysis are two additional “locations”, which focus on the following:

- Climate Change (3)
- Nuclear Reactors and Facilities (1).

As mentioned earlier, this report is accompanied by the preliminary mapping database, which includes for each assessment: title, date, author, partners, donor, type, scope (environment and location), methodology, and overview, as well as a hyperlink to each assessment. It is noted that the primary implementer of each assessment is listed as the author in the database, and all other associated stakeholders are listed as a partner or donor.

The next section of this report involves further analysis of the scope, methodologies, and key findings of the assessments and data to identify gaps and overlaps in the assessments and areas where further or deeper assessment may be required to complement data or support improved coordination.

## 2.2 Preliminary Identification of Gaps and Overlaps in the Assessments

Further review and analysis of the scope, methodologies, and key findings of the assessments involved the following three tasks:

1. Identification of gaps and overlaps in the assessments and areas where further or deeper assessments may be required to complement data
2. Prioritization of gaps to be addressed by future assessment work
3. Identification of possible tools, methodologies and actors that could support areas where further assessment may be required.

The findings of each of these tasks are presented in the following subsections.

### 2.2.1 Identification of Gaps and Overlaps

In order to analyse the assessments and data for gaps and overlaps, it was first necessary to define what is an “environmental assessment”. The guidance outlined below was referred to as part of the analysis to determine whether an item was considered an environmental assessment.

- **Environmental Assessment**<sup>2</sup> is the entire process of undertaking an objective evaluation and analysis of information designed to support environmental decision making. It applies the judgement of experts to existing knowledge to provide scientifically credible answers to policy-relevant questions, quantifying where possible the level of confidence. It reduces complexity but adds value by summarising, synthesising and building scenarios, and identifies consensus by sorting out what is known and widely accepted from what is not known or not agreed. It sensitises the scientific community to policy needs and the policy community to the scientific basis for action.
- A **Rapid Environmental Assessment** (REA) identifies acute environmental risks caused by conflicts and industrial accidents using, for example, the Flash Environmental Assessment Tool (FEAT) or other rapid assessment tools.<sup>3</sup>
- **Post-Crisis Environmental Assessment** (PCEA)<sup>4</sup> aims to identify, evaluate, assess, prioritise and respond to critical environmental issues, such as damage to ecosystems and the environment, and to identify urgent environmental risks during or immediately following crisis situations. Some of the key information collected during a PCEA includes:
  - Conflict-related factors that may have an immediate impact on the environment
  - Possible immediate environmental impacts of conflict agents

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<sup>2</sup> <https://www.unep.org/resources/report/introduction-environmental-assessment>

<sup>3</sup> <https://ehaconnect.org/crisis-response-recovery/assessments/>

<sup>4</sup> <https://www.unep.org/explore-topics/disasters-conflicts/what-we-do/preparedness-and-response/post-crisis-environmental>

- Unmet basic needs of survivors that could lead to adverse impacts on the environment
- Potential negative environmental consequences of relief operations.

In some post-crisis situations, especially in post-conflict situations, the assessment would include the current status of institutions mandated to manage the environment and the associated legislative framework, as both may have become outdated during protracted conflicts.

- **Post-Disaster Needs Assessment (PDNA)**<sup>5</sup> looks at identifying the key issues present on the ground and costing them, rather than systematically assessing all of the environmental consequences, yet identifies, classifies, quantifies, and assesses environmental effects of crises.

Based on further analysis of the **scope** of the assessments and data, only 27 out of 88 were deemed to be environmental assessments. It is noted, however, that all items (88) were further reviewed for key findings and gaps/overlaps. As part of this task, key findings and gaps were added to the preliminary mapping database for each item (**Annex 2**); however, any planned or ongoing assessments that were not available for review have not been categorized as to whether they would be considered an environmental assessment. A star (\*) was placed to the left of an item (first column) in the database if considered an environmental assessment.

As described in Section 2.1.3, the assessments and data generally covered the main environmental elements of air, soil and water (38 to 44%), as well as locations across Ukraine (77%); however, of those considered environmental assessments (27), 59% included all three of the main environmental elements (air, soil and water). To date, 11 assessments and data (13%) have focused on one location/incident: Kakhovka dam.

Other environmental elements with notable coverage included: Nature Reserves/Protected Areas (32%), Agricultural (26%), Forests (20%), and Ecosystems/Ecosystem Services (20%). Environmental elements that featured in less than 20% of the assessments and data included: Marine (17%), Biodiversity (14%), Wetlands (8%), Land (7%), Steppe/Grassland (7%), Wildlife/Species At Risk (5%) and Sediment (3%).

In terms of **methodologies**, primary data collection and analysis (damage assessment) was observed in only 7% of the assessments and data. Secondary data analysis of potential impacts and risks due to incidents or events (impact/risk assessment and monitoring) has been, or is being, conducted by numerous stakeholders (73%/36% and 23%, respectively).

Approved methodologies by MEPR for calculating the amount of damage caused by emergencies and/or during martial law<sup>6</sup> were not cited in any of the assessments or data, except on “EcoZagroza”, MEPR’s official resource for collecting and recording data on environmental threats caused by military actions.

**Key findings** of the monitoring data indicate the following:

- 1,478 acts of violations drawn up by SEI (on MEPR’s “EcoZagroza”)
- 1,382 cases of potential negative environmental damage (by Ecoaction)
- 2,319 incidents at 1,230 locations across Ukraine (by Zoï Environment Network [Zoï])

As described in the preliminary mapping database, further in-depth analysis has been conducted on air (Arnica and Eco City), soil (Ecoaction), water (Conflict and Environment Observatory [CEOBS] and various scientific institutions), coastal/marine, fossil fuels, industry, nuclear/radiation (CEOBS and PAX), agriculture (Food and Agricultural Organization [FAO] and PAX), energy (PAX), and nature

<sup>5</sup> [https://www.undp.org/sites/g/files/zskgke326/files/publications/PDNA\\_Environment\\_FINAL.pdf](https://www.undp.org/sites/g/files/zskgke326/files/publications/PDNA_Environment_FINAL.pdf)

<sup>6</sup> <https://www.dei.gov.ua/post/2309>



(Ministry of Climate and Environment of Poland, Department of Nature Conservation [MCEP] and Ukraine Nature Conservation Group [UNCG]).

### **2.2.2 Prioritization of Gaps**

Priorities for future assessment work have been identified based on further analysis of the scope, methodologies and key findings of the assessments and data, and interviews conducted with key stakeholders, including government agencies, as part of the mapping exercise.

Based on approved methodologies developed to date by MEPR for calculating damage, priority environmental elements of concern include the following **scope**:

- Air (fugitive emissions of pollutants into the atmosphere)
- Land and soil
- Water (as a result of pollution)
- Forests
- Nature reserves.

Certain locations or types of environments have been prioritized as high-risk hotspots of potential significant impact due to incidents or events, including:

- Kakhovka Dam and other flooded areas (e.g., Irpin river valley)
- Black Sea, Sea of Azov, estuaries, and wetlands
- Energy-related infrastructure, including fossils fuels and nuclear power plants (NPPs)/hydroelectric power plants (HPPs)
- Industry, including agricultural
- Military and other hazardous wastes, including unexploded ordnance (UXO), depleted uranium, and asbestos
- Forests and nature reserves
- Other critical infrastructure (water/wastewater).

It is understood that some of the approved **methodologies** by MEPR are currently being evaluated by experts for potential revisions or updates, and new methodologies are potentially under development as up to 10 methodologies have been cited in the national recovery plan (see Section 2.3.1). Therefore, sampling and analytical methods, either approved or agreed upon based on international best practice, should be prioritized for use in identification, characterization, and verification of damage from potential impacts.

In addition, further assessment should be prioritized to evaluate capacities for laboratory analysis of media and parameters (e.g., explosive substances, asbestos, etc.) in Ukraine related to potential impacts caused by the war, to identify existing resources or any needs for capacity development.

### **2.2.3 Identification of Tools, Methodologies and Actors**

Possible tools, methodologies and/or actors were identified to support areas where further assessment may be required. Capacities were identified from the assessments and data to potentially support prioritizing and/or conducting assessments, or activities related to the process.

One activity involves legislative reform, including the development and approval of policies, methodologies and standards on environmental damage assessment, to serve as the legal basis for further assessments and support appeals to international stakeholders; however, as reform can be a timely process, support may also include identifying best practices that could be used to support further assessments as an interim measure, such as those already adopted by the European Union (EU) and aligned with Ukraine's integration plans and agreements. Actors identified as already supporting

such initiatives or that could support further initiatives in this regard include: MEPR and SEI, UNDP, OECD, OSCE, Kyiv School of Economics (KSE), Zoï, Scientific Institutions/National Laboratories, and Environment-People-Law (EPL).

Another activity related to prioritization involves consolidation of the monitoring data to assist in selecting high-risk locations for further assessment, either by conducting more in-depth secondary analysis (if access is limited) or collecting primary data (if accessible). Actors involved in ongoing data collection that could support consolidation and prioritization include: MEPR and SEI, UNDP, CEOBS, Ecoaction, PAX, and REACH.

## **2.3 Identification of Environmental Recovery and Remediation Processes and Plans**

Analysis of Ukraine's environmental recovery and remediation processes and plans involved the following three tasks:

1. Review of existing recovery plans and opportunities at policy and strategic levels
2. Based on the assessments, identification of critical areas for urgent remediation by establishing criteria for prioritization (including geographic or thematic areas)
3. Identification of environmental recovery and remediation processes and plans for possible follow-up support by UNEP and its partners.

The findings of each of these tasks are presented in the following subsections.

### **2.3.1 Review of Existing Recovery Plans and Opportunities**

The following environmental recovery plans and opportunities have been identified and reviewed:

- Ukraine's National Recovery Plan (NRP), National Recovery Council, July 2022<sup>7</sup>
  - Materials of the Environmental Safety working group<sup>8</sup>
  - Materials of the Audit of War Damage working group<sup>9</sup>
- Ukraine Recovery Conference (URC), June 2023<sup>10</sup>
  - Community-Led Restoration Approach, Ministry for Communities, Territories and Infrastructure Development (MTU), June 2023
- Parliamentary Committee on Environmental Policy and Nature Management
  - Plan to organize Committee hearing on Green Recovery and Green Reconstruction, November/December 2023
- URC, 2022
  - Environmental Recovery brief, Centre of Economic Recovery (CER), July 2022
  - Environmental Recovery and Development: Clean and Safe Environment panel discussion, July 2022
  - Prospects for Green Reconstruction: Policy Response, OECD, July 2022
  - Relief, Recovery and Resilient Reconstruction, World Bank, May 2022
  - Energy and Environment Reforms, Economist Impact, 2022
- Other

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<sup>7</sup> [https://uploads-ssl.webflow.com/621f88db25fbf24758792dd8/62c166751fcf41105380a733\\_NRC%20Ukraine%27s%20Recovery%20Plan%20blueprint\\_ENG.pdf](https://uploads-ssl.webflow.com/621f88db25fbf24758792dd8/62c166751fcf41105380a733_NRC%20Ukraine%27s%20Recovery%20Plan%20blueprint_ENG.pdf)

<sup>8</sup> <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/ecosafety-eng.pdf>

<sup>9</sup> <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/audit-of-war-damage-eng.pdf>

<sup>10</sup> <https://www.unc-international.com/>

- Recovery principles, policies, and plans have been documented by other organizations and groups, such as Ecoaction, German Environment Agency (UBA), MCEP, EPL, and PAX.

The objective and vision of Ukraine's NRP is to provide environmental resilience and have strong human capital to increase quality of life. Under this plan, there is a national program to re-build a clean and safe environment and ensure sustainable development in line with the EU Green Deal. Immediate and wartime priorities of the plan for 2022 included minimizing negative impacts on the environment, launching a demining effort, and securing military waste utilization (estimated funding needs \$2B). Post-war recovery (2023-2025) and modernization (2026-2032) priorities include ecological safety, balanced use of natural resources, and preservation of natural ecosystems (estimated funding needs \$20B).

The materials of the Environmental Safety working group of the NRP include **five directions**, as follows:

1. Climate policy: mitigation and adaptation to climate change
2. Environmental safety and effective waste management
3. Sustainable use of natural resources
4. Conservation of natural ecosystems and biodiversity, and restoration and development of protected area system
5. Effective public administration in environmental protection and control, and use of natural resources.

Each direction includes a list of projects for implementation of the tasks to achieve its goals, and the necessary legal framework within the scope of each direction. A limited selection of planned tasks under each direction are summarized below, which pertain to assessment of environmental damage caused by the war in Ukraine and support for environmental recovery and remediation.

Direction 1 – Climate policy:

- Analyze the impact of the war on the progress of climate policy and develop an implementation plan within United Nations Framework Convention on Climate Change (UNFCCC) commitments, Paris Agreement, and Montreal Protocol
- Renew the Action Plan for implementation of Ukraine's 2<sup>nd</sup> Nationally Determined Contribution (NDC2), taking into account the economic impact of the war
- Analyze the progress of monitoring, reporting and verification of greenhouse gas emissions and accounting of controlled substances, taking into the account the impact of the war
- Include adaptation to climate change into integrated NRP programs, strategies, and projects at regional and local levels

Direction 2 – Environmental safety and effective waste management:

- Introduce a risk-oriented approach to environmental safety in accordance with requirements of EU legislation aimed at preventing damage to the environment and human health
  - Minimize environmental safety risks (chemical and radiation)
  - Reduce and prevent industrial pollution
  - Effective waste management
- Adopt key legislative acts to improve environmental safety, creating the necessary legal basis to eliminate threats to the environmental
- Ensure the environmental safety of waste management objects damaged as a result of the war

Direction 3 – Sustainable use of natural resources:

- Organize the process of inventory and classification of degraded lands, including those damaged as a result of the war
- Develop and implement methods for determining damage and losses caused to forests and biological resources, and projects for the restoration of forests affected by the war
- Improve the ecological and chemical status of water bodies, taking into account the impact of the war
- Implement measures for reclamation of lands affected by the war
- Implement pilot projects aimed at clean-up of areas affected by the war

Direction 4 – Conservation of natural ecosystems and biodiversity:

- Inventory losses within protected areas due to the war in Ukraine
- Restore nature conservation areas and ecosystems, and preserve biodiversity on the territories of the Nature Reserve Fund damaged by the war
- Develop methodological guidelines for the implementation of pilot projects on landscape planning in areas that have been destroyed by the war

Direction 5 – Effective public administration:

- Develop and adopt 10 methodologies on the assessment of damage to the environment caused by the war, and calculate the amounts of losses and damages to the environment and needs for environmental restoration
- Audit damages and losses to systems of state environmental monitoring
- Implement projects on the restoration of ecosystem services degraded due to the war
- Assess the challenges and threats to sustainable development of regions of Ukraine caused by the war.

The materials of the Audit of War Damage working group of the NRP provide a damage assessment (as of 21 June 2022), which contains only certain/fragmented estimates of environmental damage caused to Ukraine as a result of active hostilities and does not account for the needs of environmental recovery. The assessment includes damage to the Nature Reserve Fund and other protected areas, forests, infrastructure and industrial facilities, and land resources, as well as military waste (destroyed equipment, destroyed and used ammunition) and emissions of hazardous substances into the atmosphere.

At the URC in 2023, little focus or follow-up was put on the environment, unlike 2022; however, one report included some environmental priorities and restoration plans. The Community-Led Restoration Approach by MTU noted anti-ecocide as a priority task of restoration. It also recommended a geographic information systems (GIS) for regional restoration by mapping of destroyed and damaged objects with environmental restoration goals, tasks and projects, and automated monitoring and reporting.

URC 2022 had a much stronger focus on the environment and included a number of recovery plans and opportunities by various stakeholders. An Environmental Recovery brief by CER presented four pillars for supporting green transition of Ukraine: 1) environmental & climate governance architecture & finance; 2) clean energy and green buildings; 3) new green economy; 4) preserved environment and developed biodiversity (environmental security focusing on citizen's health; restored degraded lands and effective use). An Environmental Recovery and Development panel discussion on Clean and Safe Environment provided a dialogue on the national Clean and Safe Environment Program. OECD presented Prospects for Green Reconstruction, including prioritization of actions to eliminate and reduce existing and potential impacts and immediate risks the war poses to human health and the environment, especially related to collection, safe disposal and treatment of military and other wastes.

The World Bank described Relief, Recovery and Resilient Reconstruction, including critical directions for resilient reconstruction, such as building sustainable infrastructure to underpin the new economic model in a way that is financially, environmentally and socially responsible (e.g., through energy-efficient construction). Lastly, Economist Impact presented initiatives on Energy and Environment Reforms, such as: protecting the environment through reforms in forestry and waste management to ensure that economic recovery is sustainable in the long term; and assuring safe storage and disposal of waste that is not suitable for reuse to minimize environmental impacts of the war in the long term. It also noted that protecting the environment will be critical in securing international support and investment, a crucial enabler of Ukraine's recovery from the current crisis.

### **2.3.2 Identification of Critical Areas for Urgent Remediation**

Critical areas for urgent remediation, or additional assessment and/or investigation, may be prioritized based on screening criteria. Once a contaminated site has been identified, it could be prioritized with respect to the level of risk it represents. Three factors can be evaluated to classify a site as high, medium or low priority for action, as follows:

1. Contaminant characteristics (hazards)
2. Exposure pathways (media/route)
3. Receptors (humans, plants, animals, environmental resources).

Sites lacking sufficient information (as is the case for most of the environmental assessments in the preliminary mapping database) will likely require additional assessment and/or investigation to properly identify and prioritize critical areas for remediation.

Initial screening criteria could be used to determine if:

- A site could be considered for immediate remediation
- More information must be collected before a site could be prioritized
- Other hazards exist at the site that must be addressed first.

A priority for immediate remediation or risk management may include the following:

- Direct and significant evidence of impacts to humans (e.g., acute health risks) on site or due to migration of contaminants off site
- Direct and significant evidence of impacts to ecological receptors (e.g., severe ecotoxicity) on site or due to migration of contaminants off site
- Indicators of significant adverse effects in the exposure zone (i.e., the zone in which receptors may come into contact with contaminants) – for example, visible contamination (e.g., oily sheen, spills, etc.) or severely stressed biota or devoid of biota.

More information is likely needed if partial, incomplete or no environmental assessment or investigation has been conducted at a site of potential impact.

Other hazards that would need to be addressed first include radioactive materials, bacterial contamination, biological hazards, and explosives (UXO and/or measured concentrations of volatiles).

Based on the assessments and data, and recovery and remediation plans, the following geographic or thematic areas exemplify key topics that have been identified and prioritized for urgent remediation or risk management (or additional assessment and/or investigation) in the various reports, databases and plans:

- Mitigate **immediate and significant risks to human health** and the environment, especially related to collection, safe disposal and treatment of military and other **wastes**, and implement strategic interventions to address environmental hazards that will deliver the greatest health benefits and allow displaced families to safely return to their communities and livelihoods

- Prioritize **high-risk sites** or so-called **hotspots** for response, such as those with potential impacts caused by releases of hazardous substances to the environment due to incidents or events (e.g., Kakhovka Dam breach and others) using monitoring data to inform risk characterization and subsequent targeting of field-based site investigation, environmental sampling and analysis, and remediation, as soon as the situation allows.

### **2.3.3 Identification of Environmental Recovery and Remediation Processes and Plans**

A number of considerations are highlighted below as prerequisites to the processes of environmental recovery and remediation, which relate to governance, coordination, data consolidation, and other challenges.

- Environmental governance has suffered mobilization, personnel and equipment losses, decreased funding and operational capacities, and increased extraction of natural resources. In the long term, it will be important that the necessary equipment, expertise and funding be restored to address environmental issues and enforce environmental regulations to prevent and minimize environmental risks.
- Under the leadership of national and regional authorities, coordination will be key to ensure that resources and capacities to address impacts are prioritized and that duplication of effort is avoided. Coordination among government agencies, UNEP and its partners is needed to promote efficient and effective collaboration on damage assessment and subsequent recovery and remediation efforts.
  - At the national level, coordination is needed among government agencies – especially MEPR and SEI – for strategic and policy development, approval of laws and regulations, and leadership of initiatives communicated to regional levels (oblasts, raions, hromadas, etc.) for implementation. Coordination among other government stakeholders identified through the mapping exercise may also include, but is not limited to: Ministry of Defence/Armed Forces of Ukraine, Ministry of Reintegration of the Temporarily Occupied Territories of Ukraine, State Agency of Forest Resources of Ukraine, Ukrainian Association of District and Regional Councils, and All-Ukrainian Association of Amalgamated Territorial Communities.
  - Coordination is also needed among Ukraine and its national and international partners that can support environmental damage assessment and related efforts. Informal environmental working groups already exist (as mentioned in Section 2.1.1) and could be drawn upon to formalize coordination mechanisms, such as an effective network of stakeholders, a global platform on assessment of environmental damage, and unified instruments to assess damage.
- The extensive amount of environmental data being collected should be unified, evaluated and used to jointly target priority assessments and investigations, and support recovery and remediation plans.
- Methods for assessment, investigation and remediation should be transparent, robust and aligned with best international practice and scientifically appropriate standards, in agreement with government authorities, UNEP and its partners. Determining the actual extent of contamination from the current crisis may be complicated due to delayed access to sites and the presence of legacy pollution, while interpreting results may depend upon baseline data, if available. Assessing such impacts may require complex methods to establish damage.
- Support to other sectors may be required if relevant cross-cutting issues have not been factored in to sectoral recovery plans.

With these considerations in mind, the following environmental recovery and remediation processes and plans have been identified for possible follow-up support by UNEP and its partners based on their capacities and mandates, and coincide with the planned tasks of the directives [D2 to D5] of the NRP:

1. Adopt key legislative acts to improve environmental safety, and ensure environmental safety of damaged waste management objects [D2] – UNDP, OECD
2. Organize the process of inventory and classification of degraded lands, and implement measures for clean-up of areas affected by the war [D3] – UNEP
3. Inventory losses and develop guidelines to restore nature conservation areas and ecosystems, and preserve biodiversity [D4] – CEOBS, Ramsar Convention on Wetlands, UNCG
4. Audit damages and losses to systems of environmental monitoring [D5] – Arnika, Ecoaction, PAX, REACH, UWEC, Zoï.

### 3. Summary

Since the onset of the full-scale war in Ukraine, which escalated in February 2022, numerous actors have undertaken, or are undertaking, assessments to understand its environmental consequences.

The UNECE secretariat, in cooperation with UNEP, OECD, and other stakeholders of an informal interagency coordination group on environmental assessments for Ukraine, agreed to prioritize assessing the most urgent environmental needs in Ukraine, based on requests received from the Government of Ukraine.

The objectives of this report were to provide a comprehensive overview of environmental assessments in Ukraine, identify gaps and overlaps in the assessments, recommend means to support coordination between actors and recovery and remediation measures, and guide future multi-stakeholder efforts to address environmental damage caused by the war in Ukraine.

#### 3.1 Conclusions

The main findings of the mapping exercise indicate that a significant number of stakeholders (>100) have been involved in assessments of environmental damage caused by the war in Ukraine, mainly impact assessments of potential damage using secondary data sources. The key findings of the assessments and data indicate that over 1,000 incidents of potential environmental damage have been recorded by different stakeholders, with certain environmental elements (air, land and soil, water, forests, nature reserves) and high-risk hotspots of potential impacts identified and prioritized for further assessment. This suggests an overlap in the collection of such secondary data, and a gap in primary data collection and analysis, including implementation of environmental assessments and investigations to systematically verify damage of potential impacts.

Although additional assessment and/or investigation is needed to properly identify and prioritize critical areas for remediation, initial screening criteria could be used to determine if: a site could be considered for immediate remediation; more information must be collected before a site could be prioritized; or other hazards exist at the site that must be addressed first (e.g., UXO).

Ukraine's NRP and other recovery and remediation processes and plans were reviewed to identify possible follow-up support by UNEP and its partners. Based on the assessments and plans, geographic or thematic areas were identified and prioritized for urgent remediation or risk management (or additional assessment and/or investigation), including areas posing immediate and significant risks to human health, locations of so-called high-risk hotspots, and regions in need of military or other waste clearance.

#### 3.2 Recommendations

The following recommendations are provided as next steps on the possible ways forward and for improving the effectiveness and coordination of environmental damage assessments in Ukraine:

- **Coordination** – Under the leadership of national and regional authorities, coordination will be key to ensure that resources and capacities to address impacts are prioritized, and duplication of effort is avoided. At the national level, coordination is needed among government agencies – especially MEPR and SEI – for strategic and policy development, approval of laws and regulations, and leadership of initiatives communicated to regional levels (oblasts, raions, hromadas, etc.) for implementation. Coordination among government authorities, UNEP and its partners, as well as other national and international stakeholders, is needed to promote efficient and effective collaboration on damage assessment and subsequent recovery and remediation efforts. Informal environmental working groups already exist, and could be leveraged to formalize coordination mechanisms, such as an effective network of stakeholders, a global platform on assessment of environmental damage, and unified instruments to assess damage.
  - Stakeholders primarily include MEPR and SEI, UNEP, UNECE, and OECD



- **Governance** – In the long term, it will be important that the necessary equipment, expertise and funding be restored to address environmental issues and enforce environmental regulatory compliance to prevent and minimize environmental risks. In the short term, support from stakeholders, including international organizations, academia and civil society, could complement ongoing monitoring and further assessment work, such as on-site investigations of contaminated areas and health surveillance, which are crucial to address current and future environmental and related public health issues.
  - Stakeholders include MEPR and SEI, UNEP, PAX, CEOBS, Zoï, EPL, UNCG, and Ecoaction
- **Legislative Reform and Methodologies** – Legislative reform, including the development and approval of methodologies and standards on environmental damage assessment, to serve as the legal basis for further assessments and to support appeals to international stakeholders, should be prioritized. However, as reform can be a timely process, support could include the identification of, and agreement on, best international practices to conduct further assessments in the interim, such as those already adopted by the European Union and aligned with Ukraine’s integration plans and agreements. Methods for assessment, investigation and remediation should be transparent, robust and aligned with scientifically appropriate standards, in agreement with government authorities, UNEP and its partners, Assessing such impacts may require complex methods to establish damage due to delayed access to sites, the presence of legacy pollution, and limited baseline data. Identification and characterization of potential impacts based on approved, or agreed upon, sampling and analytical methods are recommended to verify damage.
  - Stakeholders identified as already supporting, or could support, such initiatives include MEPR and SEI, UNDP, OECD, OSCE, KSE, Zoï, Scientific Institutions/National Laboratories, and EPL
- **Consolidation of Monitoring Data** – The extensive amount of environmental data being collected should be unified, evaluated and used to jointly target priority assessments and investigations, and support recovery and remediation plans. Consolidated monitoring data could assist in selecting high-risk locations for further assessment, either by conducting more in-depth secondary analysis (if access is limited) or collecting primary data (if accessible).
  - Stakeholders involved in previous or ongoing data collection that could support consolidation and prioritization include MEPR and SEI, UNDP, CEOBS, Ecoaction, PAX, and REACH
- **Analytical Capacity Development** – Laboratory analysis of media and parameters (e.g., explosive substances) in Ukraine related to potential impacts caused by the war should be evaluated for potential capacity development support, as needed.
  - Stakeholders include OSCE, UNDP, Ecoaction, and Scientific Institutions/National Laboratories
- **Cross-Cutting Support to Sectors** – Support to other sectors may be required if relevant cross-cutting issues have not been factored into sectoral recovery plans.
  - Stakeholders include UNEP
- **Recovery and Remediation** – Based on capacities and mandates of UNEP and its partners, support could be provided to MEPR and SEI in relation to certain tasks of the directives (D2 to D5) of the NRP:
  - Adoption of key legislative acts to improve environmental safety, and ensure environmental safety of damaged waste management objects (D2)
    - Stakeholders include UNDP and OECD
  - Organization of the process of inventory and classification of degraded lands, and implementation of measures for clean-up of areas affected by the war (D3)
    - Stakeholders include UNEP

- Inventory of losses and development of guidelines to restore nature conservation areas and ecosystems, and preserve biodiversity (D4)
  - Stakeholders include CEOBS, Ramsar Convention on Wetlands, and UNCG
- Audit of damages and losses to systems of environmental monitoring (D5)
  - Stakeholders include Arnika, Ecoaction, PAX, REACH, UWEC, and Zoï.

#### 4. References and Useful Links

The preliminary mapping database (***Annex 2***) includes the details of, and links to, all of the assessments and data that were reviewed and analysed as part of this work. Footnotes have been inserted into this report for sources of data that were not include in the preliminary mapping database.

## **Annexes**

Annex 1 List of Stakeholders

Annex 2 Preliminary Mapping Database of Assessments and Data