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Considerations for Beyond 2020

Global Governance of Highly Hazardous Pesticides – A Proposal by PAN

Note by the secretariat

1. The secretariat has the honour to provide, in the annex to the present note, the document, developed by Pesticide Action Network International (PAN International); *Global Governance of Highly Hazardous Pesticides – A Proposal by PAN*.

2. The report is presented as received by the secretariat, without formal editing.

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Annex

Global Governance of Highly Hazardous Pesticides – A Proposal by PAN

Developed by the Pesticide Action Network International (PAN International)

Global Governance of Highly Hazardous Pesticides – A Proposal by PAN[1]

February 2018[2]

PAN joins the UN Special Rapporteur on the right to food in proposing a global legally binding treaty for the life-cycle management of pesticides, including Highly Hazardous Pesticides (HHPs)

1. Rationale

Pesticide use and the resulting impacts on pollution, biodiversity, human and animal health, communities, and the sustainability of food production is the elephant in the room at any meeting on chemicals management, pollution, biodiversity, the environment, and environmental health. The problem is so huge that it does not get addressed, not comprehensively at an international level or adequately at a local level.

There is unlikely to be any habitat, geographical location, or organism that is free from adverse effects of pesticides.[3]

Pesticides are the only toxic chemicals that are intentionally released into the environment to kill. Current use pesticides[4] contaminate every environmental medium; they travel thousands of kilometres through the air;[5] they are carried through rivers and seas to distant locations; they are having a devastating effect on biodiversity including

[1] Pesticide Action Network International. http://pan-international.org/

[2] The development of the Proposal for a Global Treaty on the life-cycle management of pesticides is an ongoing process and this document is under continuous development, responsive to additional insight and input. It should therefore be regarded as a work in progress, with the latest version used and the full date cited.

[3] Hayes T, Hansen M. 2017. From silent spring to silent night: Agrochemicals and the anthropocene. *Elem Sci Anth* 5:57. doi: 10.1525/elementa.246.

[4] These are pesticides in current use or registration around the globe and are distinctly different from the now mostly obsolete organochlorine pesticides known as Persistent Organic Pollutants.

[5] Atrazine, e.g., can travel over 1000 kilometres carried on dust and transported in clouds before being deposited somewhere in rain (Hayes & Hansen 2017).

beneficial insects; they are undermining the sustainability of food production systems; they kill an unknown number of farmers, workers, children and animals every year; they alter gene pools; and they are costing society billions of dollars in adverse impacts – because there is no real global programme of management. So little attention has been paid to the problem of pesticides, there is no accurate estimate of global acute pesticide poisoning, and no clue at all as to the global level of chronic health impacts. Nor is there any real understanding of the extent of impacts on ecosystems,[6] although indications are that current pesticide use is causing catastrophic declines in insect biodiversity.[7]

The assumption that it is safe to douse the landscape with pesticides at industrial levels, based on the results of a "few field tests" is false, according to the UK's Department of Environment, Food and Rural Affairs' chief scientist, who has proposed a global monitoring programme for pesticides.[8]

Despite this drenching of the planet in pesticides, and all the attendant adverse impacts, 20-40 percent of global crop yields are still being lost to pests and diseases; clearly the current approach to pest management is not working.[9]

According to the 2017 report on pesticides by the Special Rapporteur on the right to food to the UN Human Rights Council, "*the pesticide industry's efforts to influence policymakers and regulators have obstructed reforms and paralysed global pesticide restrictions*".[10]

The Sustainable Development Goals, and in particular Goals 2, 3, 6, 12 and 15,[11] cannot be met until there is proper global governance of pesticides; and until the widespread use of highly hazardous pesticides (HHPs) is replaced by agroecological practices as

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[6] UNEA 3, in December 2017, expressed concern about the impacts of pesticides on the environment and human health and requested the Executive Director of UNEP to present a report on these impacts and ways to minimize them, in collaboration with WHO, FAO and other relevant organizations, by UNEA-5 (UNEP/EA.3/L.8/Rev.1).

[7] Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, Stenmans W2, Müller A, Sumser H, Hörren T, Goulson D, de Kroon H. 2017. More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PLoS One* 12(10):e0185809. doi: 10.1371/journal.pone.0185809.

[8] Carrington. 2017. Assumed safety of pesticide use is false, says top government scientist. The Guardian. https://www.theguardian.com/environment/2017/sep/21/assumed-safety-of-widespread-pesticide-use-is-false-says-top-government-scientist

[9] FAO. 2015. Keeping plant pests and diseases at bay: experts focus on global measures. March 16th 2015. FAO, Rome.

[10] Report of the Special Rapporteur on the right to food (Effects of pesticides on the right to food). A/HRC/34/48. Human Rights Council, Thirty-fourth session, 27 February-24 March 2017, Agenda item 3: Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development. http://www.ohchr.org/EN/Issues/Food/Pages/Annual.aspx

[11] Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture. Goal 3: Ensure healthy lives and promote well-being for all at all ages. Goal 6: Ensure availability and sustainable management of water and sanitation for all. Goal 12: Ensure sustainable consumption and production patterns. Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

recommended by the Fourth International Conference on Chemicals Management (ICCM4).[12]

The time has come when pesticides must be addressed at the global level: it is not possible to adequately address their global human and environmental impacts, or to provide adequate nutrition for the world's growing population, or to meet the Sustainable Development Goals, until this happens.

Some Impacts of Pesticides:

Pollution:
Arctic – current use pesticides atrazine, chlorothalonil, chlorpyrifos, dactal, trifluralin all found in the Arctic seawater, ice, plankton, seals and polar bears.[i] [ii] [iii]
Freshwater – a huge range of current use pesticides are found in surface waters and groundwater, and in all countries where they are monitored; e.g. in 2017, 88% of samples of UK waterways were found to be contaminated with neonicotinoid insecticides.[iv]
Rain – current use pesticides 2,4-D, alachlor, atrazine, bentazone, bromoxynil, chlorothalonil, chlorpyrifos, clopyralid, cypermethrin, deltamethrin, diazinon, dicamba, dichlorprop, glyphosate, fenvalerate, malathion, MCPA, mecoprop, methyl parathion, metolachlor, monocrotophos, profenofos, propanil, triazophos, trifluralin, propiconazole, are measured variously in the rain in Asia,[v] Canada, [vi] [vii] Europe,[viii] [ix] Latin America, [x] USA.[xi] [xii]
Marine – atrazine, azoxystrobin, boscalid, brodifacoum, chlorpyrifos, diazinon, diuron, fenobucarb, flutolanil, glyphosate, hexazinone iprobenfos, mefenacet, phthalide, propyzamide, pyraclostrobin, pyriproxifen all have been found in the marine environment variously in Australia,[xiii] Asia,[xiv] Europe,[xv] New Zealand,[xvi] [xvii] USA.[xviii]

Biodiversity:
Aquatic invertebrates – "*The biological integrity of global water resources is at a substantial risk*", according to an analysis of surface waters in 73 countries, which found that levels of insecticides in the water exceeding regulatory threshold levels at 68.5% of the sites tested. [xix]
Terrestrial invertebrates – A 76% decline in flying insect biomass in natural protected areas over 27 years has been recorded in Germany, expected to provoke cascading effects on food webs and to jeopardize ecosystem services.[xx]
Birds – **"***Across Europe and North America, dramatic and widespread declines have been observed in populations of birds associated with farmland and wetland habitats*;" [xxi] and pesticide toxicity is a better correlate of bird declines that agricultural intensification.[xxii]
Ecosystem services – because of their persistence, high invertebrate toxicity, and widespread dispersal in the environment, neonicotinoid insecticides pose a global threat to ecosystem services on which human food production depends.[xxiii]

Human Health:
Acute poisoning – 40-50 farmers died, and more than 1000 were hospitalised in one district in India over a 2 month-period in 2017 after spraying their cotton crops with insecticides, mainly monocrotophos which is widely banned in HICs.[xxiv] PAN's community survey in Africa, Asia and Latin America found that 47-59% of those exposed to pesticides suffered symptoms of poisoning.[xxv]
Children – unknown numbers of children are acutely poisoned by pesticides each year. PAN Asia Pacific is aware of the following incidents between 2013 and August 2017: 1206 affected; 552 via drift/fumes; 601 via food/accidental ingestion; 44 deaths. This will be a gross under-reporting of the real problem.[xxvi]
Intelligence – organophosphate insecticide residues in food in the EU, alone, costs USD 147 billion in lost IQ each year.[xxvii]

[12] UNEP. 2015. Report of the International Conference on Chemicals Management on the work of its fourth session. SAICM/ICCM.4/15.

2. Existing global governance of pesticides is inadequate

The report by the Nordic Council of Ministers – *Chemicals and Waste Management Beyond 2020*[13] – noted that aspirational goals and voluntary approaches have not achieved sound management of chemicals, including pesticides, and that "*there is a general global consensus that the current international regulatory framework for chemicals and waste is fragmented and contains many critical lapses*", noting pesticides as one of these.

Global governance of pesticides is weak and inadequate. There is no overall governance process, but rather a disjointed patchwork of some aspects of pesticide management in a variety of conventions and agreements, leaving large gaps in overall management. Other conventions, the successful implementation of which are impacted by pesticide use, fail to address that use – for example, the Convention on Biological Diversity, the Ramsar Convention on Wetlands, and the UN Framework Convention on Climate Change. Instead, global governance of pesticides relies heavily on the non-binding voluntary FAO/WHO International Code of Conduct on Pesticide Management, which is powerless to take action or implement programmes.

2.1 International Code of Conduct on Pesticide Management

This Code was first agreed in 1985. However, it has failed to halt the poisoning of farmers, rural workers and children; it has failed to halt environmental pollution, decline in pollinators, and songbirds, and other biodiversity losses. The Code is constantly violated by the pesticide industry and some countries. It has been proven unable to deal with systemic problems: when civil society provided an in-depth report, in 2016, on two companies that sell hazardous pesticides in India contrary to the provisions of the Code, the FAO/WHO Joint Meeting on Pesticide Management (JMPM)[14] was unable to do anything to redress the situation, other than to "support collaborating" and "encourage multi-stakeholder dialogue".[15] The Code is nothing more than a set of recommendations and guidelines, frequently ignored and with no ability for actions to be taken.

2.2 The Rotterdam Convention on Prior Informed Consent in Trade of Certain Hazardous Chemicals and Pesticides

has the requirement for certain information[16] to be shared, and agreement to the import of, listed pesticides (34 to date, of which 9 are also listed under the Stockholm Convention). The Secretariat has the ability to work with

[13] Honkonen T, Khan S. 2017. *Chemicals and Waste Governance Beyond 2020: Exploring Pathways for a Coherent Global Regime.* TemaNord 2017:502. Nordic Council of Ministers. http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A1061911&dswid=-8758

[14] The FAO/WHO Joint Panel of Experts on Pesticide Management (JMPM) advises on matters pertaining to pesticide regulation, management and use, including the Code.

[15] Report of the 10th FAO/WHO Joint Meeting on Pesticide Management, 10–13 April 2017, New Delhi, India. http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/JMPM_2017_Report.pdf

[16] This does not include mandatory reporting of environmental and human health incidents associated with the pesticides.

stakeholders to find safer alternatives, including agroecological approaches, to listed pesticides. But it is unable to address the vast majority of current use pesticides that are polluting the environment, decimating biodiversity and poisoning people.

2.3 The Stockholm Convention on Persistent Organic Pollutants bans or restricts a small number of mostly obsolete pesticides that are deemed to be POPs.[17] There are a small handful of current use pesticides that may be eligible for listing should they be nominated by a Party; but the Convention can do nothing about the vast majority of current use pesticides that are polluting the environment, decimating biodiversity and poisoning people.

2.4 Strategic Approach to International Chemicals Management (SAICM)

Hazardous pesticides were included in the original 2006 SAICM texts, but it was not until 2015 that the International Conference on Chemicals Management (ICCM) finally identified Highly Hazardous Pesticides (HHPs) as an 'issue of concern', after 65 countries and organisations had in 2012 called for a global phase-out of HHPs.[18] Yet, SAICM has still failed to develop any programmes of management or action, ensuring that it cannot meet its goal of the Sound Management of Chemicals by 2020. As currently structured, it appears that SAICM is unable to do so.

2.5 Agroecology

As ICCM4 recommended emphasis be placed on agroecologically-based alternatives to HHPs[19], it is important to note that FAO is convening a High Level Panel of Experts on agroecology,[20] as well as holding its 2nd International Symposium on Agroecology in April 2018.[21] Implementing agroecology is integral to the sound management of pesticides.

[17] Current use pesticides covered by the Stockholm Convention are DDT, lindane, endosulfan and sulfluramid.

[18] In 2012 at ICCM3, a resolution on HHPs, that included: "*Supports* the progressive ban of Highly Hazardous Pesticides and their substitution with safer alternatives" was proposed by Antigua & Barbuda, Armenia, Bhutan, Dominican Republic, Egypt, Guyana, International Trade Union Congress, IPEN, Iraq, Kenya, Kiribati, Kyrgyzstan, Libya, Mongolia, Nepal, Nigeria, Peru, Pesticide Action Network, Republic of Moldova, St Lucia, Tanzania, Tunisia and Zambia. SAICM/ICCM.3/CRP.16.

[19] UNEP. 2015. Report of the International Conference on Chemicals Management on the work of its fourth session, Annex I. SAICM/ICCM.4/15.

[20] During its 44th Plenary Session (9-13 October 2017), the FAO Committee on Food Security 9CFS) requested the High level Panel of experts to produce a report on "Agroecological approaches and other innovations for sustainable agriculture and food systems that enhance food security and nutrition", to be presented at CFS46 Plenary session in October 2019. http://www.fao.org/fsnforum/cfs-hlpe/agroecology_innovation

[21] http://www.fao.org/about/meetings/second-international-agroecology-symposium/en/

3. Future Global Governance

"*Successful governance models require a clear statement of objective …, clear over-arching responsibility…, clearly identified obligations for the parties/member states/stakeholders, a Bureau that is representative of the stakeholders/parties on an equal basis and performance evaluation*."[22] This is the conclusion of the SAICM secretariat's review of existing governance models; and this is precisely what is missing from global governance of pesticides.

Given the failure of the voluntary approach of SAICM to the sound management of HHPs, there are two remaining options for achieving the sound management of HHPs: a separate treaty on life-cycle management of pesticides; or legally binding elements within the SAICM framework for HHPs. Both are addressed here.

3.1 A global legally binding treaty on the life-cycle management of pesticides

In 2017, the UN Special Rapporteur on the right to food, Hilal Elver presented to the Human Rights Council a clear account "*of global pesticide use in agriculture and its impact on human rights; the negative consequences that pesticide practices have had on human health, the environment and society, which are underreported and monitored in the shadow of a prevailing and narrow focus on 'food security'*".[23] She noted that a comprehensive treaty that regulates highly hazardous pesticides does not exist, leaving a critical gap in the human rights protection framework." She concluded **"*the international community must work on a comprehensive, binding treaty to regulate hazardous pesticides throughout their life cycle, taking into account human rights principles*."**

PAN supports the UN Special Rapporteur's call for a global treaty on pesticides. We believe that the lack of a global treaty on the lifecycle management of hazardous pesticides not only leaves a critical gap in the human rights protection framework, but also leaves a critical gap in the global environmental protection framework; and as a result there are now critically endangered ecosystems, ecosystem services and life forms. It needs to be clearly understood that this is not only the result of past use of POPs pesticides, but of the continuous use of current pesticides, especially HHPs.

Many low and middle income countries (LMICs) are swamped by illegal, counterfeit, low quality pesticides that harm farmers, consumers and the environment, because the countries lack the resources for compliance and border checking for products that should

[22] UNEP. 2018. Review of existing governance models of potential relevance to the sound management of chemicals and waste, including science-policy interfaces. Second meeting of the intersessional process considering the Strategic Approach and the sound management of chemicals and waste beyond 2020. Stockholm, Sweden, 13-15 March 2018 Item 4(e) of the provisional agenda. Considerations for Beyond 2020: Governance**.** SAICM/IP.2/10.

[23] Report of the Special Rapporteur on the right to food (Effects of pesticides on the right to food). A/HRC/34/48. Human Rights Council, Thirty-fourth session, 27 February-24 March 2017, Agenda item 3: Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development. http://www.ohchr.org/EN/Issues/Food/Pages/Annual.aspx

be regulated at the global level. Some officials state that markets in their countries are "out of control".[24] Much more regulation and control is needed at a global level on the marketing, use, and disposal of product and packaging, to reduce the burden on individual countries, not least because as the Special Rapporteur pointed out, "*the pesticide industry is dominated by a few transnational corporations that wield extraordinary power over global agrochemical research, legislative initiatives and regulatory agendas*".

Many LMICs face double standards from high income countries (HICs): countries which ban the use of a particular pesticide because it is too hazardous for them, but allow their companies to manufacture it and export it to LMICs. Paraquat is an example of such a pesticide: patented by a Swiss company but banned in Switzerland; banned in the UK, but manufactured there for export to LMICs.[25] Paraquat causes many cases of death from accidental occupational exposure, as well as other chronic and acute effects, every year.[26] And no country is immune from poisonings: in late 2017, a young man narrowly escaped death after he drank paraquat left in a coca-cola bottle in the disabled toilet in an Australian sports complex.[27]

3.2 Legally binding elements within SAICM

The Nordic Council of Ministers' report advised that consideration needs to be given to an international legally binding framework for chemical management, with ICCM hosting the framework. The life-cycle management of pesticides could be part of such an overarching framework. Another option is for SAICM to continue as a largely voluntary approach but with some legally binding elements such as for HHPs, with dedicated financial resources and plans of action for implementation. However, if SAICM adopts a framework of sustainable chemistry, SAICM/ICCM would become an inappropriate framework for addressing HHPs. ICCM has already agreed that the focus for replacing HHPs is agroecologically-based practices; and as explained in PAN's companion paper *Highly Hazardous Pesticides – Sustainable Chemistry – Agroecology,* an agroecological approach is incompatible with sustainable chemistry. The chief inputs in agroecology are farmers' knowledge, wisdom and skill, integrated with ecological science and principles, in ways that conserve soil, water and biodiversity – not external inputs derived from sustainable or green chemistry.

3.3 Elements to consider for a global treaty on pesticides or a SAICM-based binding instrument

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[24] E.g.: http://vietnamnews.vn/society/417266/fake-low-quality-pesticides-out-of-control.html#gmU8zU1ED06A5kMw.97

[25] https://www.theguardian.com/global-development/2017/aug/22/uk-condemned-shocking-export-deadly-weedkiller-poorer-countries-paraquat

[26] Isenring R. 2017. *Adverse Health Effects Caused by Paraquat: A bibliography of documented evidence*. Public Eye, Pesticide Action Network UK and Pesticide Action Network Asia-Pacific. https://www.publiceye.ch/fileadmin/files/documents/Syngenta/Paraquat/PE_Paraquat_2-17_def.pdf

[27] Vince ML. 2017. Paraquat poisoning: Weedkiller drunk by autistic man meant to be 'under lock and key', chemical company says. ABC News. December 12th. http://www.abc.net.au/news/2017-12-12/chemical-manufacturer-rejects-calls-for-banning-paraquat/9248072

The following proposed elements of a global treaty are based on recommendations by the UN Special Rapporteur on the right to food, the Nordic Council of Ministers report, the International Code of Conduct on Pesticide Management and its Guidelines, and PAN's own documentation.[28]

The treaty/SAICM instrument should:

(a) Be based on a human rights approach, particularly acknowledging the rights of children and the greater vulnerability of women, and including cultural, environmental and labour rights;
(b) Be based on transparency and accountability;
(c) Take a life-cycle approach to the management of pesticides;
(d) Be based on the precautionary principle and substitution, considering agroecological practices and non-chemical alternatives first;
(e) Have an emphasis on minimising harm, promoting the use of the less hazardous approaches to pest management;
(f) Promote agroecology;
(g) Remove existing double standards among countries that are particularly detrimental to countries with weaker regulatory systems, in that countries which ban pesticides because they are too hazardous should not export them to other countries;
(h) Generate policies to reduce pesticide use worldwide and develop a framework for the banning and phasing-out of highly hazardous pesticides;
(i) Place strict liability on pesticide producers for human and environmental impacts, for container return, and for unused/obsolete stocks;
(j) Prevent the sale of pesticides that require Personal Protective Equipment (PPE) in countries that are too hot for PPE to be comfortably worn, and/or where PPE is not readily available or affordable;[29]
(k) Establish systems of global monitoring of the impacts of pesticides on human health, biodiversity, and environmental contamination;
(l) Monitor corporations to ensure that labelling, safety precautions and training standards are respected;
(m) Adopt measureable targets, which form a strategic plan to ensure proper implementation of the treaty;
(n) Provide for the development of, and reporting back on, comprehensive national action plans that support alternatives to hazardous pesticides, elements of which may include:
    - binding and measurable reduction targets with time limits;
    - elimination of pesticide subsidies and initiation of pesticide taxes, import tariffs and pesticide-use fees;
    - impartial and independent hazard or risk assessment or evaluation processes for the registration of pesticides, with full disclosure requirements from the producer;

[28] See for example, Chapters 10 and 11 of *Replacing Chemicals with Biology: Phasing out Highly Hazardous Pesticides with Agroecology*, Watts MA, Williamson S, 2015, Pesticide Action Network International; and Chapter 5 of *Poisoning Our Future: Children and Pesticides*, Watts MA, 2013, Pesticide Action Network Asia Pacific.
[29] Article 3.6 of the International Code of Conduct on Pesticide Management states: *Pesticides whose handling and application require the use of personal protective equipment that is uncomfortable, expensive or not readily available should be avoided, especially in the case of small-scale users and farm workers in hot climates.*

- rigorous and regular analysis of food and beverages to determine levels of hazardous residues, including in infant formula and follow-on foods, with information accessible to the public;
- monitoring of pesticide use
- ensuring that only those with the requisite training are permitted to apply hazardous products, and that they do so according to instructions and using appropriate protective equipment;
- buffer zones around plantations and farms until pesticides are phased out, to reduce pesticide exposure risk;
- training programmes, not aligned with pesticide manufacturers and sellers, for farmers, to raise awareness of the harmful effects of hazardous pesticides and of alternative methods;
- regulation of corporations to respect human rights and avoid environmental damage during the entire life cycle of pesticides;
- imposing penalties on companies that fabricate evidence and disseminate misinformation on the health and environmental risks of their products;
- encouraging development and farmers' implementation of agroecological systems and practices that enhance biodiversity and naturally suppress pests, and measures such as crop rotation, soil fertility management, and crop selection appropriate for local conditions, as well as supporting local social and cultural needs and processes.

3.4 SDGs and HHPs

Appropriate Sustainable Development Goals (SDG) objectives and milestones to reflect the above elements could include the following:

	Objective	**Milestones**
1.	Global framework	1a ICCM or FAO/UNEP establishes a global binding mechanism for life-cycle management of HHPs. 1b ICCM establishes a programme for phasing out HHPs 1c A global programme for monitoring the impacts of pesticides is in place.
2	Legal frameworks that address the life cycle of chemicals and waste.	2a. Countries have legislation in place to phase-out HHPs. 2b. Countries have legislation to prevent the export of banned pesticides. 2c.Countries have legislation to prevent the sale of pesticides that require Personal Protective Equipment (PPE) where it is too hot for PPE to be comfortably worn, and/or where PPE is not readily available or affordable. 2d. Countries have legislation in place to require the industry take back of pesticide containers and unused stock.
3	Strong institutional frameworks and coordination mechanisms among relevant stakeholders	3a. Countries have national plans of action in place to reduce pesticide use, phase out HHPs, and implement agroecology.

		3b. Countries have adopted measureable targets for phasing out HHPs
4	Implementation of chemicals and waste-related multilateral environmental agreements, as well as health, labour and other relevant conventions and voluntary mechanisms.	4a. Countries are implementing the global binding mechanism for life-cycle management of HHPs
5	Industry participation and defined responsibility across the life cycle	5a.Industry has stopped producing HHPs. 5b. Industry is taking back used pesticide containers and unused pesticide stock. 5c. Industry is taking responsibility to prevent illegal traffic in HHPs.
6	Development and promotion of environmentally sound and safer alternatives	6. Countries and other stakeholders are researching, developing, training on, and implementing agroecology

Endnotes

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Pesticide Action Network (PAN) is a network of over 600 participating nongovernmental organizations, institutions and individuals in over 90 countries working to replace the use of hazardous pesticides with ecologically sound and socially just alternatives. PAN was founded in 1982 and has five independent, collaborating Regional Centres that implement its projects and campaigns.

For more information contact:

PAN Asia Pacific
For a just and pesticide-free future

PAN Asia Pacific (PANAP), one of five regional centres of the Pesticide Action Network, is dedicated to the elimination of harm upon humans and the environment by pesticide use and the promotion of sustainable biodiversity-based agriculture.

In addition, PANAP helps strengthen people's movements in their assertion of rights to land and livelihood; advancing food sovereignty and gender justice.

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