

25th NDM-UN Side event

Conflict, Environment and Explosive Ordnance – developing an integrated response

Thursday 23 June, 12:30—13:20



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Measuring the Environmental Impacts of Explosive Weapons in Populated Areas

25TH NDM-UN 23 June 2022

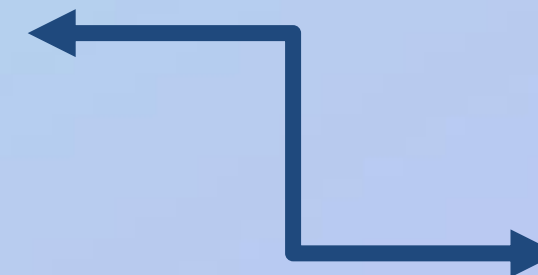
United Nations Institute for Disarmament
Research (UNIDIR)



Direct & Indirect/reverberating effects



Direct effects, including primary and secondary effects



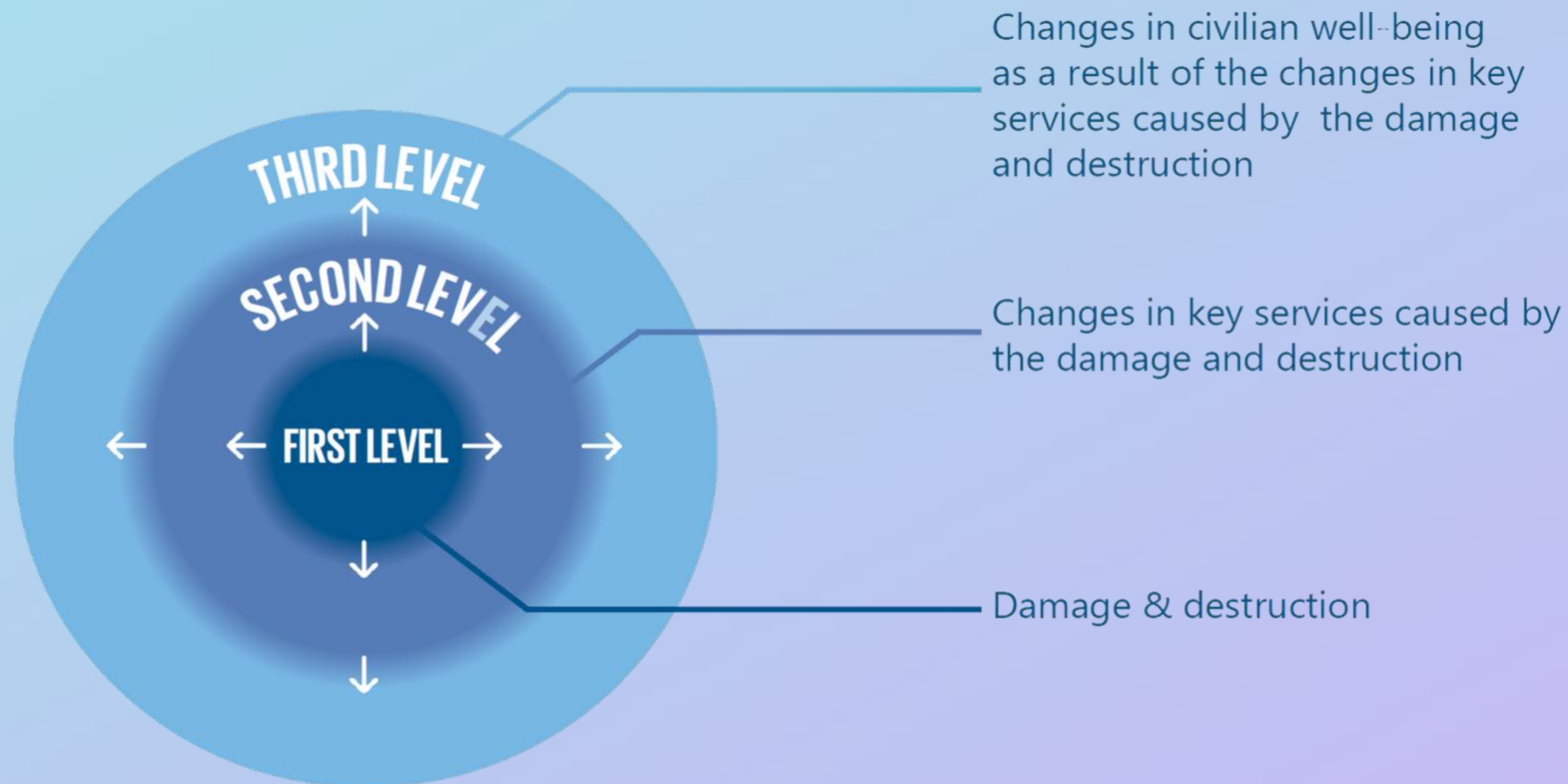
Indirect effects, also known as “reverberating” effects or tertiary or third-order effects



THE IMPACT CHAIN FROM EWIPA:



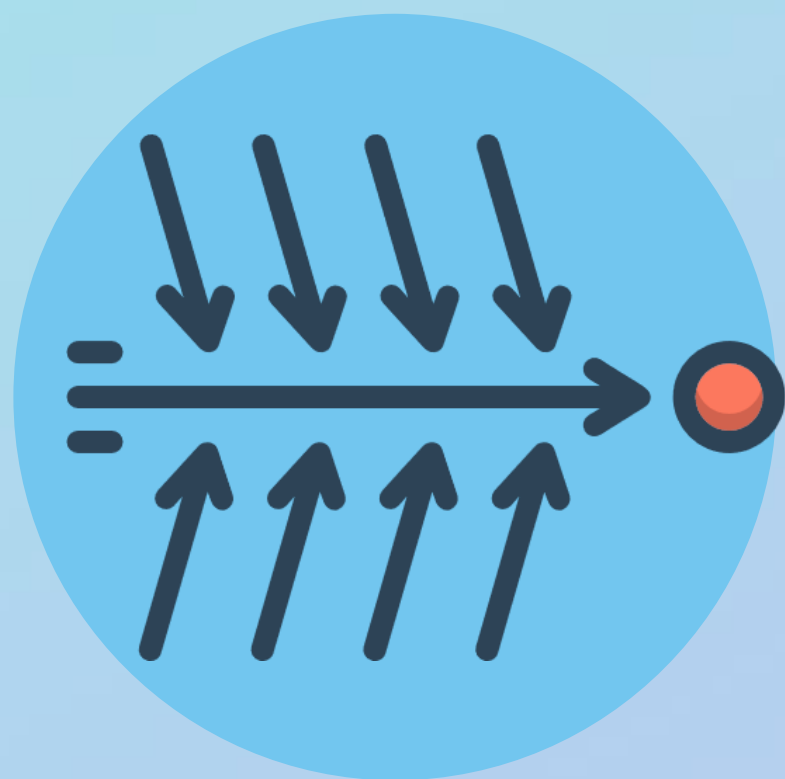
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KEY RESEARCH CONSIDERATIONS:



UNIDIR



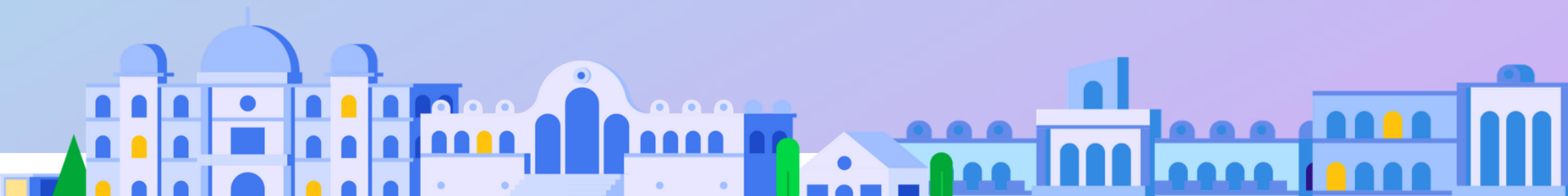
Attribution of cause and
effect (causal relation)



Location



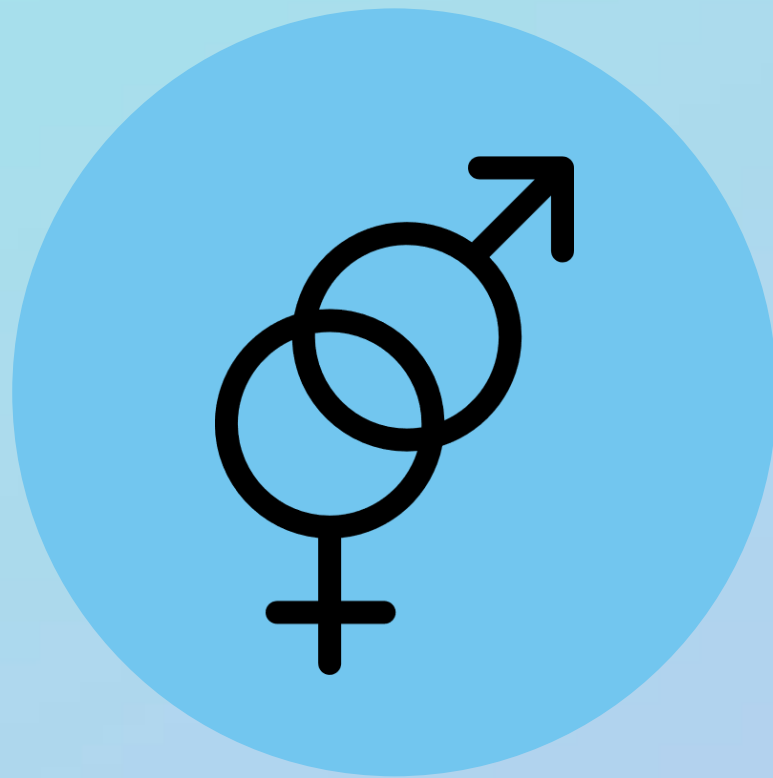
Time



KEY RESEARCH CONSIDERATIONS:



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Gender and age
disaggregation



Urban services: people,
infrastructure, and
consumables (ICRC)



Indicators, not proof



FOUR NEW FOCUS AREAS:



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WASH



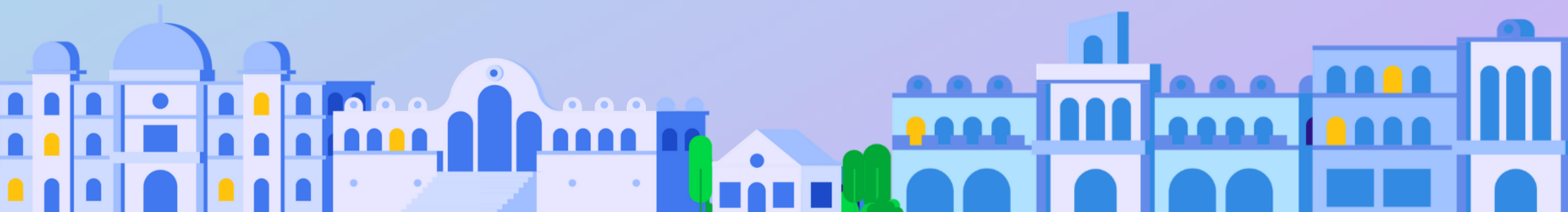
Food
Security



Environmental
Degradation



Economic
Opportunity



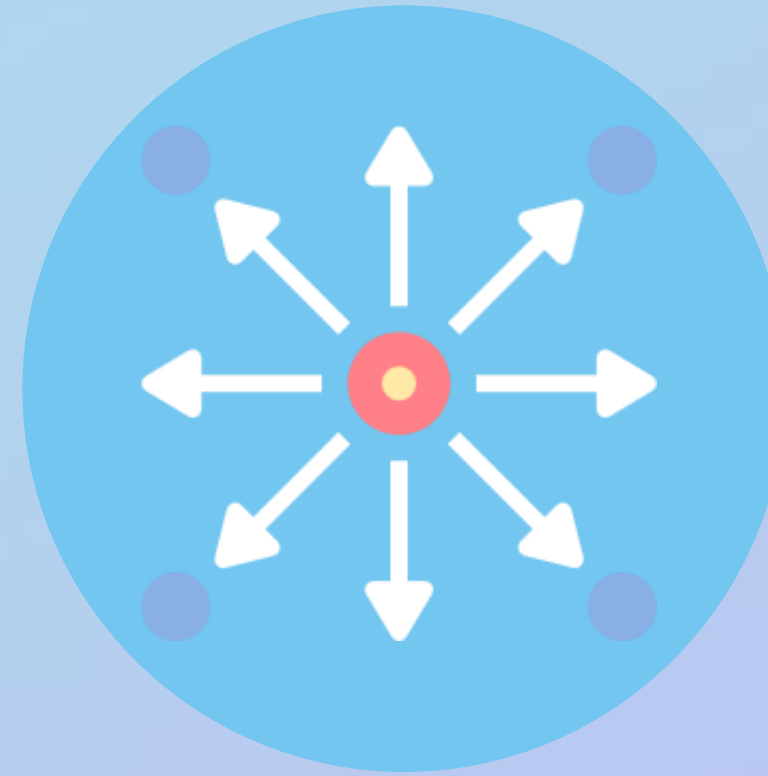
THE INDICATORS EXPLAINED:



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4 Focus Areas



3 Levels of Impact



73 Indicators





1st level:
damage
and
destruction
caused by the
use of EWIPA



ENVIRONMENTAL DEGRADATION

Suggested Indicator	Focus (What are the indicators trying to measure)		Reverberating Effect Chain
1.A Number or proportion of industrial complexes and fuel infrastructure facilities rendered inoperable (destroyed) or degraded and left with partially functioning (damaged) capacity for service delivery	The extent of damage and destruction to industrial complexes and the ensuing extent of severe pollution from hazardous chemicals.		Damage to and destruction of industrial complexes and fuel infrastructure increases the risk of environmental harm and health impacts through the contamination of soils, water resources and the wider natural ecosystem; there is an acute risk of exposure to hazardous chemicals present in heavy, medium or light industrial facilities located in or near urban areas when explosive weapons are used against industrial complexes. ³⁶
1.B Number or proportion of housing units, buildings and other civilian objects rendered inoperable (destroyed) or degraded and left with partially functioning (damaged) capacity	The extent of damage and destruction to housing units, shelters and other civilian objects and the ensuing extent of the pollution caused by their levelling.		Damage to and destruction of housing, shelters and civilian objects spurs displacement, engenders a hazardous human environment, and creates large amounts of debris and rubble.
1.C.I Tons of debris generated	Debris, rubble and hazardous waste generated by damage and destruction to civilian objects.		Damage to and destruction of civilian objects create dust, debris and rubble, which may be hazardous or toxic, have an impact on human health and have additional environmental consequences as well as complicate the identification and removal of ERW.
1.C.II Estimate of hazardous waste, given as proportion or volume of debris			
1.D Number or proportion of solid waste, wastewater and sanitation infrastructure facilities rendered inoperable (destroyed) or degraded and left with partially functioning (damaged) capacity for service delivery	The extent of damage and destruction to sanitation infrastructure, such as waste-management centres and networks, sewer conduits, and black water treatment plants, including non-potable water distribution networks.		Damage to and destruction of sanitation infrastructure results in pollution incidents, uncontrolled dumping or open burning of waste, or raw sewage flowing into waterways and the urban environment, which risks environmental contamination and human health impacts. (same as Indicator 1.B in WASH)
1.E Number or proportion of energy infrastructure facilities rendered inoperable (destroyed) or degraded and left with partially functioning (damaged) capacity for service delivery	The extent of damage and destruction to the energy infrastructure, including power-generating plants, substations, transformers, electricity transmission lines, and gas and oil pipelines.		Damage to and destruction of the energy infrastructure, which is interconnected to the larger urban system and required for its proper functioning, may result in disruption to waste management and treatment and fuel and energy production, which risks environmental contamination and human health impacts. (Indicator 1.E throughout)
1.F Number and duration of fires, including nature of the material on fire	Destruction from fires and severe decline in air quality.		Fires cause additional infrastructural damage, spread across different areas, expose civilians to burns and represent a health hazard given the inhalation of air pollutants.



2nd level:
changes in key
services from
the damage
and
destruction
caused by the
use of EWIPA



ENVIRONMENTAL DEGRADATION

Suggested Indicator	Focus (What are the indicators trying to measure)		Reverberating Effect Chain
2.A Proportion of agricultural area under cultivation (SDG indicator 2.4.1), compared to pre-conflict levels or counterfactual Alternative indicator: Levels of agricultural yield, compared to pre-conflict levels or counterfactual	Land degradation has an impact on fertility and quality of soils and damages natural habitats, biodiversity hotspots and protected areas.		Land degradation leads to loss of biodiversity, deforestation, micro-relief disruption, and over-cultivation of alternative areas or off-limits due to risks from ERW, mines or IEDs; land could also be degraded from the lack of services provided to forcibly displaced populations. ³⁷
2.B.I Number or proportion of water bodies at risk of contamination or with evidence of being polluted, compared to pre-conflict levels or counterfactual	Damage, contamination or pollution of water sources.		Damage, contamination or pollution of water sources reduces the available water supply and contaminates soil and food sources via groundwater pollution; contaminated water sources may also be linked to loss of wildlife habitat and biodiversity and increase diseases or death, both within and outside an area affected by explosive weapons use; overextraction of gravel from riverbeds and quarries for reconstruction materials could have an impact on water sources, including water purification and ground water levels. ³⁸
2.B.II Proportion of domestic and industrial wastewater flows safely treated, (SDG Indicator 6.3.1) compared to pre-conflict levels or counterfactual			
2.C Annual mean levels of fine particulate matter in cities (population weighted) (SDG Indicator 11.6.2), compared to pre-conflict levels or counterfactual	Increased air pollution and contamination due to debris and rubble.		Debris and rubble in an area affected by the use of explosive weapons, as well as the use of alternative sources of fuel, increase air pollution and lead to poor health outcomes. ³⁹
2.D Proportion of hazardous waste treated, by type of treatment (SDG Indicator 12.4.2.b), compared to pre-conflict levels or counterfactual Alternative Indicator: Changes in the capacity of waste infrastructure to manage, treat and dispose of hazardous waste	The extent of disruptions to hazardous waste treatment efforts and disruptions to the overall functioning of the services.		Disrupted treatment or disruptions in the capacity to treat hazardous waste due to damage and destruction of infrastructure by explosive weapons results in the unsafe storage, handling and accumulation of hazardous waste, resulting in environmental harm and impacts on human health.
2.E.I Municipal solid waste collected and managed in controlled facilities as a proportion of total municipal waste generated, by cities (SDG Indicator 11.6.1), compared to pre-conflict levels or counterfactual Alternative Indicator: Changes in the capacity of waste infrastructure to manage, treat and dispose of solid waste	The extent of disruptions to waste-management services.		Poor solid waste management services and the proliferation of open sewers (and open waste burning) owing to damage and destruction of infrastructure caused by explosive weapons leads to environmental damage (contaminating land, water and air) and poor health outcomes; for example, unsafe landfills with solid waste can contaminate groundwater from leachates. ⁴⁰
2.E II Proportion of the population taking part in uncontrolled dumping or open burning of waste, compared to pre-conflict levels or counterfactual			



3rd level:
changes in
civilian
wellbeing as
a result of the
changes in key
services from
the damage
and destruction
caused by the
use of EWIPA



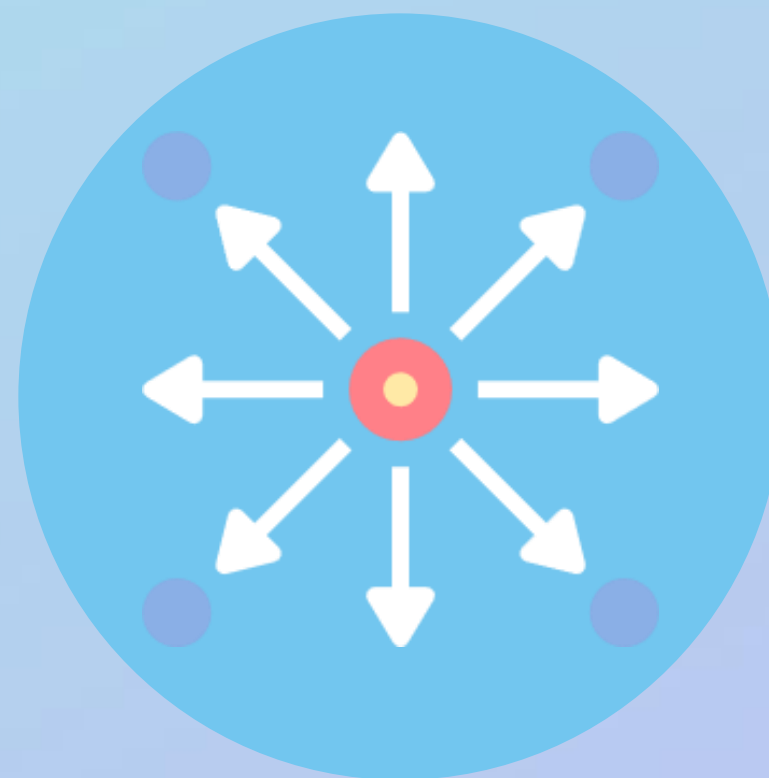
ENVIRONMENTAL DEGRADATION

Suggested Indicator	Focus (What are the indicators trying to measure)		Reverberating Effect Chain
3.A Number or proportion of population infected or killed by vector-borne diseases, disaggregated by age and gender, compared to pre-conflict levels or counterfactual	Prevalence of vector-borne diseases (malaria, dengue, schistosomiasis, filariasis, etc.) due to improper water and waste management.		Higher prevalence of insects and flies from improper waste management can cause outbreaks of communicable diseases; ⁴¹ dengue vector breeding sites multiply due to small pools of water created by rubble caused by explosive weapons; disruption of WASH interventions, which include vector-control activities, can also increase the incidence of malaria and dengue. (same as Indicator 3.E in WASH)
3.B Number or proportion of population killed or infected by zoonotic diseases, disaggregated by age and gender, compared to pre-conflict levels or counterfactual	Prevalence of zoonotic diseases due to higher number of pests and animals.		Higher rates of pests and invasive species in urban areas increase the likelihood of humans becoming infected with zoonotic diseases or bitten by snakes or scorpions. ⁴²
3.C Mortality rate attributed to unsafe water, unsafe sanitation or lack of hygiene (SDG Indicator 3.9.2), disaggregated by age and gender, compared to pre-conflict levels or counterfactual	Death and poisoning from contaminated water sources or exposure to and ingestion of hazardous materials and waste.		Damage and destruction to civilian objects, debris and rubble, as well as ERWs, can cause chemicals to leach into water sources, which may be poisonous. (same as Indicator 3.B.II in WASH)
3.D Mortality rate attributed to household and ambient air pollution (SDG Indicator 3.9.1), disaggregated by age and gender, compared to pre-conflict levels or counterfactual Alternative Indicator: Number or proportion of respiratory illnesses reported in the local population due to air quality, disaggregated by age and gender, compared to pre-conflict levels or counterfactual (both from exposure to short term, highly polluting incidents or longer-term exposure and decline in ambient air quality)	Public health problems arising from increased pollution and a decline in air quality due to debris, rubble and fires due to uncontrolled burning of waste, proliferation of toxic chemicals and other carcinogens found in buildings damaged or destroyed.		Increased air pollution can cause respiratory illnesses, cancers and other health-related problems.
3.E Number or proportion of population experiencing heavy-metal poisoning, disaggregated by age and gender, compared to pre-conflict levels or counterfactual	Public health problems arising from increased environmental pollution with metals after damage and destruction to industrial complexes.		Damage to and destruction of industrial complexes and fuel infrastructure increases risk of environmental harm and health impacts through the contamination of soils, water resources and the wider natural ecosystem; there is an acute risk of exposure to hazardous chemicals present in heavy, medium or light industrial facilities located in or near urban areas when explosive weapons are used against industrial complexes, potentially leading to heavy-metal poisoning.

TAKEAWAYS:



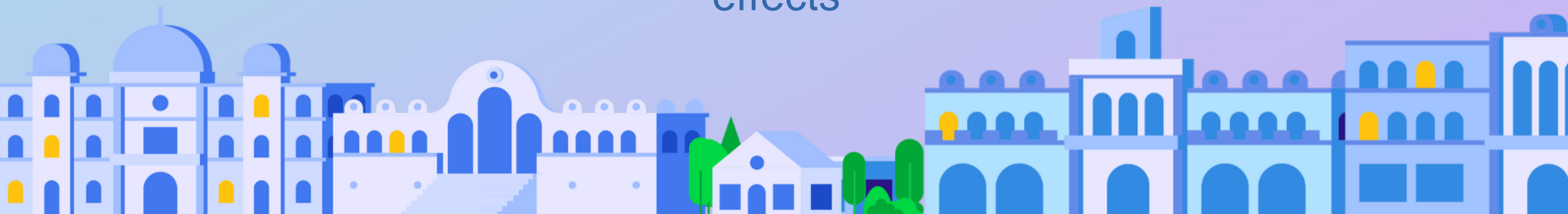
Metrics to help build
standardized data



Framework to think
about reverberating
effects



Common goal:
Protection of civilians

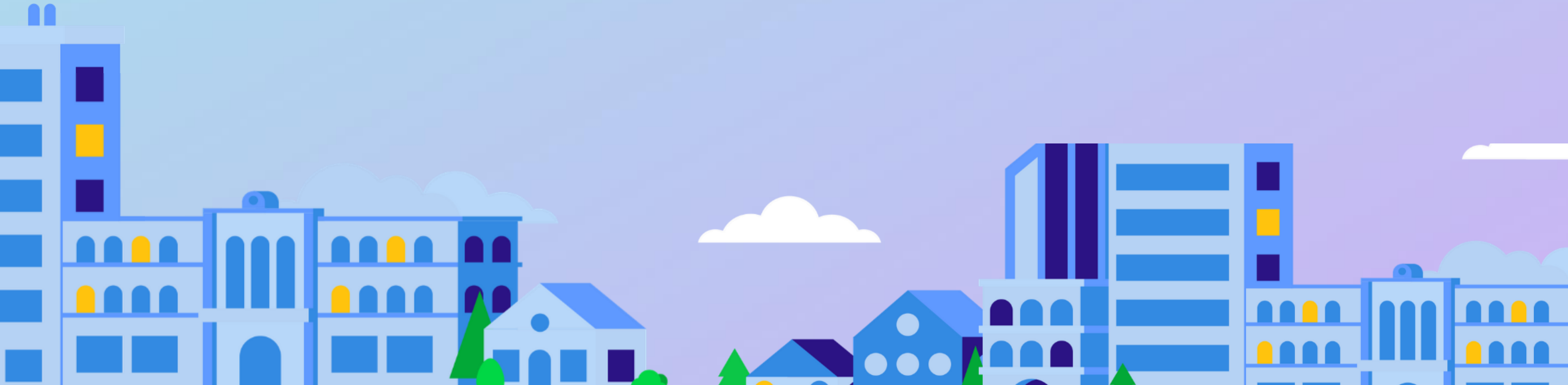




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Feel free to contact:

Erica.mumford1@un.org



**AVAILABLE NOW:
UNIDIR.ORG**





Conflict, environment and explosive ordnance

25th NDM-UN, 23 June 2022

Linsey Cottrell

Environmental Policy Officer, Conflict and Environment Observatory

www.ceobs.org



- What do we mean by conflict pollution?
- Why is it important to mine action?



Environmental aspects of mine action

1 Existing environment



how existing conditions may
affect mine action workers or
the local community

2 Changing environment



how climate change
may affect mine action
activities

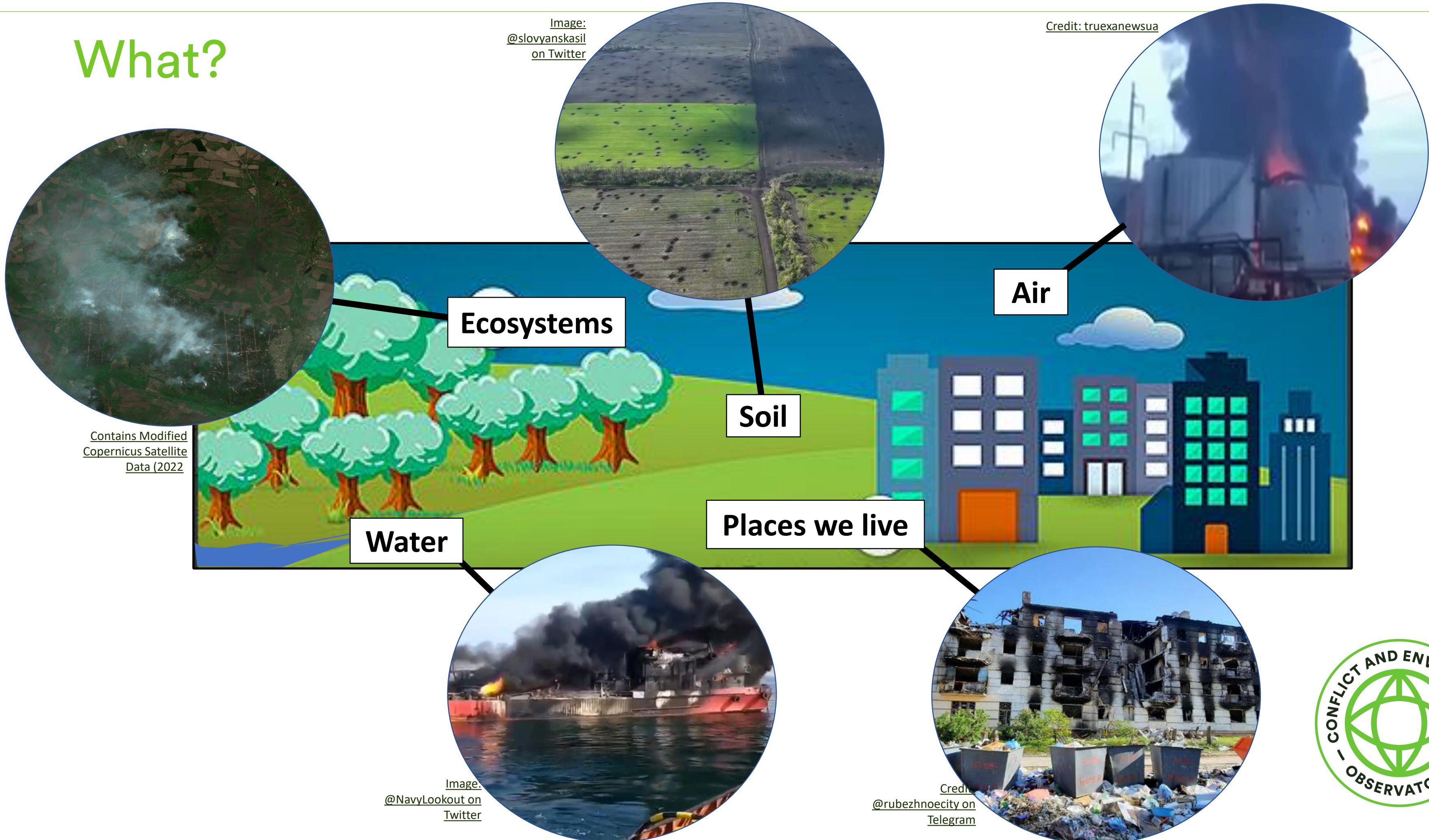
3 Impact on the environment



how mine action
activities could impact
the environment



What?



What?

- Discrete incidents of environmental harm and damage to infrastructure
- Indirectly from the reverberating effects of conflict – e.g. waste disposal and debris management
- Long-term and possibly large-scale trends of environmental damage - e.g. contamination of water resources, areas of land not fit-for-use





Credit: SES of Ukraine

Foam production plant

Kyiv, Location



Credit: UkraineNow

Chemical plant

Rubhizne | 10th April



Credit: truexanewsua

Fuel storage

Odessa | 4th April



Credit: Planet Labs

Logistics warehouses

Brovary | 22nd March



Credit: SES of Ukraine

Power plant

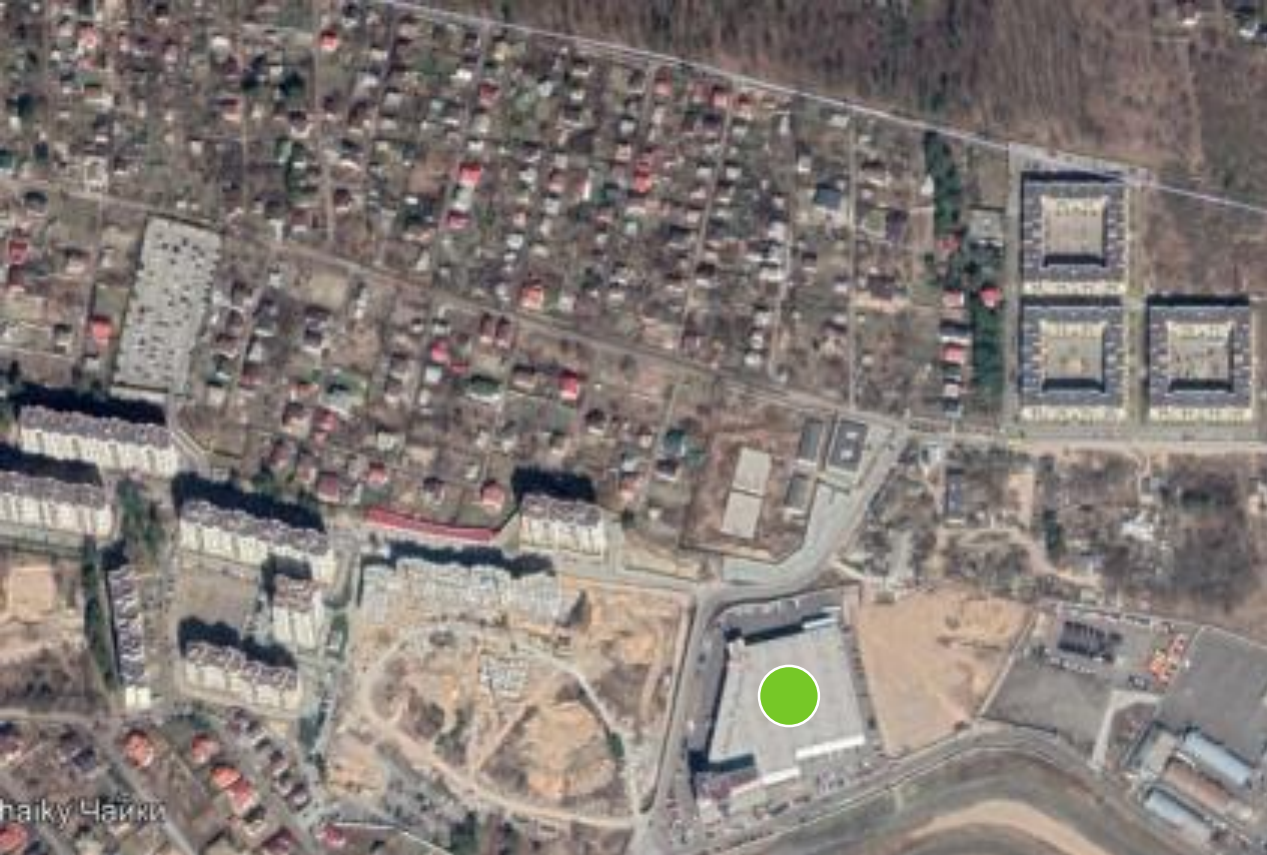
Okhtyrka | 10th March



Credit: Sentinel Hub. Contains modified Copernicus data (2022)

Food factory

Chernihiv | 23rd March



Foam production plant
Kyiv, Location



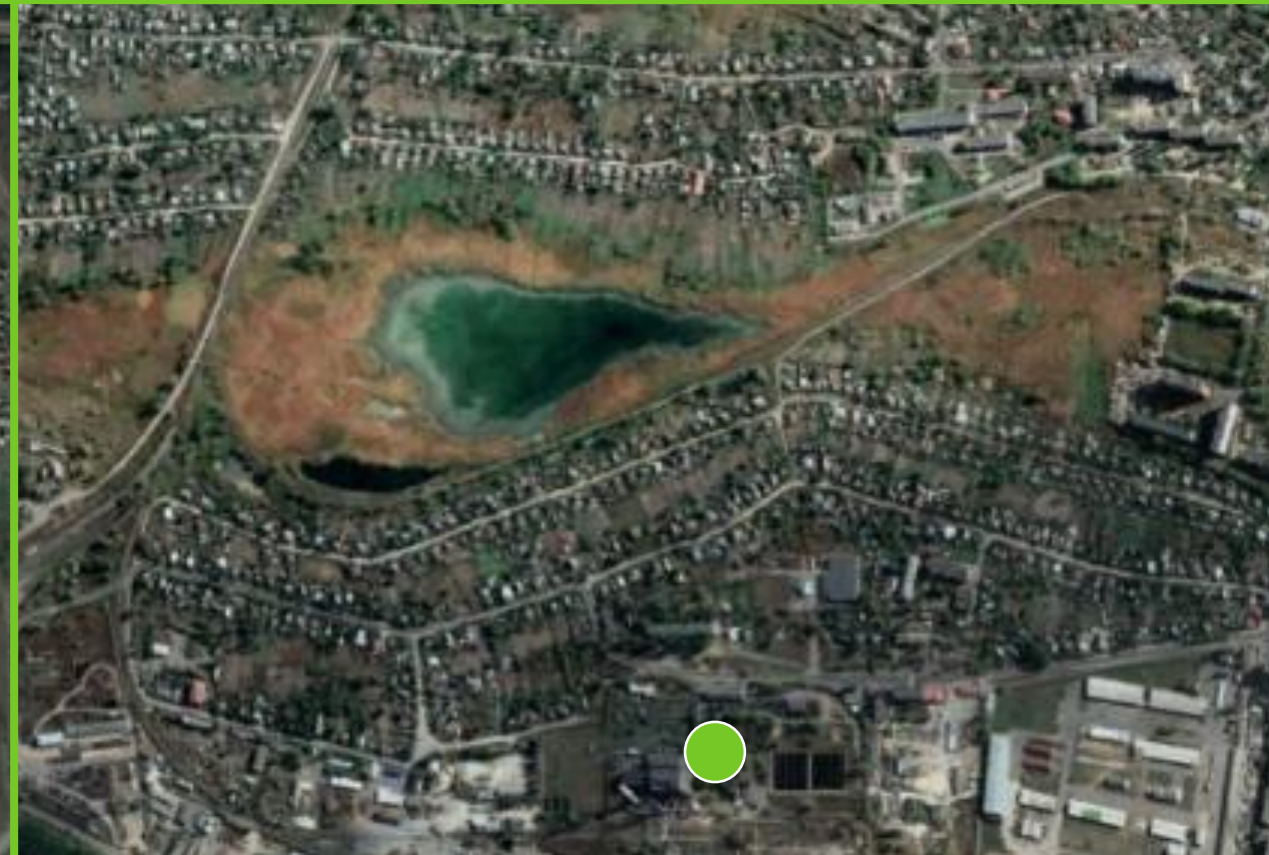
Chemical plant
Rubhizne | 10th April



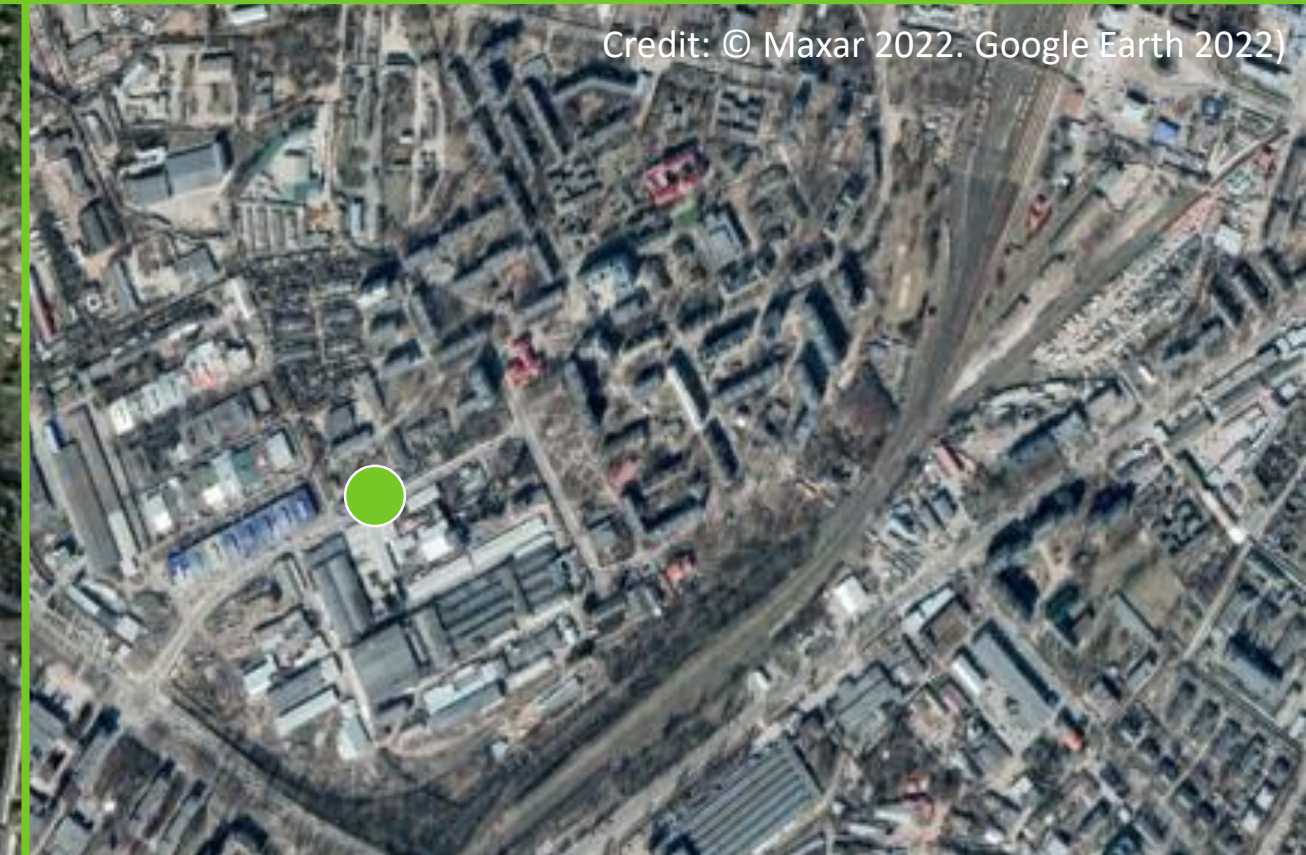
Fuel storage
Odessa | 4th April



Logistics warehouses
Brovary | 22nd March

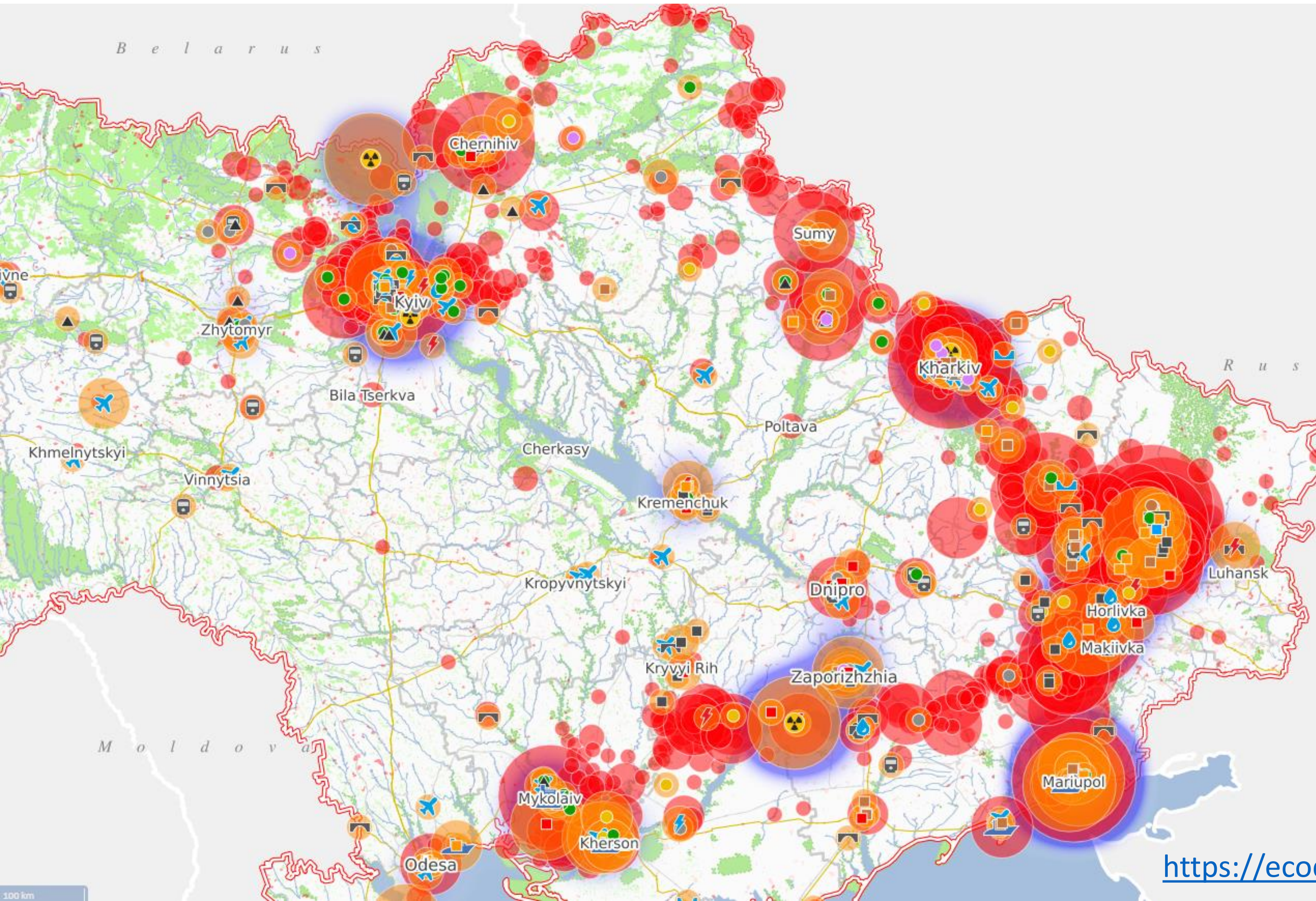


Power plant
Okhtyrka | 10th March



Food factory
Chernihiv | 23rd March

Ukraine – geographically widespread, diverse sources and pathways



Damage to industry,
infrastructure and
settlements

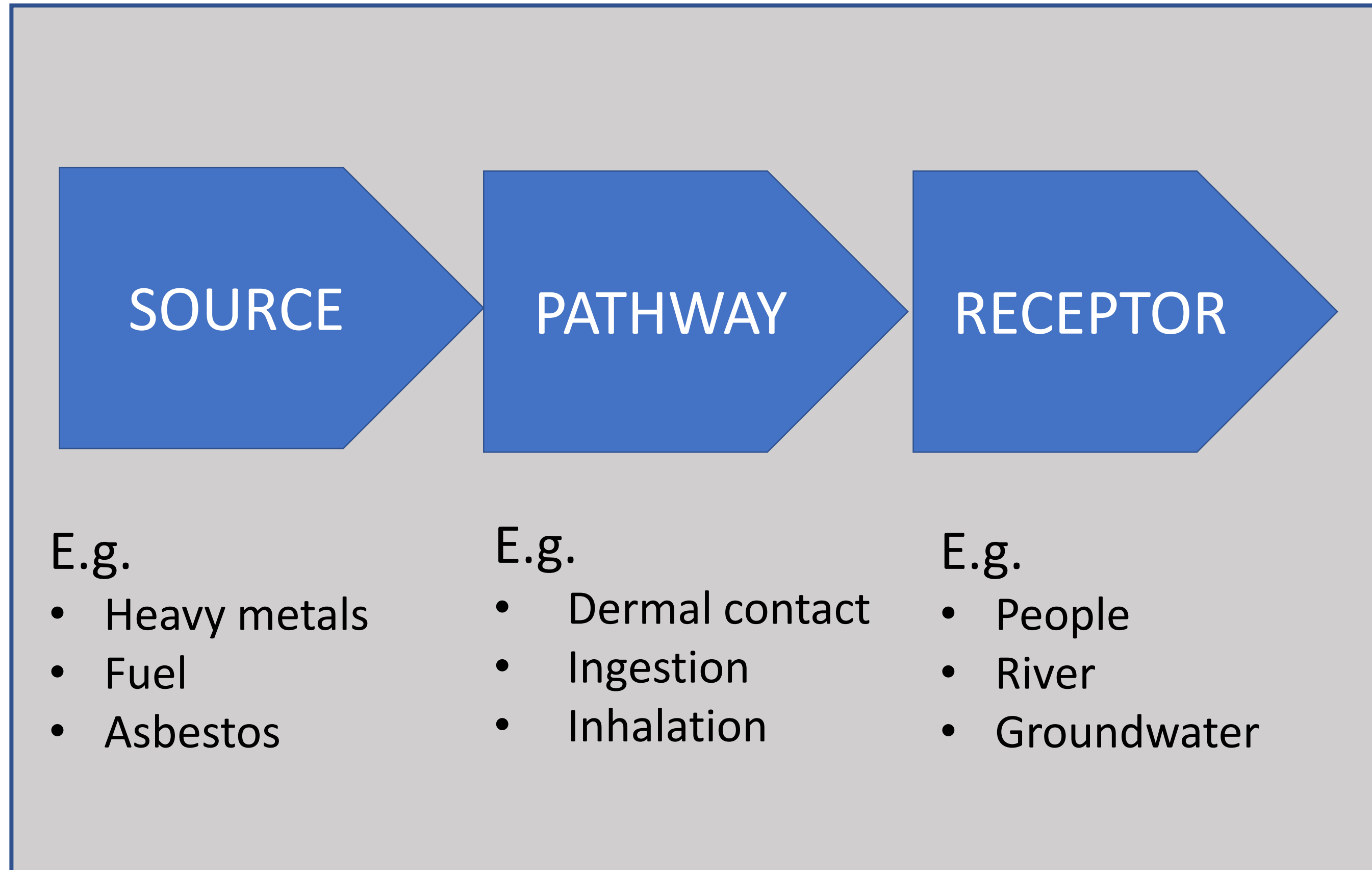
Feb-June 2022

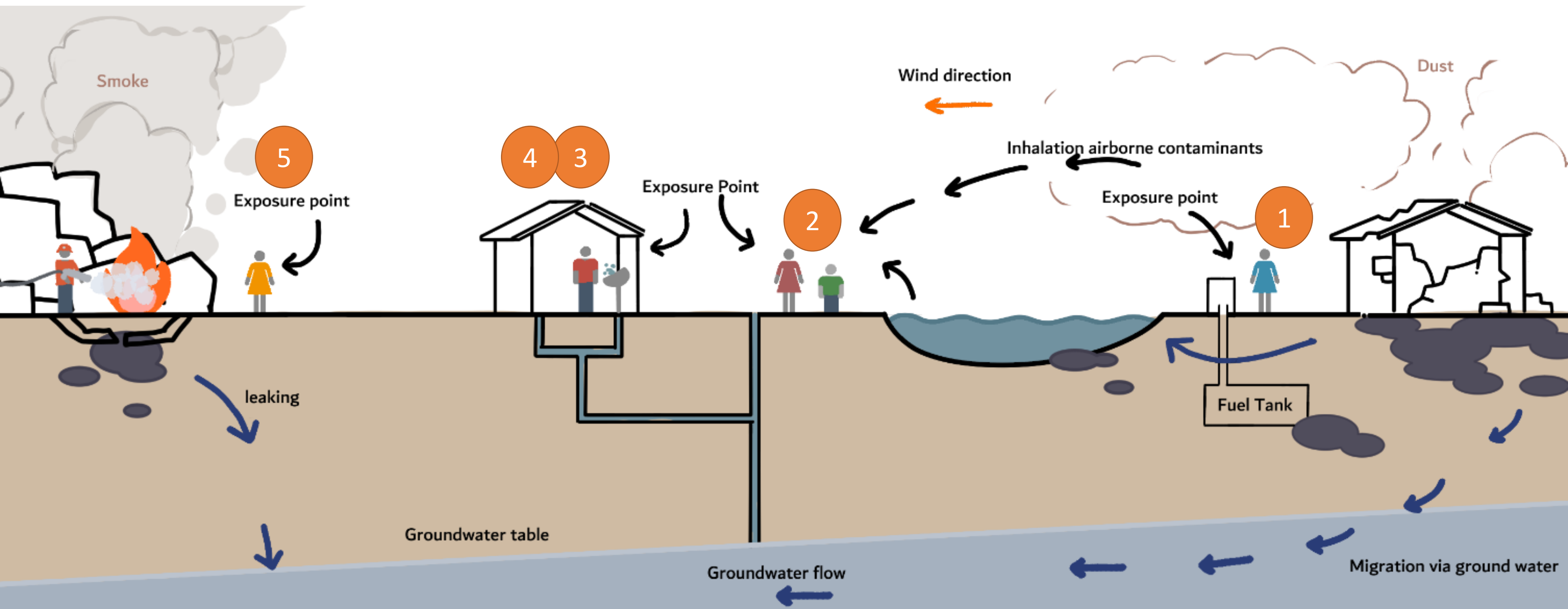
Credit:



<https://ecodozor.org/index.php?lang=en>

Concept used to assess environmental risks from pollution





Evidence on the ground.....



Buried tanks, drums etc...



Evidence of leaks or spills



Discolouration or odour



Non-natural material/waste



Dead or grasping fish



Iridescent sheens



Fire damaged assets



Dieback or signs of distress

Why?

- Inform occupational risk assessments
- Support the assessments on the scale and severity of environmental impact, trends and patterns
- Data to prioritise post-conflict remedial action
- Information to environmental authorities and international networks
- Potential evident for reparations or criminal cases?
- Complement other data collections - feed into planning or land use management strategies, 'build back better'



International Network on Soil Pollution - INSOP

- Launched in April 2022
- Aims to strengthen technical capacities and legal frameworks to prevent and remediate polluted soils
- INSOP work streams:
 1. SOPs and reference values
 2. Mapping
 3. Monitoring and regulation
 4. Management and remediation

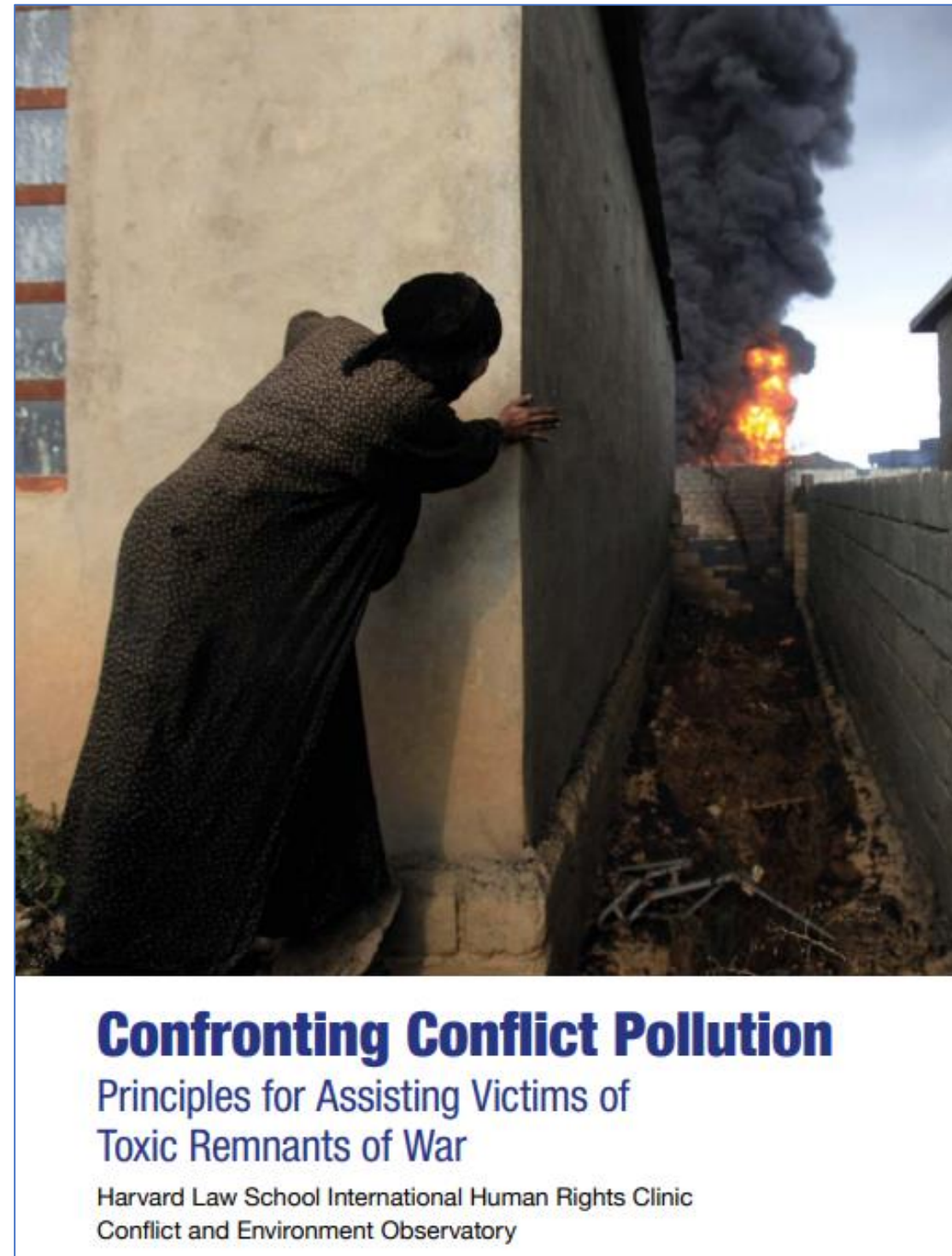


<https://www.fao.org/global-soil-partnership/insop/en/>



Harvard Law School HRC / CEOBS – Principles for assisting victims of toxic remnants of war

- Framework developed to fill the gap of victim assistance for conflict pollution
- Inadequacy of data is a barrier to assisting victims



<https://ceobs.org/harvard-ceobs-confronting-conflict-pollution-principles-for-assisting-victims-of-toxic-remnants-of-war/>



Summary

- Importance of the environment in urban and non-urban setting
- Scale and nature of risks will depend on setting and local environmental receptors
- Data on conflict pollution is critical to support mapping, assessment and prioritisation of remedial work





Conflict and Environment Observatory

CEOBS is a UK charity working to increase the protection of people and ecosystems from the impact of armed conflicts and military activities.

Learn more about our work via:

- **www.ceobs.org**
- **[@detoxconflict](https://twitter.com/detoxconflict)**
- **facebook.com/ceobs**

Norwegian People's Aid

Hilde Jørgensen
Senior Advisor Environment



Norwegian People's Aid



Norwegian People's Aid



Norwegian People's Aid



Norwegian People's Aid



Norwegian People's Aid



Norwegian People's Aid

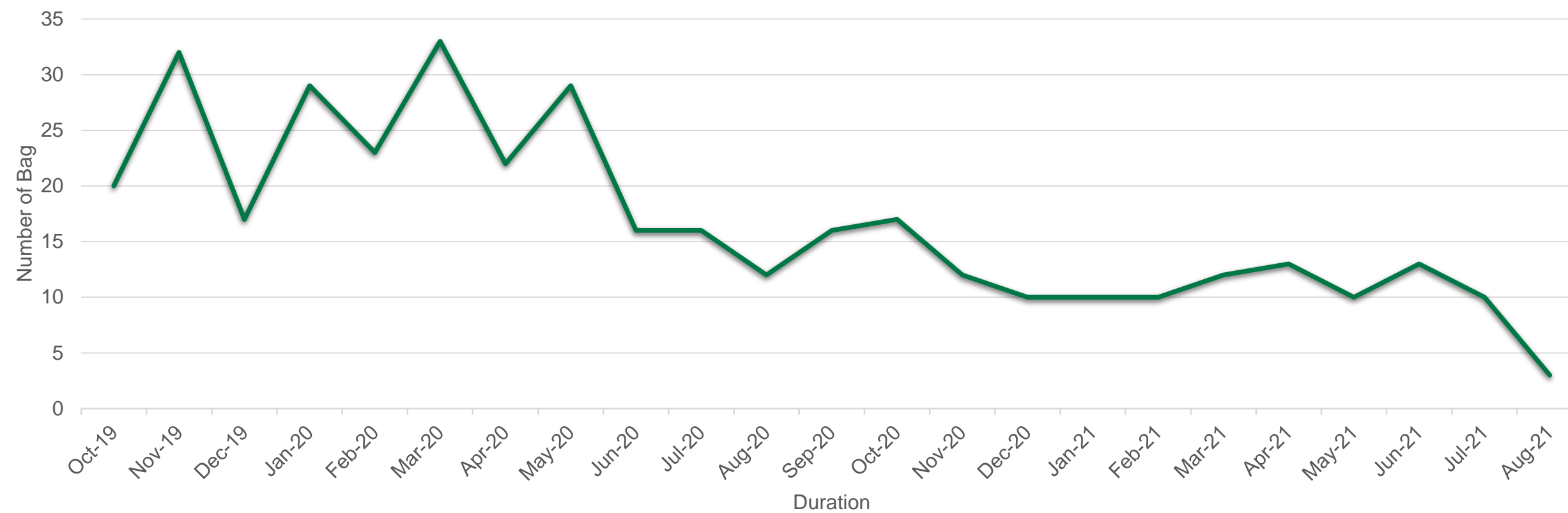


Norwegian People's Aid

Solid Waste Handling

At VTE office

Waste Generation of NPA



Norwegian People's Aid





Norwegian People's Aid

Environmental Issues and Mine Action

Working Group

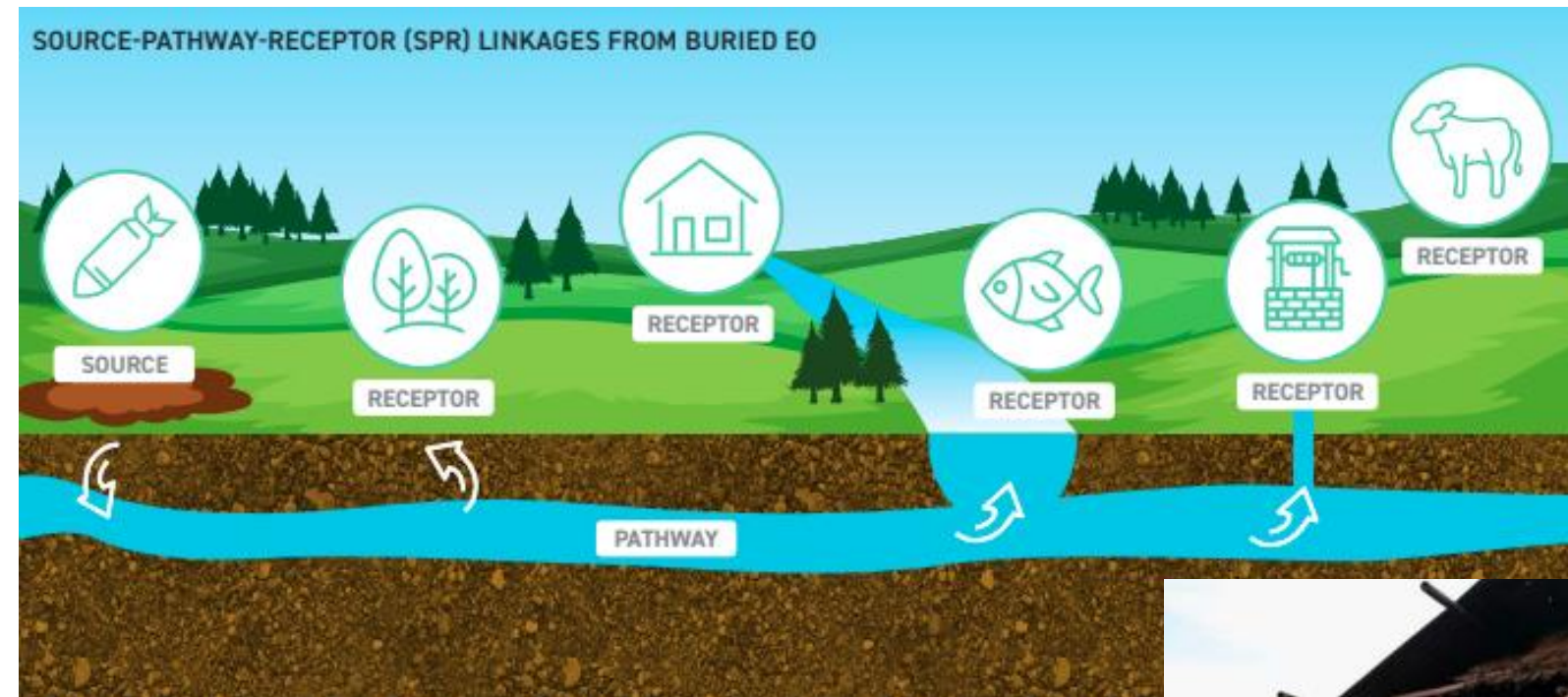
Lucy Pinches
Project Manager, Mine Action Review



MITIGATING THE ENVIRONMENTAL IMPACTS OF EXPLOSIVE ORDNANCE AND LAND RELEASE

MINE ACTION REVIEW
POLICY BRIEF NO.1 2021

mineactionreview.org



www.mineactionreview.org



Zero Waste Laos



Our program



Research

Our clean-up results will be converted to data.
We also collaborate with research organizations to develop more data regarding waste issue in Laos. Contact us for more information.



Campaign and Event

To spread awareness and train how to combat



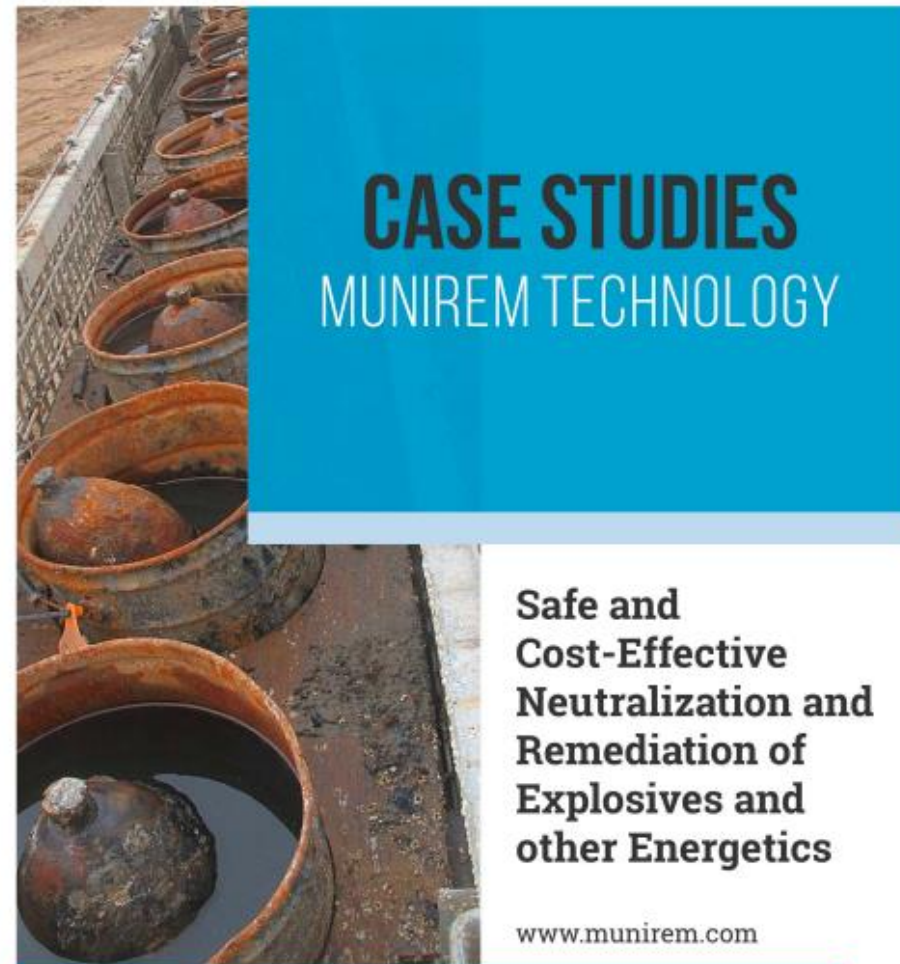
Community development



CSR/EPR Collaborator



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Email: info@munirem.com



Safe and Cost-Effective Neutralization and Remediation of Explosives and other Energetics

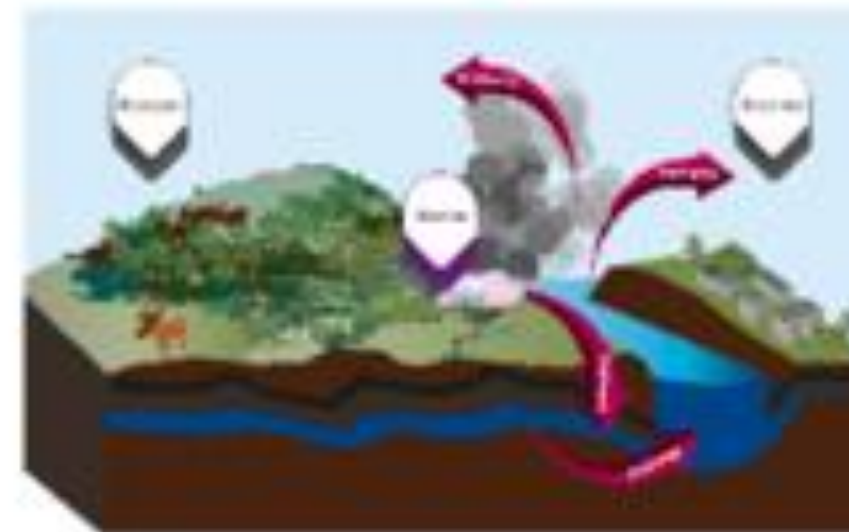
www.munirem.com

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First Edition

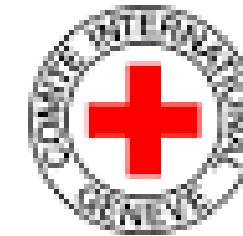
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First Edition
14 March 2017

Environmental Management in Mine Action



GUIDE TO EXPLOSIVE ORDNANCE POLLUTION OF THE ENVIRONMENT



ICRC



Norwegian People's Aid