



**Sustainable management of soil resources as
the basis of food security: challenges and
prospects in the conditions of martial law and
post-war recovery**

**Anatolii KUCHER
Dr.Sc., PhD, Senior Researcher,
Corresponding Member at Academy of Economic Sciences of Ukraine**

**International scientific conference on economic development and heritage of Simon
Kuznets “Economic Development and the Legacy of Simon Kuznets”,
May 25, 2023**

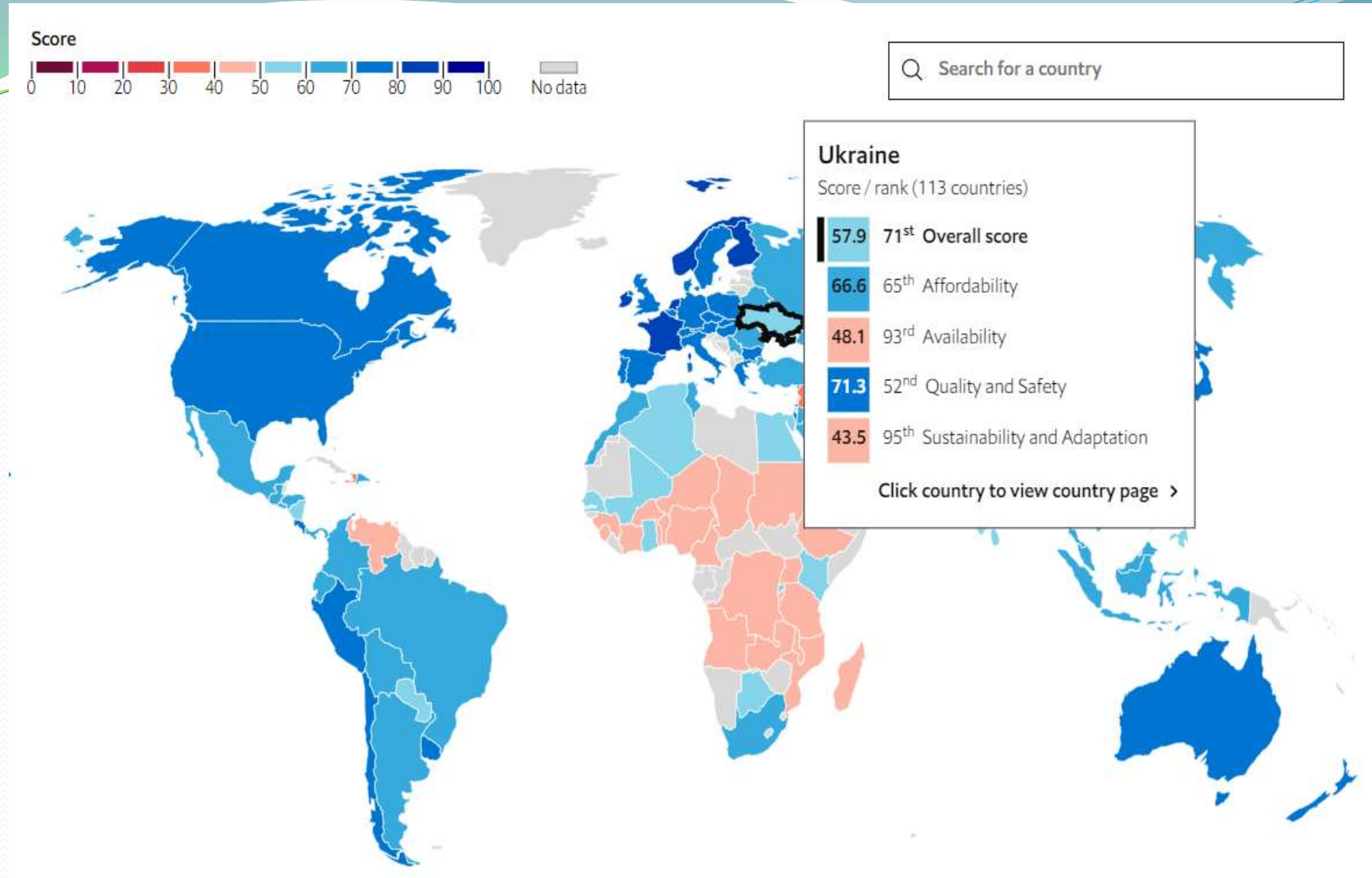
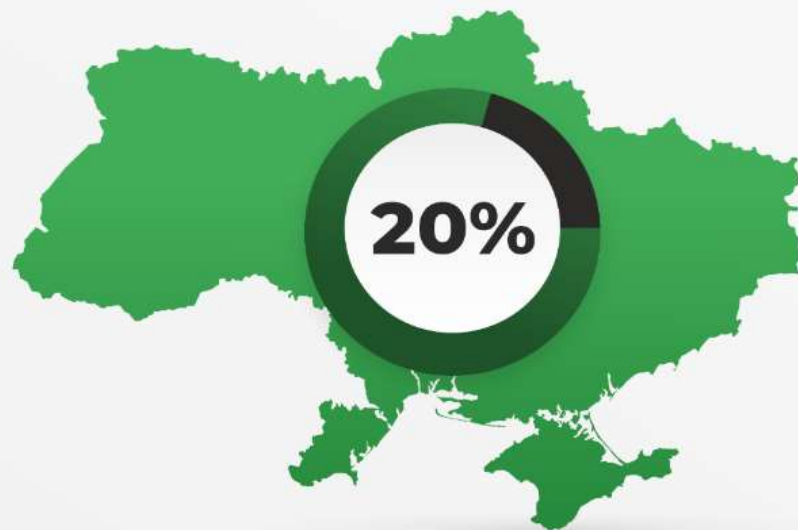


Fig. 1. Global Food Security Index (GFSI) in the countries of the world in 2021 (GFSI, 2022)

AFFECTED BY THE WAR



UNDER THREAT OF **DESTRUCTION**

160 

Emerald
Network sites,
**totalling
2.9 million
hectares**

14 

Ramsar sites,
covering a total
area of **397.7
thousand
hectares**

4 

**biosphere
reserves**

20% **of all**
protected areas in Ukraine are affected
by the war

0.9 **millions hectares of**
protected areas suffer from the effects
of war

812 **protected areas**
under threat



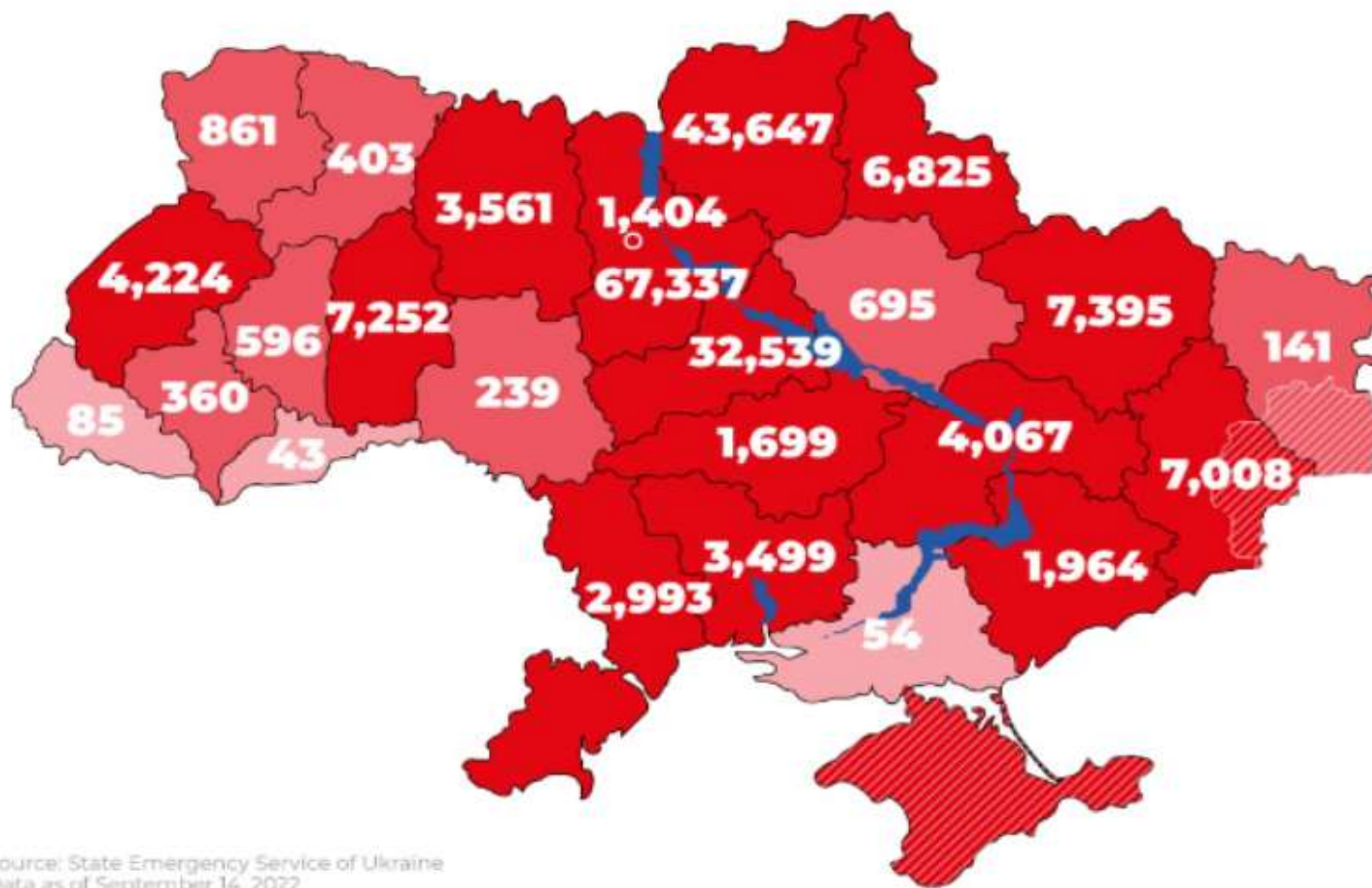
15 k
**temporarily
displaced
people** who have
found shelter at
protected areas



5 k
employees
whose work is
ongoing in
national parks
and reserves

Fig. 2. The scale of the damage caused to the protecting ecosystems as a result of russian aggression, according to the Ministry of Environmental Protection and Natural Resources of Ukraine (EcoZagroza)

Number of neutralized explosive items



Source: State Emergency Service of Ukraine
Data as of September 14, 2022

 t.me/uawarinographics

Fig. 3. Cartogram of demining of the territory of Ukraine, according to the data of the State Emergency Service, the number of defused explosive objects

Approximate damage calculations were calculated by the State Environmental Inspection in accordance with approved methods


1 961 bln uah

 Air 994 308 bln uah

- fuel fires 50 644 mln uah
- wildfires 938 013 mln uah
- ignition of other objects 5 644 mln uah

 Soils 12 bln uah

- pollution of soils 11 996 mln uah

 Waste 896 bln uah

- land pollution with waste 896 102 mln uah

Fig. 4. Estimated amount of damage caused to the environment of Ukraine as a result of russian aggression, according to the Ministry of Environmental Protection and Natural Resources of Ukraine (EcoZagroza, May 24, 2023)

Fires

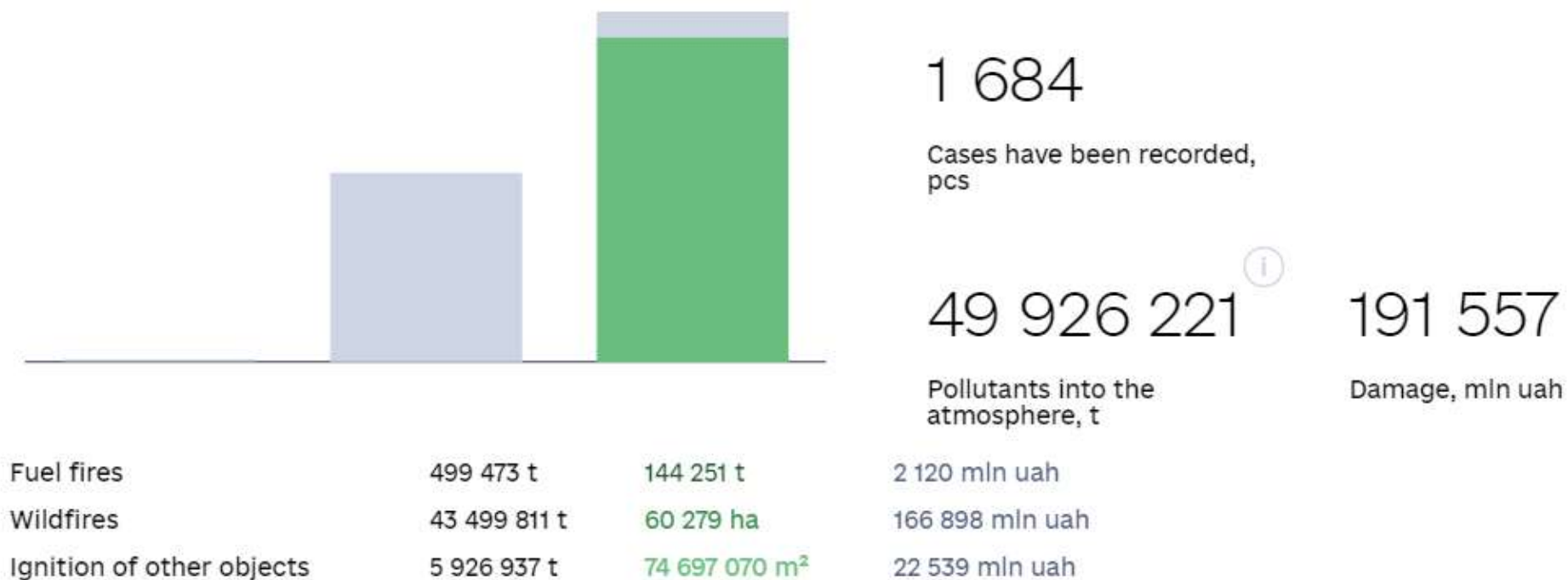


Fig. 5. Damage caused to the environment of Ukraine from fires as a result of russian aggression, according to the Ministry of Environmental Protection and Natural Resources of Ukraine (EcoZagroza, May 24, 2023)

Events: forest and nature reserve fund, soils, water, waste



330

Cases have been recorded,
pcs

230

Liquidation plans have been
developed

224 983

Damage, mln uah

Deforestation	281 223 ha	6 521 mln uah	Oil products spillage in water	11 070 t	106 347 mln uah
Nature Reserve Fund objects damage	1 240 113 ha	102 309 mln uah	Explosive substances (projectiles)	333 pcs	4 mln uah
Oil products spillage in soils	14 589 t	8 835 mln uah	Waste pollution	1 594 840 m ²	966 mln uah

Fig. 6. Damage caused to certain components of Ukraine’s environment as a result of russian aggression, according to the Ministry of Environmental Protection and Natural Resources of Ukraine (EcoZagroza, May 24, 2023)

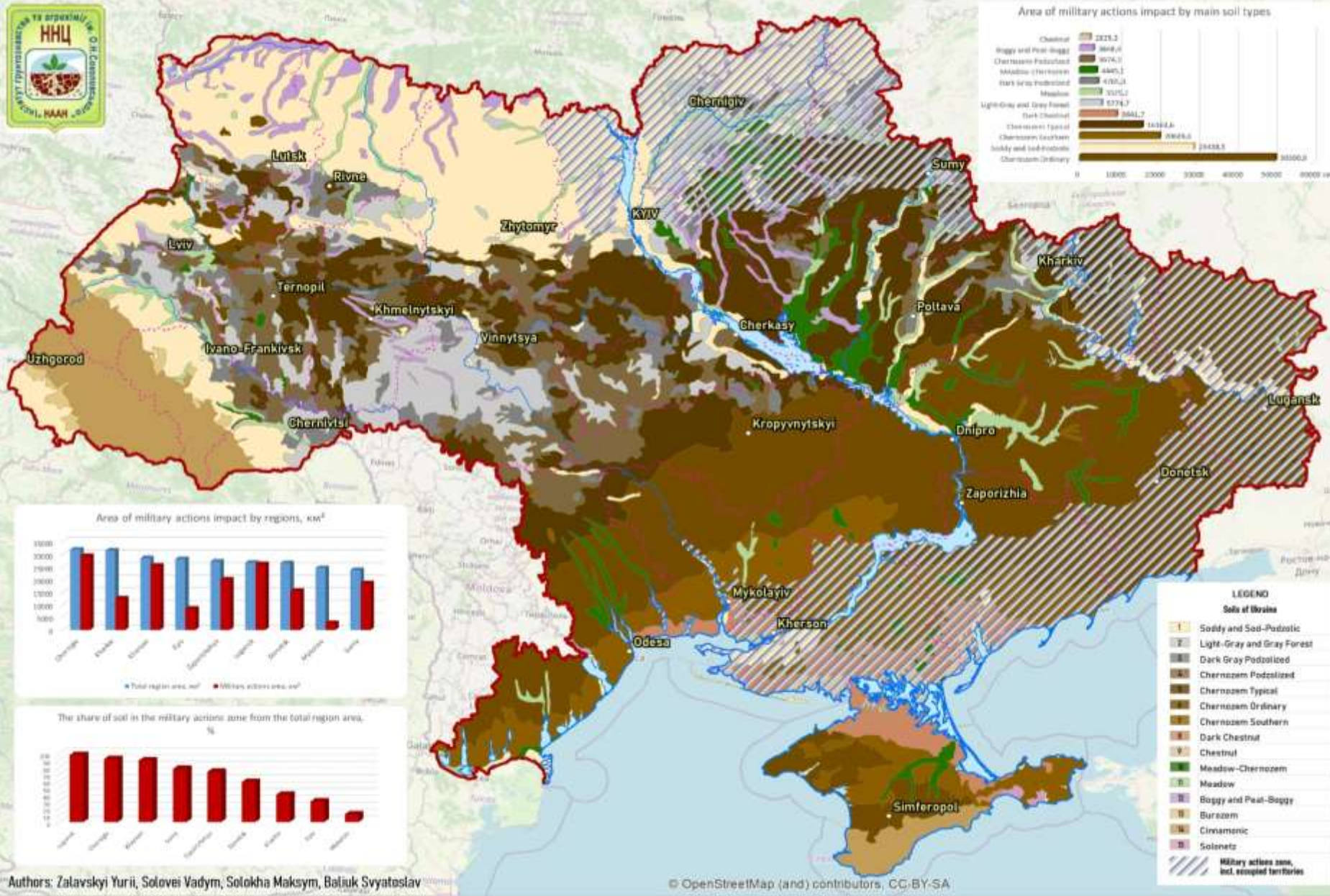


Fig. 7. Cartogram of the impact of the war on the soil cover of Ukraine, according to the data of the NSC ISSAR (Baliuk et al., 2022)

Table 1. The amount of damage and losses caused to lands and soils of Ukraine as of February 24, 2023

Indicator	Damage and losses	
	billion UAH	billion USD
Losses of the land fund:		
Costs for the reclamation of lands that were disturbed as a result of hostilities (according to the estimates of the NSC ISSAR)	171.0	4.672
Damages caused to the owners (land users) of agricultural plots of land (according to the estimates of KSE)	79.0	2.135
Costs for the restoration of reclamation areas (according to the estimates of the working group “New Agrarian Policy” of the Plan for the Restoration of Ukraine)	148.0	4.000
Costs for demining (according to the estimates of the State Emergency Service of Ukraine)	16.1	0.436
Damage caused to land resources and soils:		
Damage caused to soils and land as a result of soil contamination and littering of plots of land (according to the calculations of the Operational Headquarters at the State Environmental Inspectorate of Ukraine)	688.0	19.111
In total	1102.1	30.354

More details about the impact of war on soil and food security can be found in our works:

Baliuk, S. A., Kucher, A. V., Solokha, M. O., Solovei, V. B., Smirnova, K. B., Momot, H. F., Levin, A. Ya. (2022). Impact of armed aggression and hostilities on the current state of the soil cover, assessment of damage and losses, restoration measures: scientific report. Publisher Brovin, Kharkiv, Ukraine. 102 p. <https://doi.org/10.13140/RG.2.2.15740.41608>

Kucher A. (2022). Methodology for assessing damages and losses caused by the armed aggression to the land fund and soils: problems and directions of improvement. *Journal of Innovations and Sustainability*. Vol. 6. No. 2. 10. <https://doi.org/10.51599/is.2022.06.02.10>



THANK YOU FOR ATTENTION!

<https://www.avkucher.com>

anatoliy_kucher@ukr.net

