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# VISION ZERO FUND



## Banning hazardous pesticides: Recommendations for Myanmar

September 2021

International Labour Organization  
Liaison Office in Myanmar



# ▶ **Banning hazardous pesticides: Recommendations for Myanmar**

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## ► Foreword

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Agrochemicals, such as pesticides and herbicides, are widely used in Myanmar, with both positive and negative effects on health, well-being, socio-economic aspects and the environment. Significant but still insufficient progress has been made internationally in chemicals management and regulations, and the situation for Myanmar is no different; there is some work to do on ensuring an effective regulatory framework is in place to guide agrochemical safety and is actively enforced.

Protecting workers from exposure to hazardous substances has always been a major concern for ILO. Several instruments exist, such as the Chemicals Convention 1990 (No. 170) and the Chemicals Recommendation 1990 (No. 177). ILO implements projects like Vision Zero Fund in order to support Member States in their adoption and implementation of these and other relevant International Labour Standards on chemical safety, actively promoting impactful activities among farmers and stakeholders in places like Shan state and advocating for the substitution of the most hazardous substances with safer alternatives.

I would like to thank the authors of the note, Dr Vasundhara Verma, independent consultant, and Mariana Infante Villarroel, Senior Technical Officer, ILO Vision Zero Fund Myanmar, with support from Khun Maung Toke, National Programme Coordinator, ILO Vision Zero Fund Myanmar. I would also like to thank Ockert Dupper, Andrew Christian and Halshka Graczyk (ILO's Labour Administration, Labour Inspection and Occupational Safety and Health (LABADMIN/OSH) Branch); colleagues from GIZ Myanmar; and all the national-level stakeholders of the Myanmar agriculture sector who shared their experience with the research team.



**Donglin Li**

Liaison Officer/Representative  
ILO Liaison Office in Myanmar

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## ▶ List of acronyms

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<b>DSH</b>	Deliberate Self-Harm
<b>FAO</b>	Food and Agriculture Organization of the UN
<b>FAS</b>	Foreign Agriculture Service
<b>GAP</b>	Good Agricultural Practices
<b>HHP</b>	Highly Hazardous Pesticides
<b>ILO</b>	International Labour Organization
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OEHD</b>	Occupational and Environmental Health Division
<b>OP</b>	Organophosphate
<b>OSH</b>	Occupational Safety and Health
<b>PPD</b>	Plant Protection Division
<b>PPE</b>	Personal Protective Equipment
<b>PRB</b>	Pesticide Registration Board
<b>SAICM</b>	Strategic Approach to International Chemicals Management
<b>USDA</b>	United States Department of Agriculture
<b>VZF</b>	Vision Zero Fund
<b>WHO</b>	World Health Organization
<b>WUR</b>	Wageningen University & Research

# Introduction

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Vision Zero Fund (VZF) has been implementing a project on occupational safety and health (OSH) in Myanmar since May 2017, working specifically within the garment and ginger value chains. The risks to farmers from the handling and use of agrochemicals within the ginger value chain are recognized as a significant OSH concern. As a result, in 2020, VZF commissioned a study to evaluate Myanmar's legislative and policy framework related to the management of agrochemicals throughout their lifecycle (from formulation and packaging to disposal).

Following on from the study, this note aims to focus on the role of banning the most hazardous pesticides in use as a means of harm reduction. The note evaluates the international evidence for

this strategy and the national evidence available to guide bans of specific pesticides. In addition, it explores options such as strengthening the pesticide registration process, as well as the challenge posed by the illegal trade of these chemicals.



This note aims to focus on the role of banning the most hazardous pesticides in use as a means of harm reduction.



## Highly hazardous pesticides

Highly hazardous pesticides (HHP) are pesticides recognized to cause high levels of adverse acute or chronic hazard to human health or the environment.<sup>1</sup> Serious and systemic adverse effects can result from unsafe handling of pesticides as well as from accidental or intentional (as a means of self-harm) ingestion of these substances. Acute exposure to these HHP can have long-term harmful effects on the liver, kidneys, blood, lungs, nervous system, immune system and gastrointestinal system. Children are the most vulnerable to this exposure, given their smaller body mass. These chemicals often remain active in the environment for a prolonged period, causing health risks to handlers and consumers across the agri-food value chain.<sup>2</sup>

An estimated 385 million cases (with an estimated 11,000 deaths) of unintentional acute pesticide poisoning occur each year, affecting 44 per cent of farmers worldwide.<sup>3,4</sup> In addition, an estimated 110,000–168,000 deaths worldwide occur from intentional self-poisoning with pesticides, accounting for up to 20 per cent of global suicide deaths, largely in low- and middle-income countries.<sup>5</sup> Evidence shows that, despite levels of deliberate self-harm (DSH) being similar across the world, completed suicide rates are much higher in poorer countries.<sup>6,7</sup> The easy availability of HHP for impulsive acts of self-harm without suicidal intent has inadvertently led to the deaths of many, often young, men and women. The large number of cases of unintentional poisoning as well as the significant burden of fatalities from intentional poisoning has made acute pesticide exposure a major global health crisis.

## Elimination of hazardous pesticides

Elimination of hazardous pesticides is the first step in the hierarchy of controls in risk mitigation strategies. Where possible, pesticides that cause significant morbidity and mortality should be prohibited and alternatives sought (Box 1).

An analysis of implementing bans on HHP in 14 countries where >2 per cent of suicides are from pesticides has shown this to be the most cost-effective mental health intervention with the largest impact in low- and middle-income countries, particularly where suicide from paraquat (>50 per cent mortality) is present.<sup>8</sup> Such legislation has the potential to prevent 361,000 suicides by 2030 in addition to reducing other adverse effects to humans and the environment resulting from acute and chronic exposure.

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<sup>1</sup> WHO (2019) Preventing Disease through Healthy Environments. Exposure to Highly Hazardous Pesticides: A Major Public Health Concern. Geneva: WHO.

<sup>2</sup> SAICM (n.d.) "Highly Hazardous Pesticide", [www.saicm.org/Implementation/EmergingPolicyIssues/HighlyHazardousPesticides/tabid/5479/Default.aspx](http://www.saicm.org/Implementation/EmergingPolicyIssues/HighlyHazardousPesticides/tabid/5479/Default.aspx)

<sup>3</sup> ILO (2021) Exposure to Hazardous Chemicals at Work and Resulting Health Impacts: A Global Review. Geneva: ILO.

<sup>4</sup> Boedeker, W. et al. (2020) "The Global Distribution of Acute Unintentional Pesticide Poisoning: Estimations Based on a Systematic Review". BMC Public Health 20(1): 1–19.

<sup>5</sup> Mew, E. et al. (2017) "The Global Burden of Fatal Self-Poisoning with Pesticides 2006-15: Systematic Review". Journal of Affective Disorders 219: 93–104.

<sup>6</sup> Eddleston, M. et al. (1998) "Deliberate Self Harm in Sri Lanka: An Overlooked Tragedy in the Developing World". BMJ (Clinical Research) 317(7151): 133–135.

<sup>7</sup> Hvistendahl, M. (2012) "Making Sense of a Senseless Act". Science 338(6110): 1025–1027.

<sup>8</sup> Lee, Y. et al. (2020) "The Cost-Effectiveness of Banning Highly Hazardous Pesticides to Prevent Suicides Due to Pesticide Self-Intoxication across 14 Countries: An Economic Modelling Study". The Lancet Global Health.

## ► Box 1: Risk minimization through bans on highly hazardous pesticides – case examples<sup>9,10,11,12,13</sup>

Bans of the most toxic pesticides – particularly paraquat and certain organophosphate (OP) insecticides – have led to a reduction in pesticide suicide and overall suicide in Sri Lanka and Bangladesh. The greatest positive impact from these bans is seen in countries where legislation is targeted at the pesticides that are responsible for the most deaths.

**Sri Lanka:** Between 2009 and 2011, the government introduced a phased ban of OP insecticides dimethoate and fenthion as well as the herbicide paraquat. These pesticides were specifically banned following a recognition that they had led to significant cases of self-poisoning in the country with high case fatality (dimethoate 21 per cent, fenthion 15 per cent, paraquat 43 per cent). A reduction of 50 per cent was seen in the age standardized pesticide suicide rate in the following

years. The cumulative effect of regulations introduced in Sri Lanka is estimated to have prevented 93,000 deaths over 20 years up to the year 2015.

**Bangladesh:** Since 1996, many HHP, including several World Health Organization (WHO) hazard class I OP insecticides, have been banned from agriculture. This has been associated with a 65.1 per cent reduction in deaths from pesticide ingestion between 1996 and 2014.

Neither country has seen a negative impact on crop yield as a result of these bans.

<sup>9</sup> Gunnell, D. et al. (2017) "Prevention of Suicide with Regulations Aimed at Restricting Access to Highly Hazardous Pesticides: A Systematic Review of the International Evidence". *Lancet Global Health* 5(10): e1026–e37.

<sup>10</sup> Knipe, D.W. et al. (2017a) "Suicide Prevention through Means Restriction: Impact of the 2008-2011 Pesticide Restrictions on Suicide in Sri Lanka". *PLoS One* 12(3): e0172893.

<sup>11</sup> Knipe, D.W. et al. (2017b) "Preventing Deaths from Pesticide Self-Poisoning-Learning from Sri Lanka's Success". *Lancet Global Health* 5(7): e651–e52.

<sup>12</sup> Gunnell, D. et al. (2007) "The Impact of Pesticide Regulations on Suicide in Sri Lanka". *International Journal of Epidemiology* 36(6): 1235–1242.

<sup>13</sup> Chowdhury, F.R. et al. (2018) "Bans of Who Class I Pesticides in Bangladesh-Suicide Prevention without Hampering Agricultural Output". *International Journal of Epidemiology* 47(1): 175–184.

## ▶ Process for banning hazardous pesticides

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Decisions on specific pesticides to ban should be based on country-specific data, so as to maximize the impact of legislation. In this effort, processes and legislation need to be in place for:

- ▶ Registration and regular renewal of all pesticides being sold in the country. This process should involve a robust risk assessment of each chemical, including classification using an internationally recognized algorithm such as the WHO classification of pesticides by hazard. Such processes need adequate human and technical resources, which are often limited in low- and middle- income countries.
- ▶ Determining the pesticides responsible for the greatest adverse impact on human health and the environment in the country. Data should be recorded and published on diseases caused by pesticides (ILO List of Occupational Diseases) to aide decision-making.<sup>14</sup> For example, China phased out 16 pesticides as a result of chronic toxicity and adverse events, banned liquid preparations of paraquat because of high levels of use in completed suicide and outlawed fipronil owing to its negative impact on bee and fish populations.<sup>15</sup>
- ▶ Investigating safer alternatives and innovative technology to reduce reliance on pesticides.
- ▶ Meetings with all stakeholders to address entrenched commercial interests that lead to a resistance to bans.
- ▶ A phasing-out period. Most countries accept six months to two years, to make it possible to sell remaining product in the market prior to law enforcement.<sup>16</sup> The alternative to this strategy is to initiate immediate product recall and safe disposal of the banned chemical; this is more resource-intensive.
- ▶ Understanding local drivers for counterfeit and illegal trade and taking coordinated regional action against this.

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<sup>14</sup> ILO (2010) List of Occupational Diseases. Geneva: ILO.

<sup>15</sup> FAO (2015) Progress in Pesticide Risk Assessment and Phasing-out of Highly Hazardous Pesticides in Asia. Rome: FAO.

<sup>16</sup> Ibid.

## ► The Myanmar context

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The Pesticide Law in Myanmar covers the registration, production, distribution and use of pesticides. As part of this, all businesses interested in formulation, import, export or retail of pesticides for experimental, provisional, special or full use must apply to the Pesticide Registration Board (PRB) for a licence.<sup>17</sup>

The process of registration entails an application to the PRB followed by an evaluation, which focuses largely on an analysis of samples to verify the quality of the product. There is no formal risk assessment process to evaluate its impact on human health and the environment; such a process is an integral part of the international code of conduct for pesticide management. The applicant pays a fee upon approval. Provisional registration is valid for five years; full registration is granted if studies carried out during provisional status are satisfactory and is valid for ten years. The law does not fully outline the need to classify pesticides by hazard.

### Progress so far

The Plant Protection Division (PPD) of the Department of Agriculture in the Ministry of Agriculture, Livestock and Irrigation is responsible for implementation of the Pesticide Law. PPD has collaborated with the Wageningen University & Research (WUR) group to introduce a robust risk assessment process in the evaluation of every pesticide prior to granting registration.<sup>18</sup> This aims to harmonize the evaluation with international standards, including use of the WHO classification of pesticides by hazard. Using this process, WUR has classified approximately 3,000 registered pesticides in Myanmar, with 165 of these, or 5.5 per cent, identified as HHP. Among these 165, there were 19 active ingredients identified as HHP. Fifteen of these have been banned or will be denied new registration requests, two have been restricted and two are undergoing formulation change (Annex A). Ongoing collaboration is underway to find alternatives to those restricted or banned – in particular carbendazim, carbofuran, benomyl, glufosinate ammonium and aluminium phosphide.

Data on pesticides leading to acute hospitalization is recorded by the Occupational and Environmental Health Division (OEHD) of the Department of Public Health in the Ministry of Health and Sports; however, this is not published. Consultations with the department suggested that the greatest burden of disease from acute pesticide poisoning came from OP insecticides.



**Wageningen University & Research has classified approximately 3,000 registered pesticides in Myanmar, with 165 of these, or 5.5 per cent, identified as Highly Hazardous Pesticides**

<sup>17</sup> PPD (2016) “The Pesticide Law: Pyidaungsu Hluttaw Law No. 14.” Naypyidaw: PPD.

<sup>18</sup> ter Horst, M. et al. (2018) “Risk Reduction of Pesticides in Myanmar”. Interim Report of the Dutch–Myanmar Project on Pesticide Registration and Pesticide Risk Reduction 2016–2018. Wageningen: Wageningen Environmental Research.

## Strengthening the registration process

PPD needs sufficient capacity to continue the risk assessment and classification process for registering pesticides beyond the period of collaboration with WUR. Currently, several products with the same active ingredient are registered for use in Myanmar – an issue that has arisen in many countries.<sup>19</sup> This unnecessary plethora of products can be confusing for farmers and put unnecessary pressure on the limited capacity of PPD to complete registration processes. One way to reduce this burden of applications on PPD would be to limit the number of products with the same active ingredient that are granted registration.



Currently, several products with the same active ingredient are registered for use in Myanmar.

Other strategies to reduce the burden of work on PPD could include charging the registration fee upfront rather than upon the granting of registration and granting provisional registration to a product only once. The personal protective equipment (PPE) required for safe use of the pesticides should be scrutinized at the time of registration, with serious consideration given to refusing registration where the required PPE is unrealistic. Companies applying for registration should be required to outline clearly the PPE required and its availability in the market. Input retailers in turn should provide the PPE required for the products they sell.

Registered products should be re-evaluated after a defined period with a renewed risk assessment that considers any new data on the chemical in question. This process should not be so frequent as to burden PPD but also not so infrequent as to oversee emerging evidence. Further exploration of the current process, as well as discussion of feasible changes, to strengthen the process is needed.

## Implementation of bans and restrictions already in place

Fieldwork conducted by VZF in 2020 identified widespread recommendation and use of carbendazim and carbofuran among farmers and input retailers in Shan state – both pesticides that were banned in January 2020. Although these may still be in the “phase-out” period, input retailers and farmers need active education on the use of alternative techniques and chemicals to curtail the use of these HHP.<sup>20</sup> In addition, aluminium phosphide – a highly volatile and lethal pesticide that is registered for restricted use only in Myanmar – was noted to be freely sold in Shan state.

## International evidence for the ban of further HHP

Several pesticides that do not meet the criteria for being an HHP using the main inclusions of the WHO classification are still capable of causing serious and irreversible harm to human health and have been banned in many countries. One such pesticide that is widely used in Myanmar is paraquat (Box 2).

<sup>19</sup> FAO (2015) Progress in Pesticide Risk Assessment and Phasing-out of Highly Hazardous Pesticides in Asia.

<sup>20</sup> The exact length of the phase-out period for newly banned pesticides currently needs to be clarified.

## ► Box 2: Mounting evidence for the need to ban paraquat<sup>21,22,23,24,25,26,27,28</sup>

Over 40 countries have recognized the significant public health concerns from paraquat exposure and banned its use – including Serbia, South Korea, Togo and Zimbabwe. Thailand and China banned the sale and use of paraquat in 2020.

In 2012, South Korea had one of the highest suicide mortality rates among Organisation for Economic Development and Co-operation (OECD) countries, at 29.1 per 100 000. Although pesticides were used in 7.5 per cent of total poisoning cases seen between 2006 and 2010, they accounted for 20.8 per cent of suicide deaths. Paraquat was identified as a major player and banned in 2012, leading to a 56 per cent decline in overall suicide mortality in 2013 (with the greatest decline seen

in herbicide case fatality). An overall increase in crop yield was seen during this period.

A reduction of the import and thus the availability of paraquat in Western Samoa and Suriname led to a 45 per cent reduction in total suicides in Samoa (where paraquat was responsible for 72 per cent of suicides) and a three-fold decrease in paraquat poisoning admissions in Suriname.

<sup>21</sup> Dawson, A.H. et al. (2010) "Acute Human Lethal Toxicity of Agricultural Pesticides: A Prospective Cohort Study". *PLoS Med* 7(10): e1000357.

<sup>22</sup> Isenring, R. (2017) "Poisoning and Adverse Health Effects Caused by Paraquat among Agricultural Workers and the Public: A Bibliography of Documented Evidence".

<sup>23</sup> Dalvie, M.A. et al. (1999) "Long-Term Respiratory Health Effects of the Herbicide, Paraquat, among Workers in the Western Cape". *Occupational and Environmental Medicine* 56(6): 391–396.

<sup>24</sup> Allen, M.T. and Levy, L.S. (2013) "Parkinson's Disease and Pesticide Exposure--a New Assessment". *Critical Reviews in Toxicology* 43(6).

<sup>25</sup> OECD (Organisation for Economic Co-operation and Development) (n.d.) "OECD Data: Suicide Rates". <https://data.oecd.org/healthstat/suicide-rates.htm>

<sup>26</sup> Cha, E.S. et al. (2014) "Mortality from and Incidence of Pesticide Poisoning in South Korea: Findings from National Death and Health Utilization Data between 2006 and 2010". *PLoS One* 9(4): e95299–e99.

<sup>27</sup> Perriëns, J. et al. (1989) "The Epidemiology of Paraquat Intoxications in Surinam". *Tropical and Geographical Medicine* 41(3): 266–269.

<sup>28</sup> USDA FAS (2020) "Thailand: Thailand Moves Forward with Ban on Paraquat and Chlorpyrifos on 1 June 2020". [www.fas.usda.gov/data/thailand-thailand-moves-forward-ban-paraquat-and-chlorpyrifos-1-june-2020](http://www.fas.usda.gov/data/thailand-thailand-moves-forward-ban-paraquat-and-chlorpyrifos-1-june-2020)

A major challenge in eliminating HHP such as paraquat is the continued export of these chemicals from countries that have banned their use, such as China and the United Kingdom, to countries like Myanmar that have not yet banned their use. The import of such hazardous pesticides has been linked to high pesticide suicide rates in India, for example.<sup>29</sup>

In the absence of country-specific data, evidence outlined in Boxes 1 and 2 on the impact of bans – particularly of aluminium phosphide, paraquat and certain OP insecticides – can be a useful guide for national policy. In addition, Table 1 highlights pesticides that are registered for use in Myanmar but that have seen significant case fatality rates from acute (intentional or accidental) poisoning recorded in other countries, and may be a useful tool for decision-making.

Building national capacity to assess chemicals that have a high adverse effect on the ecology of the country is also needed. For example, the European Union has completely banned imidacloprid – a pesticide widely used among farmers in Shan state – for outdoor use as a result of its environmental impact.<sup>30</sup>



**Building national capacity to assess chemicals that have a high adverse effect on the ecology of the country is also needed.**

## Tackling the illegal trade of pesticides

Field surveys and consultations with PPD and trade unions revealed a significant challenge in the form of the illegal trade of pesticides – paraquat and glyphosate in particular – and reported that these products were much cheaper than those with Myanmar labels and therefore more attractive to purchase. Consultations with trade unions revealed instances of chemicals such as paraquat being repackaged for sale in unlabelled drinking water bottles.

Another aspect that remains a challenge is the export of pesticides that have been banned for use in the country of manufacture. A key example of this is paraquat, which is manufactured in Europe and China (where their use is banned) for export to countries such as Myanmar.

<sup>29</sup> Rory O'Neill (Occupational Health and Safety Advisor to the International Trade Union Confederation) at the Vision Zero Fund High Level Forum 2021, Day 3.

<sup>30</sup> FAO (Food and Agricultural Organization of the UN) and WHO (World Health Organization) (2019) Detoxifying Agriculture and Health from Highly Hazardous Pesticides: A Call for Action. Rome and Geneva: FAO and WHO.

► **Table 1: Case fatalities from acute poisoning with pesticides and their WHO classification<sup>31</sup>**

Pesticide	Class	Percentage case fatality	WHO hazard classification
<b>Hazardous pesticide commonly used in Shan state*</b>			
Aluminium phosphide	Insecticide	30–100	Not classified
Paraquat	Herbicide	42.7	II – Moderately hazardous
Abamectin	Insecticide	11.1	IV – Unlikely to produce hazard
Chlorpyrifos	OP insecticide	7.6	II -- Moderately hazardous
Glyphosate	Herbicide	2.4	IV – Unlikely to produce hazard
Carbofuran	Carbamate insecticide	1.0	Ib – Highly hazardous
<b>Other hazardous pesticides registered for use in Myanmar</b>			
Dimethoate	OP insecticide	20.6	II – Moderately hazardous
Fenthion**	OP insecticide	14.8	II – Moderately hazardous
Profenofos	OP insecticide	11.0	II – Moderately hazardous
Propanil	Herbicide	10.9	III – Slightly hazardous
Carbosulfan	Carbamate insecticide	10.7	II – Moderately hazardous
Esfenvalerate	Insecticide	8.3	II – Moderately hazardous
Prothiofos	OP insecticide	7.7	II – Moderately hazardous
Phenthoate	OP insecticide	6.5	II – Moderately hazardous
Fenobucarb	Carbamate insecticide	5.8	II – Moderately hazardous
carbaryl	Carbamate insecticide	5.6	II – Moderately hazardous
Diazinon	OP insecticide	4.8	II – Moderately hazardous
MCPA	Herbicide	4.8	III – Slightly hazardous
Bispyribac-sodium	Herbicide	2.9	IV – Unlikely to produce hazard
Malathion	OP insecticide	1.9	III – Slightly hazardous
*Findings from VZF field survey. **Fenthion – restricted for use in Myanmar for malaria control only.			

<sup>31</sup> Dawson et al. (2010) "Acute Human Lethal Toxicity of Agricultural Pesticides: A Prospective Cohort Study".



## ► Recommendations for Myanmar

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Separate policy notes developed by VZF in 2020 point to aspects of the Pesticide Law and the Occupational Safety and Health Law that can be strengthened to improve the registration, distribution, use and management of pesticides.<sup>32</sup> Besides policy-level action, a great deal can be done by focusing on the following practical steps to inform decision-making:

### 1. Gather data on the health impact of pesticides

Country-specific data on pesticides that cause the greatest number of hospitalizations and the highest environmental impact is needed to determine the priorities in Myanmar. Data recorded by OEHD on diseases caused by pesticides (ILO List of Occupational Diseases) should be made available to aid decision-making.<sup>33</sup> Further capacity-building to collect more data on long-term impacts on human health and the environment is also needed.

### 2. Initiate the process of phasing-out the most hazardous substances

Of registered pesticides in Myanmar, aluminium phosphide and paraquat (both readily available and used in the country) have exceptionally high case fatality rates from intentional or accidental poisoning. Many countries have acknowledged this danger and have already banned these chemicals, an action that Myanmar should also consider. Greater engagement with PPD is needed to understand the current re-evaluation process of registered pesticides to determine what is needed to bring about such a change.

Clear published directives are needed on the phasing-out period and process set for pesticides that are banned, with law enforcement strategies put in place following this period.

### 3. Limit the number of hazardous pesticides with similar characteristics

PPD should seek to reduce the number of products with the same active ingredient that are registered for use, in order to reduce excess choice of hazardous products and an unnecessary burden on its registration process.

### 4. Strengthen the pesticide registration and phasing-out processes

Further engagement with PPD is needed to evaluate current practices of risk assessment during registration and phasing-out of pesticides to better inform recommendations for change.

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<sup>32</sup> Although further development of these policy notes is needed.

<sup>33</sup> ILO (2010) List of Occupational Diseases.

## **5. Ensure that clear alternatives to the most hazardous substances are available and work with retailers and farmers to raise awareness on safer choices**

Clear alternatives need to be identified and discussed with communities to prevent the continued use of banned chemicals through the illegal market. Engaging input retailers and farmers through resources promoting safer alternatives is needed. Promoting awareness of and access to good agricultural practices (GAP) or organic markets may be a useful way to reduce reliance on hazardous chemicals and may be profitable for farmers. This can be done even before an official phasing-out strategy has been implemented.<sup>34</sup>

## **6. Address the illegal border trade through enforcement and regional cooperation**

Illegal trade of agrochemicals brought in over the land border with China and Thailand was universally identified as a key challenge by the Department of Agriculture, trade unions, international agencies, input retailers and farmers. The nature of the directives given to tackle this issue and of the specific actions taken against this trade are unclear and need clarification. Publication of information on the key products being traded illegally, their source and action taken so far would be invaluable in devising effective ways forward. Sharing information and collaborating with neighbouring countries to take coordinated action is needed to address this global challenge.

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<sup>34</sup> VZF Myanmar has carried out several activities in this regard. See the note on “Pesticide Safety in Action” and [www.ilo.org/vzf](http://www.ilo.org/vzf) for further information.

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## ► Annex A

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HHP registered for use in Myanmar identified by the WUR group using FAO/WHO guidelines were discussed at the 28th Pesticide Registration Board Meeting in 2018 with the following outcomes for each pesticide.

Active ingredient	Type of pesticide	Decision
Trichlorfon	Insecticide	Banned
Magnesium phosphide	Insecticide	Restricted use
Carbofuran	Insecticide	Import permitted until December 2018, banned from 1 January 2020
Carbendazim	Fungicide	Import permitted until December 2018, banned from 1 January 2020
Benomyl	Fungicide	Import permitted until December 2018, banned from 1 January 2020
Glufosinate-ammonium	Herbicide	Import permitted until December 2018, banned from 1 January 2020
Tridemorph	Fungicide	Not allowed for registration
Triflumizole	Fungicide	Not allowed for registration
Diafenthiuron	Insecticide	Not allowed for registration
Terbufos	Insecticide	Not allowed for registration
Borax decahydrate	Insecticide	Not allowed for registration
Hydramethylnon	Insecticide	Not allowed for registration
Metaflumizone	Insecticide	Not allowed for registration
Mineral oil	Insecticide	Not allowed for registration
Boric acid	Insecticide	Not allowed for registration
Brodifacoum	Rodenticide	Allowed with formulation change
Bromadiolone	Rodenticide	Allowed with formulation change
Methamidophos	Insecticide	Banned
Aluminium phosphide	Insecticide	Restricted use

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