



SUSTAINABLE CROP PROTECTION THROUGH RESPONSIBLE PESTICIDE USE:

**A CALL TO ACTION AGAINST HIGHLY
HAZARDOUS PESTICIDES.**



June, 2025

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FoSCU Membership



Global Consumer Centre



Executive Summary

This position paper provides a comprehensive analysis of the management of Highly Hazardous Pesticides in Uganda, emphasizing the urgent need for sustainable crop protection and responsible pesticide use. As defined by the International Code of Conduct on Pesticide Management and Uganda's Agricultural Chemicals (Control) Act, pesticides play a crucial role in safeguarding agricultural productivity and food security. However, the significant increase in pesticide use, evidenced by a doubling of both volume and monetary value of imports over the past decade, raises critical concerns regarding public health, environmental safety, and long-term sustainability.

Highly Hazardous Pesticides, as classified by international systems such as the World Health Organization and Globally Harmonized System, are associated with acute and chronic risks, including carcinogenicity, mutagenicity, reproductive toxicity, endocrine disruption, and environmental persistence. These risks have positioned Highly Hazardous Pesticides as a global priority within international chemical policy frameworks, leading to the adoption of treaties such as the Basel, Bamako, Rotterdam, and Stockholm Conventions. Uganda is a signatory to these key conventions, demonstrating its commitment to international best practices in hazardous chemical management, and has acceded to several regional frameworks, including the East African Community harmonization initiatives.

Uganda's national framework for pesticide management is anchored in constitutional provisions for environmental protection and human rights, the Agricultural Chemicals (Control) Act of 2006, and a robust institutional structure led by the Agricultural Chemicals Board. These frameworks regulate the registration, distribution, use, and disposal of pesticides, with a focus on minimizing risks to human health and the environment. Regional harmonization efforts, such as the East African Community Guidelines on Pesticide Registration, further strengthen Uganda's capacity to ensure safe and effective pest control while facilitating trade and regional cooperation.

Despite these efforts, the continued use of Highly Hazardous Pesticides poses significant challenges, including risks of human exposure, environmental contamination, and adverse effects on biodiversity and pollinators. The paper calls for a balanced approach that aligns agricultural productivity with public health and environmental integrity. Key recommendations include strengthening regulatory enforcement, promoting safer alternatives, enhancing public awareness, and fostering multi-sectoral collaboration.

In conclusion, the responsible management of Highly Hazardous Pesticides is not only an agricultural or environmental imperative but also a human rights and economic issue. Uganda's continued commitment to international and regional frameworks, coupled with robust national policies and institutional capacity, is essential for safeguarding present and future generations while supporting sustainable agricultural development.

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1.0 Context

The International Code of Conduct on Pesticide Management defines a pesticide as “any substance or mixture of substances of chemical or biological origin intended for repelling, destroying, or controlling any pest, or for regulating plant growth” (FAO & WHO, 2014). According to the Agricultural Chemicals (Control) Act, 2006, a pesticide is defined as **“a chemical which, by its poisonous properties, is used to kill pests in agriculture and forestry”** (GOU, 2007). Together, these definitions highlight the critical role pesticides play in protecting animals and plants and supporting food security. At the same time, they underscore the need for their careful management to safeguard the health and integrity of humans, animals, plants, the environment, and biodiversity.

In response to the escalating challenges posed by climate change and the rising incidence of crop and livestock pests and diseases, farmers are increasingly turning to agrochemicals as a primary strategy for pest and disease management, aiming to safeguard and enhance agricultural yields. This trend has led to a significant surge in agrochemical usage within the country. According to the Food and Agriculture Organization (FAO), the total volume of pesticides applied in Uganda has more than doubled over the past decade, increasing from 2,990.23 metric tonnes in 2010 to 6,009.78 metric tonnes in 2022 (FAOSTAT, 2024).

Based on the rising demand for pesticides in Uganda, there is clear evidence of a significant increase in the monetary value of pesticide imports over recent years. Specifically, the value of pesticides imported into the country more than doubled from approximately 32.57 million USD in 2010 to 75.87 million USD in 2022, with a notable peak of 108.57 million USD recorded in 2020 (FAOSTAT, 2024).

While pesticides play a crucial role in enhancing agricultural productivity, their use must not compromise public health or environmental integrity. This principle aligns with international commitments such as the Rio Declaration on Environment and Development (1992) and the Wingspread Conference (1998), both of which Uganda endorses.

At the global level, regional economic partners like the European Union have set strict maximum residue levels for agricultural products to protect the people and the planet. Chapter Four of the 1995 Constitution of the Republic of Uganda provides for the protection and promotion of fundamental and other human rights and freedoms. Accordingly, all measures involving pesticide use must prioritize preventing harm to both human and environmental health. This balanced approach ensures that while agricultural needs are met, sustainable development and safety remain at the forefront of Uganda’s pesticide management policies.

Therefore, a balanced and forward-looking approach to pesticide management in Uganda is an environmental, human rights, and economic issue. This calls for concerted efforts to regulate hazardous pesticides and promote sustainable agricultural practices for both the present and future generations.

2.0 The Global Concern of Highly Hazardous Pesticides

Highly Hazardous Pesticides (HHPs) are defined by the International Code of Conduct on Pesticide Management as “pesticides that present particularly high levels of acute or chronic hazards to human health or the environment, according to internationally accepted classification systems such as those of the World Health Organization (WHO) or the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), or by their inclusion in relevant binding international agreements or conventions”. Additionally, pesticides that are found to cause severe or irreversible harm to health or the environment under conditions of use in a specific country may also be considered highly hazardous.

2.1 What pesticides are categorized as Highly Hazardous Pesticides

According to the Globally Harmonized System (GHS) classification, HHPs may be identified as carcinogens (agents that can induce cancer), mutagens (substances that can cause genetic mutations), or reproductive toxicants (compounds linked to adverse reproductive outcomes such as infertility, miscarriage, or developmental defects). Additionally, certain HHPs act as endocrine disruptors, interfering with hormonal regulation, while others exhibit pronounced toxicity to pollinators, including bees, or aquatic organisms. Furthermore, some HHPs demonstrate environmental persistence, thereby posing prolonged ecological risks.

Given the significant risks posed by HHPs, their identification and management have emerged as key priorities within international chemical policy frameworks and multilateral environmental agreements. Notably, the Rotterdam, Basel, and Stockholm Conventions collectively emphasize the reduction of HHP use through stringent regulatory measures, including restrictions and prohibitions, while actively promoting the adoption of safer and more sustainable alternatives.

2.2 Uganda’s Commitment to International Frameworks and Collaborative Initiatives Addressing Highly Hazardous Pesticides”

Global concerns over the health and environmental risks posed by Highly Hazardous Pesticides (HHPs) have driven the development of international treaties, as well as legal, regulatory, and policy frameworks. These instruments govern the manufacture, distribution, trade, use, and disposal of HHPs across borders, aiming to protect public health and safeguard the environment.

Uganda is a signatory to multiple regional and international treaties and protocols that govern the management, regulation, and safe use of pesticides and agrochemicals. The key agreements to which Uganda is a party are outlined below:

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes;

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted in 1989 and entering into force in 1992, is a global treaty designed to protect human health and the environment from the adverse effects of hazardous and other wastes. Uganda acceded to the Convention on March 11, 1999. The Convention regulates the generation, management,

transboundary movement, and environmentally sound disposal of hazardous wastes, aiming to minimize their movement-especially from developed to developing countries, and to ensure wastes are treated as close as possible to their source.

It covers wastes characterized by toxicity, flammability, corrosiveness, and ecotoxicity, including household and incinerator ash wastes. The treaty establishes a strict prior informed consent procedure for transboundary shipments and obliges Parties to reduce waste generation at the source and promote environmentally sound management throughout the waste lifecycle. Exclusions include radioactive wastes governed by other international agreements. With near-universal membership, the Basel Convention remains the foremost international framework for hazardous waste control, fostering cooperation to prevent illegal trafficking and promote sustainable waste management worldwide.

Bamako Convention on the Ban of Import to Africa and Control of Hazardous Wastes;

The Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes is a treaty adopted in Bamako, Mali, on January 29th, 1991, and entered into force on April 22nd, 1998. It was established by African nations to prohibit the importation of hazardous and radioactive wastes into Africa, including substances banned in their country of origin for health or environmental reasons, as stipulated in Article 2(d). The Convention also bans the dumping and incineration of hazardous wastes in oceans and inland waters and mandates environmentally sound management of hazardous wastes generated within Africa. It promotes minimizing transboundary waste movements within the continent, requiring prior informed consent for such transfers, and emphasizes the precautionary principle and cleaner production methods.

Uganda acceded to the Bamako Convention on March 11, 1999. By acceding, Uganda committed to enforcing a strict ban on the import of hazardous and radioactive wastes, preventing illegal waste trafficking, and ensuring that hazardous waste generated domestically is managed and disposed of in an environmentally responsible manner. This accession aligns Uganda with continental efforts to protect human health and the environment from the risks posed by hazardous wastes, strengthens its regulatory framework on waste management, and fosters regional cooperation in controlling hazardous waste movements within Africa.

The Rotterdam Convention;

The Rotterdam Convention, adopted in 1998 and entering into force in 2004, establishes a multilateral framework to promote shared responsibility and cooperation among Parties in the international trade of certain hazardous chemicals, including pesticides and industrial chemicals banned or severely restricted due to health or environmental risks. Uganda acceded to the Convention on August 18, 2008, committing to its provisions. Central to the Convention is the Prior Informed Consent (PIC) procedure, which requires Parties to exchange information and obtain consent from importing countries before the shipment of chemicals listed in Annex III. This process enables countries to make informed decisions regarding the import of hazardous substances, enhancing protection of human health and the environment. The Convention also mandates notification of national regulatory actions, proper labeling, safety data sheets, and export notifications to ensure transparency and safe handling. Working

in synergy with related treaties like the Stockholm and Basel Conventions, the Rotterdam Convention facilitates global cooperation to minimize risks associated with hazardous chemical trade and supports sustainable chemical management.

The Stockholm Convention on Persistent Organic Pollutants (POPs);

The Stockholm Convention on Persistent Organic Pollutants (POPs), adopted in 2001 and effective from May 2004, is a global treaty aimed at protecting human health and the environment from toxic, long-lasting chemicals such as PCBs, DDT, dioxins, and furans. Uganda acceded to the Convention in July 2004, committing to eliminate or restrict these substances, reduce unintentional releases, and manage POPs wastes sustainably. The Convention's scientific review process enables the inclusion of new chemicals based on stringent criteria while allowing controlled exemptions. Uganda's ongoing commitment to the Stockholm Convention underscores its dedication to reducing hazardous POPs, safeguarding public health and the environment, and advancing sustainable development through international cooperation and continuous policy enhancement.

The Convention On Health and Safety in Agriculture;

The Safety and Health in Agriculture Convention, 2001 (No. 184), developed by the International Labour Organization (ILO), establishes comprehensive international standards to protect agricultural workers from occupational hazards. Under Article 12, the Convention mandates signatory countries to implement measures ensuring the safe handling, importation, classification, packaging, labeling, and disposal of chemicals used in agriculture. This includes enforcing compliance with national or recognized safety standards and providing adequate information to users to safeguard farmers' health and safety throughout the chemical lifecycle.

By acceding to this convention, Uganda committed to strengthening its legislative and regulatory framework to enforce preventive and protective measures within the agricultural sector, with a particular emphasis on chemical safety. This commitment underscores Uganda's strategic priority to enhance occupational health and safety, mitigate chemical exposure risks, and foster sustainable agricultural practices. Furthermore, accession aligns Uganda with global best practices and facilitates collaboration with international partners to advance worker protection and promote sustainable development in agriculture.

The Treaty for the Establishment of the East African Community (EAC);

Signed in November 1999 by Kenya, Uganda, and Tanzania, mandates Partner States under Article 108 to harmonize policies, legislation, and regulatory frameworks for pest and disease control. This includes strengthening regulatory institutions and adopting common mechanisms to ensure the safety, efficacy, and potency of agricultural inputs such as chemicals, drugs, and vaccines. Building on this foundation, the EAC has developed harmonized pesticide management guidelines and regional work plans-supported by FAO and other partners streamline pesticide registration, promote joint efficacy

and residue trials, and facilitate mutual recognition across Member States. These efforts aim to reduce costs and delays in pesticide approval, improve access to quality and safe pest control products, and mitigate adverse health and environmental impacts, thereby enhancing agricultural productivity and regional trade integration.

The 2019 EAC Guidelines on Data Requirements for the Registration of Conventional Chemical Pesticides in Agriculture and Forestry;

Specify the mandatory data and studies that applicants must submit to national pesticide registration authorities. These harmonized guidelines ensure that all EAC Partner States require consistent or closely similar data, thereby standardizing and streamlining the pesticide registration process across the region.

2.3 Uganda's Comprehensive Framework for Pesticide Management: Legislative, Policy, and Institutional Dimensions

The registration of pesticides (herbicides, insecticides, and rodenticides, etc.) is a critical component of Uganda's national strategy for pest control in crops and livestock, aimed at reducing yield losses and managing disease vectors. This process is governed by national and regional legislation, which mandates the government to oversee the efficacy, toxicity, and environmental impact of all registered pesticides to ensure safe and effective use.

2.3.1 Legal, Regulatory, and Policy Frameworks

Key frameworks governing pesticide management in Uganda include;

The Constitution of the Republic of Uganda (1995);

Provides a comprehensive legal framework for sustainable development, mandating the balanced management and protection of natural resources to meet the needs of present and future generations. It guarantees every Ugandan the right to a clean and healthy environment (Article 39) and obligates the State to prevent or minimize environmental degradation of land, air, and water resources. Additionally, the Constitution requires the State to safeguard critical natural assets-including land, water bodies, wetlands, minerals, flora, and fauna-and directs Parliament to enact legislation promoting environmental protection, sustainable resource management, and public awareness.

The Agricultural Chemicals (Control) Act of 2006;

Establishes the Agricultural Chemicals Board as Uganda's primary regulatory authority responsible for the registration, control, and oversight of agricultural chemicals, including pesticides, fertilizers, and bio pesticides, to ensure their safe and effective use. The Board, comprising diverse stakeholders, oversees compliance through licensing, policy advisory, enforcement, and public awareness initiatives, thereby safeguarding agricultural productivity, public health, and environmental integrity.

The National Environmental Act, 2019, Part VI;

Governs the sound management and control of chemicals in Uganda by establishing provisions for the prohibition or restriction of hazardous chemicals in their importation, exportation, manufacture,

formulation, distribution, and use. It mandates the registration and regulation of hazardous chemicals and products containing such substances, including those classified as hazardous waste, while promoting the progressive replacement of these chemicals with safer alternatives to ensure environmental and public health protection.

2.3.2 Authorities responsible for the registration of pesticides

The Department of Crop Inspection and Certification (DCIC) within MAAIF: This department oversees inspection and certification in Uganda, ensuring compliance with national and international phytosanitary, seed, planting material, and agrochemical regulations. The DCIC comprises three divisions: The Phytosanitary and Quarantine Inspection Services Division, the National Seed Certification Services Division, and the Agrochemicals Control Division. The department is mandated to facilitate safe trade by preventing the introduction and spread of pests, supports market access through certification processes, and promotes food security and improved incomes by enforcing standards, conducting inspections, and managing registrations for seeds, agrochemicals, and plant products.

The Agricultural Chemicals Board: Established under the Agricultural Chemicals (Control) Act of 2006, comprises appointed members and ex-officio members representing key stakeholders from research institutions, academia, agricultural chemical merchants, farmers, extension services, regulatory agencies, and government ministries. The Board is responsible for the registration, regulation, importation, exportation, distribution, and licensing of agricultural chemicals. It is mandated to advise the Minister of Agriculture on registration applications, licensing, policy formulation for the safe use, storage, and disposal of agricultural chemicals, and enforcement of related regulations.

The National Drug Authority (NDA): is a government agency responsible for the regulation and oversight of drugs and pharmacies throughout Uganda, including the manufacture, importation, distribution, and licensing of human and veterinary pharmaceuticals. Its board comprises representatives from various government ministries, agencies, and professional bodies, ensuring a broad and coordinated approach to drug regulation and policy implementation nationwide.

The National Environment Management Authority (NEMA): of Uganda is the principal agency responsible for coordinating, monitoring, regulating, and supervising environmental management nationwide. Established under the National Environment Act No. 5 of 2019, NEMA leads the development and implementation of environmental policies, laws, regulations, standards, and guidelines. It facilitates environmental impact assessments, promotes public awareness and education, conducts research, and mobilizes resources to ensure sustainable use of natural resources. NEMA collaborates with relevant ministries, agencies, and stakeholders to integrate environmental considerations into national planning and development processes, thereby supporting Uganda's sustainable development goals and compliance with regional and global environmental commitments.

3.0 Situation of HHPs in Uganda

3.1 What agrochemicals are registered and used in Uganda?

A 2021 Country Situation Report on HHPs in Uganda, published by the Association of Uganda Professional Women in Agriculture and Environment (AUPWAE), found that the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) had registered 548 pesticide brands. When these were assessed using the Pesticide Action Network (PAN) criteria, 41 of the registered active ingredients in these brands were identified as Highly Hazardous. The report also highlighted that the most commonly used HHPs among Ugandan farmers include: Cypermethrin, Profenofos, Abamectin, Lambda-cyhalothrin, Thiamethoxam, Dimethoate, Emamectin, Dichlorvos, Mancozeb, Carbendazim, Chlorpyrifos, and Carbofuran. Notably, more than half (59%) of these 41 HHPs registered in Uganda were not approved for use in the European Union (AUPWAE, 2021).

Similarly, in December 2024, the Food Safety Coalition of Uganda (FoSCU) released a synthesis report titled *“Food Safety Crop Protection Nexus: Insights from Uganda’s Agriculture Sector.”* The report highlighted that by July 2023, Uganda had legally registered 115 active ingredients and 669 brands of synthetic pesticides for use, referencing official registers from MAAIF and the National Drug Authority (NDA) (FoSCU, 2024; MAAIF, 2023; NDA, 2023).

FoSCU additionally noted that, based on the Pesticide Action Network (PAN) criteria, 47.8% of the active ingredients and 68.6% of the pesticide brands assessed were classified as HHPs (FoSCU, 2024; PAN, 2021). Table 1 in the Annex presents the list of active ingredients registered for use in Uganda that meet the PAN HHP classification criteria.

Despite the risks associated with HHPs, a notable disparity exists in pesticide regulation between Uganda and the European Union (EU). As of July 2023, 65.5% of the active ingredients officially registered in Uganda and classified as HHPs under the PAN criteria were either not approved for use or were banned in the EU. This discrepancy underscores concerns regarding double standards in the regulation and use of HHPs. Table 2 in the annex provides a list of some of the Active ingredients officially registered and used in Uganda and not approved for use or banned in the EU (Uganda’s trade partner).

3.2 Documented Exposure and Impact Assessment of Highly Hazardous Pesticides (HHPs) in Uganda

The utilization of pesticides in developing countries has escalated considerably in recent years, primarily driven by increasing demands for enhanced agricultural productivity (Cuenca et al., 2019; Oesterlund et al., 2014; Adekunle et al., 2017; Damalas and Koutroubas, 2017). This intensification of pesticide application, while contributing to crop yield improvements, has concurrently elevated the risk of pesticide exposure among agricultural workers and the entire population. The heightened exposure risk is predominantly associated with inadequate training of pesticide users, insufficient regulatory frameworks governing access to HHPs, limited knowledge of safe handling protocols, suboptimal use of personal protective equipment (PPE), unsafe storage conditions, improper disposal of pesticide containers, and hazardous practices such as the mixing of multiple pesticides in a single application tank (Atuhaire, 2017).

3.2.1 Documented Evidence of Human Exposure and Environmental Contamination by Highly Hazardous Pesticides

In the context of Uganda, empirical evidence indicates that a substantial proportion of pesticide applicators lack fundamental training, which has precipitated widespread unsafe and improper handling of HHPs (Diemer et al., 2020). Specific challenges identified include inconsistent or minimal use of PPE (Oesterlund et al., 2014; Sapbamrer & Thammachai, 2020), excessive chemical mixing rates (Atuhaire et al., 2016, 2017a), non-adherence to recommended pre-harvest intervals and re-entry periods (Atuhaire et al., 2016), unsafe storage of pesticides within domestic environments, and inappropriate disposal of pesticide waste and containers (Atuhaire, 2017). Furthermore, instances of pesticide over-application have been documented, alongside reports of pesticide misuse in self-harm and violent acts (Pearson et al., 2017; Pedersen et al., 2017; Sekabojja et al., 2020; Sibani et al., 2017; Ssemugabo et al., 2017). Of particular concern is the involvement of children in both the trade and application of pesticides, which exacerbates the public health risks associated with pesticide exposure in these communities (Atuhaire, 2017).

Over recent years, although comprehensive data on the adverse effects of HHPs on human and environmental health in Uganda remain limited, there has been a growing body of research documenting pesticide exposure and its consequences. Between 2013 and 2017, the Uganda National Association of Community and Occupational Health (UNACOH), in collaboration with local health facilities, recorded 393 cases of acute pesticide poisoning in the districts of Pallisa and Wakiso, highlighting the public health burden associated with pesticide use (Sekabojja et al., 2020).

Subsequent investigations under the Pesticide Use in Tropical Settings Project (PESTROP) in 2017 identified frequent glyphosate application among smallholder farmworkers as a potential contributor to neurobehavioral impairments and depression (Winkler et al., 2019). Environmental monitoring further corroborates the persistence of HHPs in Ugandan ecosystems; for instance, air sampling conducted over a six-month period in Wakiso district detected continuous presence of the herbicide atrazine and the insecticide chlorpyrifos, both classified as HHPs and banned within the EU but still authorized for use in Uganda (Fuhriemann, et al., 2020).

In 2018, a nationwide assessment of tomato samples by UNACOH revealed contamination with up to seven distinct HHPs, including profenofos, cypermethrin, lambda-cyhalothrin, dichlorvos, chlorpyrifos, malathion, and mancozeb, with particularly elevated levels of mancozeb, underscoring the extent of pesticide residues in these products. Complementing these findings, UNACOH's evaluation of 86 community drinking water sources across Uganda identified contamination with as many as 25 different pesticides. The highest residue concentrations were found for several HHPs such as glyphosate, dichlorvos, atrazine, aldicarb, and chlorfenvinphos, most of which are prohibited in the EU (UNACOH, 2019) thus putting the consumer at a high risk.

Evidence from multiple African countries highlights the significant adverse health effects associated with exposure to highly hazardous pesticides. In South Africa, Rahimi et al. (2020) reported that female greenhouse workers with high agrochemical exposure exhibited markedly increased rates of spontaneous abortion, infertility, low birth weight, congenital abnormalities, and preterm birth compared to unexposed controls. Complementing these findings, Farr et al. (2004) demonstrated that premenopausal women engaged in agricultural work who used hormonally active pesticides had

60–100% higher odds of experiencing menstrual irregularities, including prolonged cycles, missed periods, and intermenstrual bleeding, relative to women without pesticide exposure.

More recent evidence from a 2023 systematic review and meta-analysis by Lin et al. (2023) further substantiated the association between maternal pesticide exposure and adverse birth outcomes, indicating that a tenfold increase in pesticide concentrations was potentially linked to an elevated risk of preterm birth. Additionally, Kalliora et al. (2018) identified positive correlations between pesticide exposure and congenital anomalies, specifically neural tube defects, urogenital malformations, and cardiac abnormalities among offspring born to exposed mothers.

Beyond reproductive health, pesticide exposure has been implicated in respiratory and neurodevelopmental disorders. Mwanga et al. (2016) documented an association between pesticide exposure and increased asthma risk. Furthermore, Chetty-Mhlana et al. (2021) reported that children in the Western Cape exposed to pesticides exhibited significant neurocognitive impairments, including deficits in memory, learning, motor and visual processing, multitasking ability, and overall cognitive performance.

Collectively, these studies and data provide compelling evidence that exposure to highly hazardous pesticides in African agricultural settings presents multifaceted health risks, particularly impacting vulnerable populations such as women, children, agricultural workers, and their communities. The documented reproductive, respiratory, and neurodevelopmental effects, coupled with widespread environmental and dietary contamination of air, water, and food sources, underscore the pervasive nature of pesticide exposure and its broader ecological implications. This situation is further compounded by regulatory gaps, including the continued registration and use of pesticides banned in other jurisdictions, which highlights significant challenges in pesticide management across the region.

Therefore, there is an urgent and critical need for strengthened regulatory frameworks, enhanced surveillance and enforcement mechanisms, improved occupational safety measures, and targeted public health interventions to effectively mitigate HHP-related health burdens and protect both human and environmental health in Uganda and Africa as a whole.

3.2.2 The economic impact of hazardous pesticides

Multinational corporations continue to make significant investments and reap substantial profits from the production and global distribution of hazardous pesticides. However, these financial gains come at a heavy cost to society. Despite annual expenditures to manage the health and environmental impacts of pesticide use, these efforts fall short of reversing the irreversible damage inflicted on ecosystems and human health.

In 2019, the European Union (EU) approved over 450 active pesticide ingredients, with exports generating USD 5.8 billion that same year (Pesticide Atlas, 2022). While such figures reflect the economic significance of pesticide trade, they also highlight a troubling imbalance, where profits are privatized but the damage is socialized.

Uganda mirrors this global pattern. According to FAOSTAT (2024), the volume of agricultural pesticides used in Uganda more than doubled over 12 years, from 2,990.23 tonnes in 2010 to 6,009.78 tonnes in 2022. Over the same period, the monetary value of pesticide imports rose from \$32.57 million to

\$75.87 million, with a peak of \$108.57 million recorded in 2020. Approximately 40% of agrochemicals on Uganda's market are counterfeit (FAO, 2019), leading to substantial financial losses and compounding environmental and public health risks. FAO (2020) estimates that Africa loses nearly \$4 billion annually due to pesticide mismanagement.

Uganda is vulnerable to non-compliance with the pesticide regulations. In 2020, the country lost more than \$60 million in fresh produce exports due to excessive pesticide residue levels (UBOS, 2021). These losses are not only economic but also affect Uganda's reputation in international agricultural markets.

4.0 Our call to action/recommendations

Based on the identified gaps and supported by existing literature and policy analyses, the following strategic recommendations are proposed to enhance pesticide management and mitigate the risks associated with highly hazardous pesticides in Uganda:

- The Ministry of Agriculture, Animal Industry and Fisheries, as the principal regulatory authority overseeing pesticides through its Department of Crop Inspection and Certification, must take action and ban or impose stringent restrictions on the use of identified HHPs within Uganda's agricultural sector to safeguard consumer health and environmental integrity.
- The Government of Uganda, through the coordinated efforts of relevant ministries, departments, and agencies (MDAs), including the Ministry of Health (MoH), MAAIF, Ministry of Trade, Industry and Cooperatives (MTIC), and Ministry of Local Government (MoLG) must strengthen the enforcement of existing regulatory frameworks and implement complementary non-regulatory interventions to enhance food safety standards nationwide. This should take into account the action to develop and review strategies of the Agricultural Chemical (control) Act Cap.35 and develop relevant regulations, Review the Pesticide residual monitoring plan as proposed under the National Development Plan IV.
- In collaboration with key stakeholders and institutions, the government should expedite the finalization, official launch, and effective implementation of the National Agroecology Strategy, thereby promoting sustainable agricultural practices that reduce reliance on hazardous agrochemicals.
- Furthermore, the government should adopt integrated pesticide and disease management approaches that encompass the entire lifecycle of pesticide products-from importation and registration through use and disposal-ensuring sound, environmentally responsible, and health-conscious pesticide management aligned with international best practices. The private sector, including manufacturers, importers, distributors, and retailers of animal and plant protection products, should proactively expand the trade and promotion of effective bio pesticides and safer pesticide alternatives to highly hazardous pesticides. This strategic shift will support sustainable agricultural practices while minimizing health and environmental risks associated with conventional chemical pesticides.
- Advocacy actors, including civil society organizations, faith-based groups, cultural institutions, as well as producer and consumer associations-should systematically mobilize and support smallholder farmers to adopt safe food production practices. This involves promoting the integration of non-chemical animal and plant protection methods and encouraging judicious pesticide use, with strict adherence to recommended mixing ratios and preharvest intervals. Concurrently, these actors must implement comprehensive mass awareness campaigns to educate communities on the health and environmental impacts of highly hazardous pesticides, thereby fostering informed decision-making and safer agricultural practices.
- Knowledge brokers-including public and private research institutions, academic bodies, and think tanks-should lead the development and implementation of a strategic research roadmap focused on creating sustainable, safer, affordable, and effective Integrated Pest and Disease Management (IPDM) packages. This approach should aim to reduce dependence on synthetic chemical pesticides by advancing sustainable, science-based pest control solutions tailored to local agricultural contexts.

Annexes

Table 1. Showing the list of active ingredients registered for use in Uganda that meet the PAN HHP classification criteria.

S/N	Active ingredients(ais)	Official registration Category in Uganda	Criteria met
1	2,4-D	Herbicide	☞ GHS+ Carcinogen & Reproductive toxicity
2	Abamectin	Insecticide	☞ WHO 1b (highly hazardous); ☞ Fatal if inhaled (H330); ☞ Highly toxic to bees
3	Alpha-Cypermethrine	Insecticide & acaricide	☞ Highly toxic to bees
4	Aluminium phosphide	Fumigant	☞ Fetal if inhaled; ☞ Highly toxic to bees
5	Atrazine	Herbicide	☞ GHS+ Carcinogen & Reproductive toxicity
6	Beta-Cypermethrine	Insecticide	☞ Highly toxic to bees
7	Betacyfluthrine	Insecticide	☞ WHO 1b (Highly Hazardous) ☞ Fatal if inhaled(H330) ☞ Highly toxic to bees
8	Bifenthrin	Insecticide	☞ GHS+ Carcinogen & Reproductive toxicity
9	Brodifacoum	Rodenticide	☞ WHO 1a (extremely Hazardous) ☞ EU GHS Reproductive toxicant
10	Bromoxynil	Herbicide	☞ Fatal if inhaled(H330) ☞ EU GHS Reproductive toxicant
11	Bromoxynil Octanoate	Herbicide	☞ EU GHS Reproductive toxicant ☞ Very bio-accumulative ☞ Highly toxic to aquatic organisms
12	Buta cholar	Herbicide	☞ EPA Probable/likely carcinogen
13	Carbendazim	Fungicide	☞ EU GHS Mutagenic(1A,1B) ☞ EU GHS Reproductive toxicant
14	Carbofuran	Insecticide	☞ WHO 1b (Highly Hazardous) ☞ Fatal if inhaled(H330) ☞ Highly toxic to bees ☞ Rotterdam Convention (PIC)
15	Carbosulfan	Insecticide	☞ Fatal if inhaled(H330) ☞ Highly toxic to bees ☞ Rotterdam Convention (PIC)

S/N	Active ingredients(ais)	Official registration Category in Uganda	Criteria met
16	Chlorantraniliprole	Insecticide	☞ Very persistent in water, soil or sediments ☞ Highly toxic to aquatic organisms
17	Chlorfenvinphos	Acaricide	☞ WHO 1b (Highly Hazardous) ☞ Highly toxic to bees
18	Chlorothalonil	Fungicide	☞ Fatal if inhaled(H330) ☞ EPA Probable/likely carcinogen
19	Chlorpyrifos	Insecticide	☞ EU GHS Reproductive toxicant ☞ Highly toxic to bees
20	Cypermethrine	Insecticide	☞ Highly toxic to bees
21	Cyproconazol	Fungicide	☞ EU GHS Reproductive toxicant
22	Deltamethrine	Insecticides	☞ GHS+ Carcinogen & Reproductive toxicity ☞ Highly toxic to bees
23	Dimethoate	Insecticide	☞ Highly toxic to bees
24	Diuron	Herbicide	☞ EPA Probable/likely carcinogen
25	Emamectine benzoate	Insecticide	☞ Highly toxic to aquatic organisms ☞ Very persistent in water, soil or sediments ☞ EPA Probable/likely carcinogen
26	Epoxiconazole	Fungicide	☞ EPA Probable/likely carcinogen ☞ EU GHS Reproductive toxicant ☞ GHS+ Carcinogen & Reproductive toxicity
27	Fenitrothion	Insecticide	☞ Highly toxic to bees ☞ GHS+ Carcinogen & Reproductive toxicity
28	Fenvalerate	Insecticide	☞ Highly toxic to bees
29	Fipronil	Insecticide	☞ Highly toxic to bees
30	Flubendiamide	Insecticide	☞ Highly toxic to aquatic organisms ☞ Very persistent in water, soil or sediments
31	Glufosinate ammonium	Herbicide	☞ EU GHS Reproductive toxicant
32	Glyphosate	Herbicide	☞ IARC Probable carcinogen
33	Imidacloprid	Insecticide	☞ Highly toxic to bees
34	Indoxacarb	Insecticide	☞ Highly toxic to bees
35	Lambda-cyhalothrin	Insecticide	☞ Fatal if inhaled(H330) ☞ Highly toxic to bees ☞ GHS+ Carcinogen & Reproductive toxicity

S/N	Active ingredients(ais)	Official registration Category in Uganda	Criteria met
36	Lufenuron	Insecticide	☞ Highly toxic to aquatic organisms ☞ Very persistent in water, soil or sediments ☞ Very bio accumulative
37	Magnesium phosphide	Fumigant	☞ Fatal if inhaled(H330)
38	Malathion	Insecticide	☞ IARC Probable carcinogen ☞ Highly toxic to bees
39	Mancozeb	Fungicide	☞ EPA Probable/likely carcinogen ☞ EU GHS Reproductive toxicant ☞ GHS+ Carcinogen & Reproductive toxicity ☞ EU EDC-Endocrine disruptor (1)
40	Maneb	Fungicide	☞ EPA Probable/likely carcinogen ☞ GHS+ Carcinogen & Reproductive toxicity
41	Metribuzin	Herbicide	☞ GHS+ Carcinogen & Reproductive toxicity
42	Oxyfluorfen	Herbicide	☞ EPA Probable/likely carcinogen
43	Pendimethalin	Herbicide	☞ Very persistent in water, soil or sediments ☞ Very bio accumulative
44	Permethrin	Insecticide	☞ EPA Probable/likely carcinogen ☞ Highly toxic to bees
45	Pirimiphos-methyl	Insecticide	☞ Highly toxic to bees
46	Profenofos	Insecticide	☞ Highly toxic to bees
47	Propicanazole	Insecticide	☞ EU GHS Reproductive toxicant
48	Propineb	Fungicide	☞ EPA Probable/likely carcinogen
49	Pyrethins	Fungicide	☞ Highly toxic to bees
50	Tebuconazole	Fungicide	☞ Fatal if inhaled(H330) ☞ GHS+ Carcinogen & Reproductive toxicity
51	Thiamethoxam	Insecticide	☞ Highly toxic to bees
52	Thiophanate-methyl	Fungicides	☞ EPA Probable/likely carcinogen
53	Triazophos	Insecticide	☞ WHO 1b(highly hazardous)
54	Zeta-Cypermethrin	Insecticide	☞ WHO 1b (highly hazardous) ☞ Highly toxic to bees
55	Zinc phosphide	Rodenticide	☞ WHO 1b(highly hazardous)

Table 2: A list of some HHP Active ingredients officially registered and used in Uganda and not approved for use or banned in the EU

S/N	Active ingredients(ais)	Official registration Category in Uganda
1	Alpha-Cypermethrine	Insecticide & acaricide
2	Atrazine	Herbicide
3	Beta-Cypermethrine	Insecticide
4	Betacyfluthrine	Insecticide
5	Bifenthrin	Insecticide
6	Brodifacoum	Rodenticide
7	Bromoxynil	Herbicide
8	Bromoxynil Octanoate	Herbicide
9	Buta cholar	Herbicide
10	Carbendazim	Fungicide
11	Carbofuran	Insecticide
12	Carbosulfan	Insecticide
13	Chlorfenvinphos	Acaricide
14	Chlorothalonil	Fungicide
15	Chlorpyrifos	Insecticide
16	Cyproconazol	Fungicide
17	Dimethoate	Insecticide
18	Diuron	Herbicide
19	Epoxiconazole	Fungicide
20	Fenitrothion	Insecticide
21	Fenvalerate	Insecticide
22	Fipronil	Insecticide
23	Glufosinate ammonium	Herbicide
24	Imidacloprid	Insecticide
25	Indoxacarb	Insecticide
26	Lufenuron	Insecticide
27	Mancozeb	Fungicide
28	Maneb	Fungicide
29	Permethrin	Insecticide
30	Profenofos	Insecticide
31	Propicanazole	Insecticide
32	Propineb	Fungicide
33	Thiamethoxam	Insecticide
34	Thiophanate-methyl	Fungicides
35	Triazophos	Insecticide
36	Zeta-Cypermethrin	Insecticide

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