Overview of responses received to the March/April 2025 online survey

Background and introduction:

Members of the task team on the development of the high-level indicator (HLI) on the "global environmental burden attributable to chemicals and waste" were invited to share their perspectives through an online survey on the following topics: definition of the environmental burden, objectives, scope dimensions, constituting elements and structure of the HLI. A total of 10 main questions were asked, with the opportunity for additional observations. The survey was developed based on the work carried out so far, incorporating input provided by stakeholders through previous task team meetings[1] [2], as well as expert consultations. The questions included multiple-choice options, written responses, and rating scales. The survey was circulated on 28 March 2025, and the input shared at the 3rd task team meeting[3] held on 24 April 2025. A summary of responses received, including responses received after the meeting, is presented below. In total, 16 responses were received from civil society/ NGOs (38%), governments (38%), intergovernmental organizations (13%), academia (6%), and the private sector/industry (6%).

Question 1. Definition of Global Environmental Burden

Stakeholders were invited to rate on a scale from 1 to 10 the following possible definition of the "environmental burden": "*Degradation of the environment and its services resulting from activities involving chemicals and waste throughout their life cycle*.". Responses were grouped into four categories: disagree (1–2), low agreement (3–4), agree (5–7), and strongly agree (8–10). Results showed 88% agreement with this definition, as presented in Figure 1.

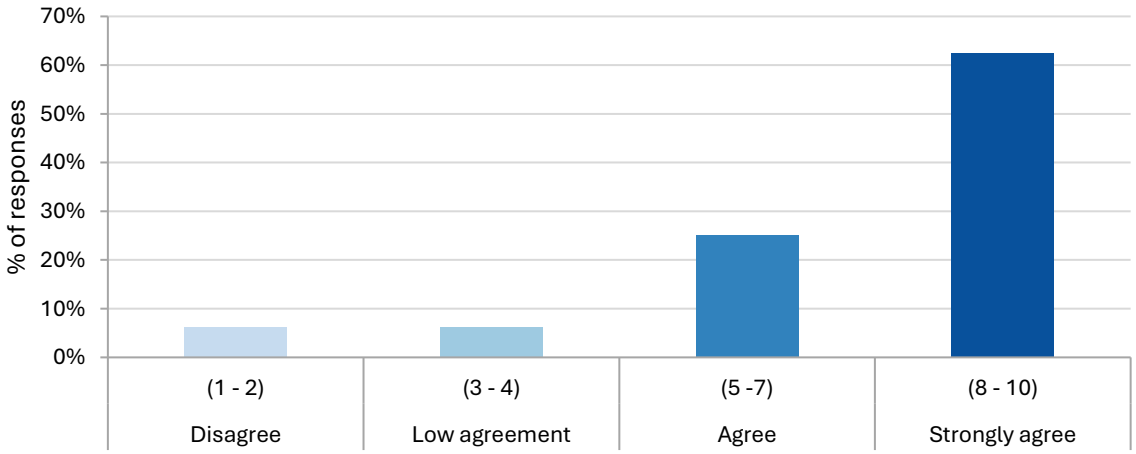

Figure 1. *Percentage of responses grouped by level of agreement with the proposed definition of the global environmental burden.*

The following additional suggestions/observations were made:

- *"After the word "degradation" it's recommended to include the word "damage".*

[1] First task team meeting webpage: https://www.unep.org/events/conference/oeahgmi-first-meeting-workstream-2-task-team-high-level-indicator-global
[2] Second task team meeting webpage: https://www.unep.org/events/conference/oeahgmi-second-meeting-workstream-2-task-team-development-high-level-indicator
[3] Third task team meeting webpage: https://www.unep.org/events/conference/oeahgmi-third-meeting-workstream-2-task-team-development-high-level-indicator

- *"It is not only about services, but also about the value of nature, healthy ecosystems and a clean and healthy environment in itself. It might also be helpful to include all living organisms as a phrase, as this, on the one hand, includes humans and does not suggest that we are not part of the environment, and on the other hand raises awareness that living organisms are the part of the environment most threatened by chemicals."*
- *""burden" should represent a wider set of negative effects beyond "degradation" and focus on the "natural" environment. Proposed adaptations: Negative effects or impacts on the natural environment caused by activities involving the release of chemicals and waste throughout their life cycle."*
- *"Environmental and human health impacts resulting from the use and mismanagement of chemicals and waste during times of financial constraint. Additional pressures on the environment due to reduced controls, budget cuts in environmental monitoring, and the increase in informal waste management activities. Weakened institutional capacity to respond to chemical emergencies or adequately manage waste. Political and social responses, including reforms, subsidies, or regulatory adjustments, that may lead to increased or reduced risks. Cross-cutting economic indicators, such as public investment in chemical and waste management, or the evolution of employment in sectors related to recycling and hazardous chemicals."*
- *"Harm caused by chemicals and waste throughout their life cycle, leading to environmental degradation, health risks, and violations of human rights, especially for vulnerable communities."*
- *"Global Environmental Burden refers to the total and interconnected pressures that human activities exert on the Earth's environment—through pollution, climate change, resource depletion, biodiversity loss, and toxic exposures—which collectively threaten the ecological balance, human health, and planetary sustainability. This burden is often unevenly distributed, with vulnerable populations and ecosystems bearing the greatest impact despite contributing the least."*
- *"What do you mean by "the environment and its services"? The wording sounds weird."*
- *"Please find below the suggestion to change the text of the HLI objective. "To monitor the state of degradation of the environment and its services based on data, trends and releases of chemicals and waste into the environment, to promote response measures for sustainable management of chemicals and waste, and to increase public awareness and engagement.""*
- *"Degradation of the environment and its ecosystem services caused by the production, use, or disposal of chemicals and waste, where the precautionary principle compels proactive measures to prevent harm—even amid scientific uncertainty—by requiring proof of safety before permitting such activities and prioritizing safer alternatives to minimize risks across their full life cycle. "*
- *"No changes, the link between activities and chemicals is essential."*
- *"Negative impacts on the environment that result from activities/emissions involving chemicals and waste throughout their entire life cycle."*

Question 2. Objectives of HLI on the Global Environmental Burden

Stakeholders were asked whether the following possible description sufficiently captured the overall objective of the HLI "*The objectives of the HLI is to provide a comprehensive picture that integrates data on the impacts, trends, and environmental releases of chemicals and waste; tracks and promotes response measures; enhances public awareness and engagement, while reflecting the linkage with the burden of disease, and supporting progress in sustainable chemicals and waste management*". They were requested to rate the definition on a scale from 1 to 10. Responses were subsequently grouped into four categories: disagree (1–2), low agreement (3–4), agree (5–7), and strongly agree (8–10). A 94% level of agreement with the definition was observed, as presented in Figure 2.

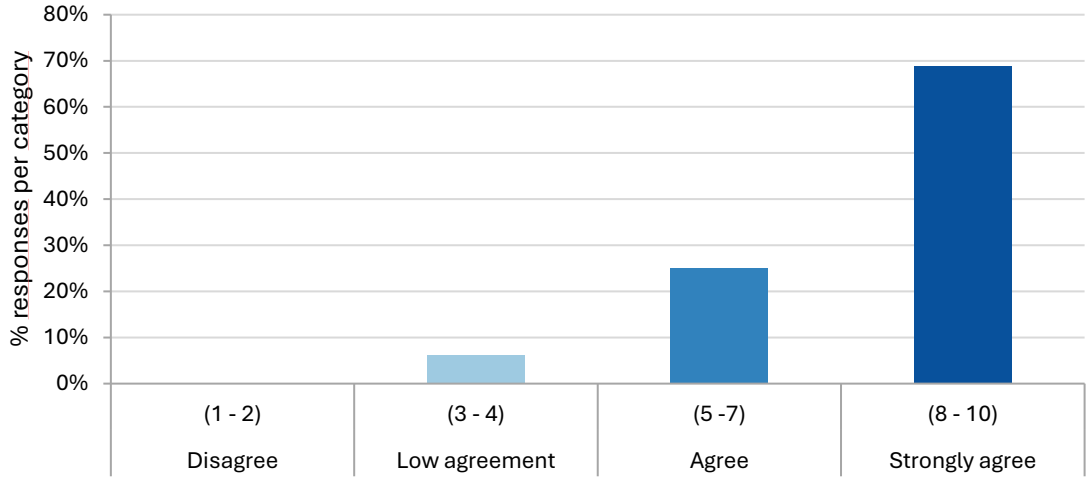

Figure 2. *Percentage of responses grouped by level of agreement with the proposed objective*

The following additional suggestion(s)/observation(s) was made:

- *"To monitor the state of degradation of the environment and its services based on data, trends and releases of chemicals and waste into the environment, to promote response measures for sustainable management of chemicals and waste, and to increase public awareness and engagement."*

Question 3. Dimensions of the HLI scope on the global environmental burden

Stakeholders were invited to indicate the level of importance (from least relevant to top priority) that each dimension should be given to the HLI, and to add additional comments on the topic. The results are presented in Figure 3, where each dimension was assigned to one of four categories: least relevant, relevant but not essential, important to focus on, and top priority.

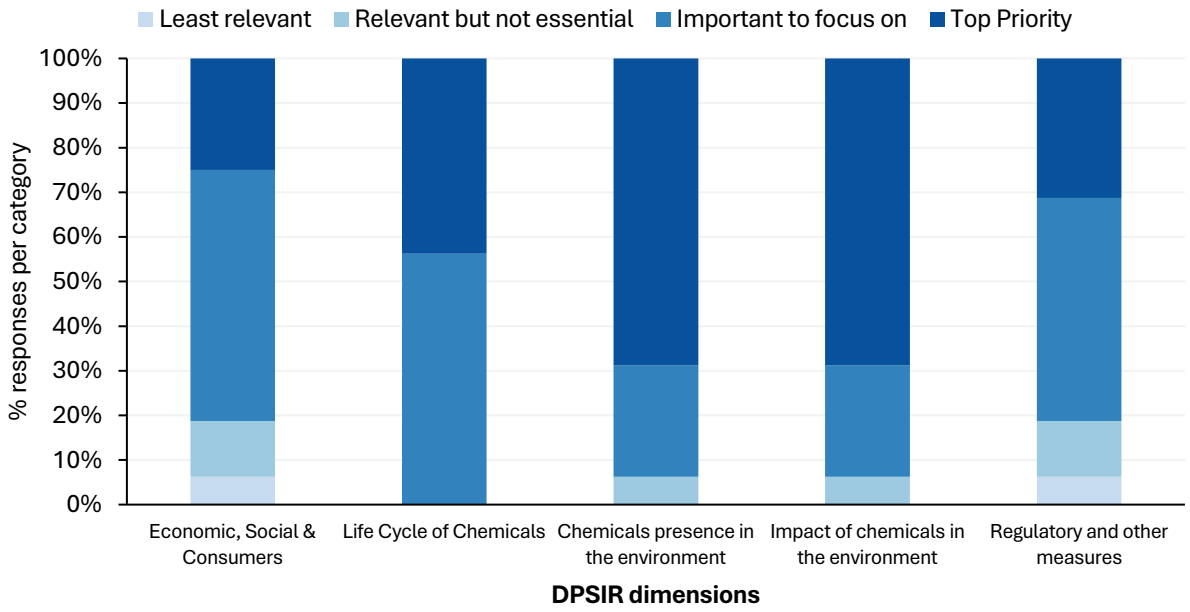

Figure 3. *Results of the level of importance that each dimension should be given to the HLI.*

The following additional suggestions/observations were made:

- *"It is extremely hard to measure the impact that "Responses" have on the "state". As the environment is a special sphere, it usually takes multiple years for the response to be reflected in the state."*
- *"Son determinantes clave del aumento en la producción, uso y desecho de productos químicos. Bajo la GFC, estas fuerzas pueden intensificarse o reconfigurarse, afectando directamente la presión sobre el ambiente. Las presiones ejercidas a lo largo del ciclo de vida (producción, uso, liberación, disposición) son fundamentales para cuantificar la carga ambiental. La medición de la presencia efectiva de sustancias en aire, agua, suelo y biota es esencial para establecer la línea base y los cambios reales en el ambiente. Refleja los efectos adversos, incluyendo contaminación, pérdida de biodiversidad, y morbilidad humana. Es clave para conectar con indicadores de salud ambiental. El monitoreo de políticas y acciones de respuesta permite evaluar la efectividad de las intervenciones y orientar mejoras, especialmente en contextos de crisis económica."*[4]
- *"Priority should be given to driving forces and regulatory responses for better results in the other three phases."*
- *"It is important to understand the different pressures during each stage of a chemical life cycle. "*
- *"The standard DPSIR framework focuses on reactive responses triggered by observed environmental impacts; DPSIR model (see Hocherman, 2023) integrates the Precautionary Principle targeting pressures and preventing harm before scientific certainty is achieved."*
- *"A high-level indicator should combine multiple aspects, not prioritize one over others"*

Question 4. Indicators and their respective sources

Task team members were asked to provide potential elements (indicators) that could constitute the HLI and be connected to the different dimensions of its scope. Additionally, they were requested to provide, alongside the indicator's name, information regarding its coverage, frequency of update, and a source link or reference to its custodian. Information not provided is noted as "NA".

a) Economic, Social, and Consumer dimension

A total of 18 indicators were proposed, with details described in Table 1 below.

Table 1. *Proposed indicators, including their name, coverage, frequency of update, and source (as per information provided), to constitute the HLI and connect with the "Economic, Social, and Consumer" dimension.*

	Indicator | Coverage | Frequency of update	Information on source
1	Number of countries with legislation in place to manage industrial and consumer chemicals | Global, national level | Annual	5
2	Carbon border adjustment / Global / Quarterly basis	6
3	Amount of fossil-fuel subsidies (production and consumption) per unit of GDP | Global, national level | Annual	5
4	Pesticide consumption | Global, national level | Annual	5

[4] Translation to English: "*They are key drivers of the increase in the production, use, and disposal of chemicals. Under the GFC, these forces may intensify or be reconfigured, directly affecting environmental pressure. The pressures exerted throughout the life cycle (production, use, release, disposal) are fundamental to quantifying the environmental burden. Measuring the actual presence of substances in air, water, soil, and biota is essential to establish the baseline and real changes in the environment. It reflects adverse effects, including pollution, biodiversity loss, and human morbidity. It is key to linking with environmental health indicators. Monitoring policies and response actions allows for assessing the effectiveness of interventions and guiding improvements, especially in contexts of economic crisis.*"

[5] https://www.chemicalsframework.org/sites/default/files/documents/SAICM_IP.4_INF_39_Rev.1.pdf

[6] https://trade.ec.europa.eu/access-to-markets/en/news/carbon-border-adjustment-mechanism-cbam

5	Household spending on chemical goods and services (cleaning products, cosmetics, pesticides, etc.) | Global / Regional | Annual	7
6	Household Consumption Expenditure | Global | Annual	8
7	Global Production of Chemicals | Global | Annual	N/A
8	Index of Industrial Production for the chemical sector | Regional / National | Monthly / Quarterly	9
9	Chemical Consumption by Sector | Regional | Periodic	10
10	Trade data of chemicals | Global | Annual	N/A
11	Proportion of informal employment in waste management and recycling | Global / National | Annual or variable by country	11
12	Consumer Behavior and Waste Generation | Sub-global | Periodic	12
13	Gender-specific exposure risks | national/regional and global | Annual	N/A
14	GDP per capita growth | Global | Annual	13
15	Employment in Chemical Industries | National | Annual	14
16	Public awareness on chemical risks | National and global | Bi-annually	N/A
17	Apparent consumption of hazardous chemicals per capita | National / Regional | Annual	15
18	Consumer behavior trends in cosmetic/pesticide/cleaning product use | Regional or national | Annual	N/A
19	Inflation, consumer prices (annual %) | Global | Annual	16
20	Employment to population ratio, 15+, total (%) (modeled ILO estimate) | Global | Annual	17
21	Children in employment, total (% of children ages 7-14) | Global | Annual	18
22	GDP per capita, PPP (current international $) | Global | Annual	19
23	Annualized average growth rate in per capita real survey mean consumption or income, bottom 40% of population (%) | National | Annual	20
24	Share of food grown in accordance with sustainability standards (biological or other standards that limit the use of pesticides and fertilisers)	21
25	Share of population that consumes more sustainable food (biological food, vegetarian, vegan)	21
26	Consumption and/or production of textiles | NA | NA	22
27	Share or surface of organically produced cotton	23

The following additional suggestions/observations were made:

- *"Exchange "Total chemicals production" with "Total chemicals production and trade" as not all produced chemicals are used in the country of production, the same goes for not accounting for imported/exported quantities. This dimension does not include anything about waste. It could be good to add indicators on per capita waste generation, recycling rate, waste disposed of.... All these indicators are part of the UNSD/UNEP Questionnaire on Environment Statistics, Waste section and some of these indicators are SDG indicators. "*

[7] https://data.oecd.org/hha/household-spending.htm
[8] https://data.worldbank.org/indicator/NE.CON.PRVT.CD
[9] https://www.oecd-ilibrary.org/industry-and-services/index-of-industrial-production-iip/indicator/english_0de2b1b4-en
[10] https://ec.europa.eu/eurostat/databrowser/view/env_chmhaz/default/bar?lang=en&category=env.env_chm
[11] https://ilostat.ilo.org/topics/informality/
[12] https://www.oecd.org/environment/consumption-innovation/
[13] https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG
[14] https://ilostat.ilo.org/topics/employment/
[15] https://www.unep.org/resources/report/global-chemicals-outlook-ii-legacies-innovative-solutions
[16] https://data.imf.org/en/news/accessing%20international%20financial%20statistics
[17] data.worldbank.org/indicator/SL.EMP.TOTL.SP.ZS
[18] https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@asia/@ro-bangkok/@ilo-dhaka/documents/publication/wcms_169128.pdf
[19] https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD
[20] https://data.worldbank.org/indicator/SL.EMP.TOTL.SP.ZS?name_desc=false
[21] https://www.fao.org/faostat/en/#data/
[22] https://www.eea.europa.eu/en/newsroom/news/consumption-of-clothing-footwear-other-textiles-in-the-eu-reaches-new-record-high
[23] https://openknowledge.fao.org/server/api/core/bitstreams/c3e60e94-076d-4898-839c-eaa552b972f6/content

- *"There need to be several other indicators such as the quantum of waste production, growth of the chemical industry, public availability of data on the gendered impacts of chemicals,"*
- *"Social and Consumer Influence: The CFP framework reflects growing consumer demand for safer, more sustainable products. Companies that reduce their chemical footprint respond to consumer preferences, regulatory pressures, and reputational risks, which in turn influence production and consumption patterns. The chemical footprint metric quantifies the use of Chemicals of High Concern (CoHCs) in products and supply chains, providing companies and investors with a clear measure of chemical management performance. This transparency supports responsible investment, risk management, and market differentiation, all of which are key economic."*
- *"This dimension is not my expertise, therefore left the boxes blank."*

b) Life cycle of chemical's dimension

A total of 27 indicators were proposed with details described in Table 2.

Table 2. *Proposed indicators, including their name, coverage, frequency of update, and source (as per information provided), to constitute the HLI and connect with the "Life Cycle of Chemicals" dimension.*

	Indicator | Coverage | Frequency of update	Information on source
1	Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP | National level | Annual	5
2	Life Cycle Impact Assessment - LCIA | Regional | NA	24
3	Production and consumption of chemicals by hazard class | Regional / EU | Annual	25
4	Chemical Waste Management Indicators | Sub-global | Periodic	26
5	Pollutant Release and Transfer Registers (PRTR) | National/Global | Annual	N/A
6	Raw materials consumption | Regional | Annual	27
7	Number of countries operating the PRTR system | NA | NA	28
8	PRTR data include releases of pollutants from industrial facilities related to the sub-dimensions: resource depletion (e.g. mining and quarrying), chemical production (e.g. chemical production, emissions), and Disposal / End-of-life (e.g. sewerage, waste management, remediation) | NA | NA	28 and national PRTR websites
9	Chemical footprint KPI of the Chemical Footprint Project (CFP) | NA | NA	29
10	GRI standards (305-307) | Multinational companies | Annually	30
11	Production and consumption of chemicals by hazard class: Tracks hazardous chemicals throughout their lifecycle | Regional | Annual	31
12	% of patents issued on new cleaner production technologies.| National level | Annual	55
13	Pollutant Release and Transfer Register (PRTR/PRTR) | Global / National | Annual	28
14	Production and consumption of chemicals by hazard class | National | Annual	N/A
15	Hazardous waste | Regional | Annual	32
16	Amount of emissions and releases into the environment based on the global PRTR data | NA | NA	28
17	Pollutant Release and Transfer Register (PRTR): Monitors industrial pollution | Global | Annual	28

[24] https://eplca.jrc.ec.europa.eu/glam.html
[25] https://ec.europa.eu/eurostat/databrowser/view/env_chmhaz/default/bar?lang=en
[26] https://lc-impact.eu/doc/deliverables/Life_Cycle_Impact_Assessment_of_chemicals.pdf
[27] https://www.indicators.be/en/i/G12_RMC/Raw_materials_consumption_%28i59%29
[28] https://www.oecd.org/en/topics/monitoring-and-preventing-industrial-pollution.html
[29] https://chemicalfootprint.org/
[30] https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/
[31] https://ec.europa.eu/eurostat/web/main/home
[32] https://www.indicators.be/en/i/G12_WSH/Hazardous_waste_%28i60%29

18	Volume of international trade in chemicals (imports/exports) | Global | Annual	33
19	Chemical imports and exports, National and Global | Annual	37
20	Municipal waste | Regional | Annual	34
21	Amount of emissions and releases of mercury into the environment | NA | NA	35
22	Amount of hazardous waste generated by industrial sector | National / Regional | Annual	36
23	Illegal trade in hazardous chemicals and wastes | Regional and Global | Annual	N/A
24	Concentration of POPs regulated by the Stockholm Convention in the environment | NA | NA	37
25	Take-back or extended producer responsibility (EPR) schemes for chemical-containing products | National and Global | Quarterly	N/A
26	Concentration of pesticides in surface water bodies | NA | NA	38
27	Concentration of ozone-depleting substances | NA | NA	39
29	Chemicals production and consumption | EU | Annual	40
30	Pesticides Use around the world | Global | Annual	41
31	Circular material use rate in Europe | EU | Annually	42
32	Production of biopesticides | NA | NA	43
33	Agricultural land that is cultivated in accordance with sustainability standards (biological, organic, etc) | NA | NA	43

The following additional suggestions/observations were made:

- *"Yes, the chemical footprint KPI of the Chemical Footprint Project (CFP) is a highly relevant indicator for the "life cycle of chemicals" dimension in the HLI. The chemical footprint metric quantitatively measures the total mass of chemicals of high concern (CoHCs) used in products and supply chains, tracking both use and reductions over time. It is designed to reflect chemical management across the entire product life cycle, including design, manufacturing, use, and end-of-life stages. The CFP framework is used globally by companies in various sectors (retail, consumer goods, electronics, building products) to assess, disclose, and reduce their chemical footprint, supporting transparency and safer chemistry transitions."*
- *"To facilitate informed decision-making for all life stages of chemicals that are parts of materials and products, we need to develop a transparency and traceability system: This could be done under any of the GFC Implementation Programmes. "*
- *"Considering all life cycles stages of chemicals should be taken into account. Like for example now at the EU PFAS restriction proposal, the industry is indicating that fluoropolymers are to be considered polymers of low concern and have no effect during hum (env) exposure. However, during manufacturing various PFAS are released at the FP plants. New studies demonstrate such releases (e.g. [44]). Furthermore, during the waste stage FPs are not degraded to non PFAS at current household waste incineration."*

c) Presence of chemicals in the environment dimension

A total of 28 indicators were proposed with details described in Table 3.

[33] https://comtrade.un.org/
[34] https://www.indicators.be/en/i/G12_WST/Municipal_waste_%28i62%29
[35] https://www.unep.org/topics/chemicals-and-pollution-action/pollution-and-health/heavy-metals/mercury/global-mercury-2
[36] https://www.basel.int/Implementation/NationalReporting/LatestReports/tabid/7932/Default.aspx
[37] https://www.unep.org/topics/pollution-and-health/persistent-organic-pollutants-pops/global-monitoring-persistent-organic
[38] https://www.unep.org/resources/report/environmental-and-health-impacts-pesticides-and-fertilizers-and-ways-minimizing
[39] https://wesr.unep.org/index.php/article/ozone-layer-protection
[40] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Chemicals_production_and_consumption_statistics
[41] https://www.fao.org/faostat/en/#data/RP/visualize
[42] https://ec.europa.eu/eurostat/databrowser/view/env_ac_curm__custom_13756021/default/table?lang=en
[43] https://www.fao.org/faostat/en/#data/SDGB
[44] https://pubs.acs.org/action/showCitFormats?doi=10.1021/acs.est.4c13943&ref=pdf

Table 3. *Proposed indicators, including their name, coverage, frequency of update, and source(as per information provided), to constitute the HLI and connect with the "* Presence of chemicals in the environment*" dimension.*

	Indicator | Coverage | Frequency of update	Information on source
1	Levels of persistent chemicals in the environment and in humans due to anthropogenic emissions and releases | National level | Annual	5
2	Per- and polyfluoroalkyl substances (PFAS) | Regional | NA	45
3	Chemical Indicators for Pollution Detection | Terrestrial and Aquatic Ecosystems | Periodic	46
4	Concentration of hazardous substances in biota | National | Varies	NA
5	Greenhouse gas emissions | Regional | Annual	47
6	Concentration of POPs regulated by the Stockholm Convention in the environment (Concentration of pesticides in surface water bodies) | NA | NA	38
7	PRTR data include releases of pollutants to air, water, and land. Eco-toxicity weighted releases can be also calculated. | NA | The data can be updated periodically (mostly annual update).	28
8	Chemical Footprint KPI of the Chemical Footprint Project (CFP) | NA | NA	29
9	PRTR | Global | Annual	28
10	Pollutants released to the environment | National level | Annual	5
11	PFAS pollution in European waters | Regional | NA	48
12	PFAS levels in surface and drinking water | National and Regional | Varies	N/A
13	Nitrates in river water | Regional | Annual	49
14	Concentration of pesticides in surface water bodies | NA | NA	38
15	Global POPs monitoring: Tracks persistent organic pollutants | Global | Frequency varies	37
16	Amount of pesticide use per hectare | National level | Annual	5
17	Microplastics and associated chemical contaminants in the marine environment | National and Regional | Varies	N/A
18	Nitrates in groundwater | Regional | Annual	50
19	Ozone-depleting substances: Measures substances that harm the ozone layer | Global | Annual	39
20	Emissions of pollutants into the atmospheric air | National level | Annual	5
21	Presence of EDCs in surface water, sediments, and biota (e.g. phthalates, BPA, nonylphenol, parabens) | National and Regional | Varies (based on national monitoring programs)	51
22	Oil pollution | Regional | Annual	52
23	Global Mercury Observation System (GMOS) | Global | Annual	53
24	Most hazardous Pesticide use per area of cropland | National level | Annual	55
25	Ambient air concentrations of hazardous chemicals (PM2.5, SO_2, NOx, VOCs, benzene, dioxins) | National and Regional | Varies	N/A
26	OSPAR environmental monitoring, e.g. of chemical pollutants and plastic litter | Regional | Annual	54
27	Let's stay updated regarding PARC activities on this matter | NA | NA	55
28	Enforcement (EU), projects | NA | NA	56
29	Global POPs monitoring | N/A | N/A	57

[45] https://echa.europa.eu/hot-topics/perfluoroalkyl-chemicals-pfas
[46] https://bnrc.springeropen.com/articles/10.1186/s42269-019-0203-x
[47] https://www.indicators.be/en/i/G13_GHG/Greenhouse_gas_emissions_%28i64%29
[48] https://www.eea.europa.eu/en/analysis/publications/pfas-pollution-in-european-waters
[49] https://www.indicators.be/en/i/G06_NIT/Nitrates_in_river_water_%28i33%29
[50] https://www.indicators.be/en/i/G06_NGW/Nitrates_in_groundwater_%28i34%29
[51] https://www.eea.europa.eu/data-and-maps/indicators/chemicals-in-the-european-environment-1/
[52] https://www.indicators.be/en/i/G14_OPO/Oil_pollution_%28i68%29
[53] https://www.gmos.eu/
[54] https://www.ospar.org/work-areas/eiha
[55] https://www.eu-parc.eu/thematic-areas/risk-assessments/monitoring
[56] https://echa.europa.eu/de/about-us/who-we-are/enforcement-forum/forum-enforcement-projects
[57] http://www.unep.org/topics/pollution-and-health/persistent-organic-pollutants-pops/

30	Ozone-depleting substances | Global | Annual	58
31	Hazardous substances in biota | Regional | Not consistent	59
32	GHG emissions | Global | Annual	60
33	Pesticides in rivers, lakes and groundwater in Europe | EU | 2017-2022	61
34	European Monitoring and Evaluation Programme | NA | NA	62
35	Arctic Monitoring and Assessment Programme | NA | NA	63
36	IPCHEM - the Information Platform for Chemical Monitoring | NA | NA	64

The following additional suggestions/observations were made:

- *"Availability of (validated) analytical methods on soil, water, air, with which qualitatively and quantitatively chemicals/substances can be measured/monitored."*
- *"Availability of reference standards of chemicals to be monitored. Actually, when a substance is registered/authorized to be available on the market, analytical methods and reference standards should be submitted to the authorities at this very moment."*
- *"This KPI provides a standardized, quantitative measure of hazardous chemical use, enabling year-over-year tracking and benchmarking of progress toward reducing chemical risks. The metric is analogous to a carbon footprint but focuses on toxic chemicals rather than greenhouse gases."*
- *"The reference to GHG emissions does not seem directly relevant."*

d) Impact of chemicals in the environment dimension

A total of 21 indicators were proposed, with details described in Table 4.

Table 4. *Proposed indicators, including their name, coverage, frequency of update, and source (as per information provided), to constitute the HLI and connect with the " Impact of chemicals in the environment" dimension.*

	Indicator | Coverage | Frequency of update	Information source
1	Total amount of fertilizers used (Natural fertilizers + Chemical fertilizers); Area, mass, volume; National • Subnational • By ISIC economic activity (forestry, agriculture) • By type of fertilizer • By type of pesticide | NA | NA	21, 65, Stockholm Convention.
2	Water Quality Index for Biodiversity (Trends in ecosystems affected by pollution | National level | All five years	5
3	Substances restricted under REACH - ECHA - European Union | Regional | NA	66
4	Species occurrence | Global | NA	67
5	Toxic Release Inventory (TRI) | National | Annual	68
6	Red List Index (Impact of Pollution) | National and Global | NA	69
7	Premature deaths due to chronic diseases | Regional | Annual	70
8	Human toxicity/Ecotoxicity weighted releases | NA | NA	28
9	Eco-toxicity weighted releases based on PRTR data can show the impact of chemicals in the environment. | NA | The data can be updated periodically (mostly annual update).	28

[58] https://wesr.unep.org/index.php/article/ozone-layer-protection
[59] https://oap.ospar.org/en/ospar-assessments/quality-status- reports/qsr-2023/indicator-assessments/
[60] https://unfccc.int/topics/mitigation/resources/registry-and-data/ghg-data-from-unfccc
[61] https://www.eea.europa.eu/en/analysis/indicators/pesticides-in-rivers-lakes-and/country-surface-area-in-km2?activeTab=570bee2d-1316-48cf-adde-4b640f92119b
[62] https://www.emep.int/
[63] https://www.amap.no/maps-and-graphics
[64] https://ipchem.jrc.ec.europa.eu/
[65] https://unstats.un.org/unsd/environment/FDES/FDES-2015-supporting-tools/FDES.pdf
[66] https://echa.europa.eu/substances-restricted-under-reach
[67] https://www.gbif.org
[68] https://www.epa.gov/toxics-release-inventory-tri-program
[69] https://www.bipindicators.net/indicators/red-list-index/red-list-index-impacts-of-pollution
[70] https://www.indicators.be/en/i/G03_DCP/Premature_deaths_due_to_chronic_diseases_%28i16%29

10	Chemical Footprint (CFP) KPI (mass)[71] | NA | NA	29
11	Impact of Pollution: Assesses the impact of pollution on species | Global | Frequency varies	72
12	More indicators can be derived from the link | NA | NA	65
13	Biodiversity loss due to chemicals, link to the CBD | NA | NA	NA
14	Authorisation list under REACH - ECHA - European Union | Regional | NA	73
15	Chemical Footprint of Products | Sub-global | Periodic	74
16	Freshwater and marine eutrophication (due to nutrient and chemical pollution) | National and Global | Annually	N/A
17	Ocean Acidification: Measures the impact of CO_2 on ocean pH levels | Regional | Annual	75
18	Red List Index (impacts of pollution) (Trends in extinction risk and populations driven by pollution | National or regional level | All five years	5
19	Extent of ecosystems affected by persistent chemicals (e.g. POPs, PFAS hotspots) | National and Global | Annually	N/A
20	EU PARC| Regional | Annual	76
21	Novel Entities Planetary Boundary status | Global | Varies	77
22	Ocean Health Index | Global | Annual	78
23	Water Quality Index for Biodiversity | Global | N/A	79
24	Cumulative Human Impacts on Marine Ecosystems | Global | N/A	80
25	Red List of Ecosystems | Sub-global | N/A	81
26	Soil monitoring | N/A | N/A	82
27	Monitoring of insect populations | N/A | N/A	83

The following additional suggestions/observations were made:

- *"Please use the Framework for the Development of Environment Statistics, 2013, published by UNSD and includes a lot of information on indicators to be used for chemicals[65]."*
- *"The above indicator (n° 8) suggested quantifies the impact of chemicals released into the environment."*
- *"A relevant indicator for the "Impact of chemicals in the environment" dimension, aligning with planetary boundaries (novel entities) and sustainable chemical management goals"*

e) Regulatory and Other Response Measures Dimension

A total of 18 indicators were proposed with details described in Table 5.

[71] Additional description provided: "is a relevant indicator for the "Impact of chemicals in the environment" dimension, aligning with planetary boundaries (novel entities) and sustainable chemical management goals. Quantifies use of Chemicals of High Concern (CoHCs) – persistent, bioaccumulative, toxic, or mobile substances – across products, packaging, and supply chains. Directly addresses the "novel entities" boundary by tracking synthetic chemicals exceeding Earth's assimilation capacity. This indicator complements existing biodiversity-focused metrics (e.g., Red List Index) by targeting anthropogenic drivers of chemical pollution"
[72] https://www.bipindicators.net/
[73] https://echa.europa.eu/authorisation-list
[74] https://link.springer.com/article/10.1065/espr2005.08.285
[75] https://www.eea.europa.eu/en/analysis/indicators/ocean-acidification
[76] https://www.eu-parc.eu/news/science-policy/first-joint-eu-wide-assessment-chemical-pollution-drivers-and-impact-released
[77] https://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundary-framework.html
[78] https://www.bipindicators.net/indicators/red-list-index
[79] https://www.bipindicators.net/indicators/water-quality-index-for-biodiversity
[80] https://www.bipindicators.net/indicators/cumulative-human-impacts-on-marine-ecosystems
[81] https://www.bipindicators.net/indicators/red-list-index-of-ecosystems
[82] https://esdac.jrc.ec.europa.eu/euso/soil-monitoring
[83] https://ipt.nina.no/resource?r=insectdb

Table 5. *Proposed indicators, including their name, coverage, frequency of update, and source (as per information provided), to constitute the HLI and connect with the "* Regulatory and other response measures*" dimension.*

	Indicator | Coverage | Frequency of update	Information on source
1	Number of countries that have legislation in place to manage industrial and consumer chemicals | Global level | Annual |	5
2	Market Surveillance Conformity (ANNEX XVII REACH) | Regional | NA	84
3	Air Quality Index (AQI) | Regional | Daily	85
4	Number of countries implementing national action plans for chemicals and waste (e.g. NIPs under Stockholm Convention) | National | Varies	N/A
5	PRTR data[86] | NA | The data can be updated periodically (mostly annual update).	28, national PRTR webpages
6	Chemical Footprint KPI (mass) of the Chemical Footprint Project (CFP) | NA | NA	29
7	Progress in the management of contaminated sites: Tracks remediation efforts | Regional | Every 5 years	87
8	Number of tools, guidelines and best practices available (international, regional, national) | National, regional and global level | Annual |	5
9	Biodiversity Index | Global | 5 years	88
10	Implementation of pollutant release and transfer register (PRTR) systems | National | Varies	N/A
11	Environmental tax: Measures fiscal policies aimed at reducing environmental impact | Sub-global | Annual	89
12	Countries which have implemented pesticide legislation based on the FAO/WHO International Code of Conduct | Global | Annual	5
13	Bans/restrictions on specific hazardous substances (e.g. POPs, HHPs, PFAS) | National | Varies	N/A
14	ESPR with fully developed requirements for materials/products safe by design and Digital Product Passports. This can be reflected in the number of products with Digital Product Passports in the publicly available database., regional, continuous. It will be operational within the next few years. | NA | NA	90
15	Budget allocated to chemicals and waste management | National| Annual	N/A
16	Gender-responsive chemical safety policies (e.g., gender mainstreaming in national chemical policies) | National and Global | Varies	N/A
17	ECHA, restrictions| NA | NA	66
18	OECD, PFAS | NA | NA	91
19	SDG Indicator 12.4.1 International agreements on hazardous waste| Global | Annual	92
20	SDG 12.1.1 Number of countries developing, adopting or implementing policy instruments aimed at supporting the shift to sustainable consumption and production | Global | Annual	93

The following additional suggestions/observations were made:

[84] https://data.europa.eu/data/datasets/restricted-list-reach?locale=en
[85] https://waqi.info/
[86] Additional information provided: "Protocol on PRTR is one of the MEAs. OECD legal instrument on PRTRs is a driving force for countries to establish and implement PRTR systems. PRTR data are a driving force for safer and alternative solution. The data are directly linked to SDG12, Target 12.4. One of the main purposes of PRTRs is to promote voluntary measures by enterprises to prevent pollutions."
[87] https://www.eea.europa.eu/en/analysis/indicators/progress-in-the-management-of
[88] https://geohub.data.undp.org/data/683138801529c7aa73636710d4b55927
[89] https://www.oecd.org/en/topics/policy-issues/tax-and-the-environment.html
[90] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1781&qid=1719580391746
[91] https://www.oecd.org/en/topics/sub-issues/risk-management-risk-reduction-and-sustainable-chemistry/per-and-poly-fluorinated-chemicals.html
[92] https://ourworldindata.org/sdgs/responsible-consumption-production#sdg-indicator-12-4-1-international-agreements-on-hazardous-waste
[93] https://ourworldindata.org/sdgs/responsible- consumption-production#sdg-indicator-12-1-1-sustainable-consumption-and-production-action-plans

- *"We can add more gender-specific indicators such as Gendered health impacts from chemical exposure. Implementation of gender-sensitive waste management policies and response measures, Number of countries with gender-specific measures in national action plans on chemicals and waste, and Gender analysis of chemical exposure in high-risk sectors (e.g., agriculture, informal waste sector)."*
- *"The KPI supports transparency, encourages the adoption of restricted substances lists (RSLs) and manufacturing RSLs (MRSLs), and incentivizes the transition to safer alternatives—key goals of regulatory and policy interventions."*
- *"We would be looking for indicators in regard to the implementation of chemical management systems, next to (voluntary) recovered area's."*

Question 5. Structure and other elements of the HLI

The survey indicated that the HLI could be structured into multiple layers: basic indicators at the foundational level, composite indicators (combining two or more indicators into a single metric) at intermediate levels, and higher-level indicators at subsequent layers. It further noted that the HLI structure could hence be organized in different ways depending on the grouping approach chosen.

Stakeholders were invited to indicate what should be, in their opinion, the grouping at the sub-HLI level. Participants were requested to choose between environmental matrices, a footprint approach, no opinion at this stage, or other. Under the "Other" option, members could suggest alternatives. The results are presented in Figure 4. Most of the responses (44%) favoured the environmental matrices, followed by 19% for the footprint approach, and 19% for the option "other". Within the "Other" option, two different views were expressed: 17% suggested that there should be no clustering, while 7% proposed grouping by both chemical categories and environmental matrices.

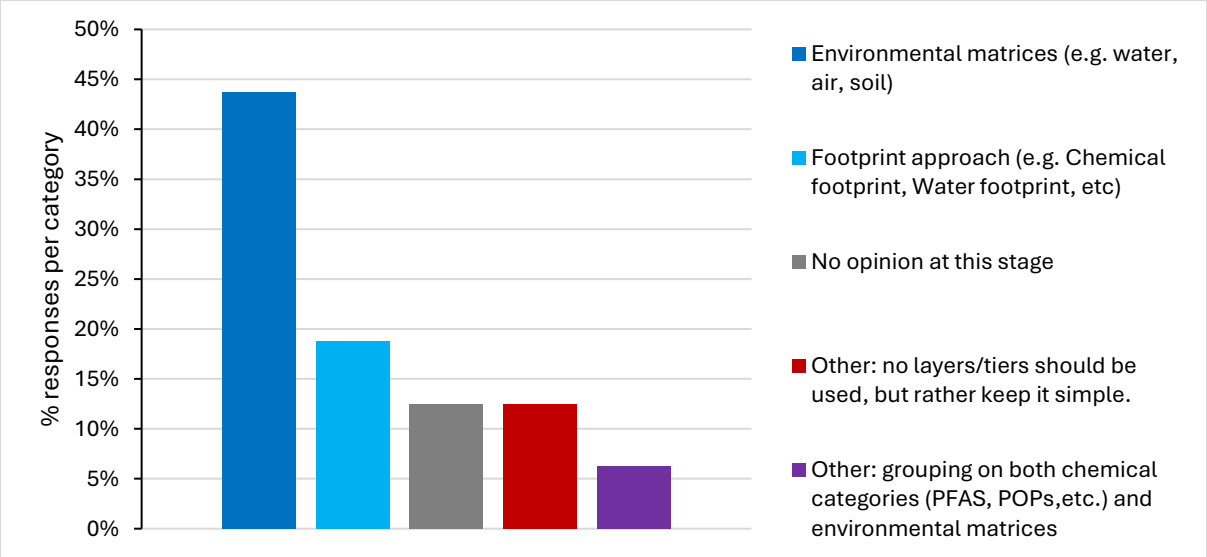

Figure 4. *Results about HLI structured into multiple layers.*

Stakeholders were also invited to indicate what indicator/information currently unavailable should be considered in the future to build a more robust HLI. The following responses were provided:

- *"Contribution of different stressors (e.g. chemicals, nutrients, invasive species, etc.) to a common target (i.e. biodiversity loss)"*
- *"Community Health Impact "*
- *"Emerging Pollutants"*
- *"Global Trade of Chemicals"*
- *"Integration with Planetary Boundaries"*
- *"Chemical footprint"*

- *"A globally harmonized transparency and traceability system for chemicals in manufactured materials and products would allow us to make informed decisions for all life stages of materials, supporting reuse and recycling free from harmful chemicals, as well as sound management of waste."*
- *"Analytical methods and chemical reference standards of chemicals*."

Question 6. Any other suggestions for the improvement of the HLI

Participants were asked if, in their opinion, other improvements could be taken into consideration. The following suggestions were made:

- *"EU regulatory evaluation of the socioeconomic impact of sustainability should be integrated into HLI"*
- *"Databases (EG ICSMS) on the nonconformity of environmental chemicals should be the basis for the indicator's development."*
- *"Prioritize data harmonization across different countries, particularly for low- and middle-income regions, to ensure comparability and inclusiveness. "*
- *"Include indicators that track chemical pollution's impacts on human rights, biodiversity loss, climate change, and human health, particularly among vulnerable populations. "*
- *"Promote transparency and open access to chemical data globally. Integrating lifecycle analysis and monitoring emerging contaminants will improve relevance. "*
- *"Multi-stakeholder engagement, including Indigenous knowledge systems, can enhance contextual accuracy. "*
- *"Finally, these indicators should also align with existing international frameworks, such as the SDGs, to drive coherent, cross-sectoral action in reducing the global environmental burden of chemicals."*
- *"The sharing of FAIR data should be encouraged on a global basis, in order to monitor more efficiently the management of chemicals and waste along their whole life cycle."*
- *"PRTR data, including eco-toxicity weighted releases, can directly contribute to a quantitative HLI, as they are closely related to all dimensions covered in this survey. The HLI on global environmental burden should be simplified and avoid multiple layers as much as possible; otherwise, reaching a consensus may be difficult."*
- *"Just a few points: For the objective of the HLI to provide a comprehensive picture is well described regarding data integration. It is just that 'while reflecting the linkage with the burden of disease' is highly recommended to be left out.... since for every substance, in a group of substances (PFAS for example) for where for not every single substance a burden of disease has been demonstrated, this comprehensive picture should be made."*