



UKRAINE RAPID DAMAGE AND NEEDS ASSESSMENT

AUGUST 2022

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Disclaimer: The Ukraine Rapid Damage and Needs Assessment – August 2022 report was jointly prepared by the World Bank, the Government of Ukraine, and the European Commission. The report is based on data as of June 1, 2022, gathered in the timeframe between May 30 and July 30, 2022. The rapid assessment was produced in a short timeframe to ensure the relevance of the estimations and in-depth efforts have been made to improve the accuracy of the information that was collected, analyzed, and verified to the extent possible. Given the ongoing nature of the conflict and the lack of access in territories temporarily not under government control, the data collection is primarily remote-based but validated through ground-based information. The remotely sourced data have been triangulated and validated whenever possible against ground-based information obtained from the Government of Ukraine, local agencies, the United Nations, and other international partners. Given these constraints, the authors of the report cannot guarantee the absolute accuracy of the data included in this work. The report uses the exchange rate US\$1 = UAH 27.28 from December 31, 2021.

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ACKNOWLEDGMENTS

The Ukraine Rapid Damage and Needs Assessment (RDNA) was jointly prepared by the World Bank, the Government of Ukraine, and the European Commission, in coordination with government institutions, UN agencies and development partners, academia, civil society organizations, and the private sector. The RDNA core team consisted of government representatives, World Bank and European Commission staff and experts.

On the part of the Government of Ukraine, the RDNA was led by the Ministry for Communities and Territories Development, with support from the Ministry for Reintegration of the Temporarily Occupied Territories and the Ministry of Infrastructure. All relevant line ministries have participated in the assessment, in coordination with the Kyiv School of Economics (KSE).

The report benefited from the contribution of the European Commission led by the Delegation of the European Union to Ukraine and the Directorate-General for Neighborhood and Enlargement Negotiations (DG NEAR), with contributions of other services.

The World Bank's technical support was provided by the World Bank's Country Management Unit, the Global Practice of Urban, Resilience, and Land (GPURL), and other Global Practices and Cross-Cutting areas.

This report benefited from the generous support of the United Kingdom Foreign, Commonwealth and Development Office's Good Governance Fund; the Global Facility for Disaster Reduction and Recovery (GFDRR); the United States Government, including the State Department; Swiss Secretariat for Economic Affairs (SECO); and the Swiss Government through the Sustaining Health Sector Reforms in Ukraine Trust Fund, supported by the Swiss Development Cooperation. Multiple other partners contributed to the report's content including the British Foreign Office, the Food and Agriculture Organization (FAO) of the United Nations; the United Nations International Children's Fund (UNICEF); the World Health Organization (WHO); the United Nations High Commissioner for Refugees (UNHCR); and the International Organization for Migration (IOM).

The full list of sectoral leads and contributors is included in **Annex 1**. The RDNA team would like to express its deep appreciation to all individuals and organizations who contributed to this assessment.



FOREWORD

On February 24, 2022, the Russian Federation invaded Ukraine, resulting in civilian casualties, displacement of millions of people, and widespread and significant destruction to homes, businesses, social institutions, and productive and economic activity. The impact of the invasion will be felt for generations, with families displaced and separated, disruptions to human development, destruction of intrinsic cultural heritage and reversal of a positive economic and poverty trajectory.

The Government of Ukraine, the World Bank Group and the European Commission in cooperation with development partners, launched a Rapid Damage and Needs Assessment (RDNA). Following an internationally accepted methodology, the RDNA aimed to assess the impact of the war on the population, human development, service delivery, physical assets, infrastructure, productive sectors and the economy. For the purpose of this assessment, damage from the war between February 24 and June 1, 2022, is included, verified to the extent possible, and assessed. The RDNA results are preliminary, and damage, losses and needs should be considered as minimums. As the war continues, the social and economic impact will further increase and intensify. However, there is a need to start reconstruction and recovery now where it is safe and practical to do so.

As of June 1, 2022, direct damage has reached over **US\$97 billion**, with housing, transport, and commerce and industry being the most affected sectors. Damage is concentrated in the frontline oblasts (74 percent), particularly Donetsk, Luhanska, Kharkivska, and Zaporizka, and in oblasts that were brought back under government control (22 percent) such as Kyivska and Chernihivska. Disruptions to economic flows and production, as well as additional expenses associated with the war, are collectively measured as losses and amount to some **US\$252 billion**. Ukraine's Gross Domestic Product (GDP) shrank by 15.1 percent year over year in the first quarter of 2022, and poverty is expected to increase from 2 to 21 percent (based on the poverty line of US\$5.5 per person per day).

Reconstruction and recovery needs, as of June 1, are estimated at about **US\$349 billion**, which is more than 1.6 times the GDP of Ukraine in 2021. Integrated into these needs are critical steps toward becoming a modern, low-carbon, disaster- and climate-resilient, and inclusive country that is more closely aligned with European Union standards. While the financing envelope is overwhelming, experience from other countries shows that reconstruction spans many years and a phased approach to reconstruction is critical. The report also details some **US\$105 billion** needed in the immediate and short term to address the most urgent needs, including social infrastructure (such as schools and hospitals, especially in areas brought back under government control), preparation for the upcoming winter through winterization and restoration of heating and energy to homes, urgent repairs, gas purchases, support to agriculture and social protection, and restoration of vital transport routes. These actions will lay the groundwork for a safe, prioritized, and efficient reconstruction and recovery.

The report offers a strong analytical foundation for a comprehensive financial and operational strategy and plan to support the early recovery and long-term reconstruction of Ukraine, to which we are strongly committed. This next phase of planning should consider the balancing and prioritization of needs and investments, absorptive capacity, financing availability, the development of common systems and processes to ensure maximum efficiency, the development and expansion of the managerial and technical capacity of implementation units, the mobilization of funds for project preparation, and the development of financial strategies for different sectors.



EXECUTIVE SUMMARY

The Russian Federation's invasion of Ukraine, which began February 24, 2022, has caused significant civilian casualties and damage to infrastructure and has taken a severe human, social, and economic toll. As a result of the war, which still continues after more than six months, dwellings and public infrastructure have been demolished or damaged, public services and economic activity have been impeded, and significant numbers of Ukrainians have been displaced from their homes.

This Rapid Damage and Needs Assessment (RDNA) is part of an ongoing effort, undertaken jointly by the Government of Ukraine, the World Bank, and the European Commission and supported by other partners, to take stock of Ukraine's damage and losses from the war—but just as importantly to assess the scale of economic and social needs for Ukraine's survival during the war and its prospering afterward. Detailed sectoral data for the assessment use June 1, 2022, as a cutoff; given the progress of the war since that date, the extent of damage, losses, and needs is clearly larger as of the date of publication. While the calculation of needs has been done by joint government and World Bank teams in each of the sectors covered, the differential availability of data has meant that the extent of coverage varies somewhat across sectors.

Still, the RDNA provides the first rigorous overview of the various economic needs that Ukraine and its people have as a consequence of the war. The objective of the RDNA is to deliver a consistent, validated, and transparent assessment of (i)

quantified physical **damage** to infrastructure, buildings, etc.; (ii) quantified indirect **losses** for a time period of 21 months (3 months between February and June 2022, and 18 additional months), considering elements such as disrupted services, economic impacts, costs related to internally displaced persons (IDPs), debris management, restricted access and costs due to land contamination,¹ etc.; and (iii) corresponding recovery and reconstruction **needs** (Box 1 provides definitions). The RDNA also outlines general guiding principles for building back better and sequencing investments for a green, resilient, inclusive, and sustainable recovery and reconstruction, focusing on immediate and short-term needs (18 to 36 months) and medium- to long-term needs (up to 10 years).

An important limitation is that the RDNA presents the needs at a sector level and does not consider the balancing of one sector's needs against those of another sector. Strategic prioritization of reconstruction across all sectors is the next important step as part of recovery and reconstruction planning, with this RDNA providing analytical support to this critical decision-making. Further work will involve prioritizing needs based on absorptive and implementation capacity of different sectors, priorities related to different geographic areas, humanitarian and IDP needs, institutional capacity, financing availability, etc. This further work is critical for investment planning and implementation, and can form part of an immediate recovery plan for Ukraine.

Box 1. RDNA definitions

Damage: Direct costs of destroyed or damaged physical assets; valued in monetary terms with costs estimated based on replacing or repairing physical assets and infrastructure, considering the replacement price prevailing before the war.

Losses: Changes in economic flows resulting from the war; valued in monetary terms.

Needs: Value associated with the resumption of prewar normality through activities such as repair and restoration, including a premium linked to building back better principles (e.g., improved energy efficiency, modernization efforts, and sustainability standards). Needs do not equal the sum of damage and losses.

1 Land contamination refers to land that may contain land mines and/or explosive remnants of war.

Summary of Damage, Losses, and Needs

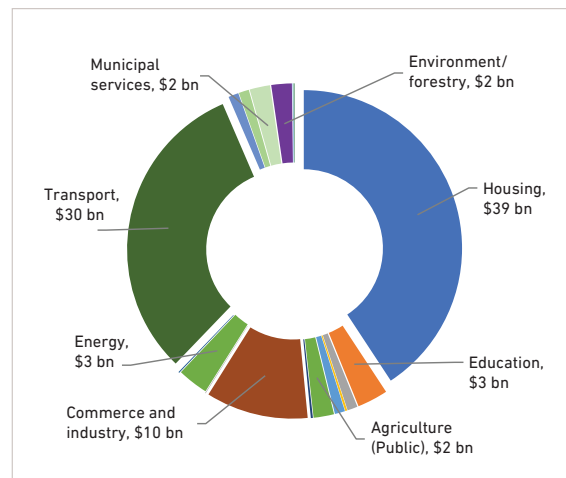
Considering the impact of the war between February 24 and June 1, 2022, the damage across sectors covered in the RDNA is estimated at approximately US\$97 billion (Figure 1 and Table 1). The most damage-affected sectors are housing (40 percent of total damage), transport (31 percent), and commerce and industry (10 percent). The most affected oblasts are Donetsk, Luhanska, and Kharkivska, followed by Kyivska, Chernihivska, and Zaporizka (Figure 4 and Table 2).

Aggregate losses total almost US\$252 billion (Figure 2 and Table 1). It should be noted that losses in one sector flow into and intersect with those in other sectors. For example, reduction in agricultural production affects transportation needs, or loss of electricity affects commerce and industry in areas that are otherwise unaffected by the war. Losses are dominated by land decontamination (demining and clearance of explosive remnants of war) (29 percent), commerce and industry (19 percent), agriculture (11 percent), and transport (10 percent). Culture and tourism (8 percent), housing (5 percent), and energy (5 percent) contribute substantially to the remaining losses. As data by oblast were not available across all sectors.

The total reconstruction and recovery needs are estimated at about US\$349 billion. As shown in Figure 3 and Table 1, the sectors with the highest estimated needs are transport (21 percent), land decontamination (demining and clearance of explosive remnants of war) (21 percent), and housing (20 percent). Other sectors, including commerce and industry (6 percent), social protection and livelihoods (6 percent), and agriculture (5 percent), contribute substantially to the remaining needs.

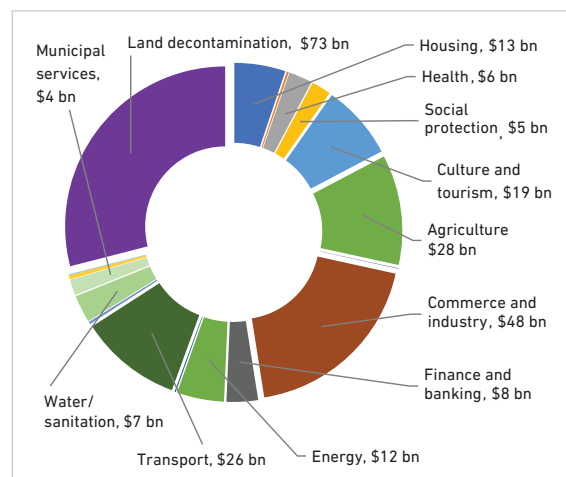
All these needs arise from a war that has spanned a large geographical area (including urban areas), and thus their magnitude is considerable. Meeting these needs will be critical for the long-term recovery from the war. However, specifying these needs does not mean that they can be met immediately. How soon they can be met will depend on the availability of financing, but also on the absorptive capacity of the Ukrainian budget, line ministries, subnational entities, and implementing agencies; the readiness of the private sector to support capital investments; and the trajectory of the war.

Figure 1. Total damage as of June 1, 2022: US\$97 billion



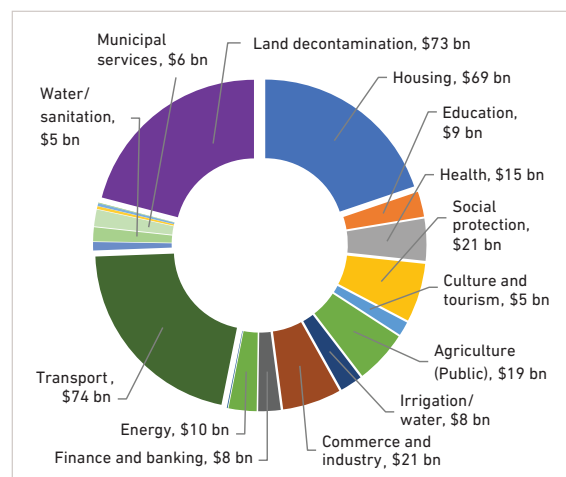
Source: Assessment team.

Figure 2. Total losses as of June 1, 2022: US\$252 billion

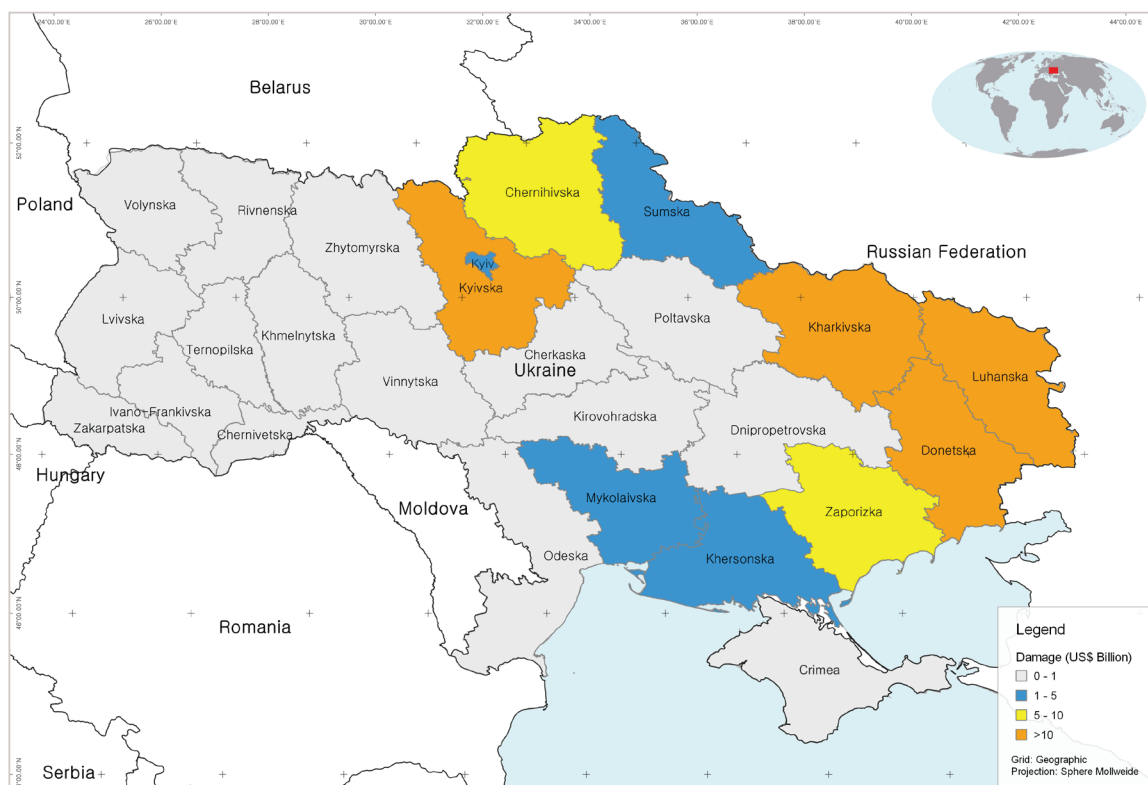


Source: Assessment team.

Figure 3. Total needs as of June 1, 2022: US\$349 billion



Source: Assessment team.

Figure 4. Extent of damage by region as of June 1, 2022

Source: Assessment team.

While the RDNA's assessment of damaged assets differentiates between public and private assets wherever possible, experience in disaster and conflict situations highlights the strong and very necessary role of public finances even for the restoration of privately owned assets, especially in the short term. For housing, for example, there are humanitarian and implicit public obligations associated with ensuring that Ukrainians have safe and warm shelter, and these entail public intervention in private assets. Similarly, productive sectors such as agricultural production may require significant public financing for recovery; the banking and financial sector will require capitalization; and the restoration of commerce and industry will need a certain level of initial funding by the public sector. Moreover, the public sector will likely play an important role in providing guarantees and other de-risking instruments (particularly insurance) to enable private sector participation. This will be particularly important to restore trade and commerce flows.

It is estimated that about 80 percent of the short-term needs, or some US\$80 billion, will need to come from public financing. This includes a range of obligations—recovery and reconstruction of assets owned by the public sector (such as schools and

roads), anticipated implicit support for humanitarian reasons of private assets (such as housing and energy), and the need to kick-start recovery in the productive sectors.

In the immediate and short term (in the next 18–36 months), about US\$105 billion will be needed to address the most urgent needs across the analyzed sectors (Table 3). These include urgent needs related to the following:

- Preparation for the upcoming winter (e.g., heating, electricity, and winterization of lightly damaged buildings) and the purchase of gas
- Transport repairs for connectivity and service delivery
- Support for the next agricultural planting season
- Safeguarding of human development, especially in education and health, and support to the poorest and the displaced
- Immediate actions related to decontamination of land to enable safe reconstruction and recovery in critical areas

Beyond the coming winter, the short-term recovery and reconstruction needs are dominated by support to the social sector (45 percent of the total), though

cross-cutting issues such as land decontamination and environmental protection will need to be integrated into all investments in social, productive, and infrastructure sectors. The large share of needs in the *social sector* reflects the impacts on housing, health, and education services, the expanded social protection needs, and steps to protect cultural heritage from further damage. The short-term needs

in *infrastructure* (22 percent) are dominated by energy and transport sector needs, though measures for water supply and sanitation and municipal services are also critical. In the *productive sectors*, the short-term needs (22 percent) cover support to agriculture as well as actions to support finance and banking and commerce and industry.

Table 1. Total damage, losses, and needs by sector (US\$ billion) as of June 1, 2022

Sector	Damage	Share (%)	Losses	Share (%)	Needs	Share (%)
Social sectors						
Housing	39.2	40	13.3	5	69.0	20
Education	3.4	3	0.5	0	9.2	3
Health	1.4	1	6.4	3	15.1	4
Social protection and livelihoods	0.2	0	4.5 ^a	2	20.6 ^b	6
Culture and tourism	1.1	1	19.3	8	5.2	2
Productive sectors						
Agriculture	2.2	2	28.3	11	18.7	5
Irrigation and water resources	0.2	0	0.1	0	7.5	2
Commerce and industry	9.7	10	47.5	19	20.8	6
Finance and banking	0.03	0	8.1	3	8.0	2
Infrastructure sectors						
Energy	3.0	3	11.7	5	10.4 ^c	3
Extractives	0.1	0	0.3	0	0.3	0
Transport	29.9	31	26.1	10	73.8	21
Telecom and digital	0.7	1	0.6	0	3.3	1
Water supply and sanitation	1.3	1	6.8	3	5.4	2
Municipal services ^d	2.3	2	4.3	2	5.7	2
Cross-cutting sectors						
Environment, natural resource management, and forestry	2.5	3	0.7	0	1.2	0
Emergency response and civil protection	0.1	0	0.2	0	0.7	0
Justice and public administration	0.1	0	0.03	0	0.2	0
Land decontamination	-	0	73.2	29	73.2	21
Total	97.4	100	252.0	100	348.5	100

Source: Assessment team.

a. Under social protection, household income loss valued at US\$46.1 billion is not included to avoid potential double-counting in relation to other sectors.

b. Means-tested social assistance programs and other benefits that depend on the changes in households' income and the cost of basic needs (including cost of food and energy) are assessed for the immediate/short term only.

c. The needs for the energy sector also include the short-term need for purchasing natural gas for the upcoming heating season (around 4.8 bcm), that would generate a financial gap in Naftogaz of around US\$5 billion, depending on the weather and evolution of gas import prices. It is estimated that Naftogaz could need some 4.8 billion cubic meters (bcm) of additional gas to reach the estimated required level 15 bcm. Naftogaz will use its produced gas (up to 1.4 bcm), purchase from domestic producers/private stored gas (1.3 bcm), and import the remaining amount (2.1 bcm). The value of this volume can vary depending on the import price. Assuming that the domestic price for the gas from other domestic producers will be around US\$1,000 and that imported gas is purchased at US\$ 2,000 per 1,000 cubic meter, the total purchase costs would be US\$ 5.1 billion if the import price is US\$2,000, and US\$7.2 billion if the import price is \$3,000. Considering the selling price of the gas for Naftogaz at the level of US\$190 per 1,000 cubic meters, the financial gap would be US\$4.37 billion if the import price is US\$2,000 and US\$6.47 billion if the import price is US\$3,000.

d. Municipal governments in Ukraine are responsible for a wide range of municipal services, from own services (e.g., local roads, municipal transit, solid waste management, housing, urban parks, and utilities) to services delegated by the central government (e.g., education, health care, social welfare). In the RDNA, municipal service mainly covers assets related to solid waste management, urban spaces and facilities (e.g., local parks, community centers, cemeteries, sports, etc.), and local administrative buildings. Utilities and housing are covered by infrastructure and housing sections, respectively.

Table 2. Damage by oblast for select sectors (US\$ billion) as of June 1, 2022

Oblast	Damage
Frontline regions, subtotal	71.8
Donetska	26.2
Zaporizka	6.0
Luhanska	16.7
Mykolaivska	3.7
Odeska	0.3
Kharkivska	14.4
Khersonska	4.4
Support regions, subtotal	0.9
Vinnytska	0.1
Dnipropetrovska	0.5
Kirovohradska	0.1
Poltavska	0.1
Cherkaska	0.1
Backline regions, subtotal	0.2
Volynska	0.0
Zakarpatska	0.05
Ivano-Frankivska	0.02
Lvivska	0.07
Rivnenska	0.02
Ternopil'ska	0.01
Khmeln'ytska	0.02
Chernivetska	0.00
Regions where government has regained control, subtotal	22.4
Kyiv (city)	1.1
Zhytomyrska	0.8
Kyivska	11.2
Sumska	2.9
Chernihivska	6.4
Not specified, subtotal	2.2

Source: Assessment team.

Note: Regions are grouped according to Government of Ukraine presentations at the Ukraine Recovery Conference in Lugano, Switzerland, in July 2022. Frontline regions are areas temporarily not under government control and areas of active conflict; support regions are providing logistics for defense and humanitarian cargo; backline regions are protecting export/import logistics hubs and evacuated enterprises; and regions where the government has regained control are areas recovering from sustained damage. Table data are incomplete, as damage data by oblast were not available for the culture and tourism sector; and for several sectors only nationwide (not oblast-specific) data were available, or only a fraction of available data was disaggregated by oblast. It is noted that for some sectors (for example, transport), Kyivska oblast also includes damage for Kyiv city. Losses data by oblast were not available for the following sectors: culture and tourism, finance and banking, energy and extractives, housing, and health sectors. Needs data by oblast were not available for most sectors and are not included here.

Table 3. Total recovery and reconstruction needs by sector (US\$ billion) as of June 1, 2022

Sector	Immediate/short term	Medium- to long-term	Total
Social sectors			
Housing	33.1	35.9	69.0
Education	2.8	6.5	9.2
Health	1.2	13.9	15.1
Social protection and livelihoods	8.1	12.5 ^a	20.6
Culture and tourism	1.6	3.6	5.2
Productive sectors			
Agriculture	10.0	8.7	18.7
Irrigation and water resource management	0.02	7.5	7.5
Commerce and industry	6.6	14.2	20.8
Finance and banking	6.4	1.6	8.0
Infrastructure sectors			
Energy ^b	7.3	3.1	10.4
Extractives	-	-	0.3
Transport	8.9	65.0	73.8
Telecommunications and digital	1.3	2.0	3.3
Water supply and sanitation	3.5	1.9	5.4
Municipal services	1.9	3.9	5.7
Cross-cutting sectors			
Environment, natural resource management, and forestry	0.4	0.9	1.2
Emergency response and civil protection	0.5	0.2	0.7
Justice and public administration	0.08	0.1	0.2
Land decontamination	11.0	62.2	73.2
Total	104.5	243.7	348.5

Source: Assessment team.

Note: - = not assessed.

a. Needs for means-tested benefits, benefits to IDPs, social services, and military social assistance include only estimates for the immediate/short term, given that a number of additional factors will influence them over the medium/long term, such as changes in incomes and cost of basic needs, including food and energy.

b. The needs for the energy sector also include the short-term need for purchasing natural gas for the upcoming heating season, in the amount of US\$5 billion.

MACROECONOMIC AND SOCIAL IMPACTS

The damage, losses, and needs presented here contribute to the very significant economic, social, and poverty impacts of the war. Estimated gross domestic product (GDP) losses in 2022 go beyond physical asset losses and reflect disruption of economic activities via several channels: damage to productive assets and infrastructure, logistic problems, labor force losses, ruined supply-demand chains, uncertainty, and elevated risks. Ukraine's GDP shrank by 15.1 percent year over year (YoY) in the first quarter of 2022 (or 19.3 percent quarter over quarter, seasonally adjusted), driven by a 45 percent GDP contraction in March YoY. After Ukraine regained control of Kyivska oblast, economic activity in April showed the first signs of improvement, even though it remains much below the prewar level.

Poverty, based on the upper-middle-income poverty line of US\$5.5 per person per day, is projected to increase by tenfold and reach at least 21 percent in 2022; war-affected regions are expected to experience even higher poverty rates. For instance, in Khersonska oblast, which is temporarily not under government control, food prices have increased by 62 percent since the start of 2022, compared to 21.5 percent for Ukraine as a whole.² Given food's large share in the budgets of low-income households, these high rates of inflation are bound to result in a spiking poverty rate.

The rise in poverty has been driven by the enormous costs to human lives and livelihoods. As of July 24, 2022, the number of civilians confirmed killed or wounded since February 24 officially stood at 12,272; however, the United Nations (UN) estimates that this

figure is incomplete.³ One-third of Ukrainians have been displaced by the war. Over 6.8 million Ukrainian residents have left the country, a large majority of them women and children.⁴ An estimated 6.6 million people are internally displaced—fewer than in the previous month⁵—with many individuals displaced more than once since leaving their homes of origin.⁶ According to the UN Office for the Coordination of Humanitarian Affairs (OCHA), the humanitarian situation is deteriorating rapidly, as access to critical services such as clean water, food, sanitation, and electricity declines, and 17.7 million people are left in need of humanitarian assistance.⁷

The projected increase in poverty, though large, is expected to be much larger if existing financing gaps are not addressed by a scale-up in external financing. Since the beginning of the war, tax revenue collection has deteriorated significantly, while public expenditure has increased sharply to ensure delivery of key public services during wartime. This has resulted in a large nonmilitary fiscal deficit. If partners do not continue to provide significant support to finance this deficit, Ukraine will need to further reduce its now bare-bones social expenditures and continue to avail itself of deficit monetization. In a scenario of continued deficit monetization, the poverty rate is expected to climb to 34 percent by the end of 2022—a level not seen since the early 2000s—as rising inflation erodes the purchasing power of low- and middle-income households. Going forward, if the extent of monetization is limited to avoid excessive inflation, sweeping expenditure cuts will be needed and will affect the most vulnerable segments of Ukrainian society. Under this scenario of austerity, poverty rates are projected to further increase to over 40 percent in 2022 and 58 percent by 2023. In this worst-case scenario, an additional 18 million Ukrainians would fall below the poverty line.

2 Data are as of June 2022 and are based on regional Consumer Price Indices published by the State Statistics Service of Ukraine, [Link](#).

3 Most of the civilian casualties recorded were caused by the use of explosive weapons with a wide impact area, including shelling from heavy artillery and multiple launch rocket systems, and by missile and air strikes. The Office of the High Commissioner for Human Rights (OHCHR) believes that actual figures are considerably higher, especially in Mariupol (Donetska oblast), Izium (Kharkivska oblast), and Popasna (Luhanska oblast). OHCHR, "Ukraine: Civilian Casualty Update 25 July 2022," [Link](#).

4 The number was 6,865,625 as of August 26, 2022. United Nations High Commissioner for Refugees; see Operational Data Portal: Ukraine Refugee Situation, [Link](#).

5 IOM, "Regional Ukraine Response: Situational Report—22 August 2022," [Link](#).

6 OCHA Ukraine, "Situation Report," August 17, 2022.

7 Ibid.

SECTORAL ASSESSMENTS

Social Sectors

Housing

The total damage to the housing sector as of June 1, 2022, is estimated at US\$39.2 billion, with concentrated damage to urban housing. Around 817,000 residential units were impacted by the war, 38 percent of them destroyed beyond repair. This number includes apartment units, single family houses, and dormitories. Apartment buildings have been the most affected, a finding that highlights the significant impacts of the war on the urban housing stock and indicates that urban areas carry the bulk of the damage burden in housing. The extent of housing damage is spread unevenly across the oblasts, with the Donetsk, Luhanska, Kharkivska, and Kyivska oblasts accounting for over 82 percent of total damage to housing stock in the country. **Losses in the housing sector are estimated at US\$13.2 billion**, which reflects the cost of demolition and debris removal, loss of household goods, temporary rental and shelter provision by owners, and adjusted losses in rental incomes. The loss estimation does not reflect bank losses and mortgage defaults.

The recovery and reconstruction needs amount to US\$69 billion, with US\$33.1 billion needed in the immediate/short term, especially to address the needs for winter. Addressing housing recovery needs in postwar Ukraine will require an integrated green, resilient, and inclusive approach, with a focus on returning families to their homes and restoring livelihoods and services. There is an urgent need to provide temporary rental for displaced households, undertake winterization, repair partially damaged residential buildings, and establish a housing reconstruction and recovery strategy and implementation mechanism. In particular, providing repair and rental subsidies before cold, wet weather begins will mitigate the risk of further displacement. While the situation is fluid, measures for ensuring safety and adequate housing for households remain necessary to address the primary needs of IDPs, returnees, and host communities for safe housing options. There is also a need to establish a framework for housing reconstruction and recovery in the medium term. These actions can begin even during the war and will allow for appropriate sequencing of key actions and planning of budgets accordingly.

Education

As of June 1, 2022, the Ukrainian education sector has sustained US\$3.4 billion in damage and US\$0.5 billion in losses, with a particular impact on students/learners from Eastern Ukraine. A total of 1,885 education institutions have been impacted by the war, with 178 buildings destroyed and a further 1,707 partially damaged. The damage to infrastructure is pronounced in the east, especially in Kharkivska, Donetsk, and Luhanska oblasts; nearly 1 million enrolled students (at all levels of education) are affected just in these three oblasts. Meanwhile, losses are driven by debris removal costs, unpaid teachers' salaries, and decreases in private sector revenues, and there have been additional costs associated with the use of education institutions as temporary shelters.

Recovery and reconstruction needs are over US\$9.2 billion in the education sector, with US\$2.8 billion urgently needed. These needs include the reconstruction of affected education facilities following new safety, sustainability, and quality standards, but also needs related to the restoration of interim and long-term teaching and learning services, such as investments to ensure safe access to in-person education where possible (e.g., the addition of bomb shelters to education institutions, acquisition of temporary learning spaces, and purchase of electronic devices). Recovery needs also cover educational catch-up programs and psychological support that are critical to limiting learning losses, particularly for the most vulnerable students. At the same time, the reconstruction and recovery of the sector must coincide with investments in reforms to increase quality and efficiency in education, which to a considerable extent had already been initiated before the war.

Health

The damage to the health sector is estimated at US\$1.4 billion. This represents the monetary estimate of the cost of destroyed and damaged health infrastructure included in the inventory of damage compiled by the Ministry of Health. The actual level of damage is likely higher, given that damage reports are incomplete for facilities located in the territories temporarily not under government control and for private sector facilities. **The estimated losses of US\$6.4 billion** include the removal of debris and demolition of the destroyed facilities, loss of income of private providers, losses from the financing of facilities that have not been fully operational during

the war, and the additional losses of the population's health. **The needs of the health sector are estimated to be US\$15.1 billion to cover the accumulated infrastructure damage and losses to the health sector, as well as scale-up of critical health services for the population of Ukraine.** This amount includes the cost of building new infrastructure using a building back better approach and the immediate recovery of facilities that are partially damaged. It also includes a significant expansion of rehabilitation and mental health services in Ukraine, which will need to be scaled up to address the impacts of the war. The estimate of needs does not include the full cost of recovery for the health care sector. Of these total needs, **US\$1.2 billion is urgently needed in the immediate/short term.**

Social Protection and Livelihoods —

Damage to the social protection infrastructure (such as residential care units, social centers, and social services providers) is estimated at **US\$0.2 billion**. Overall, 56 such stand-alone buildings were damaged or destroyed. Damage to the shared building space used for social protection purposes, such as offices in administrative buildings of the local governments, are included in other parts of the RDNA. **The losses in the social protection and jobs sector are much more substantial, amounting to US\$50.6 billion.** They relate to (i) loss of jobs and household income from wages, (ii) resulting higher poverty and related increased expenditures under existing means-tested social programs, (iii) additional needs of programs such as survivor's benefits or programs related to disability, and finally (iv) lower affordability of basic needs, including energy and food, which will result in the need to significantly increase expenditure on a number of social programs linked to the subsistence minimum, ranging from pensions to means-tested programs. **The estimated social protection and jobs sector needs amounts to US\$20.6 billion.** Most of these needs consists of recurrent expenditures related to social benefits and services, including payments to vulnerable populations such as IDPs and the newly impoverished. Significant expenditures are required to restore permanently lost jobs. Bringing Ukraine's workforce back would require additional efforts and costs, including through mobility grants, settling-in grants, or wage subsidies for the employers.

Culture and Tourism —

The war is estimated to have caused **US\$1.1 billion in damage to the culture sector and a significant loss of US\$19.3 billion.** The sector has also sustained damage to its intangible cultural heritage and intrinsic values of spiritual, symbolic, emotional, and existential significance, as well as to the creative industries. **Over US\$5.2 billion is needed for safeguarding the sector in Ukraine.** The value of culture is associated with its authenticity, shared values, and social connections, which cannot be monetized in market value. Thus, recovering culture does not directly translate into reconstructing physical/tangible assets. However, restoring and rebuilding the damaged cultural properties and rehabilitating them would be an initial step to reestablish the lost/broken cultural and social fabrics and restore their utility value, the sense of belonging they inspire, and people's affiliation with them, and any recovery efforts should lay the foundation for the sustainable, green, resilient, inclusive, and smart development of Ukraine. **The most urgent needs amount to US\$1.6 billion.**

Productive Sectors

Agriculture —

As of June 1, 2022, the war has resulted in total damage of **US\$2.2 billion for the agriculture sector, while the aggregate losses total US\$28.3 billion.** The damage includes partial or full destruction of machinery and equipment, storage facilities, livestock, and perennial crops, as well as lost inputs and outputs and agricultural land that needs recultivation.⁸ The losses include production loss, including unharvested winter crops, higher farm production costs, and lower farm gate prices due to the export logistic disruptions, which are significant for Ukraine's export-oriented agriculture. **The total reconstruction and recovery needs from the public sector are estimated at US\$18.7 billion, with private farmers having to invest considerably more in terms of their own resources over the next years.** The most pressing investments of **US\$10 billion** include rebuilding the damaged assets, helping agriculture bounce back by addressing liquidity and other constraints, and restoring the agricultural public institutions to effectively support recovery and reconstruction.

⁸ The losses from mines on agricultural land and the need for agricultural land's demining, which is likely to be large, are not included in the agriculture sector estimates. They are presented separately in the RDNA.

Irrigation and Water Resources —————

As of June 1, 2022, damage in the irrigation, drainage, and water resource management (WRM) sector for several oblasts is estimated at US\$0.2 billion, including damage to dams, irrigation canals, embankments, buildings, and agency premises. This is a partial number representing damage to areas previously taken by Russian forces and now under control of Ukrainian authorities, territories that had damage due to bomb attacks, and areas that were flooded to protect against attack. The initial aggregate losses accounted for thus far are US\$0.1 billion. The losses include operational losses based on lost profit as reported by the different operational entities in the Ukrainian water system and collected by the State Agency of Water Resources (SAWR). The total reconstruction and recovery needs in the public sector are estimated at US\$7.5 billion for building back better irrigation, drainage, and flood protection assets. The most pressing investments involve restoration of destroyed hydraulic assets and water storage structures in areas where control has been regained, as well as investments in areas that did not face hostilities; these investments will help the WRM sector rebound by addressing the major gap—the lack of water supply and lack of irrigation services to farmers, which must be addressed to increase crop productivity in the agriculture sector. They will also protect communities against flood-related risks and restore the public institutions involved in irrigation and WRM so they can effectively support recovery and reconstruction. These urgent needs total US\$0.02 billion.

Commerce and Industry —————

Commerce and industry is one of the sectors most affected by the war. As of June 1, 2022, approximately US\$9.7 billion of damage is estimated to have been sustained in this sector. Both privately and publicly owned enterprises in conflict-affected areas have been destroyed or bankrupted. Value chains have been disrupted through the destruction of, or damage to, connective infrastructure, the inability to access key inputs, and the severing of business links with firms located in affected areas. Damage to large factories accounts for most of the damaged assets, including the destruction of steel plants in Donetsk that makes up almost 10 percent of the total damage. Approximately 2,900 retail shops, shopping malls, and warehouses have been damaged or destroyed. Estimated aggregate losses equal US\$47.5 billion. The losses are estimated based primarily on expected lost income from firms over the course of 21 months and the

costs for demolition and debris removal. The total reconstruction and recovery needs are estimated at US\$20.8 billion, with US\$6.6 billion needed in the immediate/short term from both public and private actors. More than 80 percent of the needs are for rebuilding and modernizing buildings, equipment, and inventory. For industry, the regions with the greatest needs for reconstruction and recovery are Donetsk, with almost half of the total amount, followed by Kharkivska, Luhanska, Chernihivska, and Kyivska oblasts.

Finance and Banking —————

The Ukrainian financial sector has been significantly impacted by the war. The banking system entered the war in relatively good condition, and banks remain operational. However, loss of assets, collateral, and revenues will severely affect banks' profitability and solvency. During March–May, the banking sector accounted for US\$1.1 billion of loan loss provisions for expected war-related credit losses. It can be anticipated that the nonbank financial institution (NBFI) sector will also suffer significant losses as a result of the war on top of prewar vulnerabilities but given its small size, the NBFI sector is not expected to have systemic impacts on the overall financial system. From the preliminary estimates, the total damage is estimated at US\$0.03 billion, and potential losses suffered by the banking sector are expected to be US\$8.1 billion; however, data on NBFIs are very limited. It will take many months for the true extent of damage to the financial sector to become fully apparent/quantifiable. The quantification of losses also does not recognize the inherent risks posed to the gains made over recent years by reforms to the financial sector, such as relaxation of prudential and state-owned bank governance rules; nor does it recognize the potential delays to the implementation of further reforms as a result of the need to address postwar problems first. The total cost for reconstruction and recovery needs is estimated at US\$8 billion, with US\$6.4 billion for the immediate/short term and US\$1.6 billion for the medium term. This primarily includes provisions for banks' credit losses but also captures the cost of rebuilding damaged physical infrastructure of banks.

Infrastructure Sectors

Energy and Extractives —————

As of June 1, 2022, the war has resulted in total damage of around US\$3 billion for the energy sector, while the aggregate losses total US\$11.7 billion. The

value of damage includes damage in the power sector (US\$1.4 billion), district heating (US\$0.7 billion), gas sector (US\$0.5 billion), transport fuel sector (US\$0.4 billion), and coal mining (US\$0.11 billion). The losses include lost revenues and production decreases, higher costs, losses due to deterioration of liquidity positions, and losses due to lost access to energy services. **The total reconstruction and recovery needs in the public sector are estimated at almost US\$10.4 billion, including US\$7.3 billion for the immediate/short term and US\$3.1 billion for the longer term.** Given that the energy sector provides critical services, the above reconstruction and recovery investments are all considered as pressing. In addition, part of the losses can also be considered as pressing for short-term operations of the energy sector. This includes the need to close liquidity gaps in the power sector transmission system operator (Ukrenergo) and other stakeholders in the amount of US\$2.6 billion. Naftogaz needs at least US\$5 billion only for purchasing gas for the next heating season, assuming average purchasing gas price of approximately US\$1,000 per 1,000 m³. For the extractives sector, in the context of limited data available, US\$0.1 billion in damage, US\$0.3 billion in losses, and US\$0.3 billion in needs were identified in addition to the energy sector estimates. In addition to the physical damages and losses generated by the war, some key energy market and governance reforms are suffering delays due to the need to implement temporary emergency measures to ensure the provision of basic energy services to the population.

Transport

Damage (US\$29.9 billion), losses (US\$26.1 billion), and needs (US\$73.8 billion) in Ukraine's transport sector are large and indicative of the strategic value that combatants have placed on transport networks. Overall damages until June 1, 2022 include: (i) 8,699 km of motorways, highways, and other national roads; (ii) 7,619 km of oblast and village roads; (iii) 3 million m² of bridges on national roads; (iv) 428,470 m² of bridges on local roads; (v) 1,119 km of railway lines; (vi) 93 railway stations; (vii) 63,072 m² of railway bridges; (viii) 392,843 private vehicles; (ix) 9,473 km of communal roads; (x) 16 airports; and (xi) 850 units of urban public transport rolling stock. Losses include consideration for (i) loss of Black Sea transport; (ii) disruptions to road and rail transport services due to damaged infrastructure; (iii) losses associated with closure of Ukraine's airspace; and (iv) the cost of rail transport service provided free of charge for refugee evacuation as well as import of humanitarian supplies. Envisaged short-, medium-,

and long-term needs reflect the enabling role that transport will play across sectors as well as the need to facilitate European Union (EU) integration.

Transport sector reconstruction is estimated to require US\$73.8 billion, with approximately US\$8.9 billion in the immediate/short term along with an additional US\$64.9 billion in the medium-to long-term. The estimates are approximate and are subject to assumptions about the configuration and scope of Ukraine's transport networks after reconstruction. The nature and level of demands on that network may affect the economic viability of building back to a given set of standards. Under assumptions where Ukraine may not build back road and rail infrastructure to EU standards, needs could be US\$ 2.1 billion to US\$ 13.2 billion lower than RDNA projections. Conversely, needs may also be higher than RDNA estimates if actual costs to achieve a specific set of standards are greater than expected (if affordable). At this stage in Ukraine's recovery, it is important to note the inherent uncertainty around the configuration of post-war transport networks and the impact this has on estimated needs. The highest-priority needs for reconstruction are (i) restoration of basic network functionality (road, rail, and air) for both humanitarian aid flows and support to broader reconstruction efforts across sectors, as these will rely on transport access; (ii) enhancement of westward road and rail linkages to the EU to facilitate economic integration with Europe's single market and provide resilience to any potential future disruptions of Black Sea access; and (iii) transformation of legacy networks toward EU standards for safety, service quality, and interoperability as a complement to Ukraine's stated policy objective of EU accession, which will require alignment with the EU acquis.

Telecommunications and Digital

The damage in the telecommunications and digital sector has reached US\$0.7 billion. This includes US\$0.6 billion for telecom operators (fixed and mobile), US\$0.08 billion for postal service companies, and US\$0.04 billion for Ukraine's broadcasting provider. Donetsk, Kharkiv, Kherson, and Zaporizka oblasts account for 67 percent of the damage to telecom operators. The damage to postal services is similarly concentrated: Donetsk and Kharkiv oblasts account for 68 percent of damage to postal infrastructure (post offices, depots, sorting centers, etc.). In broadcasting, there are 49 damaged and nonoperational TV towers as of June 1, 2022, 11 of them in Luhanska oblast and

12 in Zaporizka. Losses of economic value added in the sector amount to US\$0.6 billion for the period between the war's start and June 1, 2022. The needs for reconstruction and recovery are estimated at US\$3.3 billion with an estimated US\$1.3 billion needed in the immediate/short term. Among the immediate recovery investments is restoring the broadband coverage in territories that have been brought back under government control. Internet coverage and postal service access are of strategic importance, given the need for connectivity among the local population.

Water Supply and Sanitation _____

The estimated damage for the water supply and sanitation (WSS) sector stands at US\$1.3 billion. Given various challenges in data collection (especially for territories temporarily not under government control), this is a conservative figure; however, it provides a fair assessment of the magnitude of WSS infrastructure damage. **Losses have been estimated at approximately US\$6.8 billion, noting similar challenges in accessing data.** The main part of the losses (over 50 percent) stems from lost revenues from WSS services provision. **The total reconstruction and recovery needs for the sector are estimated at around US\$5.4 billion, with US\$3.5 billion needed in the immediate/short term.** The building back better approach has been limited to the reconstruction of the damaged/destroyed WSS assets and not geared toward achieving compliance with the WSS Sustainable Development Goals. However, there is room to further optimize existing WSS systems and facilities (developed before the war) to meet increased standards and sustainability and climate change requirements.

Municipal Services _____

As of June 1, 2022, the estimated damage for the municipal services sector amounts to US\$2.3 billion, while the aggregate losses total US\$4.3 billion. The damage includes partial or full destruction of key municipal assets (for which data were available) as well as damage to goods and equipment. The estimated losses focus on revenue losses, debris removal, and increased operational costs. Over 90 percent of the total losses valued stem from incurred and projected revenue losses of local governments; this finding indicates that local governments will continue to face financial burdens and highlights the potential instability of service delivery maintenance in coming months. **The total reconstruction and recovery needs are estimated at US\$5.7 billion,**

with US\$1.9 billion needed in the immediate/short term. This includes costs for building back better and inflation. The most pressing needs in the short term relate to the maintenance and increase of service delivery, rapid scaling up of investments in the waste management sector, and the formulation of citywide reconstruction and recovery strategies and action plans. Key guiding principles for recovery and reconstruction include the explicit prioritization and sequencing of investments based on technical assessments, and the facilitation of an enabling institutional and legal environment for the efficient implementation of plans.

Cross-Cutting Areas

Environment, Natural Resource Management, and Forestry _____

The war in Ukraine has significantly harmed the environment and natural resources of the country. Multiple air pollution incidents and potentially serious contamination of ground and surface waters and soil have already been observed, and the long-term impact of the war could be even more harmful—not only for the population's health and safety, but also for ecosystems and biodiversity. Most of the environmental risks are linked to the damage to industrial installations and houses (asbestos release), energy infrastructure (power plants, oil storage tankers, oil refineries, drilling platforms, and gas facilities and distribution pipelines), and ecosystems (forest fires and land mines). The main environmental risks include air pollution, water pollution, and soil pollution, with accumulation of hazardous wastes that affect the health and safety of the population as well as biodiversity. Losses and damage in monetary terms are estimated where feasible, such as for the forest sector. Due to the active war situation, measuring of key pollutants in air, water, and soil was not possible. The RDNA did not estimate damage and needs for these receptors due to the lack of monitoring data on environmental assets. Priority areas for cleanup and building back better are identified for a fundamental transformation of Ukraine toward a green and net-zero economy. The rebuilding process should be harmonized with the EU environmental and climate goals.

The forestry sector has been significantly impacted by the war. As of June 1, 2022, approximately 3 percent has been lost due to forest fires, and 38 percent is inaccessible due to the presence of mines. **Damage across growing stock, roads, buildings, and**

equipment is almost US\$2.5 billion. Lost ecosystem services value—a result of mines making the forests inaccessible—is estimated at US\$0.7 billion over the 21 months beginning in March 2022. However, forestry has a slow recovery rate and these losses may extend much further beyond this period. **Sectoral recovery and reconstruction needs, including building back with strengthened institutions, equipment, and nursery capacity, are estimated at US\$1.2 billion with US\$0.4 billion needed in the immediate/short term.** As part of the recovery and reconstruction needs, capacity building includes a functional review of the institutions in the sector, with a focus on modernized planning and on the best afforestation and reforestation methods for climate-smart forestry. Recommended for further study is the creation of investor-ready carbon projects and the potential for mass employment in afforestation and reforestation via “green wage” schemes.

Emergency Response and Civil Protection

As of June 1, 2022, the war has resulted in total damage of US\$0.1 billion for the emergency response and civil protection sector, while the aggregate losses total US\$0.2 billion. The damage includes partial or full destruction of vehicles, equipment, and buildings used for the purpose of civil protection and emergency response. The losses include debris removal and additional operational costs for increased involvement of first responders in emergency and rescue operations related to the war. **The total reconstruction and recovery needs from the sector are estimated at US\$0.7 billion, with US\$0.5 billion urgently needed.** The most pressing investments include repair, reconstruction, and replacement of damaged, destroyed, and seized assets, respectively. Support for scaled-up emergency response related to the war is also necessary; this includes preparedness for chemical, biological, radiological, and nuclear incidents; measures related to disaster risk management to prevent, prepare, and respond to disasters; and restoration of institutions to effectively support the recovery and reconstruction effort.

Justice and Public Administration

In the justice and public administration sector, a total of US\$0.1 billion in damage, US\$0.04 billion in losses, and US\$0.2 billion in recovery and reconstruction needs have been estimated as a result of the war. Related to justice, damage is

estimated at US\$0.07 billion, while losses amount to US\$0.03 billion. These figures include damage of US\$0.06 billion for the judiciary and US\$0.01 billion for law enforcement, comprising partial or full destruction of buildings, furniture, and vehicles used for judicial or law enforcement purposes. Losses include US\$0.01 billion for the judiciary, and US\$0.4 million for law enforcement. Losses consider items such as demolition and debris removal and loss of public services/fees. Reconstruction and recovery needs for the justice sector are estimated at US\$0.2 billion. The most pressing needs include restoration of delivery of justice services, specifically through the availability and training of law enforcement, anticorruption officials, private lawyers, and judges, as well as the reconstruction of the judiciary and judicial infrastructure.

Damage of US\$0.03 billion is also reported to central-level public administration infrastructure and services. Local-level administrative buildings are covered under the municipal services sector, and relevant line ministry buildings such as education and health are covered under those respective sectors. This damage is estimated based on government reports. **Losses, including debris removal, are estimated at US\$3.4 million. Recovery and reconstruction needs are estimated at US\$0.07 billion.** The recovery and reconstruction of central-level public administration should prioritize buildings from which the most-urgent public services are provided.

Land Decontamination (Demining and Clearance of Explosive Remnants of War)

Land decontamination, which covers demining and clearance of explosive remnants of war, is a precondition to safe rebuilding, resumption of service provision, and return to normality. The State Emergency Service of Ukraine (SESU) and Ministry of Internal Affairs estimate that 13 percent of Ukraine’s territory may be contaminated. **Based on conservative estimates, land decontamination costs are expected to exceed US\$73.2 billion.** Of this, US\$0.06 billion needs to be urgently invested in equipment, training, and salaries to expand the work force of decontamination authorities in Ukraine. It will be critical to prioritize areas requiring the most urgent decontamination, such as areas with a high concentration of civilian populations, areas critical for restoring production and economic flows, etc. In the immediate/short term, close to US\$11 billion is needed for nontechnical surveys, technical

surveys, and demining, including US\$0.06 billion for procurement of varied equipment (demining machines, metal detectors, personal protective equipment, etc.); these efforts will ensure readiness for scaled-up decontamination and allow significant progress in areas where government control has been restored and where active military actions have ceased. It should be noted that land decontamination efforts may need to be sustained over decades, considering experience of other countries in land

decontamination. Costs associated with the removal of anchored and floating sea mines in the Black Sea are yet unquantified. However, until decontamination of the Black Sea and Ukraine harbors is completed, (re)insurers of shipping vessels in the Black Sea will continue to charge high and even historic levels for insurance—a cost that will eventually be passed on to consumers, a particularly significant issue in relation to grain exports.

Toward Recovery and Reconstruction

There are already ongoing efforts by the Government of Ukraine to lead the country toward recovery and reconstruction. In July 2022, Ukraine presented a US\$750 billion Recovery Plan.⁹ Under the Ukraine Recovery Vision, US\$150–250 billion is envisaged for restoration and modernization of housing and infrastructure. A three-stage reconstruction plan was presented: Stage 1 is a plan blueprint; Stage 2 is a plan drill-down and roadmap; and Stage 3 is implementation. The Recovery Plan has set targets for 2032: it aims to accelerate sustainable economic growth (with a plan for 7 percent annual GDP growth and an increase in investments); to reach the top-25 economies in the Economic Complexity Index and the World Bank Human Capital Index; and to achieve a 65 percent reduction in CO2 emissions from 1990. The key guiding principles of the government’s Recovery Plan are to start now and ramp up gradually; grow prosperity in an equitable way; integrate into the EU; build back better (for the future); and enable private investment and entrepreneurship. The plan will be implemented in a region-focused and parameter-based approach. Within the plan, 15 national programs have been developed to support the achievement of short-, medium-, and long-term targets.¹⁰

The RDNA can be instrumental in supporting the Government of Ukraine’s Recovery Plan and implementation efforts. The RDNA provides a baseline of sectoral and cross-cutting information on recovery and reconstruction needs that is linked to the damage and losses incurred as well as sectoral prewar baselines, while considering building back better, right-sizing, right-placing, and overall modernization efforts. This information creates a

data set that can help guide recovery planning as well as monitoring and evaluation (M&E).

Beyond the guiding principles that the government’s Recovery Plan establishes, the following principles could be considered based on international experience related to post-conflict and post-disaster recovery and reconstruction:

- **Balancing urgent needs and medium- to long-term goals:** The recovery and reconstruction planning will need to address the most urgent needs immediately and in the short term, while ensuring preparations for longer-term reconstruction and recovery. In the short term, there is a need to ensure safety and security of people and to address the most urgent and basic needs (including for vulnerable populations) through shelter, public services, and economic restoration activities. In the medium to long term, recovery and reconstruction should build on the foundation of green, resilient, and inclusive development; it should also ensure efficiencies by upgrading access to and quality of services and infrastructure and by right-sizing/right-siting service networks and infrastructure.
- **Strategic prioritization of reconstruction across all sectors:** Building on the identified baselines, damage, losses, and needs across sectors in a consistent manner as done under the RDNA, needs should be prioritized based on absorptive capacity of different sectors, priorities related to different geographic areas, and humanitarian and IDP needs, as well as financing availability, institutional capacity, and other elements.

9 URC2022, “Recovery Plan,” 2022, [Link](#).

10 See Government of Ukraine, “Plan for the Recovery of Ukraine (ПЛАН ВІДНОВЛЕННЯ УКРАЇНИ),” 2022, [Link](#).

- **Inclusiveness and equity:** Recovery and reconstruction need to be closely aligned with efforts to decrease poverty, efforts to enhance social inclusion and gender equity, and investments targeting the most disadvantaged social groups.
 - **Transparency and good governance:** The recovery process should be measured against established targets/performance indicators and timelines; and it should be monitored within a transparent M&E system and process, including consultation with the affected stakeholders.
 - **Addressing needs of different (groups of) oblasts:** Ukraine will also need to balance its efforts across the different groups of regions of Ukraine—frontline, recovered, backline, and support areas—depending on the progress of the war. Specific recovery and reconstruction plans can help guide the recovery within relevant oblasts based on their highest needs.
 - **Resilience and building back better:** Most of Ukraine’s infrastructure was built during the Soviet era and has suffered from years of underinvestment and neglect. The country’s economic infrastructure is in dire need of improvement to be done in alignment with broader climate change and sustainability goals and targets. For example, the road network suffers from chronic lack of maintenance and repair works and requires major upgrading. At the same time, about 40 percent of water supply networks are in critical condition. Social infrastructure is likewise deficient; schools, kindergartens, and basic medical facilities are outdated and need to be rehabilitated and modernized, while also being made more energy efficient and climate resilient. In addition, the country’s agricultural assets are increasingly vulnerable to weather-related events, as most of Ukraine’s small and medium farm enterprises have not yet adopted climate-smart technologies. Ukraine’s industries and the energy sector too will need to adapt to more efficient and sustainable good practice and standards.
 - **Leadership and coordination:** Continuous leadership from the highest level of government will be essential, together with strong operational support. To keep the momentum for the revitalization of the county, the highest levels of central government will need to be involved and strategically lead this process. The operational structure will also be key for delivering results and preserving a sense of perspective among the population.
 - **Local solutions and local development:** Recovery and revitalization will need to be designed in a way that strongly supports local economies, with local governments at the helm of the planning and implementation efforts, especially in cities. Recovery and revitalization at the local level would necessitate adopting an integrated and place-based approach and ensuring the presence of strong intergovernmental, inter-sectoral, and inter-municipal coordination mechanisms. Any structure or process for recovery and revitalization should make use of the economic and human capital in the country, and local firms should be involved in the process. Partnerships between them and firms from other parts of Ukraine and abroad should be promoted and supported. Building reconstruction should rely as much as possible on the local industry and on solutions produced in Ukraine.
 - **Focus on community needs:** Community-driven development with strong citizens’ involvement is a crucial element for building ownership and ensuring sustainability of recovery and revitalization. Innovative approaches for ensuring that the entire local community participates in recovery and revitalization is instrumental. The needs of the community cannot be identified using a top-down approach, and any such attempts can only result in investments disconnected from the real needs on the ground and unlikely to achieve sustainable results.
- Related to the implementation of the recovery activities, the following practical considerations could be taken into account based on international experience:**
- **Project identification, prioritization, sequencing, and commercial strategy:** There is a need to identify and frame reconstruction and recovery project packages and to sequence them over time. This should reflect the relative priority of needs, a logical sequencing of interdependent works, and commercial considerations for bundling contracts according to the scale and scope that the market for engineering and contractor services can meet. The commercial strategy for delivering works at the scale envisaged for Ukraine’s reconstruction would likely require an increase in the number of international construction firms that are active in

Ukraine in parallel with efforts to grow smaller domestic firms into internationally competitive firms.

- Use of common systems and processes:** Where feasible, the use of agreed and common systems, processes, and procedures should be promoted for procurement, financial management, management of environmental and social risks, M&E, etc. across recovery and reconstruction activities/investments. This will ensure all government officials (horizontal and vertical) are using the same systems, thus maximizing efficiency, including benefits of training, and avoiding situations where the same implementing unit is using multiple different systems of donor organizations or international financial institutions.
- Focus on developing institutional capacity and managerial and technical capacity of implementation units:** Recovery efforts should focus on developing the capacity of institutions across different administrative levels. Moreover, implementation units (or multiple units) that will manage projects in specific sectors, subsectors, and/or regions should be capable of preparing and managing projects to the requirements of bilateral or multilateral development institutions, with respect to technical, fiduciary, and environmental and social requirements. Therefore, capacity development should start early. Mobilization of external resources to augment capacity will also be critical.
- Mobilization of technical project preparation:** The nature of reconstruction projects needed across many sectors with large infrastructure works will be technically complex and engineering intensive. Beyond debris and waste management and land contamination, many projects will require environmental and social assessments and potentially land acquisition processes with public consultation processes. Alignment with European Union peers will also require Ukraine to apply standards that are different or modified from those previously used. While it may be possible to temporarily apply foreign standards, Ukraine's own domestic standards would eventually need amendments to align with the EU acquis. Project preparation tasks would reasonably be expected to cost between 2 percent and 10 percent of total civil works investment. Mobilizing funds for these project preparation tasks immediately and beginning technical preparations for "no regret" investments that are highly likely to fall into highest-priority categories, is essential to rapid mobilization and Ukraine's ability to absorb reconstruction funding across different sectors.
- Financial strategy and the roles of international funds, sovereign funding, and user charging in specific subsectors:** The scale of investment needed for Ukraine's reconstruction is beyond the financial capacity of the government and its subsidiary institutions in virtually all sectors. International assistance in the form of grants, loans, and/or guarantees from external sources is expected to augment the fiscal capacity of Ukraine during reconstruction. Beyond these sources, there will also be a role for user charging to support investment and long-term sustainability of public services. Each specific sector will accordingly need a financial strategy and indicative expenditure envelope that reflects credible funding sources and their role in supporting direct expenditures or underpinning different forms of financing (sovereign, nonsovereign, commercial, etc.). Providing financial strategies for relevant sectors during reconstruction is both necessary in the immediate term and likely to prove complementary for post-reconstruction efforts to ensure financial sustainability of critical public services.

ANNEXES

ANNEX 1. RDNA TEAM

The RDNA team would like to express its deep appreciation to all individuals and organizations who contributed to this assessment.

From the Government of Ukraine, support was provided under the guidance of **Minister Oleksiy Chernyshov**, Ministry for Communities and Territories Development.

From the European Commission, support was provided under the guidance of **Katarina Mathernová**, Deputy Director-General.

From the World Bank, support was provided under guidance of **Arup Banerji**, Regional Country Director for Eastern Europe; **Sameh Wahba**, Regional Director for Sustainable Development; **Fadia Saadah**, Regional Director for Human Development; **Charles Cormier**, Regional Director for Infrastructure; **Lalita Moorty**, Regional Director for Equitable Growth, Finance and Institutions; **Christoph Pusch**, Practice Manager, Urban, Disaster Risk Management, Resilience & Land; **Baher El-Hifnawi**, Infrastructure and Sustainable Development Program Leader; **Karlis Smits**, Lead Country Economist; **Caryn Bredenkamp**, Lead Economist and Human Development Program Leader; **Tom Farole**, Lead Economist Sustainable Development and others.

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