

# THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) AND LINKS TO AGROCHEMICALS – CHALLENGES AND OPPORTUNITIES



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## 1. Introduction and background information

The Globally Harmonized System of Classification and Labelling of Chemicals (*GHS*) is a comprehensive, non-legally binding worldwide system for classification and labelling of the intrinsic hazardous properties of chemicals. It includes hazard statements, symbols and signal words which are standardized and harmonized and form a single integrated hazard communication system, including labels and safety data sheets.

The GHS applies to all chemical substances and mixtures, except for pharmaceuticals, food additives, cosmetics and pesticide residues in food. Pesticides are thus included in the GHS. Products containing biological organisms are not in the scope of the GHS. Following a mandate in 1992 and prepared under the auspices of the United Nations, the first version of the GHS was approved in 2002. Countries were then encouraged to implement it swiftly with a view to having the system fully operational by 2008.

Updated every two years, the latest edition (*10<sup>th</sup>*)<sup>1</sup> of the GHS was approved and published in July 2023.

The GHS aims to overcome divergence in classification and labelling of chemicals between national systems and regulations, particularly in the workplace, agriculture, transport, and consumer products (*considered as the four, traditional sectors of the GHS*), and provide an internationally harmonized approach to contribute to the sound management of chemicals, their safe use, transport and disposal. As one of the four target sectors of the GHS, for agricultural chemicals, it is expected that the system, including the appropriate GHS hazard criteria would be adopted globally. It is also worth noting that pesticides are used in the workplace and can also constitute consumer products, thus presenting significant overlap with agriculture. Pesticide labels should include the core elements of the GHS (*signal words, hazard statements, and pictograms*), as well as precautionary statements.

Chemical classification of the GHS is based on the hazardous properties of the substances and mixtures, including pesticides. As such, it is not based on the risk, nor does it aim to harmonize risk assessment or risk management procedures. However, the GHS does accept that countries may choose a risk-based approach to classification, in particular for consumer products. In the GHS a “building block principle”<sup>2</sup> has been followed, namely hazard classes are a collection of “building blocks” and within a hazard class, each hazard category can be seen as a building block. Within certain criteria, countries can choose which building blocks to adopt.

It is anticipated that once implemented, the GHS would enhance the protection of human health and the environment, provide a common and recognized framework for countries, reduce regulatory procedures on testing and evaluating of chemicals, and facilitate trade. The GHS can be a solid basis for developing national regulatory programmes for safe chemicals management and provide consistent and unified

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<sup>1</sup> <https://unece.org/transport/dangerous-goods/ghs-rev10-2023>

<sup>2</sup> GHS text, chapter 1.1, section 1.1.3 on “Application of the GHS”

application of the requirements by governments and institutions. It also provides clear guidance and guarantees certainty and predictability for businesses and industry engaged along the chemicals lifecycle.

Though agreed at the international level, the GHS is not subject to ratification (*unlike international legally-binding agreements*) and provides flexibility to countries – adoption in legislation and implementation could be restricted to certain sectors, based on the needs and the existing national regulatory framework of the country.

As such, countries are free to determine which of the GHS building blocks will be introduced in their national systems and which sectors out of the four –workplace, **agriculture**, transport<sup>3</sup> and consumer products – will be covered. For example, implementation of the GHS building blocks in the workplace by a country would not necessarily mean that the country is on track to implement or has already implemented the GHS in the entirety of the agricultural sector as regards classification and labelling of pesticides, even if there is overlap.

Pesticides, used in agriculture, are inherently hazardous, and among them, a relatively small number of Highly Hazardous Pesticides (*HHPs*) cause disproportionate harm to the environment and human health including severe environmental hazards, and high acute and chronic toxicity<sup>4</sup>. HHPs are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS, or their listing in relevant binding international agreements<sup>5</sup>.

Occupational exposure to hazardous pesticides is causing devastating harm to the health of workers around the world. Around 385 million agricultural workers suffer from unintentional, acute pesticide poisoning each year, which equates to 44 per cent of all farmers. Many more are subjected to serious chronic health conditions, such as cancers, neurotoxic effects and reproductive dysfunction. Some populations of workers are particularly vulnerable, such as pregnant women and migrants, however pesticides pose a serious health risk for all workers exposed.<sup>6</sup>

The growing global population, climate change, emerging crises and the need for security of food production and supply will require continued agricultural productivity, which is likely to result in the growing use of chemical pesticides, which, especially in cases of overuse and misuse, result in significant negative impacts to health and the environment, including poisoning, chronic diseases and severe contamination of food, water and soil<sup>7</sup>.

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<sup>3</sup> Implementation of the GHS for transport means implementation of the UN Model Regulations and related legal instruments. <https://unece.org/transport/dangerous-goods/un-model-regulations-rev-23>

<sup>4</sup> <https://saicmknowledge.org/epi/highly-hazardous-pesticides>

<sup>5</sup> FAO/WHO International Code of Conduct on Pesticide Management. Guidance on pesticide licensing schemes - <https://www.who.int/publications/i/item/9789240030428>

<sup>6</sup> ILO (2019).

[https://www.ilo.org/wcmsp5/groups/public/---ed\\_dialogue/---lab\\_admin/documents/publication/wcms\\_811455.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---lab_admin/documents/publication/wcms_811455.pdf)

<sup>7</sup> <https://www.fao.org/documents/card/en/c/NI996en/> - FAO - COAG/2022/INF/10 - Update on the Action Plan on Highly Hazardous Pesticides (HHP)

The GHS has been acknowledged as the acceptable international standard<sup>8</sup> and recommended by FAO-WHO in their 2022 guidelines on good labelling practice<sup>9</sup> for pesticides (*which was harmonized in 2015 with the GHS*) to be used for classification and labelling of chemical pesticides.

Notwithstanding the above recommendation of FAO-WHO and the political call to countries back in 2002 for swift implementation and operationalization of the GHS at the national level by 2008, according to the 2018 FAO-WHO survey<sup>10</sup>, worldwide only some 55% out of 53 responding countries have national requirements for pesticide labelling for agriculture corresponding to the GHS. On a more general note, as referenced in a report<sup>11</sup> by UNITAR, while a number of countries have implemented the GHS, the Global Chemicals Outlook-II (*GCO-II, UNEP, 2019*) notes that the system is “not operational in more than 120 countries”. Countries in the African, the Caribbean, Latin American, West Asian and South Asian regions are of particular note as not implementing the system.

In light of the global efforts towards sustainable agriculture (*SDG2*<sup>12</sup>), high-level standards for protection of human health and the environment, sound chemical pesticides management appears of utmost importance. Therefore, the potential of the UN GHS in terms of classification and labelling of chemical pesticides should be further explored and more widely deployed.

## 2. Scope and aim of the report

This report focuses on the application of the GHS in the agricultural sector, seeking to understand some of the main obstacles and opportunities to promote GHS implementation, focusing on its links to agricultural chemicals. It compares the similarities and divergences between the GHS<sup>13</sup> and the FAO-WHO guidelines and requirements as regards pesticide labeling and analyzes the inter-links with the Rotterdam Convention<sup>14</sup> as an international, legally-binding instrument for information-exchange in international trade of chemicals and pesticides.

The report further points out major findings stemming from pesticide management in agriculture at the global level and explores the state of play of the implementation of the GHS in some regions and countries. Based on this, key challenges and the main obstacles preventing uptake of the GHS in the agricultural sector are outlined.

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<sup>8</sup> <https://apps.who.int/iris/handle/10665/329971> - Global situation of pesticide management in agriculture and public health: report of a 2018 WHO-FAO survey

<sup>9</sup> <https://www.who.int/publications/i/item/9789241509688> - Guidelines on good labelling practice for pesticides (revised). International code of conduct on pesticide management

<sup>10</sup> <https://apps.who.int/iris/handle/10665/329971> - Global situation of pesticide management in agriculture and public health: report of a 2018 WHO-FAO survey

<sup>11</sup> GHS Implementation Experiences and lessons learned - [GHS Implementation Experiences and lessons learned - FINAL 8.7.2021.pdf \(unitar.org\)](#)

<sup>12</sup> <https://sdgs.un.org/goals/goal2>

<sup>13</sup> For this report, direct references are the 9<sup>th</sup> revised edition, unless specified otherwise.

<sup>14</sup> Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade - <http://www.pic.int/TheConvention/Overview/TextoftheConvention/tabid/1048/>

A summary of replies collected in a specifically designed survey for some governments and stakeholders is provided and conclusions drawn that could support application of the GHS, and possible future actions are proposed.

This output is not intended to be a final report on the GHS and pesticides, but an exercise in understanding some of the knowledge and gaps, as a means to identify key opportunities to support the implementation of the GHS from the perspective of agricultural chemicals.

### 3. Methods used

**Three main streams of information were used in the preparation of this report:**

- 1) Desk research of reports, surveys and deliverables of international organizations (*UNITAR, FAO, WHO, UNECE, SAICM, ILO*), European institutions (*European Parliament*), national regulators (*such as Swedish Chemical Agency, Ministry of Agriculture of Angola*), stakeholders and NGOs (*CropLife, Cefic, PAN-Europe*), official publication in trusted sources;
- 2) Specifically designed questionnaires addressed to governments, regional organizations, industry and non-governmental organizations;
- 3) In addition, semi-structured interviews were carried out with a view to discussing with a range of stakeholders, obtaining information from around the world, from different sectors (*governments, industry, NGOs*) and representing a range of implementation statuses. (*See Annex I for the list of stakeholders consulted, respectively*)

### 4. International Labour Standards, and other relevant international agreements FAO/WHO International Code of Conduct on Pesticide Management

As acknowledged in the FAO/WHO International Code of Conduct on Pesticide Management - Guidelines on Good Labelling Practice for Pesticides<sup>15</sup>, two international classification systems for health hazards of pesticides are presently in use, the GHS and the WHO Recommended classification of pesticides by hazard<sup>16</sup>.

Comparison between both is provided in Table 1 below based on the information and data sources in the FAO/WHO International Code of Conduct on Pesticide Management.

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<sup>15</sup> [Guidelines on good labelling practice for pesticides \(revised\). International code of conduct on pesticide management \(who.int\)](#)

<sup>16</sup> [The WHO Recommended Classification of Pesticides by Hazard and guidelines to classification, 2019 edition](#)

**Table 1. Comparison of features of the GHS and the WHO Recommended classification<sup>17</sup>**

<b>Compared features</b>	<b>GHS (as of the 9<sup>th</sup> revised edition)</b>	<b>WHO Recommended classification</b>
<b>History</b>	Adopted in 2002	Approved in 1975
<b>Alignment to the GHS</b>	<i>n/a</i>	Aligned in 2009 with the corresponding GHS Acute Toxicity Hazard Categories ( <i>NB classification criteria not identical to the GHS</i> )
<b>Substantive elements</b>	<p>1. Harmonized criteria for classifying substances and mixtures according to three hazard dimensions – <b>health</b> (e.g. acute toxicity, chronic toxicity eye and skin irritation), <b>environment</b> (e.g. ozone layer, aquatic organisms) and <b>physical</b> hazards (e.g. flammability, corrosiveness), and</p> <p>2. Harmonized hazard communication elements, incl. requirements for labelling and safety data sheets.</p>	<p>1. Classification to distinguish between the more and the less hazardous forms of selected pesticides based on acute risk to <b>human health</b>;</p> <p>2. Takes into consideration the toxicity of the technical active substance and also describes methods for the classification of formulations.</p>
<b>Health hazards covered</b>	<p>1. <b>Acute toxicity</b> (oral, dermal, inhalation)  <b>Chronic hazards:</b></p> <p>2. Germ cell mutagenicity  3. Carcinogenicity  4. Reproductive toxicity  5. Specific target organ systemic toxicity – repeated exposure  <b>Other short-term hazards:</b></p> <p>6. Skin corrosion/irritation  7. Serious eye damage/eye irritation  8. Respiratory or skin sensitization  9. Aspiration hazard  10. Specific target organ toxicity – single exposure</p>	<p><b>Acute toxicity primarily</b> (oral and dermal)  <b>Chronic hazards</b> (e.g. carcinogenicity, reproductive toxicity)</p> <p><b>Not covered by WHO classification</b></p>

<sup>17</sup> Guidelines on good labelling practice for pesticides (revised). International code of conduct on pesticide management (who.int) – point 5 “Hazard classification”

<b>Scope</b>	<b>All pesticides</b>	<b>Some pesticides</b> ( <i>where internationally acceptable evaluations are available</i> )
<b>Classification of individual chemicals</b>	No	Yes
<b>Labelling of pesticide formulations</b>	Acute toxicity Skin corrosion/irritation Serious eye damage/ eye irritation Respiratory or skin sensitization Specific target organ systemic toxicity – single exposure Aspiration hazard	Acute toxicity Pesticides with high chronic toxicity must be properly labelled
<b>Implementation</b>	Worldwide, by some countries	Worldwide, by many countries

The Guidelines on Good Labelling Practice for Pesticides does not recommend combined use of both GHS and WHO classifications for pesticide labelling (*for instance, the WHO classification for acute toxicity should not be combined with the GHS for other health hazards*). To avoid possible conflicts in classification and confusion for users, either the GHS or the WHO classification should be applied to classify and assign label elements for all health hazards in a given country.

Implementation of the GHS would provide a more comprehensive and overarching global approach in covering hazards of chemical substances (incl. pesticides) and requirements for classification and labelling in comparison to the WHO classification of pesticides by hazard. With this in mind, a recommendation to countries has been made by FAO and WHO to progressively step up and enforce the GHS as a global system for classification and labelling of pesticides. Furthermore, a more standardized approach across the globe would facilitate trade and compliance between countries.

Labelling of pesticides is enshrined in the FAO/WHO International Code of Conduct on Pesticide Management<sup>18</sup> which stipulates that Governments and industry should ensure that all pesticides made available to the general public are packaged and labelled in a manner which is consistent with FAO/WHO or other relevant guidelines on packaging and labelling and with appropriate national or regional regulations.

The Code of Conduct serves as a voluntary framework on pesticide management for all public and private entities engaged in, or associated with, production, regulation and management of pesticides. It has been endorsed by FAO Members, and is supported by key pesticide industry associations and civil society organizations. It serves to strengthen the capacity of developing countries to regulate, evaluate and enforce effective control over pesticides, which are traded and used in their territories.

<sup>18</sup> The International Code of Conduct on Pesticide Management s. – found at <https://www.fao.org/pest-and-pesticide-management/pesticide-risk-reduction/code-conduct/en/>

## The Rotterdam Convention

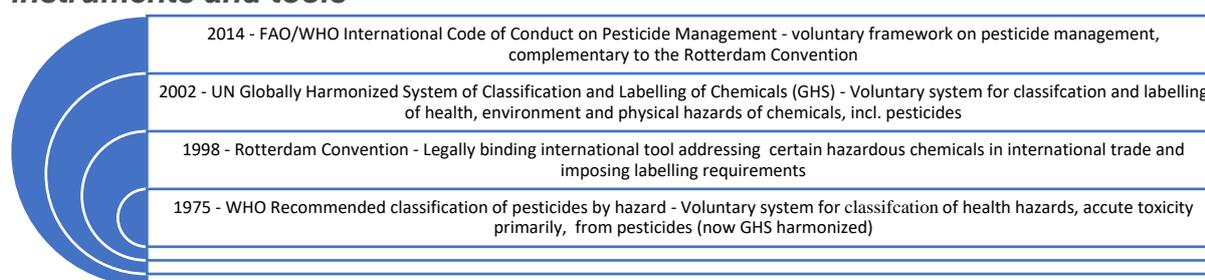
The Code of Conduct comes as a complement to legally binding instruments among which is the Rotterdam Convention<sup>19</sup>, adopted in 1998, with 165 Parties at present.

The Convention is an international legally binding instrument establishing the Prior Informed Consent (*PIC*) procedure based on import responses with regard to 35 pesticides, 18 industrial chemicals and 1 chemical<sup>20</sup> in both the pesticide and the industrial chemical categories that have been banned or severely restricted for health or environmental reasons by two or more Parties.

Moreover, to ensure adequate availability of information with regard to risks and/or hazards to human health or the environment, the Convention requires labelling of exported chemicals listed under the Convention, taking into account relevant international standards. Parties to the Convention have the option to expand these labelling requirements to all chemicals subject to environmental or health labelling requirements in their territories.

Based on the above, the inherent relation between international pesticides management instruments and tools, regardless of their form or character (voluntary or binding), is evident (also visualized in the diagram below). The levels of adoption and implementation of these tools and instruments, however, particularly the GHS as regards the pesticide management, vary between countries and regions. Further information on the current status and a more detailed analysis is provided in the next chapters.

**Diagram 1. Interlinks between international pesticides management instruments and tools**



## 5. Pesticide management in agriculture and implementation of the GHS – current status and examples

The current global GHS implementation trend indicates that greater efforts have been made in the industrial workplace compared to other sectors, such as agriculture or

<sup>19</sup> Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade -

<http://www.pic.int/TheConvention/Overview/TextoftheConvention/tabid/1048/language/en-US/Default.aspx>

<sup>20</sup> As of 31.12.2022

consumer chemicals. Governments might decide not to implement GHS in certain sectors, such as agriculture because the pesticide classification and labelling system in their countries might have been well-established before the GHS was developed, and complementary systems may have already evolved around this, such as education requirements to teach the WHO/FAO classification *systems* (e.g. in *Zimbabwe*). Furthermore, some past efforts to implement the GHS have focused on voluntary implementation, while more recent considerations have promoted the legal adoption of the system (e.g. as promoted by the emerging framework for the sound management of chemicals and waste beyond 2020).<sup>21</sup>

According to the latest research<sup>22</sup> the amount of pesticides used worldwide has increased by 80 percent since 1990, causing harm to the health of farmers, consumers and nature alike and the global pesticide market has almost doubled in the last 20 years. The EU is the top exporting region, increasingly selling to countries of the “Global South”. The growing amount of pesticides used globally leads to a rise in pesticide poisoning worldwide - especially in the Global South, where farmworkers are often not in a position to sufficiently protect themselves. According to some calculations, there are around 255 million poisoning accidents in Asia, just over 100 million in Africa and around 1.6 million in Europe<sup>23</sup>.

This trend requires robust pesticide legislation worldwide, strict monitoring and control and requirements on classification, packaging and labelling, including the application of the GHS as a possible measure.

A note<sup>24</sup> from 2020 jointly prepared by UNITAR, ILO and OECD provides an overview of the global GHS implementation status in 2019. While a number of countries have implemented the GHS, many countries still have not done so, notably in Africa, the Middle East, Latin America and South Asia.

According to a study<sup>25</sup> conducted by the European Parliament, the lack of labelling of pesticides in local languages and high levels of illiteracy among farm workers means critical safety information is often not communicated to the individuals that actually handle pesticides. GHS is the accepted international standard for pesticides labelling. However, only 55% of countries have reported that their regulations for the labelling of agriculture pesticides are in line with GHS. Countries in the Americas were reported to be least in line with the GHS (30%), followed by the Western Pacific (40%), African (56%), Eastern Mediterranean (56%), South-East Asia (75 %), and Europe (86%) (WHO and FAO, 2018).

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<sup>21</sup> GHS Implementation to Strengthen Global Chemical Hazard Communication: Will We Ever Get There?, Goh Choo Ta

ACS Chemical Health & Safety 2021 28 (3), 153-158, DOI: 10.1021/acs.chas.0c00114

<sup>22</sup> ‘Pesticide Atlas 2022’ released by the Heinrich-Böll-Stiftung, Friends of the Earth Europe and PAN Europe - [https://www.pan-europe.info/sites/pan-europe.info/files/public/resources/reports/PesticideAtlas2022\\_Web\\_20221010.pdf](https://www.pan-europe.info/sites/pan-europe.info/files/public/resources/reports/PesticideAtlas2022_Web_20221010.pdf)

<sup>23</sup> ‘Europe must slash pesticide use to protect people’s and planet’s health’ press release 18 October 2022 by Heinrich-Böll-Stiftung, Friends of the Earth Europe and Pesticide Action Network Europe - <https://eu.boell.org/en/2022/10/18/europe-must-slash-pesticide-use-protect-peoples-and-planets-health>

<sup>24</sup> Scaling-up Commitment for Implementation of the Globally Harmonized System of Classification and Labelling Generating High-Level Commitment by ICCM 5, 29 December 2020

<sup>25</sup> The use of pesticides in developing countries and their impact on health and the right to food – DEVE Committee, European Parliament, 2021

At the economic bloc level, as reported by the secretariat of the Sub-Committee of Experts on the GHS, three regions- the ANDEAN Community<sup>26</sup> (*Bolivia, Colombia, Ecuador and Peru*) and the European Union and the European Economic Area<sup>27</sup>- have implemented the GHS as regards agriculture and the management of pesticides. The Eurasian Economic Union has adopted a technical regulation “on the safety of chemical products” which was expected to enter force for all EAEU members (*Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russian Federation*) on 2 June 2021. However, the Regulation does not apply to pesticides and their production, storage, transportation and utilisation. Argentina, Brazil, Paraguay, and Uruguay apply the GHS as regards the regional transport of dangerous goods within the Common Market of South (*MERCOSUR*) countries. The information available for the ASEAN countries (*Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam*) shows there is a regional agreement between these countries concerning dangerous goods in transit<sup>28</sup>.

Further information on the GHS implementation by country<sup>29</sup>, including pesticides, is provided by UNECE in its role as the secretariat of the Sub-Committee of Experts on the GHS. The following countries have been identified to implement the GHS fully or partially (*in the agriculture and pesticide management sector*) through legislation:

- Lao People's Democratic Republic: by a decree stipulating principles, rules and measures for controlling all activities relating to import export, production, distribution, storage, use and disposal of pesticides)
- USA: the US EPA has not adopted GHS for pesticide product classification and labeling, but approves labels for pesticides regulated under the Federal Insecticide, Fungicide, and Rodenticide Act and issued a pesticide registration notice to ensure the labelling and the SDS compliance with GHS requirements<sup>30</sup>
- Vietnam: according to the revised Law on Plant Protection and Quarantine domestically circulated, imported or exported plant protection drugs shall be labelled in compliance with the GHS
- New Zealand: The Hazardous Substances and New Organisms Act defines the hazardous properties in accordance with GHS criteria, all sectors including industrial chemicals, consumer products, and agricultural and veterinary chemical products are covered
- The European Union<sup>31</sup>: the EU-27 has implemented the GHS since 20 January 2009 by means of a legally binding act - Regulation on classification, labelling and packaging (*CLP Regulation 1272/2008*<sup>32</sup>). The same legal framework has been implemented by Iceland, Liechtenstein and Norway as parties to the

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<sup>26</sup> [https://unece.org/sites/default/files/2021-01/Region\\_ANDEAN\\_0.pdf](https://unece.org/sites/default/files/2021-01/Region_ANDEAN_0.pdf)

<sup>27</sup> [https://unece.org/sites/default/files/2021-01/Region\\_EU%20and%20European%20Economic%20Area\\_0.pdf](https://unece.org/sites/default/files/2021-01/Region_EU%20and%20European%20Economic%20Area_0.pdf)

<sup>28</sup> [https://unitar.org/sites/default/files/media/file/GHS%20Legislation%20document\\_final\\_14Dec21\\_0.pdf](https://unitar.org/sites/default/files/media/file/GHS%20Legislation%20document_final_14Dec21_0.pdf)

<sup>29</sup> Latest information available at: <https://unece.org/transport/documents/2021/01/ghs-implementation-implementation-country>

<sup>30</sup> <https://www.epa.gov/pesticide-labels/pesticide-labels-and-ghs-comparison-and-samples>

<sup>31</sup> [https://single-market-economy.ec.europa.eu/sectors/chemicals/classification-and-labelling-clpghs\\_en](https://single-market-economy.ec.europa.eu/sectors/chemicals/classification-and-labelling-clpghs_en)

<sup>32</sup> Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 OJ L 353, 31.12.2008, p. 1–1355

European Economic Area (EEA), together with the EU. In line with the GHS standard, CLP helps producers identify hazardous chemicals and informs users about them through labelling. CLP is also the basis for safety data sheets (SDS), managed through the REACH Regulation<sup>33</sup>, and sets requirements for hazardous chemicals' packaging. Pesticides in the EU/EEA must be classified, packaged and labelled in accordance with the CLP Regulation. Additional labelling requirements are also in place in the EU/EEA for plant protection products, such as the name and amount of each active substance, net quantity, batch number, the type of action of the product, the type of preparation, the authorized uses, directions for safe disposal of the product and its packaging, as well as standard phrases for special risks to human or animal health or to the environment, and for safety precautions for the protection of human or animal health or of the environment.

In December 2022 the European Commission adopted a Delegated Act to introduce new hazard classes under the CLP Regulation for endocrine disruptors, as well as for chemicals that do not break down in the environment and can accumulate in living organisms, or risk entering and spreading across the water cycle, including drinking water. The need to introduce **new hazard classes and criteria** into the CLP Regulation for its adaptation to technical and scientific progress, has been recognised by its inclusion as one of the primary commitments under the **EU Chemicals Strategy for Sustainability**, which is a building block of the **European Green Deal** for protection of consumers, vulnerable groups and workers from the most harmful chemicals and for the target of zero chemical pollution in the environment.

The rules on the new hazard classes are expected to enter into force early next year (2023), after scrutiny by the European Parliament and the Council of the EU. The EU has volunteered to lead the work at the GHS Sub-Committee level to address this topic.

In 2018 WHO and FAO jointly conducted the first global survey<sup>34</sup> combining pesticide management in agriculture and public health. In total, 194 countries were targeted worldwide, with questionnaires structured around three topics – pesticides regulatory control, pesticides management in agriculture and pesticide management in public health. The highlights provided below are the synthesis in figures of the information relating to regulatory control and management of agricultural pesticides, with information focused on Africa and Southeast Asia.

Twenty African countries and four countries in S.E. Asia replied to the questions on regulatory control and management of agricultural pesticides, indicating the following:

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<sup>33</sup> Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, OJ L 396, 30.12.2006, p. 1

<sup>34</sup> <https://apps.who.int/iris/bitstream/handle/10665/329971/9789241516884-eng.pdf?sequence=1&isAllowed=y>

- National or sub-national legislation (*i.e. at federal or regional level*) for registration and control of pesticides reported to be present in 95% of the African countries and 75% in S.E Asia.
- Conformity of the national legislation on pesticides to relevant FAO or WHO specifications reported by 93% of African countries and 100% of S.E. Asia;
- 75% or more of the countries from both regions report existence of national legislation for re-registration or periodic/regular review of agricultural pesticides;
- Contrary to the above, **only some 35% of African countries and 50% of S.E. Asia countries have legislation in place for HHPs;**
- **Only 15% of African countries have guidelines for registration of agricultural pesticides, while none of the four countries in S.E. Asia have;**
- On the other hand, **African countries form the second largest group (after the European Union) on regional collaboration on pesticide registration** (*a prominent example of a regional registration scheme is the Sahelian Pesticides Registration Committee (Comité Sahélien des Pesticides; CSP)*);
- As regards packaging and labelling, 84% of African countries and 75% of countries in S.E. Asia have labelling requirements for agricultural pesticides included in their legislation;
- Despite the recommendation for application of the GHS as a globally harmonized system, the FAO-WHO labelling standard continues to be widely used by countries worldwide, including Africa with 83% from the respondents and S.E. Asia with 75% of the respondents (*contrasting with 56% and 75% respectively reported to be in line with the GHS*);
- Safe storage of agricultural pesticides is included in the national legislation by 37 % of African countries and none from S.E. Asia; safe transport – by 33 % of African countries and 0% of S.E. Asia; proper disposal of obsolete agricultural pesticides – by 17 % of African countries and 0% of S.E. Asia.

## The African region

The member states of the South African Development Community (*SADC*<sup>35</sup>) agreed to implement the GHS by the latest 2020<sup>36</sup>, as communicated to UN SCE GHS in 2013. Zambia (*and Mauritius, outside of SADC*) implements the original version of the GHS<sup>37</sup>, with South Africa implementing rev. 8. No updated information is available as regards further implementation of the GHS by other SADC countries.

Zambia signed in 2021 a three-year bilateral cooperation agreement with the Swedish Chemicals Agency to support the establishment of a robust pesticide registration process, improved management of highly hazardous pesticides and development of an IT support system (*including the GHS*) that will enhance public access to

<sup>35</sup> Regional Economic Community comprising 16 Member States: Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, United Republic Tanzania, Zambia and Zimbabwe

<sup>36</sup> Article ResearchGate - The Globally Harmonized System of Classification and Labelling of Chemicals— Explaining the Legal Implementation Gap - (*PDF*) [The Globally Harmonized System of Classification and Labelling of Chemicals—Explaining the Legal Implementation Gap \(researchgate.net\)](#)

<sup>37</sup> <https://cefic.org/app/uploads/2020/02/GHS-Implementations-report-2019.pdf>

information on pesticides for efficient management, ultimately reducing risks to human health and the environment.

South Africa, on 29 March 2021, promulgated into law the “Regulations for Hazardous Chemical Agents, 2021” referring to GHS Rev.8 and envisaging a transition period of 18 months for implementation for both single substances and mixtures.

Another identified group of countries is the one represented at the Permanent Interstate Committee for Drought Control in the Sahel (*CILSS*<sup>38</sup>). Some CILSS countries – Chad and Gambia - have initiated steps towards implementing the GHS.

Work is ongoing in Côte d’Ivoire, Ghana, Kenya and Nigeria in a four-year pilot project of UNEP to implement the GHS. The project is a partnership between the four countries and the SAICM secretariat, the International Council of Chemical Associations (*ICCA*), UNEP, UNITAR, and the European Commission and the European Chemical Agency. It is co-financed by the European Commission’s DG Environment and the *ICCA*.

As regards North Africa, according to the information available, only Tunisia seems to have advanced in the preparations for the implementation of the GHS. The country participated in a Quick Start Programme project initiated in 2012 and supported by UNITAR on Strengthening Capacities for National SAICM Implementation and Supporting GHS Capacity Building. Draft legislation based on the 6th revised edition of the GHS (*GHS Rev.6*) was prepared in 2016. However, it is unclear if further progress has been made.

The following information on the GHS implementation status in the pesticide sector was provided by CropLife (*Middle East and Africa*)<sup>39</sup>:

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<sup>38</sup> It currently covers 13 countries: Benin, Burkina Faso, Cabo Verde, Chad, Côte d’Ivoire, Gambia, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and Togo.

<sup>39</sup> PPPs = Plant Protection products

## CAPACITY BUILDING EFFORTS IN AFRICA

Countries Engaged in Capacity Building Efforts since 2015		
<b>KENYA:</b> <ul style="list-style-type: none"> <li>• Since 2016 developed a manual (Purple Book) to guide implementation on PPPs; Included in draft regulations 2020;</li> <li>• Accepting GHS labels</li> </ul>	<b>ZAMBIA:</b> <ul style="list-style-type: none"> <li>• GHS under application</li> <li>• Currently reviewing the law to provide more clarity on GHS application</li> </ul>	<b>SOUTH AFRICA:</b> <ul style="list-style-type: none"> <li>• The regulation of Hazardous Chemical Agents was published on 1<sup>st</sup> April 2021.; Implementation started in September 2022</li> </ul>
<b>JORDAN:</b> <ul style="list-style-type: none"> <li>• IMPLEMENTATION OF GHS SINCE 2016, ALSO EMBEDDED IN THE REGULATIONS</li> </ul>	<b>MOROCCO:</b> <ul style="list-style-type: none"> <li>• Adopted GHS since April 2018 ;</li> <li>• Applied to all new registrations and renewals</li> </ul>	<b>TANZANIA:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Accepting GHS labels</li> </ul>
<b>ALGERIA:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Accepting GHS labels, not yet in the law</li> </ul>	<b>MALAWI:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops,</li> <li>• Accepting GHS labels</li> </ul>	<b>GHANA:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Accepting GHS labels</li> </ul>
<b>ZIMBABWE:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Accepting GHS labels</li> </ul>	<b>TUNISIA:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Working on a legislation</li> </ul>	<b>NIGERIA:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Accepting GHS labels</li> </ul>
<b>CILSS/WAPRC:</b> <ul style="list-style-type: none"> <li>• focusing on harmonization ECOWAS region, Accepting GHS labels</li> </ul>	<b>COTE D'IVOIRE:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops</li> <li>• Accepting GHS labels</li> </ul>	<b>MALAWI/ETHIOPIA/BOTSWANA/NIGERIA/SUDAN/EGYPT/LEBANON</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> </ul>
<b>MAURITIUS:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Accepting GHS labels</li> </ul>	<b>UGANDA:</b> <ul style="list-style-type: none"> <li>• Participated in various workshops;</li> <li>• Accepting GHS labels</li> </ul>	

Based on the above, it can be observed that the deployment of the GHS in the African region is rather scarce, since apart from the countries mentioned above, the state of play, any progress made or intention for harmonization with the GHS by the majority of African countries (*55 members states of the African Union*) remains “unknown”. Moreover, emerging deployment or partial implementation of the GHS in only few African countries would not immediately mean that agriculture and pesticide management would be within the scope of the legislation.

## South-East Asia

In comparison to African countries, countries in the region of South-East Asia are more advanced in the adoption and the implementation of the GHS. While Vietnam and Indonesia have fully implemented the GHS, including in the area of agriculture and pesticides management, Thailand, the Philippines and Cambodia have introduced the GHS only partially, for industrial and household chemicals in Thailand, workplace in the Philippines and Cambodia, and consumer chemicals in Cambodia. Despite some steps towards initial harmonization, Laos has not yet implemented the GHS.

Project-wise, the Swedish Chemicals Agency had an Agreement with ASEAN (*The Association of Southeast Asian Nations*) secretariat, “Support for implementation of GHS and related chemical management issues within ASEAN”<sup>40</sup>. The project supported the ASEAN member states to implement GHS in national legislation, and concluded in 2019.

<sup>40</sup> [https://www.kemi.se/download/18.164ad6b3172927a9289727a8/1598537952918/final-report-2013-2019\\_full-report\\_final.pdf](https://www.kemi.se/download/18.164ad6b3172927a9289727a8/1598537952918/final-report-2013-2019_full-report_final.pdf)

## 6. Key concerns and main obstacles preventing uptake of the GHS in the agricultural sector

As presented above, there are significant regional differences in GHS implementation coverage.

In July 2022, the SAICM Secretariat together with the University of Cape Town organized a second Community of practice discussion on chemicals and Sustainable Development Goals<sup>41</sup>. Summary information from the discussion revealed that many of the participants' countries were in the process of implementing the GHS, with some countries making GHS implementation mandatory. In those countries where GHS implementation is not mandatory, implementation is limited. Some participants who said that their country implements the system stated that it is commonly applied to industrial chemicals but yet to be adopted for pesticides. In some cases, participants commented that pesticide labels still follow WHO Guidelines on Good Labelling Practice for Pesticides, and switching systems would be a complex process. Though GHS implementation helps to address the illegal trade in chemicals and pesticides, some participants expressed concern that GHS alone is inadequate in addressing the issue of illicit trade. Thus, despite the implementation of GHS in some countries, illegal pesticides remain an issue.

**Some participants mentioned the following challenges and needs in the implementation of the GHS:**

- Lack of technological capacity;
- Reinforcement of capacity of non-governmental organizations to disseminate information and tools;
- Some countries still predominantly apply the WHO system for classification of pesticides instead of the GHS as the globally harmonized and recommended system;
- Transition from the WHO system to the GHS is complex and requires awareness raising;
- Lack of mandatory character of the GHS leads to partial usage only;
- Lack of political will.

Specific examples, in particular African countries, show gaps in implementation of the pesticides legislation in general, monitoring and control and awareness raising as regards the hazards and risks to human health and the environment associated with the pesticides.

Ethiopia (*the second most populous nation in Africa, with over 70% of the population employed in the agricultural sector*<sup>42</sup>) has experienced a significant increase in use of

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<sup>41</sup> SAICM, Community of practice on chemicals and Sustainable Development Goals - <https://saicmknowledge.org/sites/default/files/meterial/SAICMUCT%20CSDG%20CoP%20Discussion%202%202022%20digest%20FINAL.pdf>

<sup>42</sup> <https://www.worldbank.org/en/country/ethiopia/overview>

chemical pesticides in the last decade in farming systems. However, studies<sup>43</sup> on farmers and farming workers show that attitudes and pesticide management practices in Ethiopia could be improved. The most likely reasons for the unsafe use of pesticides of the surveyed population are identified to be lack of formal training on pesticide-related occupational and environmental hazards such as pesticide label reading, proper disposal of empty pesticide containers, and use of complete and appropriate personal protection (a key part of the hierarchy of controls for the safe use of pesticides).

In Malawi<sup>44</sup> the agricultural sector dominates the economy, accounting for almost 30 percent of GDP, around three-quarters of total exports and 64 percent of the labor force. Over 80 percent of households depend on the sector for at least some of their income. Malawi faces poor implementation of the legislation and pesticide management practices which result in illegal import and trading of HHPs, which are linked to numerous poisoning incidents. Together with the possible identified measures for action like enhancing the capacity for risk assessment, strengthening the registration requirements and control, there is a need to intensify training on pesticide safety to pesticide handlers and farmers, together with provision of pesticide labels in native languages<sup>45</sup>.

Agriculture accounts for around 9% of Angola's GDP, which provides employment for around 46% of the population<sup>46</sup>. A five-year project was initiated in 2016 "Smallholder agriculture development and commercialization project - MOSAP II" (Integrated pest management network) aiming for capacity building and institutional development. Angola still uses the WHO recommended classification system for pesticides. Harmonization of legislation, training and awareness-raising are among the activities and measures targeted within the project. Another project<sup>47</sup> RE-FARM: Research on agroecological innovations for increasing resilience to climate change in Cuanza Sul and Benguela provinces in Angola has been initiated in 2022 (ending 2026) within Capacity4Dev financed by the European Commission. It should be noted, however, that both projects did not seem to touch upon the GHS.

This brief overview of some African countries selected on the basis of the share of agriculture and employment in agriculture reveals similar issues as regards pesticide legislation and management on their territory. None of the three countries described in more detail implement the GHS formally in legislation.

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<sup>43</sup> Use of Chemical Pesticides in Ethiopia: A Cross-Sectional Comparative Study on Knowledge, Attitude and Practice of Farmers and Farm Workers in Three Farming Systems - Ann. Occup. Hyg., 2016, Vol. 60, No. 5, 551–566 - [Use of Chemical Pesticides in Ethiopia: A Cross-Sectional Comparative Study on Knowledge, Attitude and Practice of Farmers and Farm Workers in Three Farming Systems - PubMed \(nih.gov\)](#)

<sup>44</sup> Malawi Systematic Country Diagnostic: Breaking the Cycle of Low Growth and Slow Poverty Reduction, Report No. 132785, December 2018, World Bank Group - <https://documents1.worldbank.org/curated/en/723781545072859945/pdf/malawi-scd-final-board-12-7-2018-12122018-636804216425880639.pdf>

<sup>45</sup> Article "A Critical Review of the Status of Pesticide Exposure Management in Malawi" - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7557847/>

<sup>46</sup> <https://www.trade.gov/country-commercial-guides/angola-agricultural-products#:~:text=2022-08-05-Overview,percent%20of%20the%20Angolan%20population.>

<sup>47</sup> [https://knowledge4policy.ec.europa.eu/projects-activities/re-farm-research-agroecological-innovations-increasing-resilience-climate\\_en](https://knowledge4policy.ec.europa.eu/projects-activities/re-farm-research-agroecological-innovations-increasing-resilience-climate_en)

It should be noted that ongoing studies on the use and management of HHPs in the countries of the East African Community identify the following concerns and challenges:

- Incomplete legislation on pesticide management and poor enforcement;
- Limited or no capacity to monitor and control the implementation of the pesticide legislation on national level;
- Insufficient capacity for risk assessment in evaluation the pesticides in the process of registration;
- Implementation of Basel<sup>48</sup>, Rotterdam, Stockholm<sup>49</sup> and Bamako<sup>50</sup> Conventions still remains a challenge in many countries;
- Inadequate coordination of the health, environment and agriculture administrations sharing competence on pesticide management and control;
- Inadequate systems for collecting and sharing information as regards registration, use, hazards, restrictions and bans on certain HHPs;
- Limited systematic research on the impacts of HHPs, particularly on human health;
- Lack of monitoring and assessment of the effects of the HHPs;
- Insufficient knowledge on good pesticide management practices and alternatives to HHPs.

## 7. Opportunities for enhanced GHS deployment and recommendations – conclusions

Based on the overview and the analysis provided above, the following opportunities and recommendations in terms of GHS adoption and implementation in the area of agriculture and pesticide management could be considered:

Recommendations	
<b>Priorities in the country/region/institution</b>	<p>GHS in Africa as regards agriculture and pesticide management is least represented, therefore it is recommended that relevant stakeholders target African countries and mobilizes efforts to deploy the GHS as a recommended and harmonized system for classification and labelling.</p> <p>HHPs has provided momentum, and relies on the GHS for many criteria, and could be used to promote the GHS.</p> <p>Relevant agencies, such as those in the Global Partnership to Implement the GHS, to collaborate with the Rotterdam Convention to strengthen capacity building programmes on GHS implementation and the use of the knowledge base</p>

<sup>48</sup> Basel Convention on the control of transboundary movements of hazardous wastes and their disposal

<sup>49</sup> Stockholm Convention on persistent organic pollutants

<sup>50</sup> Treaty of African nations prohibiting the import into Africa of any hazardous (including radioactive) waste. The convention came into force in 1998

	<p>maintained by the Convention: the Convention maintains a useful and up-to-date database both of the regulatory decisions in the Parties and pesticide authorities.</p> <p>Dedicated events on GHS uptake in the agricultural sector could be organized with relevant international conferences, such as BRS COPs.</p>
<p><b>Priorities in the country/region/institution</b></p>	<p>It is observed that regional collaboration on pesticide registration among the CILSS countries or mutual agreement on implementation of the GHS in the SADC countries already exists, therefore priority could be given to these two particular African regions.</p> <p>Stakeholders may wish to establish a more structured approach in identifying eligible counterparts (e.g. governments/regional organisations, farmers organisations) for technical assistance for GHS uptake in :</p> <ol style="list-style-type: none"> <li>a. countries heavily dependent on agriculture;</li> <li>b. countries with large shares of employment in the agricultural sector;</li> <li>c. countries which are in transition to implementing the GHS or have indicated emerging GHS adoption;</li> <li>d. countries belonging to a regional group where trade, control and management of agricultural pesticides have been subject to similar requirements and conditions or facilitated by mutual agreements and common understanding.</li> </ol>
<p><b>GHS in agriculture and pesticide management within ongoing initiatives</b></p>	<p>It is recommended that the GHS in agriculture and pesticide management could be mainstreamed in parallel to already ongoing project initiatives in African countries (<i>for ref. see ASEAN and Angola above</i>). Thus, stakeholders could complement existing initiatives and proceed with in-depth parallel work specifically on the area of GHS and HHPs.</p> <p>It is important to integrate the GHS into broader national chemical safety and development objectives and legislation.</p>
<p><b>Approach to be applied</b></p>	<p>The GHS implementation depends largely on political will and decision. Agreement at the political level is important (potentially in the context of international conventions, agreements and instruments, high-level political dialogues, bilateral meetings), followed by the necessary national legislation/standards, awareness raising, capacity building, and implementation.</p>

	<i>(Options for legislation and standard setting to implement the GHS, A Guidance Document to support implementation of the Globally Harmonized Systems of Classification and Labelling of Chemicals – UNITAR, October 2021 – to be followed in terms of implementation of the step-wise approach)</i>
<b>Key opportunities</b>	
<b>Gain support from stakeholders towards the promotion of the implementation of the GHS in the agrochemicals sector</b>	Initial outreach could be performed to all concerned stakeholders in the selected regions. Preparatory discussions could be conducted on readiness for uptake of GHS or transition from FAO-WHO recommendations to GHS as regards agriculture and pesticide management.
<b>Continue or increase the level of engagement in global GHS-focused activities</b>	Engage in two-way communication with key multilateral groups such as the UN Sub-Committee of Experts on the GHS, the Global Partnership to Implement the GHS, and the Global Framework on Chemicals in order to inform the international community of progress on GHS in agriculture and pesticide management, explore good practices, and share and gain experience.
<b>Engage with agriculture stakeholders in the regions, e.g. forums, meetings, trainings</b>	<p>Liaise and communicate constantly with all stakeholders in the agricultural sector who have (or would have) responsibility for GHS implementation and with legislators and other policy makers (e.g. via on-going briefing sessions, trainings, discussions); this is necessary in order to maintain essential support and to ensure effective and efficient GHS implementation, particularly with regards to HHPs.</p> <p>Focus should be given to pesticide regulators and policy and decision makers, pesticide users, pesticide industry, civil society organizations, academia and other stakeholders with interest in pesticides risk management. Stakeholders that were mentioned during the background work (often related to specific regions) were:</p> <p><b>IGOs</b></p> <ul style="list-style-type: none"> <li>• <i>IFAD</i></li> <li>• <i>Joint FAO/WHO Meeting on pesticides Management (JMPPM)</i></li> </ul> <p><b>NGOs</b></p> <ul style="list-style-type: none"> <li>• <i>PAN International</i></li> <li>• <i>IPEN</i></li> <li>• <i>Centre for Pesticide Suicide Prevention (CPSP)</i></li> <li>• <i>Centre for Environment Justice and Development (CEJAD)-Kenya – NGO</i></li> </ul>

	<ul style="list-style-type: none"> <li>• <i>Agenda- Tanzania</i></li> <li>• <i>Kenya Organic Agriculture Network (KOAN)-Kenya</i></li> <li>• <i>Biovision Africa Trust</i></li> <li>• <i>Henrich Boll Foundation Kenya</i></li> </ul> <p><b>Consumer organizations</b></p> <ul style="list-style-type: none"> <li>• <i>Consumer Federation of Kenya</i></li> </ul> <p><b>Farmers organisations</b></p> <ul style="list-style-type: none"> <li>• <i>World Farmers’ Organisation</i></li> </ul> <p><b>Industry organisations</b></p> <ul style="list-style-type: none"> <li>• <i>CropLife International,</i></li> <li>• <i>CropLife Africa Middle East</i></li> </ul> <p><b>Academia</b></p> <ul style="list-style-type: none"> <li>• <i>University of Cape Town</i></li> </ul>
<p><b>Showcase on the national/sub-regional level the importance of the GHS in priority activities /engagement opportunities for the region to increase uptake of the GHS in the agricultural sector</b></p>	<p>Initiate a pro-active dialogue and coordination with regional partners and organizations. Contribute to building unions between neighbouring countries in the region to pool resources, share information about implementation status and plans, exchange technical competencies, learn best practices, discuss challenges and solutions. Create regional coordination for GHS implementation, develop networks of technical and legal experts on HHPs management, health hazards and workers safety.</p>
<p><b>Financial instruments potential</b></p>	<p><b>Explore in detail:</b></p> <ul style="list-style-type: none"> <li>• the available financial resources and instruments through existing chemicals and waste funding mechanisms, e.g. 1) the GEF’s<sup>51</sup> Agricultural Chemicals Program addresses the agricultural chemicals that are listed as persistent organic pollutants under the Stockholm Convention and agricultural chemicals that contain mercury or its compounds and 2) the Least Developed Countries and Small Island Developing States Program of the Global Environment Facility;</li> <li>• New potential sources of financing for the sound management of chemicals and waste beyond 2020;</li> <li>• Other funding opportunities and bilateral donors. For example, EU funding opportunities in third countries.</li> </ul>

<sup>51</sup> <https://www.thegef.org/what-we-do/topics/chemicals-and-waste>

## Annex I - List of consulted stakeholders

1. **Mario Yarto**, FAO Agricultural Officer
2. **Aggrey Atuhaire**, Rotterdam specialist, FAO, Uganda
3. **Finbarr Horgan**, FAO
4. **Fredrick Otieno**, project Officer, Centre for Environment Justice and Development (CEJAD), Kenya, East Africa
5. **Joseph Morrall, Sam Baxter and Paul Taylor**, Department of Agriculture, Fisheries and Forestry, Australia
6. **Peter Rembischevski**, Toxicology Division, National Health Surveillance Agency of Brazil (ANVISA)
7. **Jayakody Arachchige Sumith**, Agriculture Department, Sri Lanka
8. **Juergen Helbig**, European Commission's official, DG ENV, Rotterdam Convention CRC member
9. **Stella Simiyu Wafukho**, Director Regulatory affairs, CropLife, Kenya, Africa

## Annex II - List of references of documents and sources

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4. Global situation of pesticide management in agriculture and public health: report of a 2018 WHO-FAO survey, 2018;
5. Guidelines on good labelling practice for pesticides (*revised*). International code of conduct on pesticide management, WHO, WHO/HTM/NTD/WHOPES/2015.3
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15. The Globally Harmonized System of Classification and Labelling of Chemicals—Explaining the Legal Implementation Gap – Article, ResearchGate, November 2017;
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17. Regional Programme: “Towards a Non-Toxic South-East Asia” - Phase II, Final progress report Sept 2013 - May 2019, KEMI, FAO, The Field Alliance;

18. GHS implementation by country, Information compiled by the secretariat of the GHS Sub-Committee, last updated on 19 October 2021, UNECE;
19. The use of pesticides in developing countries and their impact on health and the right to food – DEVE Committee, European Parliament, 2021;
20. Options for Legislation and Standard Setting to Implement the GHS, A Guidance Document to support implementation of the Globally Harmonized Systems of Classification and Labelling of Chemicals – UNITAR, October 2021;
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