

IOMC Report on SAICM Emerging Policy Issues and Other Issues of Concern

20 July 2023

The Inter-Organization Programme for the Sound Management of Chemicals (IOMC) is submitting report on recent progress on Emerging Policy issues and Other Issues of Concern, identified under SAICM.

These issues are part of the 19 Issues considered in the Assessment report on issues of concern, and are for which UNEP was asked to seek views on priorities for further work and on potential further international action, by UNEA resolution 5/7.

Organizations of IOMC have been leading work on these Issues, as highlighted below.

Contents

(A) Lead in Paint.....	2
(B) Chemicals in Products.....	5
(C) Nanotechnology and manufactured nanomaterials	8
(D) Hazardous substances within the life cycle of electrical and electronic products (HSLEEP)	10
(E) Perfluorinated chemicals and the transition to safer alternatives.....	11
(F) Highly hazardous pesticides (HHPs).....	14
(G) Endocrine-disrupting chemicals (EDCs).....	18
(H) Environmentally persistent pharmaceutical pollutants (EPPPs).....	21
Annexes.....	24

(A) Lead in Paint

Submitted by: WHO, UNEP

1. Lead is a cumulative toxicant with chronic and debilitating impacts on multiple body systems. Lead can affect all age groups but young children and pregnant women are particularly vulnerable, with impacts on neurodevelopment and IQ. Globally, exposure to lead is attributed to 0.9 million premature deaths per year, primarily due to cardiovascular disease. Evidence continues to emerge that cardiovascular impacts and consequent disease burdens may be significantly higher. No safe level of exposure to lead has so far been established and reducing the adverse health effects from lead in paints can only come from prevention - reducing and eliminating sources of exposures as far as possible.
2. Paint is one of the sources of exposure to lead where interventions are relatively straightforward. Lead is not needed in paint and increasingly countries are instituting lead paint laws to strictly control their use.
3. Efforts under the Strategic Approach to International Chemicals Management (SAICM) started in 2009, when the International Conference on Chemicals Management adopted resolution II/4.B identifying lead as an emerging policy issue and endorsing the creation of a global partnership to promote the phase-out of lead paint.
4. In 2011 the World Health Organization (WHO) and the United Nations Environment Programme (UNEP) established the Global Alliance to Eliminate Lead Paint (the Alliance). The overall goal of the Alliance is to prevent children's exposure and minimize occupational exposure to lead from paints.
5. Several features of the Alliance have helped ensure its success. An operational framework and business plan with clear goals, objectives, milestones, and indicators set an important global focus and motivation for countries to make change at the national level.
6. The Alliance's Advisory Council met on 22 June 2023 to discuss the present progress report and analysis of progress achieved. Key points include:
 - The target for the **number of countries with legally-binding laws** for lead paint was met in 2022 with 93 governments with binding laws in place. Further work is needed to meet the Alliance's 2023 target of 100 enacted laws and post 2023 targets which are expected to be set in 2024. The aspiration being that all countries having such laws.
 - The target for the **number of paint companies committed to the work** of the Lead Paint Alliance needs further effort, however in recent years the number of paint companies and industry associations working on the issue has increased, with 25 paint industry partners and at least 25 companies having conducted paint reformulation pilots as of March 2023.

- The annual WHO International Lead Poisoning Prevention Week in (ILPPW) in 2022 resulted in 117 events in 57 countries - a doubling of the number of events since 2013. Social media shows increasing participation and increased country participation is a target for the 2023 **awareness-raising target** with the aim of reaching the Global Alliance target of events in 70 countries.
 - **Membership in the Alliance** is on target has exceeded targets increasing from 26 contributors in 2013 –to 107 in 2022 including 26 governments, 50 non-government organizations, 5 inter-governmental organizations, 6 academic organizations or institutions, 20 industry or trade associations.
7. Testing paints on the market, as been spearheaded by International Pollutants Elimination Network (IPEN) working in 59 countries in collaboration with local partners. Annual updates on the status of national lead paint regulations; and reviewing and commenting on draft regulations have also been important parts of the work.
 8. Production and dissemination of a substantial range of Alliance tools and resources in UN languages continues to have an important place in informing and assisting Member States, these materials are regularly updated and include general advocacy and awareness materials, technical information and policy briefs; Q &As; annual updates on the status of countries’ legal limits, videos and graphic materials. Technical resources include a model law and guidance on regulating lead paint (2018); an online toolkit for establishing laws to eliminate lead paint; guides to measuring lead in paint and measuring lead in blood (2020); technical guidelines on reformulating lead paint (2022); and a guide to lead paint compliance and enforcement (2023).
 9. Recognizing the important role of the Alliance, the Global Environment Facility (GEF) provided financial support through a project on Global Best Practices on emerging policy issues of concern under SAICM. The GEF project was executed by the SAICM secretariat with support from a strong technical team working in collaboration with the Alliance and comprising the American Bar Association Rule of Law Initiative, IPEN, National Cleaner Production Centres in four countries, the US Environmental Protection Agency, the World Coating Council, UNEP and WHO. The GEF provided additional funding of \$3M USD with \$6M USD in co-financing was garnered from participating organizations over the period June 2019 - June 2022. Lead paint elimination workshops were held in Asia-Pacific, Africa and Latin America and the Caribbean and national initiatives across these regions to eliminate lead paint. The GEF Project met its target by assisting 21 countries to enact laws for lead in paint and helping another 19 countries with establishing laws that are in final stages of enactment. Twenty-five paint producers in 7 countries have completed paint reformulation pilots to demonstrate the production of paint without added lead components.
 10. In conclusion, considerable progress has been made and this brings us halfway towards the overall objective of elimination of lead paint. With additional effort the issue can be solved. There remain at least 73 countries that do not have legally binding restrictions on lead paint, although work is in progress in 31 of these. Understanding what is needed to achieve success will be instrumental in moving forward. Countries without laws may remain insufficiently aware that lead paint should be eliminated, or lack basic chemicals regulatory arrangements, political priority or evidence that lead paint is being used in their countries. Small and medium enterprises may face obstacles including a lack of know-how for reformulation. Some countries

with limited regulation for chemicals may wish to improve their chemicals regulatory framework, gain specific expertise for conducting regulatory impact assessments, or learn how to prevent imports of pigments containing lead and promote compliance.

11. Through the Alliance, UNEP and WHO can continue to play an important role in promoting national action however further recognition of the global importance and necessary momentum to complete the task is needed. High-level support for reducing exposure to lead has recently come from the G7 Climate, Energy and Environment Ministers communique in May 2022 and 2023. Additional work and support in this forum is ongoing.

(B) Chemicals in Products

Submitted by: UNEP

Chemicals are important building block for many of the products modern society uses and relies on. They enhance the performance and functions of materials and are also widely used in auxiliary processes or manufacturing. However, some chemicals are hazardous and, through their release from products or manufacturing lines, can have adverse impacts on human health and the environment at different stages of a products life cycle. Certain chemicals can also complicate or hinder the recyclability of materials at their end of life. Understanding and managing chemicals in products and their global supply chains is critical to advance sustainable consumption and production and phasing out the use of chemicals of concern in products plays a crucial role in addressing the global pollution challenge.

The transparency of information on chemicals in global supply chains has been an emerging policy issue for SAICM since 2009, leading to programmes such as the UNEP Chemicals in Products (CiP) Programme that focuses specifically on the textiles, toys, electronics and building materials sectors.

UNEP has led the work on Chemicals in Products since 2008 and - at the invitation of ICCM4 - continues facilitating CiP Programme pilot and implementation activities, stakeholder awareness and capacity building. The CiP Programme was produced through extensive research and stakeholder consultations, and was welcomed by the SAICM Governing Body in 2015 (at ICCM4) as the means for all stakeholders to advance on this complex issue.

One-pagers from respective Stakeholders Groups:

One-pagers have been developed by the respective stakeholders group participating in the CiP Steering Group in consultation with their constituencies and aimed at providing information on the programme and engaging those already active in the field to showcase and share their initiatives. Given the complexity, breadth, and rapid ongoing developments, these papers reflect the view of each group and might not reflect the views of other stakeholders.

Disclaimer: The designations employed and the presentation of the material in these publications do not imply the expression of any opinion whatsoever on the part of the United Nations Environment Programme or of the members of the CiP Steering Group concerning the legal status of any country, territory, city or area or of its authorities, or concerning delimitation of its frontiers or boundaries. Moreover, the views expressed do not necessarily represent the decision or the stated policy of the United Nations Environment Programme, nor does citing of trade names or commercial processes constitute endorsement.

Civil Society Group : [Guidance to the Chemicals in Products \(CiP\) Programme for non-governmental organizations \(NGOs\) representing the public interest – 2017](#)

Industry Group : [Key Features for Exchanging Product Information along the Supply Chain: An interpretation of the SAICM Chemicals in Products \(CiP\) Programme Guidance document from an industry view point - 2017](#)

Government Group: [Synopsis of the Chemicals in Products \(CiP\) Programme guidance for Governments - 2017](#)

Regulations Search Engine - 2021

In the context of the CiP Programme and in order to facilitate multi-stakeholders' access to worldwide information on regulations, a link to the database of Global Chemical Regulations developed by Chemreg.net is available through this [link](#). This comprehensive database contains existing global regulations and provides a free search engine.

Beyond the Chemicals in products programme, on-going projects are addressing chemicals in products.

Throughout the GEF-funded SAICM project "Global Best Practices on Emerging Chemical Policy Issues of Concern under SAICM" (2019-2023) tools and guidance have been developed in the three targeted value chains.

Under component 2, on "life cycle management of chemicals present in products", UNEP is working in close collaboration with stakeholders, to help further address the issue of chemicals in products on a global scale by developing and disseminating knowledge, tools and guidance and providing platforms for continued exchange. This work aims at helping to advance the sound management of chemicals and to increase transparency within supply chains in order to support the controlling and eventual phasing out of chemicals of concern in products. Key targets already achieved on chemicals in products:

- Tools for governments and value chain actors to manage chemicals of concern in products
- 40+ value chain and government actors involved

The work focuses on chemicals of concern in three sectors (building products, electronics and toys) and how to minimize the adverse effects of chemicals of concern.

Buildings: Report on chemicals of concern and potential alternatives in the building sector; USEtox-based model to assess chemicals in building products in the context of life cycle assessment (LCA); Global guidance for sustainable public procurement and for eco-innovation in the building products sector; Guide for banks on setting up green mortgages; Information Hub on Building Materials.

Electronics: Global guidance for sustainable public procurement and for eco-innovation in the electronics sector; Report on regulatory approaches addressing CoC in electronics and policy recommendations; Regional studies (Latin America and the Caribbean, and Central and Eastern European regions) on life cycle management of electronics; Analysis on how ecolabels address the issue of CoC and recommendations for further harmonization and integration

Toys: Toolkit to support regulation and compliance in the toy sector; Report on regulations for chemicals in toys in China; Report reviewing toy safety policies and regulations in selected Low- and Medium-Income Countries (LMIC).

In addition training and support has been delivered to government and value chain actors to trial and adopt new guidance and tools. This includes Training on how to use the USEtox model for companies in the building products and toy sectors in Sri Lanka and China; Eco-innovation and/or Sustainable Public Procurement training and/or pilot projects in Colombia and Sri Lanka; Sustainable finance pilot

project in Sri Lanka; and Training and consultations on regulatory and compliance approaches for toys and electronics sectors.

More information on tools developed, by sector, and implementation can be found : [Global Best Practices on Emerging Chemical Policy Issues of Concern under SAICM | SAICM Knowledge](#)

More information on Chemicals in Products global developments, can be found in the [UNEP Assessment report of issues of concern and its annexes](#) and its related [fact sheet on Chemicals in Products](#).

Complementary, upon request from UNEA-4 in 2019, UNEP has developed Green and Sustainable Chemistry Manuals, to support chemistry innovation compatible with sustainability agenda : [Green and Sustainable Chemistry | UNEP - UN Environment Programme](#). UNEP's Green and Sustainable Chemistry Framework Manual was welcomed at UNEA-5, and it's use was encouraged. Work has been carried out to apply the Manual and advance green and sustainable chemistry innovation in the buildings and construction sector, including an [expert workshop](#) held in Paris in January 2023.

(C) Nanotechnology and manufactured nanomaterials

Submitted by: OECD, UNITAR, with additional input from WHO

1. In 2022, UNITAR finalised a new version of its e-Learning course on “Nanomaterials safety”. The course is self-paced, takes approximately 30-40 hours to complete and includes videos, interactive lessons, reading materials and quizzes. The three modules cover: Introduction to Manufactured Nanomaterials, Hazard assessment, safety and risks of manufactured nanomaterials, and Risk management of manufactured nanomaterials, including societal dimensions - global approaches. It can be accessed at <https://cwcourses.unitar.org/>.
2. UNITAR collaborated with the Adolphe Merkle Institute of the University of Fribourg to develop an academic paper on “the need for awareness and action in managing nanowaste”, published in Nature Nanotechnology in March 2023. The full article is freely available online: <https://rdcu.be/c6Pcl>. Waste containing nanomaterials — or nanowaste — is an emerging safety concern worldwide, requiring environmentally sound management and regulation that still need to be established. Researchers at the University of Fribourg point out the gaps and provide first solutions for guidance. The research paper was also a direct contribution to discussions under the Basel Convention, as well as being of relevance to SAICM.
3. UNITAR and OECD attended the International Conference on "How the world deals with materials at the nanoscale" on 22-23 June 2023, in Berlin. UNITAR presented its activities over the last several years, including its national projects, regional workshops, its e-Learning course and the development of guidance materials. OECD presented the evolution of the work regarding safety of nanomaterials. The overview gave information on the initial questions regarding safety, identification of the areas where standards and guidance for addressing their potential concerns need to continue to be developed, as well as the areas that need to be anticipated for the future.
4. UNITAR proposes to continue its work on manufactured nanomaterials and nanotechnologies, by supporting countries in developing national policies for nanosafety, organising regional workshops to share government (particularly as new regulations come into force around the world), IGO (including any new guidance and initiatives), private sector, civil society and academic updates, engage the nano regional networks that have been established through previous workshops, and support the ongoing sound management of such materials and technologies. UNITAR would also envisage updating its guidance document for the “Development of a National Nanotechnology Policy and Programme”, should resources be available.
5. OECD promotes international cooperation on the human health and environmental safety aspects of manufactured nanomaterials and advanced materials. Its objective is to facilitate cooperation among countries in assessing the safety implications of nanomaterials and advanced materials and to identify strategic solutions to common challenges. This remains its major objective in the area of nanomaterials, while considering the safety of nanomaterials within the context of chemicals management. The OECD Council adopted a relevant recommendation in 2013, that is open for adherence by non-OECD countries with the aim of enhancing international cooperation in that regard. aligns the approaches of nanomaterials, and more recently advanced materials, to the rest of the work on chemical management, the WPMN gathered a combined expertise from different areas of risk management, creating a diverse convergence of disciplines with a single goal, which is to anticipate challenges posed by emerging materials. Consequently, a central area of the OECD

work is the development of harmonised methods (Test Guidelines) that can be reproducible, repeatable, and reliable, which supports the Mutual Acceptance of Data (MAD) principle. To ensure nanomaterials can be included, several Test Guidelines and Guidance Documents continue to be developed (e.g.: particle size and size distribution, solubility, agglomeration)¹ (see oe.cd/nanomet).

6. In 2022, OECD updated the document Important Issues on Risk Assessment of Manufactured Nanomaterials, which provides information on current practices, challenges, and strategies for assessing risk where data are limited, and where more research was needed on specific risk assessment issues. Several documents on the field of exposure (workplace, consumer, and environment) continue to be developed. Notably to develop guidance on existing tools and methods on exposure and their applicability to different materials. The OECD has considerable knowledge allowing for the development of test methods and assessment approaches for nanomaterials. This knowledge is gradually expanding to advanced materials. OECD is developing strategies for addressing emerging materials. As a response to the rapid development of new materials, the OECD developed two complementary strategies: i) **Early4AdMa** (Early Awareness and action for Advanced Materials)², as a pre-regulatory tool to help identify potential concerns, knowledge gaps and action needed (e.g., Development of guidance); and ii) the **Safe(r) and Sustainable Innovation Approach (SSIA)**³ to support innovation while ensuring that nanomaterials and advanced materials are developed in a safe and sustainable way supported by a circular economy. SSIA promotes prevention by enhancing regulatory preparedness and facilitating a dialogue between innovators and regulators.
7. OECD⁴ will continue to facilitate information exchange on nanosafety, advanced materials to improve transparency and facilitate decision-making processes through its programme of work, in coordination with the IOMC partners.
8. WHO and ILO, following recommendations from an earlier UNITAR workshop, undertook to trial creating International Chemical Safety Cards (ICSCs) for the nanoforms of certain chemicals, to complement the information already available for the bulk forms. In 2019, ICSCs for “Titanium dioxide (nanoform) P25” and “Zinc oxide (nanoform)” were created, but there were insufficient data available to publish an ICSC for the nanoform of silver. All published ICSCs can be viewed at <https://www.ilo.org/dyn/icsc/showcard.home>.

¹ The OECD and NanoHarmony released a report summarising the current status of projects to develop or adapt the OECD Test Guideline (TGs) and Guidance Documents (GDs) for nanomaterials as well as the outlook per project. The list was compiled in a common effort by EU projects NanoHarmony and NANOMET and is intended to be a living document that will be updated regularly <https://www.oecd.org/chemicalsafety/nanomet/status-report-test-guidelines-guidance-documents-nanomaterials.pdf>

² To be published in September 2023

³ <https://oe.cd/ssia>

⁴ OECD has published more than 100 documents related to nanomaterials. The documents and webinars (English/ Spanish) are available in the OECD website: <https://www.oecd.org/science/nanosafety/> to receive the newsletter sign up: <http://bit.ly/newsletter-chemical-safety>

**(D) Hazardous substances within the life cycle of electrical and electronic products
(HSLEEP)**

No updates since last submitted report.

(E) Perfluorinated chemicals and the transition to safer alternatives

Submitted by: OECD

The OECD/UNEP Global PFC Group was established in 2012 in response to the International Conference on Chemicals Management (ICCM 2) 2009 Resolution II/5, calling upon intergovernmental organisations, governments and other stakeholders to “consider the development, facilitation and promotion in an open, transparent and inclusive manner of national and international stewardship programmes and regulatory approaches to reduce emissions and the content of relevant perfluorinated chemicals of concern in products and to work toward global elimination, where appropriate and technically feasible”. The Global PFC Group is one mechanism to implementing the resolution, countries also have their own national activities as does industry.

The Global PFC Group has continued to increase understanding of PFAS and foster a transition toward safer alternatives. To date the group has included representatives from: Australia, Belgium, Benin, Canada, China, Costa Rica, Czech Republic, Denmark, European Union, Germany, Greece, India, Israel, Italy, Korea, Japan, Mongolia, Netherlands, New Zealand, Norway, Sri Lanka, Sweden, Switzerland, UK, US, Vietnam, Zambia; also industry representatives, NGOs and academia. The OECD has facilitated the work described below.

Activities since 2019

Characterising and understanding PFAS

Reviewing the Terminology of PFAS

Efforts between June 2018 and March 2021 focused on reviewing the universe and terminology of PFAS. A report was published in 2021 on “[Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances: Recommendations and Practical Guidance](#)”⁵ that provides (1) a revised PFAS definition to comprehensively reflect the universe of PFASs and a comprehensive overview of the PFAS universe, (2) practical guidance on how to use the PFAS terminology, (3) a systematic approach to characterization of PFASs based on molecular structural traits to assist stakeholders, including non-experts, in making their own categorization based on their needs, and (4) areas in relation to the PFAS terminology that warrant further development.

This report has been widely referenced and used across different fora in particular by countries working on refining their risk management initiatives and policies.

Fact Cards of PFAS

Between June 2018 and June 2021 a set of 15 fact cards on major groups of PFAS were developed. The [Fact Cards of Major Groups of PFASs](#)⁶ aim to provide non-expert stakeholders an initial glance into these groups of PFASs with some basic information on: (1) chemical identities synthesis and inherent properties such as bioaccumulation and transformation, (2) historical and ongoing industrial practices and commercial uses of some major commercial products, (3) regulatory status,

⁵ OECD (2021), Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances: Recommendations and Practical Guidance, OECD Series on Risk Management, No. 61, OECD Publishing, Paris, <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/terminology-per-and-polyfluoroalkyl-substances.pdf>

⁶ OECD (2022), Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances: Recommendations and Practical Guidance, OECD Series on Risk Management, No. 68, OECD Publishing, Paris, [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/CBC/MONO\(2022\)1&doclanguage=en](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/CBC/MONO(2022)1&doclanguage=en)

(4) examples of reported occurrences in the environment and humans, and (5) major knowledge gaps in terms of previous sections. These fact cards have been linked to OECD's [eChemPortal](#).

Polymeric PFAS and Their Life Cycle

To date, research has primarily focused on understanding the identity, life cycle, hazard, occurrence and exposure, and risk of non-polymeric PFASs. To ensure the sound management of the entire class of PFASs, it is important to also understand polymeric PFASs, which include sidechain fluorinated polymers, fluoropolymers and perfluoropolyethers.

A report focusing on side chain fluorinated polymers was published in 2022: [Synthesis Report on Understanding Side-Chain Fluorinated Polymers and Their Life Cycle](#)⁷. This report provides an overview of existing scientific and technical information on side-chain fluorinated polymers (SCFPs), focusing on their identities and life cycle, and with a particular goal to map the existing landscape and highlight critical knowledge and data gaps. Two additional reports are in preparation on perfluoropolyethers and fluoropolymers.

Commercial Availability and Current Uses of Alternatives

Work has also included collection of information on commercial availability and market trends of alternatives to PFAS, as well as on the hazard profile of the identified alternatives, focusing on specific industry sectors. The following reports have been published to date, with two additional reports under development in 2023:

- [PFASs and alternatives in food packaging \(paper and paperboard\): Report on the commercial availability and current uses](#)⁸;
- [PFAS and Alternatives in Food Packaging \(Paper and Paperboard\): Hazard Profile](#)⁹;
- [Per- and Polyfluoroalkyl Substances and Alternatives in Coatings, Paints and Varnishes \(CPVs\): Report on the Commercial Availability and Current Uses](#)¹⁰.

OECD WebPortal on PFAS and Webinars

The OECD work on PFAS is communicated via a WebPortal that is regularly being updated, <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/>. It regroups the publications from the OECD/UNEP Global PFC Group, information on country risk reduction initiatives for PFAS and the recording of webinars and is one of the top 10 most consulted pages on environment topics at the OECD. Webinars are organised to publicise the reports published by the Group and also

⁷ OECD (2022), Synthesis Report on Understanding Side-Chain Fluorinated Polymers and Their Life Cycle, OECD Series on Risk Management, No. 73, Environment, Health and Safety, Environment Directorate, OECD.

⁸ OECD (2020), PFASs and Alternatives in Food Packaging (Paper and Paperboard) Report on the Commercial Availability and Current Uses, OECD Series on Risk Management, No. 58, Environment, Health and Safety, Environment Directorate, OECD, <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/PFASs-and-alternatives-in-food-packaging-paper-and-paperboard.pdf>

⁹ OECD (2022), PFAS and Alternatives in Food Packaging (Paper and Paperboard): Hazard Profile, OECD Series on Risk Management, No. 69, Environment, Health and Safety, Environment Directorate, OECD, [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/cbc/mono\(2022\)2&doclanguage=en](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/cbc/mono(2022)2&doclanguage=en)

¹⁰ OECD (2022), Per- and Polyfluoroalkyl Substances and Alternatives in Coatings, Paints and Varnishes (CPVs), Report on the Commercial Availability and Current Uses, OECD Series on Risk Management, No. 70, Environment, Health and Safety, Environment Directorate, OECD, <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/per-and-polyfluoroalkyl-substances-alternatives-in-coatings-paints-varnishes.pdf>

with invited experts to share knowledge and experience on PFAS, in particular on the development of alternatives.

Risk Reduction Initiatives across Countries

Regular collection of information on risk reduction initiatives developed by countries for PFAS is included on the country information page of the OECD WebPortal on PFAS:

<https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/countryinformation/>.

To date the following countries are represented: Australia, Belgium, Canada, Denmark, Finland, Germany, Japan, Korea, Netherlands, Norway, China, Poland, Sweden and the United States.

Webinars

Since 2019, the Global PFC Group organised the following webinars (found at <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/webinars/>) with 150-300 participants per webinar:

- Advances in Understanding Per- and Polyfluoroalkyl Substances, 2022;
- Moving to Safer Alternatives, 2022;
- Recent risk reduction initiatives for Per- and Polyfluoroalkyl Substances (PFASs) in the US, EU and as part of the Stockholm Convention, 2022;
- Presentation of the report on Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances (PFAS): Recommendations and Practical Guidance, 2021;
- Latest developments in analytical and monitoring methods for PFASs, 2020;
- The European Union's actions to regulate PFASs, 2020;
- Finding Alternatives to Per- and Polyfluoroalkyl Substances of Concern: A Difficult and Continuing Challenge, 2019 ;
- Risk Reduction Initiatives for PFASs substances in Canada and in the United States, 2019;
- Best Environmental Practices for Class B Firefighting Foams, 2019.

(F) Highly hazardous pesticides (HHPs)

Submitted by: FAO, UNEP, WHO

Progress Report on Addressing Highly Hazardous Pesticides (HHPs) in 2019-2022

Introduction

1. HHPs are globally recognized as an issue of concern. FAO, UNEP and WHO have prioritized addressing HHPs in collaboration with key stakeholders and this report captures concrete activities taken to address HHPs in the period 2019-2022.

Actions to address HHPs

2. Over the period 2019-2022, FAO, WHO and UNEP, in collaboration with relevant stakeholders, have focused on reducing the risks and impacts from HHPs by raising awareness, strengthening governance, supporting structural and technical capacities, and promoting viable alternatives to HHPs. The below global instruments, guidance and tools have been developed to guide countries and stakeholders to address HHPs:
 - a. Updated [WHO Recommended Classification of Pesticides by Hazard](#) (2019)¹¹ which provides data for Criterion 1 of the HHP identification;
 - b. Updated information on HHPs among its 10 chemicals or groups of chemicals of major public health concern in 2019¹²;
 - c. In 2019, two brochures titled “[Detoxifying Agriculture and Health from Highly Hazardous Pesticides: A call for action](#)”¹³ and “[Preventing suicide: a resource for pesticide registrars and regulators](#)”¹⁴ which provide guidance to pesticide registrars and regulators on preventing HHPs related suicides;
 - d. Updated [WHO burden of disease estimates](#)¹⁵ in 2021 based on 2019 data, which indicated that 137 000 deaths per year (20% of all global suicide deaths) from self-inflicted injuries with pesticides, mainly HHPs, could be prevented;
 - e. In September 2020, UNEP issued [An Assessment Report on Issues of Concern](#)¹⁶, in which it suggested the need to address the current ambiguity of the criteria for identifying HHPs and recommended “increased research and development of safer alternatives, particularly non-chemical alternatives, and making them available, accessible and visible to farmers across the globe”;
 - f. In 2022, UNEP in close collaboration with FAO and WHO published the [Synthesis Report on the Environmental and Health Impacts of Pesticides and Fertilizers and](#)

¹¹ WHO (2019). *The WHO recommended classification of pesticides by hazard and guidelines to classification*. (<https://www.who.int/publications/i/item/9789240005662>).

¹² WHO (2020). *10 chemicals of public health concern*. (<https://www.who.int/news-room/photo-story/photo-story-detail/10-chemicals-of-public-health-concern>).

¹³ WHO/FAO (2019). *Detoxifying agriculture and health from highly hazardous pesticides*. (<https://www.fao.org/3/ca6847en/ca6847en.pdf>).

¹⁴ WHO (2019). *Preventing suicide: a resource for pesticide registrars and regulators*. (<https://www.who.int/publications/i/item/9789241516389>).

¹⁵ WHO (2021). *The public health impact of chemicals: knowns and unknowns - data addendum for 2019*. (<https://www.who.int/publications/i/item/WHO-HEP-ECH-EHD-21.01>).

¹⁶ UNEP (2020). *An Assessment Report on Issues of Concern: Chemicals and Waste Issues Posing Risks to Human Health and the Environment*. (<https://wedocs.unep.org/handle/20.500.11822/33807>).

[Ways of Minimizing Them](#)¹⁷, which also refers to HHPs as a critical issue and recommends minimizing or eliminating the risks they pose.

- g. SAICM Secretariat, in collaboration with FAO, University of Cape Town (UCT) and Umweltbundesamt (UBA) published a [Fact Sheet on HHPs](#)¹⁸ for SAICM IP4 in 2022.
 - h. In December 2022, FAO launched the FAO e-learning course 'Pesticide Registration Toolkit'¹⁹, and the FAO, together with the European Union, the Swedish Chemicals Agency (KEMI) and the IOMC, certified this e-learning course and provided a new module on risk assessment for HHPs²⁰ later.
3. The Kunming-Montreal Global Biodiversity Framework²¹, agreed at the 15th meeting of the Conference of Parties to the UN Convention on Biological Diversity in 2022, set an indicator on HHPs in target 7: "reducing the overall risk from pesticides and highly hazardous chemicals by at least half, including through integrated pest management (IPM), based on science, taking into account food security and livelihoods".
 4. UNEP is implementing projects, with the Global Environment Facility (GEF) financing, aiming to demonstrate alternatives to DDT for malaria control in Southern Africa, dispose of over 6,000 tonnes of DDT containing waste and highly contaminated soil in Central Asia and Africa, globally monitor POPs including DDT and other pesticides in selected matrices, and establish joint health and environment 'Chemical Observatories' to support evidence-based policy and investment initiatives²².
 5. FAO has supported several national and regional programmes to tackle HHPs in 65 countries in Africa, Asia, Latin America, and the Caribbean and Pacific regions through projects funded by GEF, EC, and Sweden, etc. FAO has also worked at mainstreaming the HHPs issue into regional programmes for food security in Asia and Africa to ensure that sound chemicals management is an integral part of sustainable agriculture²³.
 6. FAO, WHO and UNEP promote viable alternatives to HHPs in agricultural and health sectors through IPM and Integrated vector management (IVM). FAO, the Rotterdam Convention has supported capacity building in South East Asia, Central Africa and the Caribbean to innovate and scale-up Integrated Pest Management (IPM) and to develop safe alternatives to HHPs .
 7. Through a joint program to support the implementation of the Code of Conduct, FAO and the Swedish Chemical Agency (KEMI) aim at strengthening national capacities to address HHPs, and facilitate regional collaboration to address HHPs in Africa and Asia.
 8. Vector control programmes, encouraged by WHO, UNEP, the DDT Expert Group and other modalities associated with the Basel, Rotterdam and Stockholm (BRS) Conventions, have significantly reduced the use of DDT, and currently there are no products prequalified by WHO for vector control which meet the first 7 HHP criteria.

¹⁷ UNEP (2022). *Environmental and health impacts of pesticides and fertilizers and ways to minimize them – envisioning a chemical-safe world*. (<https://www.unep.org/resources/report/environmental-and-health-impacts-pesticides-and-fertilizers-and-ways-minimizing>).

¹⁸ SAICM (2022). *The Potential Key Role of SAICM Focal Points in Reducing Harm from HHPs*.

(<https://saicmknowledge.org/library/potential-key-role-saicm-focal-points-reducing-harm-hhps>).

¹⁹ FAO eLearning Academy (2022). *Pesticide Registration Toolkit*, (<https://elearning.fao.org/course/view.php?id=936>).

²⁰ FAO eLearning Academy (2023). *Pesticide Registration Toolkit: Highly Hazardous Pesticides*, (<https://elearning.fao.org/course/view.php?id=901>).

²¹ Convention on Biological Diversity (2022). *Kunming-Montreal Global Biodiversity Framework, agreed at the 15th meeting of the Conference of Parties to the UN Convention on Biological Diversity*. (<https://www.cbd.int/article/cop15-final-text-kunming-montreal-gbf-221222>).

²² UNEP (2023). *Africa ChemObs Project*. (<https://www.unep.org/explore-topics/chemicals-waste/what-we-do/environment-health-and-pollution/africa-chemobs-project>).

²³ FAO (2023). *Pest and Pesticide Management*. (<https://www.fao.org/pest-and-pesticide-management/pesticide-risk-reduction/hhps/en/>).

9. The SAICM project '*Chemicals without Concern – towards safer products for our environment and health*', funded by GEF, supports a Community of Practice on HHPs, hosted by the University of Cape Town, to address issues and foster discussions with relevant stakeholders on the sound management of chemicals and waste beyond 2020²⁴.
10. IOMC supports actions on HHPs through its member Organizations as follows. UNDP and UNIDO have joined FAO, WHO and UNEP to reduce HHPs in agriculture through various GEF programs. ILO together with FAO works on protecting women and youth laborers from the risks of HHPs. UNITAR supports the development of new HHP modules for the Pesticide Registration Toolkit and on implementing GHS in agrochemicals. OECD supports development of JMPM guidance on HHPs and actions to counter illegal trade in pesticides.
11. In Africa, with support of FAO and KEMI, the Southern African Development Community (SADC) and the East African Community (EAC) have drafted strategies to address HHPs regionally, and countries have identified up to 30 HHPs, conducted needs and risk assessments and are working on mitigation. In Central Africa, FAO and the Rotterdam Convention have supported capacity building for countries to identify and monitor incidents related to HHPs and to promote safer alternatives. The Asia and Pacific region supports countries in risk assessment and mitigation including phasing out HHPs and promoting alternatives. Sri Lanka has banned 36 HHPs and the country's suicide rate was reduced by 70%. The Near East and North Africa region has identified 89 HHPs and developed some priority actions on HHPs for implementation. HHP risk reduction activities have been undertaken in East Europe and Central Asia and regulatory actions to phase out or ban HHPs have been taken in 12 Caribbean countries.

Remaining challenges and Gaps

12. Awareness is growing about the harms of HHPs, and work has progressed in several regions of the world to address these very hazardous products. However, HHPs still remain widely available in LMICs where they pose the greatest concerns for a number of reasons including:
 - a. Limited regulatory capacity: There is limited policy and institutional capacity for pesticide risk assessment and monitoring of incidents or the impacts of HHPs on environmental and human health resulting in insufficient science-policy interface to support informed decision-making and regulatory action.
 - b. Poor adoption of alternatives: Unsustainable agricultural and fiscal policies and practices in many countries still favour the expansion of input-intensive, commercial agriculture and there is inadequate investment towards innovative alternative solutions and their adoption.
 - c. Lack of a holistic approach: Most LMICs cannot address all stages of the pesticide life-cycle especially for HHPs. There remains poor adoption of IPM practices and a slow transition toward inclusive and sustainable agrifood systems.
 - d. Inadequate global governance and coordination: There is no global initiative or program and no clear objectives or widely accepted concrete targets for addressing HHPs. Additionally, there is insufficient multi-stakeholder engagement and multi-sector collaboration to meaningfully address HHPs.

Way forward—initial considerations and elements of a HHP Action Plan

13. It is clear that addressing HHPs needs a new holistic approach with concrete objectives and an inclusive global implementation mechanism. Key aspects of HHPs throughout the pesticide

²⁴ SAICM - Knowledge (2023). *Towards safer products for our environment and health*, (<https://saicmknowledge.org/>).

lifecycle should be addressed. Global implementation mechanisms must be established to provide regulatory and technical support to LMICs.

14. Building on international initiatives described in this paper, FAO, UNEP and WHO have identified some of the initial considerations and elements of an action plan to address HHPs (*see Annex 1*). These action plan elements are contained in the Annex to the present document to facilitate further discussion and finalization.

(G) Endocrine-disrupting chemicals (EDCs)

Submitted by: OECD, UNEP, WHO

Activities, mostly since 2019

OECD report

The OECD has been actively standardising methodologies for testing and assessment of chemicals for endocrine disruption for the last two decades. A large number of new and updated Test Guidelines have been adopted that contain ED specific endpoints informing the mode of action or the adverse effects on human health and wildlife. Guidance material has been developed over the years for various purposes: 1) for how to conduct the assays and 2) interpret the data in the context of weight-of-evidence, culminating in 2018 with the revision of the [Guidance Document 150](#) on Guidance Document on Standardised Test Guidelines for Evaluating Chemicals for Endocrine Disruption.

Since 2019, a couple more in vitro Test Guidelines using zebrafish embryo models for testing estrogen and androgen pathways have been published (TG 250, TG 251 [\[link\]](#)). Some in vitro Test Guidelines for human health have been updated or corrected in their data interpretation procedures (TG 456, TG 455, TG 458 [\[link\]](#)). The Advisory Group on Endocrine Disruptors Testing and Assessment (EDTA AG) met in May and October 2021 virtually, to keep pace with progress with European-funded projects of the EURION cluster and deliverables that might come out for regulatory applications and method standardisation, and progress with other on-going activities. One of such activities was the EU-NETVAL (European Union-Network of Validation Laboratories) that leverage knowledge on a number of in vitro assays addressing the thyroid pathways, also described in the OECD Thyroid Scoping Document in 2014 (No. 207 in the Series on Testing Assessment). That activity, launched in 2017 came to completion in 2022.

In the course of 2022, the OECD established an Expert Group on Thyroid Disruption Methods, harvesting the results of the EU-NETVAL efforts and assessing individual assays for their status of validation and readiness for Test Guideline development. Five assays were assessed in the period Q3 2022-Q1 2023, another set of five assays are being assessed in Q2 2023 until Q3 2023. Assessment reports will be compiled and published by OECD, while the background material on the assays including intra-laboratory report is made available via the EU tracking system TSAR [\[link\]](#).

In September 2022, the OECD participated in the fourth EU Stakeholders' forum on Endocrine Disruptors [\[link\]](#). The Forum is an annual event and brings together scientists and public and private stakeholders with expertise on endocrine disruptors to exchange information and best practices, identify challenges and build synergies. Issues associated with shortage of financial resources for methods' validation and standardisation was on the agenda, as the European Union was considering new hazard classes for endocrine disruption in their Regulation on Classification, Labelling and Packaging.

A French public-private partnership for the validation of ED assays (PEPPER platform) was created in 2019 to speed up the validation and standardisation of methods at the OECD level. Five project proposals have been included in the OECD Test Guidelines workplan (3 in 2022 and 2 in 2023); the PEPPER platform will aim at validating assays addressing novel pathways beyond estrogen and androgen, where the toolbox of methods is already well developed (<https://ed-pepper.eu>).

The OECD is actively participating in the UN Globally Harmonised System for Classification and Labelling of Chemicals (UN GHS) discussions on potential hazards of interest, including endocrine disrupting chemicals (EDCs). In July 2023, the UN GHS Sub-Committee of Experts will discuss a mandate to the OECD for reviewing the state of the science and analyse possible gaps in the existing hazard classes for the classification of EDCs (<https://unece.org/transport/documents/2023/04/working-documents/potential-hazard-issues-and-their-presentation>).

UNEP Report

In February 2013, UNEP and WHO released the report [State of the Science of Endocrine Disrupting Chemicals - 2012](#) which identifies concerns, including evidence in humans, laboratory animals, and wildlife that exposure to endocrine-disrupting chemicals can result in adverse effects and highlighted that an important focus should be on reducing exposure.

To continue advancing work on Endocrine-Disrupting Chemicals (EDCs), and in response to its commitment to the ICCM Resolutions on EDCs, in January 2016, UNEP commissioned the International Panel on Chemical Pollution (IPCP) to develop a set of three overview reports on EDCs in close collaboration with the Advisory Group for UNEP on EDCs. The reports focus on a review of existing initiatives to identify EDCs and on existing scientific knowledge of the life cycles, environmental exposure, effects, legislation, and measures and gaps regarding EDCs and potential EDCs (including information from developing and transition countries). UNEP organized two meetings, including a consultative meeting on Endocrine-Disrupting Chemicals, held on 20 and 21 April 2017, followed by the fourth meeting of the UNEP Advisory Group on Endocrine-Disrupting Chemicals, held on 21 April 2017. Three reports have been launched, and are available on [UNEP website](#), to share advances in science including: (i) worldwide initiatives to identify EDCs and potential Endocrine-Disrupting Chemicals; (ii) review of existing national, regional, and global regulatory frameworks that address EDCs; (iii) overview of the current knowledge on chemicals identified as EDCs and selected potential EDCs.

In March 2022, UNEA requested, as part of resolution 5/7 on the Sound management of chemicals and waste, UNEP executive Director, in cooperation with the World Health Organization, to update the report entitled State of the Science of Endocrine Disrupting Chemicals 2012.

In this link you can find the report of 2012 and all three report: <https://www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/scientific-knowledge-endocrine-disrupting>

WHO report

In May 2023, the World Health Assembly through resolution A76.17 requested WHO to work jointly with UNEP to update the report entitled State of the Science of Endocrine Disrupting Chemicals 2012. WHO has completed a mapping of evidence on the health effects of endocrine disrupting chemicals (EDC) to assist planning the work on the update of the report. This work has resulted in a transparent methodology for mapping and querying all published literature on the health effects of EDCs from 1975 to December 2022 to determine the main health outcomes and chemical classes reported in the literature. A qualitative comparison of these main health outcomes and chemical classes with those described in 2012 has also been carried out. With a more than two-fold increase

in research output occurring over the last 10 years, together with a large number of systematic reviews and substantial international initiatives on exposures, WHO is currently working to prioritise the health outcomes for further investigation and review.

(H) Environmentally persistent pharmaceutical pollutants (EPPPs)

Submitted by: OECD, UNEP

1. Pharmaceuticals designed to be slowly degradable or even nondegradable to resist chemical degradation during passage through a human or animal body present a special risk when they enter, persist or disseminate in the environment. Such substances are referred to as environmentally persistent pharmaceutical pollutants (EPPPs).
2. When released into the environment, the biological activity of EPPPs may directly adversely affect non-target organisms, such as wildlife, and cause long-term impacts on ecosystem health and resilience. The latter occurs through population-level effects on reproductive ability, which persist into future generations of non-target organisms.
3. EPPPs are widely and increasingly being used in consumer products. However, significant knowledge gaps on the environmental and health impacts of these pollutants remain and makes it necessary to develop knowledge and raise awareness about their potential risks.
4. In 2019, the OECD released the report '[Pharmaceutical Residues in Freshwater: Hazards and Policy Responses](#)'. This report calls for a better understanding of the effects of pharmaceutical residues in the environment, greater international collaboration and accountability distribution, and policy actions to prevent and remedy emerging concerns. Unless adequate measures are taken to manage the risks, pharmaceutical residues will increasingly be released into the environment as ageing populations, advances in healthcare, and intensification of meat and fish production spur the demand for pharmaceuticals worldwide. The report outlines a collective, life-cycle approach to managing pharmaceuticals in the environment.
5. In 2020, UNEP published the '[Assessment Report on Issues of Concern: Chemicals and Waste Issues Posing Risks to Human Health and the Environment](#)'. The report aims to inform the international community about the current situation of specific issues of concern, based on a review of published evidence. Building on UNEP Global Chemicals Outlook-II findings, this report assesses the eight emerging policy issues and other issues of concern identified under the SAICM, including EPPPs. It reviews how current regulatory and policy frameworks address them, by specific instruments and actions, and highlights challenges and opportunities.
6. The OECD, in 2022, released the report '[Management of Pharmaceutical Household Waste: Limiting Environmental Impacts of Unused or Expired Medicine](#)'. Pharmaceutical household waste from expired or unused medicine does not only offer zero therapeutic benefit, but also contributes to environmental pollution when disposed of via improper routes. Medicines discarded in sinks and flushed down toilets enter sewage waters and, if not filtered out, leak into aquatic systems. Disposal of unused or expired medicines via solid household waste can also result in pharmaceutical residues entering the environment if this waste is illegally dumped, or destined for landfills. In addition to environmental risks, unused or expired medicine not only constitutes wasted healthcare resources, but also presents a possible public health risk of accidental or intentional misuse and poisoning if extracted from waste bins. Preventing pharmaceutical household waste and ensuring the effective collection and

environmentally sound treatment of unavoidable waste is thus an important policy objective. This report provides an overview of available data on pharmaceutical consumption and disposal practices across OECD countries, reviews existing collection schemes and provides recommendations to best prevent, collect and treat unused or expired medicines in order to avoid their leakage into the environment.

7. Given the global attention and the need for further information dissemination and awareness-raising specifically on EPPPs, as also highlighted by ICCM4, UNEP has carried out in 2023 a specific analysis. The document looks at the magnitude of the problems concerning the impact of EPPPs on the environment and human health, what the drivers are, and which knowledge gaps need to be addressed. The report also discusses shared challenges, and strategies to prevent and mitigate the problem, offering some examples of practical solutions that relevant stakeholders can carry out to accelerate action. Furthermore, UNEP has also developed two technical discussion papers on safe disposal of unused medicines, needs and conditions of EPPPs, and on sustainable procurement to deepen the analysis.
8. After a consultation and definition phase, in December 2022, a three-year project started, entitled “Global best practices on emerging chemical policy issues of concern under SAICM – Endocrine Disrupting Chemicals (EDC) and Environmentally Persistent Pharmaceutical Pollutants (EPPP)”. This Medium Size Project is funded under the SAICM window of GEF 7, and project Executing Agencies are: WHO, UNEP and the SAICM secretariat.
9. The project will produce global guidance on wastewater from manufacturing (led by WHO); and on disposal of medicines (led jointly by WHO and UNEP). In addition, UNEP will provide some lifecycle approach guidance and literature on EPPPs in low- and middle-income countries, which is, as mentioned, a major gap identified in the context of SAICM.
10. UNEP is also supporting the link to antimicrobial resistance (AMR), a related agenda with a number of common elements, which has remarkable traction. In February 2023, UNEP launched its first spotlight report ‘[Bracing for Superbugs: Strengthening environmental action in the One Health response to antimicrobial resistance](#)’, which offers a comprehensive overview of scientific findings on the subject. The report also analyzes the three economic sectors and their value chains that are key drivers of AMR development and spread in the environment: pharmaceuticals and other chemicals, agriculture and food, and healthcare, together with pollutants from poor sanitation, sewage and waste effluent in municipal systems.
11. UNEP is well positioned on the AMR sphere being part of a strong partnership, the Quadripartite Alliance for One Health, with FAO, WHO and the World Organisation for Animal Health (WOAH) as leaders in the multilateral system on human, animal, plant and environmental health.
12. To further increase awareness and disseminate knowledge, global discussions have been promoted mapping out and mobilizing different stakeholders through webinars and workshops that allowed for exchange of experiences and knowledge on aspects of environmentally persistent pharmaceutical pollutants and their environmental implications considering the impact on AMR, and to strategize what actions can be taken to advance policies and actions at national level. Capacity development activities have also been carried out in countries to analyze and support their efforts on safe disposal of unused medicines, and materials have

been compiled and synthesized for presentation. In addition, communication products have been developed. Some examples include a [video](#) posted at the SAICM knowledge management platform; a dedicated [website on EPPPs](#) and on [AMR](#) that UNEP have created, web stories, infographics and videos.

Annex 1: FAO/WHO/UNEP, Initial Considerations and Elements of an Action Plan on Highly Hazardous Pesticides

Contents

Acronyms and abbreviations	i
1 Introduction	2
1.1 Importance and side effects of pesticides	2
1.2 Definition and status of HHPs	3
1.3 Problems related to HHPs	3
1.4 Need for global action on HHPs	4
2 Rationale	6
2.1 Lack of sufficient global coordination	7
2.2 Lack of a holistic approach	7
2.3 Lack of viable alternatives	8
2.4 Lack of capacity	8
3 Vision and Strategic Goals	9
3.1 Vision	9
3.2 Strategic Goals	9
4 Objectives of the action plan	9
4.1 Objective 1: Strengthening governance as part of regional and national strategies for regulation and implementation	9
4.2 Objective 2: Enhancing capacity for sound HHP life-cycle management	10
4.3 Objective 3: Increasing the adoption of alternatives to HHPs	10
4.4 Objective 4: Promoting stakeholder engagement and concerted actions	11
5 Key Actions	11
5.1 Outcome 1: Governance is strengthened as part of regional and national strategies for regulation and implementation	11
5.2 Outcome 2: Capacity for sound pesticide life-cycle management is enhanced through appropriate legislation, actions and information-feedback systems	12
5.3 Outcome 3: Viable alternatives to HHPs are developed and their use is up-scaled	14
5.4 Outcome 4: Stakeholder capacity and engagement are enhanced and concerted actions are adopted	15
6 Implementation and coordination	16

6.1 Organizational structure	16
6.2 Financing	17
6.3 Technical synergy	17
6.4 Knowledge sharing.....	17
6.5 Monitoring and evaluation	17
References	19
Annex 1 Criteria for identifying HHPs	22
Annex 2 The 3-step process for managing HHPs	22

Acronyms and abbreviations

BRS	Basel, Rotterdam and Stockholm Conventions
CBD	Convention on Biological Diversity
CGPC	Coordinating Group of Pesticide Control Boards of the Caribbean
COP15	15 th Conference of Parties of the Convention on Biological Diversity
DDT	Dichlorodiphenyltrichloroethane (an insecticide)
EAC	East African Community
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAW	Fall Army Worm Program
FFS	Farmer Field Schools
FPIC	Free, Prior and Informed Consent
GAP	Good Agricultural Practice
GBF	Global Biodiversity Framework
GCO	Global Chemicals Outlook
GEF	Global Environmental Facility
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
HHP(s)	Highly Hazardous Pesticide(s)
HIC	High Income Countries
ICCM4	Fourth International Conference on Chemicals Management
ILO	International Labour Organization
IOMC	Inter-Organizational programme for the sound Management of Chemicals
IPM	Integrated Pest Management
IP4	Fourth Intersessional Process of SAICM
IVM	Integrated Vector Management
JMPM	Joint FAO/WHO Meeting on Pesticide Management
JMPR	Joint FAO/WHO Meeting on Pesticide Residues
JMPS	Joint FAO/WHO Meeting on Pesticide Standards
LMICs	Lower and Middle-Income Countries
MEAs	Multilateral Environmental Agreements
MRL	Maximum Residue Limit
NGOs	Non-Governmental Organizations
OECD	Organization for Economic Cooperation and Development
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
SADC	Southern African Development Community
SAICM	Strategic Approach to International Chemicals Management
SDGs	Sustainable Development Goals
SHPF	Severely Hazardous Pesticide Formulations
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WHO	World Health Organization

1 Introduction

1.1 Importance and side effects of pesticides

(1) Pesticides are organic or inorganic substances that either kill or disturb the normal development of vertebrate and invertebrate pests, weeds and pathogens to reduce the risks they pose to human societies ¹. Since the mid-1900s, pesticides have been used at large scales to protect agricultural and forestry production as well as human and livestock health, thereby ensuring food and nutritional security, alleviating drudgery, and eliminating poverty ². Pesticide efficacy and ease of use, together with growing demands for agricultural and forest products to meet the world's expanding human population have fueled a steady growth in the global pesticide industry ².

(2) However, pesticides have considerable negative impacts on the environment and on human health because they are toxic to a wide range of target and non-target organisms including humans, livestock and wildlife; they have varying levels of persistence in the environment; and some are bioaccumulated through food chains ^{2,3}. Such hazards, assessed against predicted exposure, determine the relative risks associated with pesticides and their use ². A dramatic acceleration in global pesticide trade since the beginning of the millennium has increased human and environmental exposure to pesticides and, thereby, elevated consequent risks ².

(3) The negative impacts of pesticides include inadvertent physiological effects on target and non-target organisms that ultimately reduce agricultural productivity and profitability either due to the evolution of resistance, due to adverse effects on crop health and yields through phytotoxicity, or because of a reduced functional biodiversity and consequent resurgence outbreaks. Because of their use as the only toxic biocides deliberately applied in the environment at large scales, pesticides and their derived metabolites have become ubiquitous contaminants of air, soils, and water, including coastal waters ². Environmental concerns around pesticide use include phytotoxicity to adjacent crops and natural vegetation; effects on biodiversity including direct and indirect impacts on terrestrial and aquatic organisms and other wildlife; a loss in soil fertility due to impacts on decomposer organisms; and declining ecosystem functionality, including adverse effects on pollinator services and a reduction in the pest regulatory capacity of natural and derived ecosystems at local and landscape scales ^{2,4}.

(4) Acute and chronic exposure to pesticides is associated with a wide range of adverse effects on human health ². Repeated exposure to some agricultural pesticides over many years has been associated with an increased incidence of depression, reduced cognition in children, neurological disorders, reproductive failure, and long-term illnesses including dementia, cancers and diabetes ^{2,3,5}. Unintentional, acute pesticide poisoning is reported to exceed 385 million per year ⁶. Pesticide exposure and associated health risks are often greatest in Lower and Middle-Income Countries (LMICs) for a range of sociological and environmental reasons including a lack of access to personal protective equipment (PPE) and the discomfort in using such equipment under tropical and sub-tropical conditions ^{2,7}.

(5) Exposure to pesticides, in particular Highly Hazardous Pesticides (HHPs), can have severe impacts on the enjoyment of human rights, including, but not limited to the right to life, the right to the highest attainable standard of health, the right to a clean, healthy and sustainable environment, the right to adequate food, the right to safe and clean drinking water and sanitation, and the right to just and favourable conditions at work.

1.2 Definition and status of HHPs

(6) Pesticides vary in their associated risks (i.e., hazard × exposure) to human and environmental health. Of greatest concern are a relatively small group of highly toxic and persistent active ingredients commonly referred to as HHPs. The International Code of Conduct on Pesticide Management defines HHPs as pesticides *'acknowledged to present particularly high levels of acute or chronic hazards to health or the environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered and treated as highly hazardous'*⁸ (Annex 1).

(7) HHPs are mainly older chemicals and make-up only a minor portion of national pesticide use. Currently, between 5 to 15% of registered pesticides are thought to be highly hazardous. For example, recent reports from Mozambique, from 13 countries in Asia and 9 countries in North Africa and the Middle East identified between 6% and 14% of registered pesticide products as HHPs^{7,9,10}. Many HHPs are already severely restricted or banned in multiple countries, and particularly in high income countries (HICs), because of their acute toxicities or because they are listed under legally binding international agreements (i.e., Stockholm and Rotterdam Conventions, or Montreal Protocol)^{2,7,11}. Nevertheless, in some regions, HHPs are still commonly used in agriculture and particularly on non-food crops such as tobacco, cotton and other fibers.

(8) Already in several countries, the voluntary deregistration of HHPs and increased restrictions around their use have been shown to bring measurable benefits by reducing environmental contamination, restoring wildlife populations and reducing mortalities, including from suicides - without affecting agricultural productivity¹². However, HHPs still pose serious problems where legislation and the implementation of regulations on pesticide management are weak. Therefore, some HHPs continue to be widely used, often without necessary risk mitigation measures, and particularly in LMICs. As such, HHPs continue to undermine vital health conditions and ecosystem services for present and future generations, they jeopardize the transformation to sustainable and resilient agri-food systems, and they represent a considerable obstacle to achieving the United Nations Sustainable Development Goals (SDGs).

1.3 Problems related to HHPs

(9) Among pesticide products, HHPs have the greatest negative impacts on biodiversity, they dramatically alter the structures of animal and plant communities, and ultimately disrupt ecosystem functions and services. Several HHPs have notable adverse effects on vertebrate wildlife, including birds and mammals. In Africa, HHPs have facilitated an illegal trade in wildlife and animal parts². Furthermore, HHPs are carried long distances through aquifers to contaminate wells and drinking water in rural and urban areas - often for decades after use. This contamination of ground waters affects some of the planet's most vulnerable aquatic communities².

(10) The effects of HHPs in food chains threaten the sustainability of food provisioning ecosystem services. Of particular concern are HHPs that disrupt soil organisms, pollinators and the natural enemies of crop pests, thereby threatening food security in the most affected areas. HHPs also affect the quality and safety of foods. For example, persistent pesticides accumulated on sea and lake beds have been associated with toxicity in farmed fish and the collapse of artisanal fisheries. The environmental persistence of HHPs results in a higher probability of pesticide residues in food - ultimately leading to greater risks of human ingestion - particularly where contaminated products are sold at local markets. High persistence also affects global trade by increasing the risk of product rejection from export markets².

(11) HHPs are commonly associated with fatal poisoning in humans after accidental or deliberate ingestion. Child mortality related to the accidental ingestion of HHPs is still prevalent in many countries and self-poisoning is a major concern in countries where HHPs are widely available ^{2,12,13}. Globally, self-poisoning using acutely toxic pesticides is among the leading means of suicide. It is estimated that over 160,000 people die each year from the ingestion of acutely toxic HHPs with the intention of self-harm ¹⁴. These fatalities predominantly occur in LMICs where acutely toxic HHPs are readily available to people in situations of distress. The health costs from acute and chronic exposure to HHPs can be considerable in terms of medical costs and losses to family income – with the most detrimental effects experienced among rural, low-income families ^{15,16}.

(12) Chronic exposure to HHPs is associated with a range of diseases including non-Hodgkin lymphoma, prostate and other cancers, Parkinson's disease and other chronic illnesses ^{2,17}. Prenatal exposure to widely-used HHPs can affect the neurological development and cognitive ability of infants, and is often prevalent in marginalized communities ¹⁸. Since the early 1970s, WHO governing bodies have published several resolutions on the safe use of pesticides and the need to address pesticide poisoning ². In 2010, WHO issued a policy brief on concerns related specifically to HHPs, warning that *"exposure to HHPs is a major public health concern"*, and acknowledging that their use has caused widespread health problems and fatalities in many parts of the world ¹⁷.

(13) Because their associated risks are disproportionate relative to exposure, mitigating actions on HHPs are predicted to dramatically reduce the general harms to human and environmental health from global pesticide use. Furthermore, actions on HHPs will protect and respect the individual and collective rights of people in vulnerable situations such as pregnant women and women farmers, migrant and child laborers, and indigenous peoples and local communities that sometimes lack access to information, are excluded from pesticide-related decision-making, and are often the most affected by an absence of transparency around pesticides and their impacts. For many countries, particularly LMIC, an inability to reduce environmental and human exposure to HHPs ^{2,12,13} indicates that actions specifically addressing hazards will be necessary to adequately mitigate associated risks.

1.4 Need for global action on HHPs

(14) The need for global action on HHPs is now widely recognized. In 2006, based on reports of significant negative impacts, the FAO Council first mentioned HHPs and suggested that *'the activities of FAO could include risk reduction including a progressive ban on HHPs'* ¹⁹.

(15) In 2015, further to FAO, WHO and UNEP initiatives on HHPs, as well as those of many other public and private stakeholders active on the topic ²⁰, the Strategic Approach to International Chemicals Management (SAICM) Fourth International Conference on Chemicals Management (ICCM4): a) acknowledged HHPs as an *"issue of international concern"* and recognized that additional actions on HHPs by all stakeholders will be needed in order to attain the objectives of the SAICM; b) welcomed the initiative of FAO, WHO and UNEP to develop, in consultation with other stakeholders, a proposed strategy to address HHPs in the context of the Strategic Approach with an emphasis on promoting agroecologically-based alternatives and strengthening national regulatory capacity to conduct risk assessment and risk management; c) agreed to adopt the strategy to address HHPs in the context of the Strategic Approach; and d) encouraged all stakeholders to undertake concerted efforts to implement the strategy at local, national, regional and international levels ²¹.

(16) In 2020, UNEP issued an assessment report on the issues of concern identified by SAICM, in which it noted that *"current instruments do not comprehensively address the sound management of HHPs at*

a global scale”; that progress on HHPs has been uneven across countries and regions; and that there is a disconnect between international recognition and national actions ¹³. The report suggested the need to: *“strengthen international support for developing and transitioning countries, including building up resources and capacities to establish and enforce national pesticide legislation, combating illegal trafficking of illicit pesticides, and treatment of existing stockpiles.”* It also recommended *“increased research and development of safer alternatives, particularly non-chemical alternatives”*

13 .

(17) For many years WHO has listed HHPs as one of ‘*ten chemicals or groups of chemicals of major public health concern*’. The role of WHO in taking action on pesticides was recognized in the Chemicals and Waste Section of UNEA resolution 3/4 on Environment and Health adopted at UNEA3 in 2017 ²². In May 2023, the 76th World Health Assembly adopted a resolution on the Impact of Chemicals, Waste and Pollution on Human Health, with specific calls to raise awareness of the health impacts of HHPs, to encourage the health sector to strengthen partnerships for biomonitoring and surveillance, including for HHPs, and to recognize the importance of science-based domestic regulations on HHPs in response to a series of health-related issues, including suicides and neurological disorders ²³.

(18) Given that issues around HHPs are most prevalent in LMIC and often affect members of society in the most vulnerable situations, including women and children, the UN Special Rapporteur on the Right to Food in a report to the Human Rights Council stated that *“although certain multinational treaties and non-binding initiatives offer some limited protections, a comprehensive treaty that regulates highly hazardous pesticides does not exist, leaving a critical gap in the human rights protection framework.”* ²⁴; thereby calling for a more coordinated approach to action. Furthermore, the UN Special Rapporteur on the Implications for Human Rights of the Environmentally Sound Management and Disposal of Hazardous Substances and wastes recognized that *“indigenous peoples face a grave threat to their health, lands and territories from exposure to hazardous substances and wastes. As a result, the Special Rapporteur claims that “the overwhelming and disproportionate impact of toxics on indigenous peoples infringes on recognized collective and individual rights, including the rights of indigenous peoples to culture, land and natural resources, free, prior and informed consent, food, water, a healthy environment, life, health and personal integrity, among others”* ²⁵.

(19) The need for actions on HHPs to counter adverse effects on biodiversity has also gained international recognition. In 2022, the Kunming-Montreal Global Biodiversity Framework (GBF) was adopted during the 15th Conference of Parties (COP15) to the Convention on Biological Diversity (CBD). Among the accepted targets, the GBF aims to *‘reduce the negative impacts of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services [including] reducing overall risks from pesticides and highly hazardous chemicals by at least half’* ⁴.

(20) Taking actions on HHPs, therefore, directly responds to a series of global concerns while contributing to a transformation of agriculture toward safe and sustainable agri-food systems that are more resilient to future climates and other global changes. Actions on HHPs directly address several of the 2030 Sustainable Development Goals (SDGs) ²⁶ including the promotion of sustainable agriculture (Goal 2), healthy lives and well-being (Goal 3), sustainable management of water (Goal 6), decent work (Goal 8), sustainable consumption and production patterns (Goal 12), the sustainable use of terrestrial ecosystems and halting of biodiversity loss (Goal 15), and multi-stakeholder partnerships for sustainable development (Goal 17).

2 Rationale

(21) In response to international assessments, as well as the specific call for concerted actions from SAICM ICCM4, several activities have already been proposed or implemented to reduce the impacts of HHPs. For example, WHO/FAO produced a set of guidelines on HHPs that elaborate on specific articles in the International Code of Conduct on Pesticide Management⁸ and a guide for regulators to help prevent pesticide-related suicides¹². FAO has supported initiatives in Africa, the Caribbean and Pacific to develop regional strategies to reduce HHP-related risks and has expanded its Pesticide Registration Toolkit to include module(s) that raise awareness of HHPs among pesticide registrars²⁷. Furthermore, FAO and WHO continue to promote sustainable pesticide management through implementation of the International Code of Conduct on Pesticide Management^{28,29} in national policy and legislation.

(22) WHO has dramatically reduced DDT use in vector control programmes and currently does not prequalify any products for vector control that meet criteria 1-7 of the criteria to identify HHPs recommended by the FAO/WHO Joint Meeting on Pesticide Management (Annex 1)^{2,30}. Furthermore, WHO has worked with regulators and health professionals in a number of countries to reduce the incidence of HHP-related suicides¹². Intergovernmental organizations including FAO, WHO, UNEP, UNDP, UNITAR, ILO, and OECD are tackling HHPs as part of the Inter-Organizational programme for the sound Management of Chemicals (IOMC)³¹ and through relevant chemical-related Multilateral Environmental Agreements (MEAs).

(23) In 2019, the Global Chemicals Outlook (GCO-II) further encouraged the development of country- and stakeholder-driven road maps on specific topics and by different stakeholder groups to support implementation of the Sound Management of Chemicals and Waste Beyond-2020 Framework and to help monitor progress at all levels including the global level. Road map themes could include: advancing the adoption of sustainability standards, minimizing the adverse impacts of HHPs in specified contexts, or reducing pesticide and fertilizer run-off in identified watersheds. Road maps could also be elaborated at national levels to set goals and targets for sustainable pest and nutrient management³².

(24) In 2022, UNEP published the “Synthesis Report on the Environmental and Health Impacts of Pesticides and Fertilizers and Ways to Minimize Them”. The report, developed in close collaboration and consultation with FAO and WHO, assessed technical and policy-related information under a broad global context to provide an information base that enables stakeholder advocacy actions - including priority actions to strengthen pesticide management - to minimize the adverse impacts of pesticides, including HHPs, and fertilizers². Furthermore, UNEP is about to launch its “Guidelines on Alternatives to Highly Hazardous Pesticides” which provides key principles and insights to identify alternatives to HHPs, defines the roles of different stakeholders in the process of replacing HHPs and suggests how stakeholders can support each other to maintain agricultural productivity while protecting human and environmental health.

(25) National and regional authorities have also taken concrete actions: The EU aims to reduce its HHP footprint (including HHP use at the sources of imported products) by at least 50% through its ‘Farm to Fork Strategy’³³. The East African Community (EAC) and Southern African Development Community (SADC) have prepared regional strategies and national action plans with the intention of phasing-out HHPs in the coming decade. Similarly, the Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC), supported through the Global Environment Facility (GEF), has developed regional and national HHP risk reduction plans, with a number of countries already taking regulatory actions

to phase-out certain pesticides. Several countries in Asia, South America and the Pacific have identified HHPs among their registered pesticides and taken concrete actions to mitigate associated risks, including phasing-out certain products and promoting sustainable alternatives. The private sector and civil society have responded to concerns over HHPs through voluntary standards and sustainability platforms and by providing innovative alternatives to chemical use - including biocontrol agents and biopesticides ².

(26) Despite actions taken since ICCM4, a range of systemic barriers have slowed progress. These include regulatory, technical and financial barriers that prevent the identification of HHPs, the monitoring of their impacts, as well as the registration and development of alternatives. Furthermore, multi-sector and multistakeholder collaboration has been insufficient to make significant advances on reducing HHP-associated risks in many countries. In this context, calls for further actions on HHPs, including a target that would dramatically reduce their use in agriculture by 2030, and for better coordination of activities through a Global Alliance were made by national and regional representatives during the Fourth Intersessional Process (IP4) of SAICM. Future actions will need to respond under a holistic and coordinated strategy to these existing barriers.

2.1 Lack of sufficient global coordination

(27) Despite the many initiatives currently addressing HHPs, and the ongoing formal and informal collaborations between institutes, there continues to be a lack of international coordination and standardization in related legislation ⁵. This reduces global capacity to deal with these most hazardous pesticides and limits international collaboration.

(28) Currently, there is a lack of centralized support among intergovernmental organizations for countries interested in identifying and phasing out HHPs through policy, awareness-raising or monitoring; and there is no centralized mechanism to promote linkages between intergovernmental organizations, regional and national governments, and other stakeholders for coordinated actions on HHPs.

(29) Without sufficient international governance and coordination, initiatives will be vulnerable to instabilities in the capacities of institutes to dedicate time and resources to tackling this global problem. Furthermore, to ensure transparency, avoid redundancies in activities, and gain from engagement with experts in specific aspects of pest and pesticide management, measures need to be taken to promote broader stakeholder involvement in the change process and to improve dialogue between parties.

2.2 Lack of a holistic approach

(30) Actions that respond to emerging issues will need to address all stages of the pesticide life-cycle, which according to the Code of Conduct includes manufacturing, formulation, packaging, distribution, storage, use and final disposal of a pesticide product and/or its container ²⁸.

(31) Efforts to eliminate the risks associated with HHPs continue to be challenged by a range of inadequate or insufficient legal and regulatory frameworks and a lack of enforcement and compliance, as well as structural and technical issues ⁵. Such challenges further indicate a continuing neglect of pesticide management within the public sector and in donor-funded programs.

(32) Given the complexities of the pesticide life-cycle, and of the legal and regulatory requirements to eliminate harms at every stage of the cycle, there is a clear need for coordinated multi-sectoral and multistakeholder involvement in the change process. This includes ensuring that regional or national

policies for agriculture, for natural resource management, and for biodiversity conservation are aligned and that stakeholders are adequately engaged to develop viable alternatives to HHPs.

2.3 Lack of viable alternatives

(33) Alternative pest and weed management options are required to facilitate a phase-out of HHPs. However, national policies and enabling regulatory frameworks on environmentally sustainable agriculture are currently lacking in many countries⁵. Whereas most countries have made calls for increased attention to biodiversity-friendly agricultural practices and to further support agroecology as part of their commitments to achieving targets set under the CBD, agricultural and resource management policies are often not aligned, and are sometimes contradictory³⁴. Furthermore, most countries currently lack sufficient policy support for pesticide use-reduction strategies such as Integrated Pest Management (IPM) or Integrated Vector Management (IVM)⁵.

(34) A range of viable alternatives to HHPs that encompass low-risk, sustainable, effective and affordable products and plant-protection methods already exist, but are still seldom used against some pests and in certain countries. Preventative pest management practices and agroecological interventions require further development including systematic evaluations for a greater range of crops than is currently available³⁵. Meanwhile, as farmers are encouraged to move away from synthetic organic pesticides, including HHPs, the availability of safer curative pest management solutions, such as biopesticides, has increased². Nevertheless, the costs of developing and registering biopesticides can be prohibitive for small to medium enterprises, and legislation to promote a shift away from chemicals and toward safer biopesticides could be strengthened in many countries (especially where biopesticides are currently included under the same legislation as chemical pesticides)².

2.4 Lack of capacity

(35) According to a recent survey distributed to government entities in 194 countries⁵, most countries currently lack legal provisions on HHPs. A majority of LMIC lack guidance documents for pesticide registration and many of these countries have few staff employed in pesticide registration which translates into a lack of capacity at the national level to address this issue. Insufficient attention to surveillance and monitoring of pesticide trade, use, and impacts presents a challenge for many countries, and particularly for LMIC, to effectively respond to pesticide and HHP issues with directed legislation or resources⁵. Furthermore, a lack of technical experts involved in pesticide registration and issues around the rapid turnover of personnel involved in pest and pesticide management in many countries is a continuing challenge to progress.

(36) Inadequate laboratory and analytical capacities in many countries hamper pesticide quality control, such as the analyses of active ingredients and the physical and chemical properties (including impurities) of locally sampled and imported pesticide products. Many countries also lack facilities to monitor pesticides in food, feeds or the environment⁵. Pesticide and poison information centers have an important function in advising pesticide registration authorities and informing and training medical practitioners, yet poison centers continue to be absent or under-resourced in many LMIC².

(37) Technical capacity necessary to reduce risks from HHPs is lacking in several areas. For example, a current lack of trained personnel and institutional capacity is a major obstacle for holistic HHP management (i.e., for all stages of the pesticide life-cycle)⁵. Furthermore, there is no centralized repository of information, no widely-accessible, critical expertise to capture and interpret data on HHPs, and a lack of resources to link specific HHPs with suitable pest or vector management alternatives.

(38) Therefore, building on current international initiatives towards sustainable agri-food systems, the international human rights framework, a better environment and better life ³⁶, and aligning strongly with the SAICM resolution ²¹, the below initial considerations and elements of the action plan have been prepared to support future consultations and concerted efforts on HHPs by addressing legal, governance, structural and technical gaps for effective coordination, for surveillance and regulation and to build capacity for sound pesticide life-cycle management; as well as to support the discovery, development and upscaling of non-chemical alternatives to the most hazardous pesticides. FAO, WHO and UNEP will facilitate further discussions and exchanges with relevant stakeholders around the world in order to finalize the action plan and initiate its implementation for supporting countries in addressing HHPs by taking actions that are appropriate to their national situations, including identification, risk mitigation and/or phase out.

3 Vision and Strategic Goals

3.1 Vision

(39) The vision of the action plan is a world in which we all live and work in a clean healthy and sustainable environment, where sustainable agriculture produces safe and high-quality products, where poisoning and illnesses caused by HHPs are ended, and adverse environmental impacts such as pollution and biodiversity loss derived from the use of pesticides are prevented.

3.2 Strategic Goals

(40) The overall goals of the action plan are to eliminate the harms posed by HHPs to human and environmental health and to encourage and support stakeholder initiatives that drastically reduce the use of HHPs in favour of non-chemical alternatives, particularly in agriculture, by 2030; thereby, achieving targets for HHPs set by the Kunming-Montreal GBF, as well as the objectives of the SAICM beyond 2020 process and ensuring a transition toward safe and sustainable agri-food systems and a pollution-free planet.

4 Objectives of the action plan

(41) Building on the 2015 proposed strategy to address HHPs in the context of SAICM that identified several focal areas in need of concerted action including awareness-raising and information sharing, identification of HHPs, capacity-building in regulatory control and piloting and mainstreaming of alternatives ²¹, and further responding to national requests on addressing HHPs under SAICM beyond 2020, an action plan could set out four mutually reinforcing objectives that attract the support and concerted action of key stakeholders to eliminate the harms posed by HHPs.

4.1 Objective 1: Strengthening governance as part of regional and national strategies for regulation and implementation

(42) The action plan would mobilize a wide range of stakeholders to strengthen legal and regulatory capacities at regional and national levels and coordinate actions to eliminate the harms caused by HHPs at all stages of their life-cycle; it would create effective mechanisms for multisector and multistakeholder coordination, collaboration and information sharing; and provide wide-ranging technical guidance for policy makers to progressively phase-out the use of HHPs, to assess and manage risks during the phasing-out of HHPs, to provide an enabling regulatory framework to promote alternatives to HHPs and to adequately report on progress as part of a global action.

4.2 Objective 2: Enhancing capacity for sound HHP life-cycle management

(43) Robust, appropriate and supportive regulatory actions on HHPs will only be achievable through strengthening of national and regional capacities that lead to better assessments of HHPs and better decision-making⁵. The action plan would take a holistic approach to HHP management by addressing all stages of the pesticide life-cycle through improved legislation that promotes adequate social and economic structures and through the enhancement of structural capacity to enable effective surveillance and implementation for change. Stakeholders already engaged in tackling problems related to HHPs, including accidental and deliberate poisoning, could bring their expertise to facilitate improved data capture and reporting from hospitals and poison centers, or to inform about novel medical and safety procedures that eliminate the greatest risks.

(44) The approach would further encourage policies that counter the aggressive promotion of chemicals and chemical-based pest control measures in favor of fostering the adoption of IPM and IVM strategies that incorporate agroecological principals and, when necessary, resort to the safest curative pest control measures - including low-toxicity pesticides and biopesticides. It would provide guidance to mobilize financing, and develop the necessary infrastructure and related technical capacity to implement actions and monitor progress. Furthermore, it would provide technical support for parties to adhere to and implement internationally binding agreements on eliminating or restricting HHPs (MEAs) and to implement international non-binding guidance such as the International Code of Conduct for Pesticide Management¹, SAICM for chemicals, and similar programs; thereby strengthening national legislation for more sustainable pest and pesticide management.

4.3 Objective 3: Increasing the adoption of alternatives to HHPs

(45) The transition away from HHPs requires access to viable pest management alternatives that compete with HHPs in terms of availability and ease-of-use, efficacy, and cost effectiveness. Furthermore, alternatives must be linked to the main pest problems and key crops for each country or region. Measures to promote alternatives to chemical pesticides would mainly target countries in Africa and the Asia Pacific Region where current national policies and financing for IPM are most deficient⁵.

(46) The action plan would take a multifaceted approach to breaking the structural lock-in to pesticide-based pest management research and promotion. It would catalyze a transition toward sustainable agricultural practices by addressing the policy, trade and social barriers to ecosystem-based IPM. Under the plan, policy support, public and private involvement in research and development, as well as in the marketing of alternatives and the receptiveness of farmers would be evaluated, and gaps in the necessary legal, structural and technical environments that curtail research and the adoption of viable alternatives would be addressed.

(47) Under the action plan, HHPs identified by country registrars during the 3-step process (Annex 2) would be checked against in-country uses (i.e., pests, weeds and crops) and proven alternatives that provide viable options to farmers and for vector management would be recommended and made available. A framework for designing ecosystem-based IPM for key crops would be developed that, together with up-to-date information on available plant protection methods and products, would guide end-users toward effective and sustainable crop management. By working together with voluntary standards and certification schemes, farmers would be further encouraged to avoid the most hazardous pesticides.

4.4 Objective 4: Promoting stakeholder engagement and concerted actions

(48) The action plan would aim to raise the general awareness among various stakeholders (e.g., agricultural and environmental policy, health professionals, regulators, technical, supply chain, end-users, communities) about HHPs, their associated hazards, the harms they cause, and the need to significantly reduce HHP use in agriculture through sustainable/viable alternatives. Furthermore, the action plan would ensure that training facilitates regional harmonization for HHP management by working with regulatory groups/regions.

(49) Several tools, including the Code of Conduct, the Pesticide Registration Toolkit²⁷ and the Farmer Field Schools (FFS) platform³⁷, are currently available to support capacity building. These tools would be expanded to include further information and modules on HHPs and their alternatives, thereby promoting global awareness of the associated risks. Specific attention would be given to ensuring that women, children, and indigenous peoples or other groups of populations in vulnerable situations are protected from HHPs and that the use of HHPs is eliminated from indigenous and other protected lands.

5 Key Actions

5.1 Outcome 1: Governance is strengthened as part of regional and national strategies for regulation and implementation

(50) Activities under objective 1 would provide a framework for stakeholder mobilization and coordination as outlined in the following table:

Output 1	Proposed activities
Output 1.1. Regional and national strategies and related legal frameworks are developed for the effective management of HHPs	(1) Support countries and regional organizations to develop strategies and action plans to eliminate the harms from HHPs (2) Support countries and regional organizations to review and revise their legislations to put in place an enabling legal framework to address HHPs at regional and national levels in accordance with international standards and the international human rights framework. (3) develop normative guidance for countries to review and update their national policies, action plans and legislation to regulate and progressively phase out HHPs, integrating a human rights-based approach (4) Set targets and define indicators at regional and country levels, based on baseline data
Output 1.2. International coordination is strengthened to effectively regulate HHPs and to monitor and report on the implementation of regional strategies	(1) Establish a global coordination mechanism that facilitates regional and national strategies for the management of HHPs (2) Develop procedural tools for regular and effective multi-stakeholder and multisectoral communication about HHPs and about the progress of the action plan (3) Propose a prioritization of actions for phasing-out HHPs on a nation-by-nation basis

(4) Encourage and support governments to ensure sufficient staff and resources are available and effective workflows are developed to manage national requirements for pesticide registrations, or alternatively, to share workloads with regional partners where resources are limited

<p>Output 1.3. Effective tools are made available to support the development and implementation of regional and national policies on HHPs</p>	<p>(1) Ensure that HHPs are specifically addressed in all intergovernmental and regional technical documents that promote sound pest and pesticide management; address HHPs in national mental health and suicide prevention strategies; and provide the necessary technical support for national governments and relevant regulatory bodies to take actions on HHPs</p> <p>(2) Develop guidance documents on pesticide registration that specifically address the identification, registration and deregistration of HHPs; to address emerging concerns under criterion 8 for the identification of HHPs; and as required to facilitate actions on HHPs as issues emerge</p> <p>(3) Promote regional collaboration to address illegal trade and potential cross-border movements of restricted chemicals;</p> <p>(4) Develop guidance on risk assessment and management during HHP phase-out; and on strengthening countries' controls on banned and restricted pesticides;</p> <p>(5) Support the disposal of obsolete persistent organic pollutants (POPs) and HHPs, as well as deregistered pesticides and empty containers</p> <p>(6) Eliminate HHPs from international pest and vector control programs by identifying efficient and cost-effective alternatives</p>
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5.2 Outcome 2: Capacity for sound pesticide life-cycle management is enhanced through appropriate legislation, actions and information-feedback systems

(51) Activities under objective 2 would close identified gaps for national legislation, surveillance and monitoring as outlined in the following table:

Output 2	Proposed activities
<p>Output 2.1. Pesticide regulatory capacity is enhanced at national levels and relevant requirements for effectively reducing the harms from HHPs are incorporated into national policies</p>	<p>(1) Reinforce national regulatory frameworks for sound pesticide management and promote pesticide life-cycle management in public and donor-funded programs</p> <p>(2) Foster the adoption of IPM and IVM through supporting legislation; remove incentives for pesticide use, such as subsidies, and enhance policies to counter the aggressive promotion of chemical pesticides and that specifically address prophylactic pesticide applications</p> <p>(3) Develop policies and a framework for actions to protect the population, including pesticide workers, applicators, rural communities and members of society in vulnerable situations, including rural women, migrant and child laborers, and indigenous peoples from HHP-related harms and to engage these</p>

actors in pesticide decision-making. Establish mechanisms for the progressive ban on production, sale and use of HHPs in proximity to human settlements, organic production land, and protected areas including the buffer zones of Biosphere Reserves established under the Man and the Biosphere Program, tribal and indigenous lands, and paying particular attention to communities affected by a high incidence of pesticide-related fatal suicides. Promote collaboration with indigenous peoples to establish mechanisms for introducing the Free, Prior and Informed Consent and a total ban to HHP in their territories

(4) Promote science-based domestic regulations of HHPs to address health-related issues, including suicides and neurological disorders

<p>Output 2.2. Surveillance, monitoring and information services are strengthened to support implementation and report on relevant indicators</p>	<p>(1) Establish infrastructural and financial conditions to facilitate actions on HHPs in the most affected regions and nations</p> <p>(2) Develop guidelines to establish analytical laboratories suitable for monitoring pesticide quality, chemical contamination of the environment, and chemical concentrations in human and animal tissues. As a priority, establish or strengthen poison centers, particularly in regions affected by high incidences of fatal pesticide poisoning (including through suicides)</p> <p>(3) Provide guidelines to develop systems for effective monitoring and reporting of incidents for data capture (e.g., environmental contamination, human exposure, intentional and unintentional self-poisoning events), data storage and information sharing as suitable for the surveillance and monitoring of pesticides and their impacts; and develop information-sharing interfaces to facilitate communication between stakeholders</p> <p>(4) Encourage the health sector to strengthen partnerships for biomonitoring and surveillance of HHPs</p>
<p>Output 2.3. Progress on the implementation of the action plan is monitored and reported nationally and conveyed through a global coordination mechanism</p>	<p>(1) Develop guidance for health and occupational health professionals to reduce the risks of poisoning, to treat cases of poisoning by HHPs and other chemicals, and to properly report cases to relevant authorities by identifying the associated chemicals</p> <p>(2) Provide technical support to regions and countries for surveillance of pesticide trade and use, as well as for monitoring of pesticide residues in the environment and chemicals in human and animal tissues. Provide support for proper registration of cases of poisoning (i.e., identification of accidental or self-poisoning and the specific pesticides ingested)</p>

(3) Provide technical support to countries to identify Severely Hazardous Pesticide Formulations (SHPFs) under the Rotterdam Convention and coordinate in-country monitoring activities with the UNEP/GEF Global Monitoring Program for POPs under the Stockholm Convention

(4) Provide technical support to parties of international MEAs on chemicals to fulfill their commitments and obligations to transmit relevant information

5.3 Outcome 3: Viable alternatives to HHPs are developed and their use is up-scaled

(52) Activities under objective 3 would create supportive legislation, structural and technical environments for the development and up-scaling of alternatives to HHPs as outlined in the following table:

Output 3	Proposed activities
Output 3.1. Relevant policies and regulations are in place to support the development, registration, and upscaling of non-chemical, alternative pest, weed and disease management solutions to replace HHPs	<p>(1) Provide technical support to national authorities wishing to review policies concerning pesticides to introduce incentives for biocontrol, biopesticide and agroecological pest, weed and disease management options</p> <p>(2) Facilitate the registration of biopesticides through policy instruments that recognize and allow for properties that are specific to biopesticides, including microbial biological control agents, and are different from chemical pesticides</p> <p>(3) Align agricultural and resource management policies to ensure effective intergovernmental communication and coordination for transitioning toward sustainable agri-food systems that conserve biodiversity and protect environmental and human health</p>
Output 3.2. Barriers that prevent farmers from accessing viable alternatives and from further up-scaling agroecology, biological control and biopesticides are removed	<p>(1) Introduce or scale-up national financial investment mechanisms that stimulate the replacement of HHPs by less hazardous alternatives</p> <p>(2) Provide technical support to national extension services and other relevant stakeholder groups to promote public outreach and communication of the benefits of preventative crop protection practices including agroecology, of the principals and practices of IPM/IVM, and of the continuing need to avoid curative practices</p> <p>(3) Encourage the adoption of organic, pesticide-free and insecticide-free crop production by promoting certification schemes, improving access to certification - including reducing related costs, providing access to product premiums, and developing technologies for traceability and product or farm monitoring</p>

(4) Support public and private research to deliver alternatives to chemical pesticides and deliver other technical innovations that support plant protection decisions and avoid curative practices

<p>Output 3.3. Technical support to develop and upscale non-chemical alternatives and to find the best replacements for HHPs on a case-by-case basis is made available and innovative IPM/IVM solutions are developed and promoted</p>	<p>(1) Address plant protection and vector management challenges by compiling systematic information on the most problematic pest, weed and disease organisms for all key crops, and to link these with viable alternatives to HHPs</p> <p>(2) Develop a framework to integrate preventative control methods such as agroecology and conservation biological control with novel curative controls such as biopesticides using IPM and IVC principals for the most affected crops and the most problematic pests, weeds and diseases</p> <p>(3) Involve end-users in the identification, development, validation and mainstreaming of alternatives and provide evidence-based information about alternatives to farmers for better integration into farming systems</p> <p>(4) Provide technical support for growers to meet international Maximum Residue Level (MRL) standards and to achieve Voluntary Sustainability Standards</p>
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5.4 Outcome 4: Stakeholder capacity and engagement are enhanced and concerted actions are adopted

(53) Activities under objective 4 would address training needs and actions to support training for a transition to sustainable agri-food systems without HHPs as outlined in the following table:

Output 4	Proposed activities
<p>Output 4.1. A global information system to report on actions around HHPs and to identify suitable alternatives, and a framework for actions to protect groups of populations in vulnerable situations against the harms of HHPs are provided</p>	<p>(1) Develop a publicly accessible portal on HHPs that is maintained and continually updated through FAO, WHO and UNEP and includes information on HHPs as made available through regional and national reporting systems</p> <p>(2) Provide a gate-keeping service on alternatives to HHPs for specific crops and pests and work with national public and private extension programs to incorporate relevant information into regional and national crop knowledge banks and grower information services</p> <p>(3) Provide technical support for the mapping of activities and outcomes related to global actions on HHPs</p>
<p>Output 4.2. Awareness of HHPs is raised and training is given across a wide range of stakeholders and sectors to reduce the harms from HHPs</p>	<p>(1) Provide training to national and regional authorities on the identification and management of HHPs and on the most suitable alternatives for relevant crop and pest scenarios</p> <p>(2) Provide technical support, training and communication platforms to facilitate regional harmonization of legislation and actions on HHPs</p>

and to promote the adoption of non-chemical alternatives

(3) Provide technical support for Farmer Field Schools (FFS) and other effective initiatives, and update the Pesticide Registration Toolkit with modules that build the capacity of end-users to avoid HHPs and adopt viable alternatives

(4) Train extension professionals and relevant authorities and provide relevant tools to protect the rights of groups of populations in the most vulnerable situations against harms from HHPs, integrating a human rights-based approach

(5) Promote awareness-raising of the health consequences of HHPs and ways to mitigate their impacts

6 Implementation and coordination

6.1 Organizational structure

(54) The action plan will be facilitated through FAO, WHO and UNEP with the participation of relevant UN agencies and their regional offices, national focal points, as well as other stakeholders, such as Non-Government Organizations (NGOs), civil society, and the private sector to coordinate and guide implementation.

(55) Governance arrangements (e.g., constitution, and/or standard operating procedures, and/or terms of reference) to support globally coordinated actions would be jointly prepared by the three organizations in consultation with interested stakeholders. Although the details of governance will depend on further inter-institutional dialogue and inputs from relevant stakeholders, the mechanism could include:

- **An Action Plan secretariat:** This would be jointly provided by FAO, WHO and UNEP (subject to separate agreements), hosted by FAO and would be supported by an advisory council.
- **An advisory council:** This might be an advisory body to FAO, WHO and UNEP on the implementation of the action plan with governance arrangements decided through interinstitutional dialogue and agreements.
- **Technical groups:** Three technical groups on agriculture, health and environment could be established under the advisory council, for different thematic areas, and resolving relations with existing mechanisms such as the JMPM, as needed to provide technical support to nations on these areas.
- **Regional focal points and national task forces:** Global, regional and national actors interested and/or active in addressing HHPs.

(56) The main tasks for coordination could be (1) to support development of regional and national strategies; (2) to coordinate actions and provide technical supports and to mobilize additional actors in support of the action plan; (3) to identify gaps and actions needed to address them and to exchange information on positive and negative lessons learned; (4) to facilitate resource mobilization; (5) to monitor progress in the implementation of the action plan; and (6) to facilitate appropriate meetings and discussions.

6.2 Financing

(57) Coordinated actions on HHPs will require resource support from governments, stakeholders and financial institutions that facilitates multisectoral and multistakeholder communication and removes the various legal, structural and technical barriers that prevent positive impacts. Further support from international donors will be sought to transition to more sustainable agri-food systems and to meet targets set by SAICM, GBF and other binding and non-binding international agreements.

6.3 Technical synergy

(58) The action plan would need to synergize relevant programs and technologies of FAO, UNEP and WHO on HHPs and chemical and waste management, and seek technical collaboration and support. By focusing on effective coordination and information-sharing, the action plan would need to create a broad technical synergy between diverse stakeholders including with international instruments and agreements such as the Basel, Rotterdam and Stockholm Conventions (BRS), the Global Environment Facility (GEF), the Convention on Biological Diversity (CBD) and the Strategic Approach to International Chemicals Management (SAICM). The plan would need to create synergies with relevant initiatives at global, regional and national levels including for new UN agri-food systems, European Union (EU) green-initiatives, Good Agricultural Practices (GAP), and international pest and vector management programs at FAO and WHO such as the Fall Army Worm (FAW), locust and malaria control programs.

(59) Furthermore, the action plan would need to ensure and enhance continued synergies between ongoing programs such as the Joint FAO/WHO Meetings on Pesticide Management (JMPPM), on Pesticide Residues (JMPPR) and on Pesticide Specifications (JMPPS), as well as other global pesticide management initiatives.

6.4 Knowledge sharing

(60) As part of the action plan and to support information-sharing and reporting, a HHP platform/portal could be developed to facilitate technology innovations such as alternatives to HHPs that include green and non-chemical biopesticides; stewardship recommendations for biocontrol agents and biopesticides; innovations in training for governance, and training of farmers and growers; information on HHPs and waste management strategies and other advances for mitigating risks associated with HHPs. The plan would include a gate-keeping task to support extension services and end-users in identifying suitable alternatives to HHPs for specific crops and pests.

6.5 Monitoring and evaluation

(61) The action plan could be coordinated through the secretariat and progress on implementation monitored regularly. Annual workplans would be developed and monitored and evaluations conducted at regular intervals subject to agreement on governance arrangements. The secretariat would support the advisory and technical committees that advise on implementation of the action plan.

(62) In order to evaluate and track progress towards the objectives of the action plan, it will be critical to set targets and indicators in order to bring about tangible and measurable reductions in deaths, illness, adverse environmental impacts, and other harms caused by HHPs. Coordination with the SDGs, GBF targets, and SAICM Beyond-2020 Framework on Chemical and Waste Management targets would need to be ensured to align indicators on HHPs with those specified in these international frameworks.

Country- and region-specific indicators could also be developed, as appropriate, to tailor the goals and objectives to local situations.

References

- 1 WHO/FAO (2014). *International code of conduct on pesticide management: guidelines on pesticide legislation*. (https://apps.who.int/iris/bitstream/handle/10665/195648/9789241509671_eng.pdf?sequence=1).
- 2 UNEP (2022). *Environmental and health impacts of pesticides and fertilizers and ways to minimize them – envisioning a chemical-safe world*. (<https://www.unep.org/resources/report/environmental-and-health-impacts-pesticides-and-fertilizers-and-ways-minimizing>).
- 3 WHO/FAO (2019). *Detoxifying agriculture and health from highly hazardous pesticides*. (<https://www.fao.org/3/ca6847en/ca6847en.pdf>).
- 4 Convention on Biological Diversity (2022). *Kunming-Montreal Global Biodiversity Framework, agreed at the 15th meeting of the Conference of Parties to the UN Convention on Biological Diversity*. (<https://www.cbd.int/article/cop15-final-text-kunming-montreal-gbf-221222>).
- 5 WHO/FAO (2019). *Global situation of pesticide management in agriculture and public health: Report of a 2018 WHO–FAO survey*. (<https://apps.who.int/iris/handle/10665/329971>).
- 6 Boedeker, W., et al. (2020). The global distribution of acute unintentional pesticide poisoning: estimations based on a systematic review. *BMC Public Health* 20, 1875, doi:10.1186/s12889-020-09939-0.
- 7 FAO (2016). *Addressing highly hazardous pesticides in Mozambique*. (<https://www.fao.org/documents/card/fr/c/4bf666a3-a130-4c00-9184-824033417fe5/>).
- 8 WHO/FAO (2016). *International code of conduct on pesticide management: Guidelines on highly hazardous pesticides*. (<https://apps.who.int/iris/handle/10665/205561>).
- 9 Yaseen, T., et al. (2023). High hazard pesticides (HHPs) in Near East and North Africa (NENA), constraints and recommendations to mitigate the risk of HHPs. *Environmental Science and Pollution Research* 30, 1133-1151, doi:10.1007/s11356-022-22023-x.
- 10 Yubak, D., et al. (2021). Status of highly hazardous pesticides and their mitigation measures in Asia. *Advances in Entomology* 10, 14-33. (<https://www.scirp.org/journal/paperinformation.aspx?paperid=113255>)
- 11 Montreal Protocol (2018). *Report of the methyl bromide technical options committee*. (https://ozone.unep.org/sites/default/files/2019-04/MBTOC-assessment-report-2018_1.pdf).
- 12 WHO (2019). *Preventing suicide: a resource for pesticide registrars and regulators*. (<https://www.who.int/publications/i/item/9789241516389>).
- 13 UNEP (2020). *An Assessment Report on Issues of Concern: Chemicals and Waste Issues Posing Risks to Human Health and the Environment*. (<https://wedocs.unep.org/handle/20.500.11822/33807>).
- 14 Mew, E. J. et al. (2017). The global burden of fatal self-poisoning with pesticides 2006-15: Systematic review. *Journal of Affective Disorders* 219, 93-104. (<https://doi.org/10.1016/j.jad.2017.05.002>).
- 15 Atreya, K., et al. (2012) Health and environmental costs of pesticide use in vegetable farming in Nepal. *Environment, Development and Sustainability* 14, 477-493, (doi:10.1007/s10668-011-9334-4).
- 16 Ramírez-Santana, M., et al. (2014). Assessment of health care and economic costs due to episodes of acute pesticide intoxication in workers of rural areas of the Coquimbo Region, Chile. *Value in Health Regional Issues* 5, 35-39, (doi:https://doi.org/10.1016/j.vhri.2014.07.006).
- 17 WHO (2019). *Exposure to highly hazardous pesticides: a major public health concern* (<https://www.who.int/publications/i/item/WHO-CED-PHE-EPE-19.4.6>).

- 18 Rauh, V. *et al.* (2011) Seven-year neurodevelopmental scores and prenatal exposure to chlorpyrifos, a common agricultural pesticide. *Environmental Health Perspectives* 119, 1196-1201. (doi:10.1289/ehp.1003160).
- 19 FAO (2007). *Report of the council of FAO, hundred and thirty first session, Rome 20-25 November 2006.* (<https://www.fao.org/3/j8664e/j8664e.pdf>).
- 20 WHO/FA/UNEP (2015). *Strategy to address highly hazardous pesticides in the context of the Strategic Approach to International Chemicals Management* (<http://www.saicm.org/Portals/12/Documents/EPI/HHP%20strategy%20English.pdf>).
- 21 SAICM (2015). *Strategy to address highly hazardous pesticides in the context of the Strategic Approach to International Chemicals Management.* (<http://www.saicm.org/Portals/12/Documents/EPI/HHP%20strategy%20English.pdf>).
- 22 UNEP (2018). *United Nations Environment Assembly of the United Nations Environment Programme: 3/4 Environment and Health.* (<https://wedocs.unep.org/handle/20.500.11822/30795>).
- 23 WHO (2023). *The impact of chemicals, waste and pollution on human health.* (https://apps.who.int/gb/ebwha/pdf_files/WHA76/A76_ACONF2-en.pdf).
- 24 UN (2017). *Report of the Special Rapporteur on the right to food. A/HRC/34/48. Thirty-fourth session.* (<https://digitallibrary.un.org/record/766914?ln=en>).
- 25 UN (2022). *Report of the UN Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes.* (<https://digitallibrary.un.org/record/3879377?ln=en>).
- 26 UN (2014). *Transforming our world: the 2030 agenda for sustainable development.* (<https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>).
- 27 FAO (2023). *Pesticide registration toolkit highly hazardous pesticides (HHP).* (<https://www.fao.org/pesticide-registration-toolkit/special-topics/highly-hazardous-pesticides-hhp/introduction/en/>).
- 28 WHO/FAO (2010). *International code of conduct on the distribution and use of pesticides: Guidelines for the Registration of Pesticides.* (<https://www.who.int/publications/i/item/who-htm-ntd-whopes-2010.7>).
- 29 WHO/FAO (2018). *International code of conduct on pesticide management: Guidelines on highly hazardous pesticides.* (<https://apps.who.int/iris/handle/10665/205561>).
- 30 WHO (2010). *Countries move toward more sustainable ways to roll back malaria.* (<https://www.who.int/news/item/11-12-2010-countries-move-toward-more-sustainable-ways-to-roll-back-malaria>).
- 31 IOCM (2023). *IOCM Home* (<https://partnership.who.int/iomc/home>).
- 32 UNEP (2019). *Global Chemicals Outlook II: From Legacies to Innovative Solutions,* (<https://www.unep.org/resources/report/global-chemicals-outlook-ii-legacies-innovative-solutions>).
- 33 European Commission (2020). *A farm to fork strategy for a fair, healthy and environmentally-friendly food system.* (https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en).
- 34 Horgan, F. G. & Kudavidanage, E. P. (2021) Translating research into wildlife conservation actions through multisector collaboration in tropical Asia, in: *Closing the knowledge-implementation gap in conservation science* (eds Catarina C. Ferreira & Cornelya F. C. Klütsch) 371-411 (Springer International Publishing). (https://link.springer.com/chapter/10.1007/978-3-030-81085-6_13)
- 35 Deguine, J.-P. *et al.* (2023) Agroecological crop protection for sustainable agriculture. *Advances in Agronomy* 178. (<https://www.sciencedirect.com/science/article/abs/pii/S0065211322001092>)
- 36 FAO (2021). *Strategic Framework 2022-31.* (<https://www.fao.org/3/ne577en/ne577en.pdf>).

- 37 Bakker, T., *et al.* (2022). Farmer Field Schools: building capacities to achieve a successful agroecological transition. *Perspective* (<https://revues.cirad.fr/index.php/perspective/article/view/36887>).
- 38 WHO/FAO (2007). *Report: 1st FAO/WHO joint meeting on pesticide management and 3rd session of the FAO panel of experts on pesticide management, 22-26 October 2007, Rome.* (<https://apps.who.int/iris/handle/10665/340602>).
- 39 WHO (2020). *The WHO recommended classification of pesticides by hazard and guidelines to classification 2019.* (<https://www.who.int/publications/i/item/9789240005662>).
- 40 UN (2011). *Globally harmonized system of classification and labelling of chemicals (GHS).* (https://unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev04/English/ST-SG-AC10-30-Rev4e.pdf).
- 41 Stockholm Convention (2023). *Stockholm Convention on persistent organic pollutants (POPs).* (<https://www.pops.int/default.aspx>).
- 42 Rotterdam Convention (2023). *Annex III.* (<http://www.pic.int/TheConvention/Chemicals/AnnexIIIChemicals/tabid/1132/language/en-US/Default.aspx>).

Annex 1 Criteria for identifying HHPs

This definition was based on recommendations from the FAO/WHO Joint Meeting on Pesticide Management (JMPM)[2008]³⁸ that HHPs should be identified by meeting one or more of eight criteria related to WHO and GHS classifications as hazardous, carcinogenic, mutagenic or demonstrating reproductive toxicity; as listed under the Stockholm or Rotterdam Conventions, or the Montreal Protocol; or showing a high incidence of severe or irreversible adverse effects on human health or the environment

- **Criterion 1:** Pesticide formulations that meet the criteria of classes Ia (extremely hazardous) or Ib (highly hazardous) of the *WHO Recommended Classification of Pesticides by Hazard*³⁹;
- **Criterion 2:** Pesticide active ingredients and their formulations that meet the criteria of carcinogenicity Categories 1A and 1B of the *Globally Harmonized System of Classification and Labelling of Chemicals* (GHS)⁴⁰;
- **Criterion 3:** Pesticide active ingredients and their formulations that meet the criteria of mutagenicity Categories 1A and 1B of the *Globally Harmonized System of Classification and Labelling of Chemicals* (GHS)⁴⁰;
- **Criterion 4:** Pesticide active ingredients and their formulations that meet the criteria of reproductive toxicity Categories 1A and 1B of the *Globally Harmonized System of Classification and Labelling of Chemicals* (GHS)⁴⁰;
- **Criterion 5:** Pesticide active ingredients listed by the *Stockholm Convention* in its Annexes A and B, and those meeting all the criteria in paragraph 1 of Annex D of the Convention⁴¹;
- **Criterion 6:** Pesticide active ingredients and formulations listed by the *Rotterdam Convention* in its Annex III⁴²;
- **Criterion 7:** Pesticides listed under the *Montreal Protocol*¹¹;
- **Criterion 8:** Pesticide active ingredients and formulations that have shown a high incidence of severe or irreversible adverse effects on human health or the environment.

Annex 2 The 3-step process for managing HHPs

The coalition will encourage countries to employ to the 3-step process for managing HHPs as outlined in the WHO/FAO guidelines on HHPs⁸ and support activities related to each step of the process. The three key steps to be taken by countries are:

1. *Identification of HHPs:* Countries analyze their pesticide registries against the eight criteria to identify which pesticide products are highly hazardous.
2. *Needs and risks assessment of HHPs:* Countries assess the actual needs and benefits for each product identified in the first step, as well as the associated risks to human health and the environment, taking into consideration available alternatives.
3. *Mitigation of HHP risks:* Countries identify risk mitigation options. The most appropriate mitigation measures may be different for each HHP and for each condition of use.

In cases where risks cannot be adequately reduced and according to the hierarchy of controls, elimination and substitution of the HHPs may then be considered the most effective mitigation methods². A key enabling factor in mitigation is the availability of alternatives.