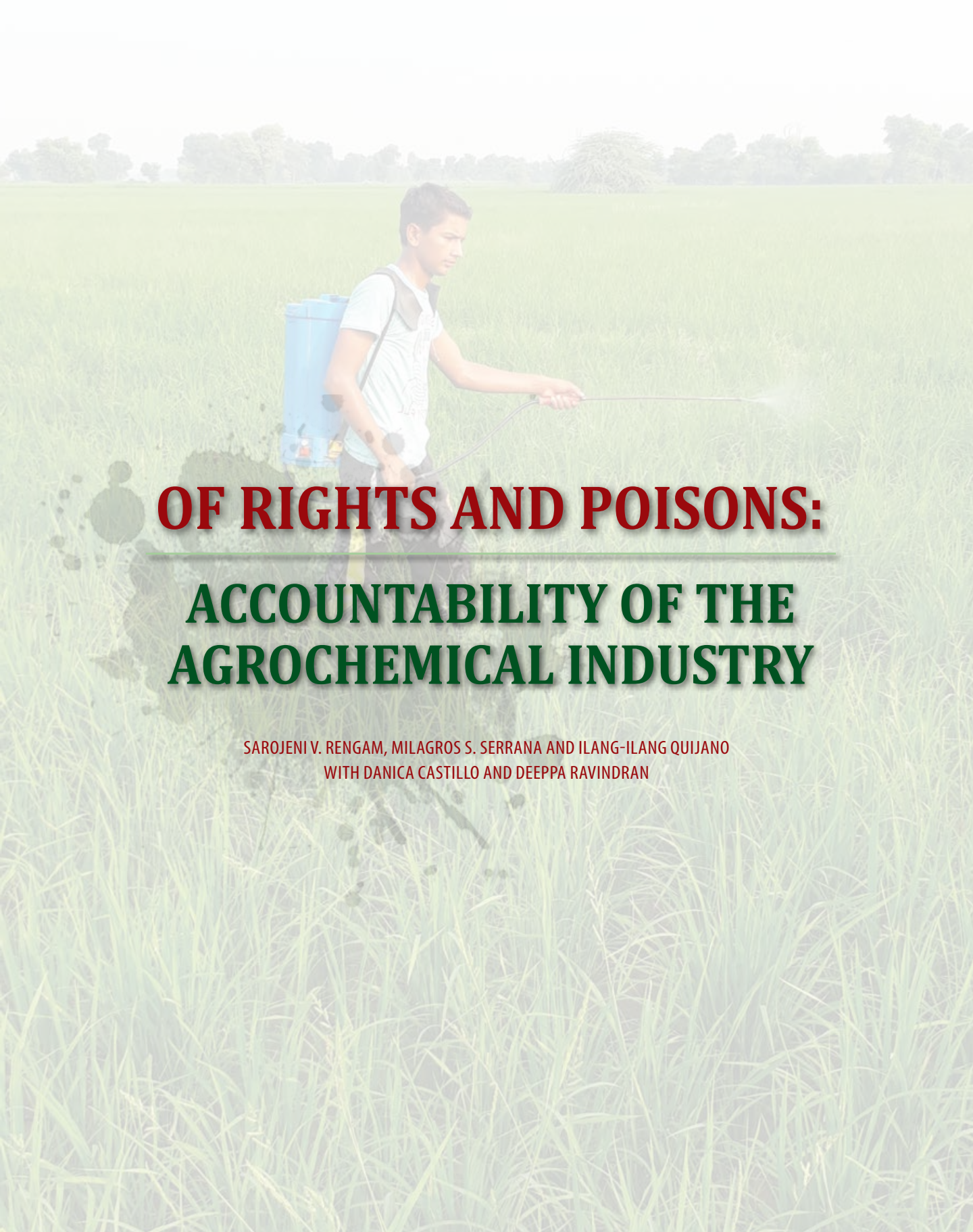
OF RIGHTS AND POISONS:

ACCOUNTABILITY OF THE AGROCHEMICAL INDUSTRY



OF RIGHTS AND POISONS:

ACCOUNTABILITY OF THE AGROCHEMICAL INDUSTRY

SAROJENI V. RENGAM, MILAGROS S. SERRANA AND ILANG-ILANG QUIJANO
WITH DANICA CASTILLO AND DEEPPA RAVINDRAN

Of Rights and Poisons: Accountability of the Agrochemical Industry

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Comments and inquiries may be forwarded to:

PAN Asia Pacific (PANAP)
P.O. Box 1170, Penang, 10850 Malaysia
Tel: +604 6570271 / 6560381 | Fax: +604 6583960
E-mail: info@panap.net | Web: www.panap.net

Writers and editors:
Sarojeni V. Rengam, Milagros S. Serrana and Ilang-Ilang Quijano with Danica Castillo and Deeppa Ravindran

Contributing editors:
Arnold Padilla and Meriel Watts

Technical assistance:
Elnard Arellano, Rowena Cahiles, Mahananthan Kalimuthu and Marjorie Pamintuan

CPAM Training conducted in all participating countries by Deeppa Ravindran and Maran Perianen

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Andhra Pradesh Vyvasaya Vruthidarula Union (APVVU)
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Kilusang Magbubukid ng Pilipinas (KMP)
North South Initiative (NSI)
OPPUK Organisasi Penguatan dan Pengembangan Usaha-Usaha Kerakyatan
Pesticide Action Network (PAN) India
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Research Centre for Gender, Family and Environment in Development (CGFED)
Sahanivasa
Society for Rural Education and Development (SRED)
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LIST OF ACRONYMS

ABERDI	A. BROWN Energy and Resource Development Inc
ACh	Acetylcholine
API	Agusan Plantations Inc
BARCIK	Bangladesh Resource Center for Indigenous Knowledge
BASF	Badische Anilin und Soda Fabrik
BAYAN	Bagong Alyansang Makabayan
BRRI	Bangladesh Rice Research Institute
CAUSE-DS	Citizens Alliance Unified for Sectoral Empowerment Davao del Sur
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
CGFED	Research Centre for Gender, Family and Environment in Development
CIBRC	Central Insecticide Board and Registration Committee
CIL	Center for International Law
CPAM	Community-based Pesticide Action Monitoring
CPHC	Community Primary Health Care
CRC	Convention on the Rights of the Child
CSOs	Civil Society Organisations
DDT	Dichlorodiphenyltrichloroethane
ECCHR	European Center for Constitutional and Human Rights
EENT	Ear, Eyes, Nose and throat
ETC Group	Action Group on Erosion, Technology and Concentration
FAO	United Nations Food and Agriculture Organization
FFMs	Fact-Finding Missions
FGDs	Focus Group Discussions
FPA	Fertilizer and Pesticides Authority
FPPI	Filipinas Palm Oil Plantations Inc.
GE	Genetic Engineering
HB	House Bill
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
HHPs	Highly Hazardous Pesticides
HYV	High-Yielding Variety
IARC	International Agency for Research on Cancer
ICCM	International Conference on Chemicals Management
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
ILO	International Labour Organization
IPM	Integrated Pest Management
IQ	Intelligence Quotient
ISPO	Indonesian Sustainable Palm Oil System
KALUMBAY	Indigenous People's Organisation, Northern Mindanao
Kg	Kampung
KII	Kenran Industries Inc.
KMP	Kilusang Magbubukid ng Pilipinas
KMU	Kilusang Mayo Uno
LADC	Lapanday Diversified Products Corporation
MARD	Ministry of Agricultural and Rural Development

MP3EI	Master Plan for Acceleration and Expansion of Indonesia's Economic Development
NSI	North South Initiative
OEIGWG	Open-Ended Intergovernmental Working Group
OP	Organophosphate
OPPQ	Ordinance on Plant Protection and Quarantine
OPPUK	Organisasi Penguatan dan Pengembangan Usaha-Usaha Kerakyatan
PACOS	Partners of Community Organisations in Sabah
PAN	Pesticide Action Network
PANAP	Pesticide Action Network Asia Pacific
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
RSPO	Roundtable on Sustainable Palm Oil
SAICM	Strategic Approach to International Chemicals Management
SBL	Syngenta Bangladesh Limited
SENTRA	Sentro para sa Tunay na Repormang Agraryo
SIT	Special Investigation Team
SOCKSARGEN	South Cotabato, Cotabato City, Cotabato Province, Sultan Kudarat, Sarangani, and General Santos City
SRD	Sustainable and Rural Development
SRED	Society for Rural Development and Education
The Code	International Code of Conduct on Pesticide Management
TNCs	Transnational Corporations
UDHR	Universal Declaration of Human Rights
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCHR	United Nations Commission on Human Rights
UNSR	United Nations Special Rapporteur
WHO	World Health Organization
WPG	Women's Pioneer Group
WU	Women's Union
YMCH	Yavatmal Medical College Hospital

CHAPTER 1

Introduction

Agrochemical TNCs and the Need for Corporate Accountability

The global reach and impact of agrochemical transnational corporations (TNCs) and their pesticide products have grown exponentially for the past decades. Input-intensive chemical-based farming systems, promoted by governments and the food and agriculture industry, have pervaded communities in practically every corner of the globe. The use of pesticides — many of which are considered as highly hazardous — has had immense impacts on the quality of human life, local ecosystems, and the global environment. Yet, little has been done to hold companies responsible for bringing hazardous pesticides into the daily lives of more than two billion people dependent on agriculture. As the United Nations Special Rapporteurs (UNSRs) Hilal Elver and Baskut Tuncak pointed out to the UN Human Rights Council (UNHRC) in 2017, "the pesticide industry's efforts to influence policymakers and regulators have obstructed reforms and paralysed global pesticide restrictions".[1] So far, efforts to make them accountable have not been successful.

The agrochemical companies are further consolidating with buyouts and mergers. According to the Action Group on Erosion, Technology, and Concentration (ETC Group), "with collective revenues of more than USD 65 billion in agrochemicals/seeds and biotech traits (2013 figures), the Big Six (Monsanto, Syngenta, Bayer, Dow, DuPont, and BASF) control 75% of the global agrochemical market; 63% of the commercial seed market; and more than 75% of all private sector research in seeds/pesticides".[2] Syngenta has been bought out by state-owned ChemChina while Dow recently completed its USD 130 billion merger with DuPont to form the world's largest chemical company. The Big Six has turned into the Big Four that control over 70% of the pesticide market.[3,4]

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1 Human Rights Council, *Report of the Special Rapporteur on the right to food (Effects of pesticides on the right to food),* 24 January 2017, A/HRC/34/48, available at https://www.ohchr.org/EN/Issues/Food/Pages/Annual.aspx

2 ETC Group. (2015, December). *Breaking Bad: Big Ag Mega-Mergers in Play Dow + DuPont in the Pocket? Next: Demonsanto? ETC Group Communiqué 115.* Retrieved from http://www.etcgroup.org/content/breaking-bad-big-ag-mega-mergers-play

3 The Big Four are: Bayer Cropscience-Monsanto (27.4% of global pesticide market share), ChemChina-Syngenta (26.9% of global pesticide market share), DuPont-Dow (16.8% of global pesticide market share), and BASF (12.9% global pesticide market share).

4 ETC Group and International Panel of Experts on Sustainable Food Systems. (2017 October). *Too Big to Feed: The Short Report.* http://www.etcgroup.org/sites/www.etcgroup.org/files/files/too_big_to_feed_short_report_etc_ipes_web_final.pdf

With the mergers, Bayer-Monsanto will dominate, followed by Corteva Agriscience (the spinoff agricultural enterprise resulting from last year's Dow-DuPont merger), and Syngenta-ChemChina (the acquisitive Chinese chemical company that is expected to merge soon with Sinochem).[5] BASF, the fourth player, will buy off all the assets of Bayer and Monsanto when they divest.[6]

Projections in Asia are that sales of pesticides and fertilisers will increase from USD 100 billion to USD 120 billion per year by 2021.[7]

Food, health, and environment are threatened now more than ever as these agrochemical giants continue to expand their monopolies and amass huge profits, while taking no responsibility for the devastating impacts of their products. Acute health effects of pesticide exposure range from skin disorders to death, and include respiratory, gastrointestinal, circulatory, and neurological effects[8]. Behind the poisoning statistics and effects is the human tragedy of women, men, girls, and boys suffering from the irreversible and intergenerational impacts of pesticides. All humans now carry a body burdened with persistent pesticides, many of which are linked to cancer, reproductive problems, birth defects, developmental and behavioural impacts, and effects on the immune, endocrine, and neurological systems.[9] People also suffer the epigenetic effects of pesticides and their residues which are transient in the body but the impacts of which are often life-long. Exposure of parents to certain highly hazardous pesticides (HHPs), such as chlorpyrifos, may result in children being born with lowered IQ.[10]

There is a demonstrated link between exposure to pesticides and a number of reproductive problems including birth defects, infertility, delayed time to pregnancy, spontaneous abortion and still births, preterm birth, intrauterine growth retardation, perinatal mortality, endometriosis, and lowered sperm counts.[11] Occupational studies have reported adverse reproductive effects linked to pesticide exposure in banana workers in Central America, grape workers in India, women in the Colombian flower industry, and rural California women.[12]

Many pesticides can cross the placenta and affect the embryo during its most vulnerable period of development with one study showing that pesticides and their breakdown products were found in

5 ETC Group. (2018, March 20). *Europe bows to Bayer-Monsanto... US may follow.* [Press release]. Retrieved from http://www.etcgroup.org/content/news-release-four-farm-europe-and-us-regulators-may-bow-bayer-monsanto-and-basf

6 Ibid.

7 Grain. (2017). *How RCEP affects food and farmers*. Retrieved from https://www.grain.org/article/entries/5741-how-rcep-affects-food-and-farmers

8 Watts, M. (2010). *Pesticides: Sowing Poison, Growing Hunger, Reaping Sorrow.* Retrieved from http://archive.panap.net/en/p/post/pesticides-info-database/448

9 PAN International. (2015). *The Permanent People's Tribunal Session on Agrochemical Transnational Corporations: Indictment and Verdict.* Retrieved from http://pan-international.org/wp-content/uploads/Peoples_Tribunal_on_agrochemical_TNCs_-_indictment_and_verdict.pdf

10 Watts, M. (2015). *Replacing Chemicals with Biology: Phasing out highly hazardous pesticides with agroecology.* Penang: PANAP.

11 The Permanent People's Tribunal Session on Agrochemical Transnational Corporations 2015, op cit.

12 Ibid.

the umbilical cord blood of 80-100 percent of new-born infants tested.[13] The developing foetus and small child are especially vulnerable to the effects of pesticides, as their rapidly developing brain, endocrine, and neurological systems as well as liver and kidneys are extremely susceptible to disruption from minute amounts of chemicals.[14] Even tiny exposures to pesticides may result in effects that are often permanent.

Pesticides have been poisoning agricultural workers and farmers for over 60 years and yet there are still no accurate estimates of pesticide poisoning. In 1990, a report in a World Health Organization (WHO) journal estimated 25 million workers suffered at least one incident of poisoning every year.[15] Recent estimates indicate that pesticides are responsible for an estimated 200,000 acute poisoning deaths each year.[16] In 1990, the overwhelming number of fatalities, some 99%, occurred in developing countries where health, safety, and environmental regulations were weaker.[17] This figure is unlikely to have changed.

Pesticide-affected communities are largely poor and disadvantaged, exposed to the worst pesticides, and suffer the worst adverse effects. The poor lack influence over policy and decision makers and lack access to justice when harm occurs. There is less ability to act, e.g. to seek treatment for health effects, or switch to safer methods of pest management.

Where there is poverty, there is often malnutrition, which can worsen the effects of pesticides. For example, low levels of protein resulting in low enzyme levels enhance vulnerability to organophosphates and increase the toxicity of pesticides such as diuron, monocrotophos, hexachlorocyclohexane (HCH) and endosulfan.[18] Pesticide poisoning aggravates the cycle of poverty and ill-health and the malnourished become less able to provide food for themselves.[19]

The problems of pest resistance and resurgence intensify heavy reliance on pesticides. Farmers resort to more toxic pesticides, to increased spraying, or to dangerous cocktails, which intensify health impacts. Many fall into debt and poverty to keep up with this increasing chemical use and crop loss. Suicide with these same pesticides often results. Toxic pesticides also cause losses of biodiversity which are the sources of food, health, and livelihoods for many rural communities, as well as providing vital natural pest management services.

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13 Marquez, E.C., & Schafer, K.S. (2016). *Kids on the Frontline: How pesticides are undermining the health of rural children.* Retrieved from http://www.panna.org/sites/default/files/KOF-report-final.pdf

14 Ibid.

15 Jeyaratnam, J. (1990). Acute Pesticide Poisoning: A Major Global Health Problem. *World Health Statistics Quarterly*, 43(3), 139-44.

16 Human Rights Council, *Report of the Special Rapporteur on the right to food (Effects of pesticides on the right to food),* 24 January 2017, A/HRC/34/48, available at https://www.ohchr.org/EN/Issues/Food/Pages/Annual.aspx

17 Ibid.

18 Watts, M. (2013). *Breast Cancer, Pesticides and You*. Penang: PANAP.

19 Ibid.

Farmers and plantation workers, including women and children, are exposed to pesticides while spraying, mixing, loading, decanting, and purchasing or transporting pesticides. Household members are also exposed by washing equipment and clothes used for spraying or mixing pesticides; through contamination of soil and water sources; and through aerial pesticide drift.

Conditions of use of pesticides in developing countries are dangerous. Many farmers use pesticides without any personal protective equipment (PPE) and just cover their mouth and nose with handkerchiefs. Farmers use their hands to mix the pesticides and spray them against the wind. The pesticide containers are stored in their homes, in the bedroom and kitchen, and many people reuse them as pails for water or food storage.

Worse, workers also face inhumane conditions in the plantations. Serious violations of the rights of workers include over-exploitation and prohibition on labour unions and on the right to organise. The use of pesticides by workers on plantations and farms clearly violates the principles of International Labour Organization (ILO) Convention 184,[20] as agricultural workers are rarely provided training on safety and health measures and/or effective and appropriate PPE.

In developing countries, PPE is not available or not affordable, but even if available, it is inappropriate for use in a hot and humid tropical climate. It also does not ensure full protection; farmers and workers may still be exposed. The provision of, and requirement to use, pesticides without proper PPE is a breach of the International Code of Pesticide Management. Studies have shown that hazardous pesticides cannot be applied safely by unprotected workers. Such hazardous conditions are normal in developing countries. Wages of agricultural workers are low to keep down costs of production and to benefit owners, landlords or the plantation industry. Cheaper, older and more hazardous pesticides are used in farms and plantations to reduce the cost of production while there is a failure to provide training or information on the dangers of these pesticides, resulting in the exposure of agricultural workers to HHPs.

In analysing the impacts of pesticide use in seven countries in Asia, it is clear that agrochemical TNCs, as well as local pesticide manufacturers and distributors, have violated human rights such as the right to life and health, the right to a safe and healthy environment, women and children's rights, workers' rights, and various political, economic, social, and cultural rights. However, with the lack of a clear and direct legally binding obligation on corporations to respect these rights, agrochemical TNCs are allowed to manufacture, sell, and promote hazardous pesticides while poisoning entire agricultural communities around the world and releasing toxic pollutants into the global environment with impunity.

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20 ILO Convention 184 adopted in 2001 enshrines the rights of workers in agriculture including ensuring that workers are provided information and consultation on safety heath matters; have safety and health representatives and committees; and have the right to remove themselves from harm of chemicals without being penalised for their actions. Under Article 12 for sound management of chemicals, it calls for everyone involved in chemical life-cycle to comply with national or other recognised safety and health standards; provide adequate and appropriate information to the users in the appropriate official language or languages of the country; and ensure a system for the safe collection, recycling and disposal of chemical waste, obsolete chemicals and empty containers of chemicals so as to avoid their reuse. This convention specifies no persons below 18 years of age should be employed in the agricultural sector as well as the protection of women workers while pregnant, during breastfeeding as well as and their reproductive health.

BOX 1.1 PANAP DEFINITION OF AGROCHEMICAL CORPORATE ACCOUNTABILITY[21]

"Agrochemical (pesticide) and seed companies are responsible for their products and actions. Their liability is for the entire life cycle of their products, covering the full supply chain (including contracts), and socio-economic, physiological, ecological, and political impacts of their products and businesses." This agrochemical corporate accountability framework includes:

- agrochemical corporations' lobbying methods, trade practices and business objectives in getting subsidies, influencing policies, partnering programmes, executing projects, product testing and responding to regulations by governments;
- their investments, subsidiaries, mergers, networking, trade, demergers, production methods, employment procedures, health and safety records, manufacturing practices, tax records, profit sharing, accounting methods and wealth accumulation; and
- research objectives, actual research, testing, certification, adherence to scientific principles, research funding, and research ethics.

Corporate accountability connotes the need for agrochemical companies to have formal duties and legal obligations to the causes and effects of their products, including responsibilities for their hazardous conditions of use. These include criminal liabilities, as well as the duty to compensate and indemnify victims and communities as well as clean up the environment."

In working for a global agreement or framework on corporate accountability, it is imperative that the deeds of agrochemical companies be examined with respect to internationally recognised and respected human rights. These companies have not merely sold hazardous products but have built and aggressively promoted an entire system of agriculture fitted for these products such that its users exercise little or no control over their use, meanwhile deliberately propagating flawed and misleading 'science' to dupe the world into believing their products are safe and to undermine the credibility of UN expert scientists.[22] The jury in the recent court case against Monsanto in California not only awarded severe punitive damages to a groundskeeper who contracted non-Hodgkin's lymphoma from long-term glyphosate exposure, but also labelled the company as having acted with "malice or oppression".[23]

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21 This corporate accountability framework drafted by Narasimha Reddy Donthi of PAN India, was adopted by PANAP and partner organisations representing 15 countries, at the Conference on Corporate Accountability at Phnom Penh, 1-3 September, 2017.

22 Gillam, C., & Donley, N. (2018, August 12). A story behind the Monsanto Cancer Trial — Journal sits on retraction. *Environmental Health News*. Retrieved from https://www.ehn.org/monsanto-science-ghostwriting-2597869694.html

23 Ibid.

Compounding these problems are States that permit a double standard in pesticide exports/imports. No country that has banned a pesticide for environmental or human health reasons should be permitted to export it to another country; and no country should permit the import of pesticides that are banned in their country of origin.

Agrochemical TNCs insist that chemical pesticides and genetic engineering (GE) are required to "feed the world". Instead, this chemical-intensive agriculture, with its packages of seeds (including GE seeds), fertilisers, and pesticides has undermined people's traditional knowledge, skills, and capability, including their problem-solving approaches, in food production. The loss of biodiversity of farms reduced the availability of fish, wild fruits and berries, and other food sources important to rural communities. As a result of these and related changes, two billion people worldwide suffer from deficiencies in micronutrients.[24] This agricultural system also encourages mono-cropping and large-scale commercial farming that displaces many small-scale farmers and indigenous peoples. In the process, these vulnerable sectors become even more food insecure and powerless to determine how to utilise the land and thus undermining their food sovereignty.

These hazardous technologies have become the dominant production strategies because of the power of agrochemical corporations to promote their products and influence governments. This happens despite the existence of sustainable alternatives and agroecology that have successfully demonstrated chemical intensification and GE crops are not necessary for food production, as well as being detrimental to global food security.

In addition, global governance of pesticides is weak and inadequate. There is no overall governance process, but rather, a disjointed patchwork of some aspects of pesticide management in a variety of conventions and agreements, leaving large gaps in overall management. Instead, global governance of pesticides rely on the following voluntary code and conventions:

The International Code of Conduct on Pesticide Management (the Code) by the UN Food and Agriculture Organization (FAO) and World Health Organization (WHO) was first agreed in 1985 and provides a set of recommendations and guidelines on minimising risk of pesticide use. However, it is voluntary and even though there is a mechanism for reporting on non-compliance with the Code, no action to remedy the situation has been taken in recent years. There is also no mechanism to stop any non-compliance and violations of the Code by governments, let alone by corporations.

The Rotterdam Convention on Prior Informed Consent in Trade of Certain Hazardous Chemicals and Pesticides has the requirement for certain information to be shared, and agreement to the import of listed pesticides (34 to date, of which nine are also listed under the Stockholm Convention). This

24 Nordin, K., & Nordin, S. (2017). Food, the source of Nutrition. *World Nutrition*, 8(1), 87-94.

does not provide for mandatory reporting of environmental and human health incidents associated with the pesticides. The Secretariat has the ability to work with stakeholders to find safer alternatives to listed pesticides. But the Convention is unable to address the vast majority of current use pesticides that are polluting the environment, decimating biodiversity, and poisoning people. Additionally, some pesticides that meet the requirements of the Convention are blocked from being listed by a very few countries and by pesticide company influence.

The Stockholm Convention on Persistent Organic Pollutants bans or restricts a small number of mostly obsolete pesticides that are deemed to be POPs. Current use pesticides covered by the Stockholm Convention are DDT, lindane, endosulfan, and sulfluramid. There are a small handful of current use pesticides that may be eligible for listing should they be nominated by a Party; but the Convention can do nothing about the vast majority of current use pesticides.

The Strategic Approach to International Chemicals Management (SAICM) included in its original 2006 texts azardous pesticides, but it was not until 2015 that the International Conference on Chemicals Management (ICCM) finally identified Highly Hazardous Pesticides (HHPs) as an 'issue of concern', after 65 countries and organisations had earlier called for a global phase-out of HHPs.[25] Yet, SAICM has still failed to develop any programmes of management or action, ensuring that it cannot meet its goal of the Sound Management of Chemicals by 2020.

Other conventions, the successful implementation of which are impacted by pesticide use, fail to address that use – e.g. the Convention on Biological Diversity, the Ramsar Convention on Wetlands, and the UN Framework Convention on Climate Change. Instead, global governance of pesticides relies heavily on the non-binding voluntary International Code of Conduct on Pesticide Management, which is powerless to act or implement programmes.

In 2017, the UNSRs on the right to food, Hilal Elver and on Toxics, Baskut Tuncak presented to the UNHRC a clear account "of global pesticide use in agriculture and its impact on human rights; the negative consequences that pesticide practices have had on human health, the environment and society, which are underreported and monitored in the shadow of a prevailing and narrow focus on 'food security'." The report noted that a comprehensive treaty that regulates HHPs does not exist, leaving a critical gap in the human rights protection framework and strongly recommended that "The international community must work on a comprehensive, binding treaty to regulate hazardous pesticides throughout their life cycle, taking into account human rights principles."[26]

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

26 Human Rights Council, *Report of the Special Rapporteur on the right to food (Effects of pesticides on the right to food)*, 24 January 2017, A/HRC/34/48, available at https://www.ohchr.org/EN/Issues/Food/Pages/Annual.aspx

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

In the meantime, because of the lack of corporate accountability for gross human rights violations and responding to the pressure from Civil Society Organisations (CSOs), the UNHRC established an Open-Ended Intergovernmental Working Group (OEIGWG) for the development of a legally binding treaty on transnational corporations (TNCs) and other business enterprises, with respect to human rights. We applaud the efforts of the OEIGWG and hope that the final document of the Treaty will achieve the goal of ensuring that companies are fully accountable for their human rights violations and environmental crimes.

Pesticide use, especially in the Asia Pacific region, is a human rights issue, thoroughly pervading all aspects of life for its users and their communities. It is only through such lens that the responsibilities and accountability of the pesticide industry as well as governments can be seen most clearly.

1.2 OBJECTIVE AND METHODOLOGY

The report synthesises key information collected by PANAP and its partners through ground investigations with a goal of developing immediate solutions to the problem of HHP use in the Asia-Pacific region. Primary source documents reviewed are the reports from Bangladesh, India, Indonesia, Malaysia, Pakistan, Philippines, and Vietnam.

Table 1.1 Primary source documents reviewed for the synthesis report

REPORT TITLES	PREPARED BY	DATE
BANGLADESH		
Community Pesticide Action Monitoring in Satkhira District, Bangladesh	Bangladesh Resource Centre for Indigenous Knowledge (BARCIK)	2017
INDIA		
Conditions of Paraquat Use in India	Pesticide Action Network India (PAN India)	April 2015

REPORT TITLES	PREPARED BY	DATE
INDIA		
Paraquat Dichloride Retailing in India: A Case Study from West Bengal: A Sequel to "Conditions of Paraquat Use in India" 2015	Pesticide Action Network India (PAN India)	April 2017
Pesticide Poisonings in Yavatmal District in Maharashtra: Untold Realities		October 2017
Reality of Pesticide Use in India: A Study on Five Pesticides		November 2017
Study Among Children Working in Floriculture in Thazhavedu and Nemili Villages of Tiruvallur District	Society for Rural Education and Development (SRED)	September 2017
Study on status of pesticide use and 'pesticide effect' by different sections of the farming community in Chittoor District, Andhra Pradesh, India, with reference to pesticide as the key determinant of agroecology, in global compatibility	Sahanivasa	October 2017
INDONESIA		
The Price of Indonesia's Palm Oil: Vulnerable and Exploited Women Workers	Organisasi Penguatan dan Pengembangan Usaha-Usaha Kerakyatan (OPPUK)	2016
Pesticide Impact to Oil Palm Sprayers in North Sumatra, Indonesia	Organisasi Penguatan dan Pengembangan Usaha-Usaha Kerakyatan (OPPUK)	2017
MALAYSIA		
CPAM Report on Pesticides Use and Health Effects in Selangor (Malaysia) Oil Palm Plantations	Tenaganita	2016

REPORT TITLES	PREPARED BY	DATE
MALAYSIA		
Fact-finding mission (FFM) Report undertaken by PACOS in three indigenous communities affected by palm oil production in Sabah	Partners of Community Organisations in Sabah (PACOS Trust)	July 2016
Pesticides Use and Effect at Kampung Sungai Sireh, Malaysia	North South Initiative (NSI) and PANAP	2016
Emerging Pesticides Practice Among the Indigenous Peoples' of Sabah	PACOS Trust	2017
PAKISTAN		
In the Mouth of Death and Disease: A report on the use of pesticides and corporate accountability	Khoj - Society for People's Education	2017
PHILIPPINES		
Community Pesticide Action Monitoring in Mindanao, Philippines	PAN Philippines, PANAP and local partners	2017
VIETNAM		
A CPAM Report by the Hai Hau's Women's Pioneer Group, Women's Union of Hai Hau and CGFED	Research Centre for Gender, Family and Environment in Development (CGFED)	2015 2016
Community Pesticide Action Monitoring in Thai Nquyen and Nam Dinh	Sustainable and Rural Development (SRD)	2017

Data Gathering

Data were gathered through fact-finding missions (FFMs) and Community-based Pesticide Action Monitoring (CPAM). Most often, these were followed with focused-group discussions (FGDs) to clarify information and/or to go deeper into the concerns surfaced during the process.

FFMs were done on a case-by-case basis. Teams were sent to troubled areas to investigate, verify reports, gather and validate information. FFMs were usually followed by the application of more comprehensive data gathering tools and CPAM.

The CPAM survey instrument was translated by the local partners into the local language. For each study site, a team of trained interviewers comprised primarily of local community leaders, local health workers, and the local partners was formed. Purposive sampling was utilised with plantation/floriculture workers and communities near or within the plantations as the target respondents.

FGDs were carried out whenever there was a need to thresh out and clarify information gathered through the CPAM or the FFM.

Photo-documentation was done throughout the process. Secondary data were gathered from concerned agencies and institutions as well as related literature.

BOX 1.2 WHAT IS CPAM?

CPAM is a participatory process developed by PANAP and its partners, by which community leaders and volunteers are trained to document the conditions of pesticide use, impacts, sales, distribution and advertisement. It builds awareness on the health and environmental hazards of chemical pesticides, organises communities and encourages action. Through it, people are empowered to analyse and address their problems, and get actively involved in societal transformation through policy advocacy and collective action.

CPAM makes use of a pre-designed survey instrument, covering various concerns on pesticides. The instrument's flexibility is such that the community makes use and adapts the various survey components according to their local situations and concerns. Questions and interviews are done in the local dialect. The CPAM team also do direct observations and focused-group discussions to further look into the surfaced concerns. Recently, PANAP developed the CPAM mobile application, an app that gathers data on pesticide use, practice, poisoning, and the impacts on health and pesticides and children. The data gathered will be available in real time.

Data Analysis

The quantitative data were statistically analysed to determine trends. Qualitative data in the form of testimonies were lifted *verbatim* to give a better picture of the respondents' condition in the study sites.

The degree of hazards posed by the reported pesticides were assessed using the PAN International HHP List (2018)[27] and Consolidated List of Bans (2017)[28].

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27 PAN International. (2018, March). *PAN International List of Highly Hazardous Pesticides*. http://www.pan-germany.org/download/PAN_HHP_List_161212_F.pdf

28 PAN International. (2017). *PAN International Consolidated List of Banned Pesticides*. http://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

BOX 1.3 PAN INTERNATIONAL HHP LIST

This database is based on the HHPs identified by Pesticide Action Network International, which includes internationally recognised toxicity classifications.

A pesticide is considered to be highly hazardous by PAN International if it has one of the following characteristics: (1) high acute toxicity (including inhalative toxicity); and/or (2) long-term toxic effects at chronic exposure (carcinogenicity, mutagenicity, reproductive toxicity, endocrine disruption); and/or (3) high environmental concern either through ubiquitous exposure, bioaccumulation or toxicity; and/or (4) known to cause a high incidence of severe or irreversible adverse effects on human health or the environment.

Corporate accountability of the companies was evaluated by using the following Human Rights Instruments and frameworks:

1. **The Universal Declaration of Human Rights (UDHR)** clearly states that *"every individual and every organ of society"* shall strive to promote respect for the rights and freedoms set out therein. The Declaration imposes a duty on all, including corporations, to meet its obligations. The UDHR recognises the rights to just and favourable working conditions (Article 23), a standard of living favourable to health and well-being (Article 25) and imposes a duty on all, including corporations to meet its obligations.

2. The **International Covenant on Economic, Social and Cultural Rights 1966 (ICESCR)** includes the rights to safe and healthy working conditions, protects children from hazardous working conditions and exploitation, and requires steps to improve health and living conditions.[29] The ICESCR Articles 6 and 7 specifically recognises the right to fair wages and safe and healthy working conditions.

3. The **Constitution of the WHO** calls for "the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being".

4. The **International Labour Organization (ILO) Convention 184** gives workers the right to:
   a. be informed and consulted on the application and review of safety and health matters
   b. participate in safety and health measures
   c. select health and safety representatives and representatives on joint worker-management health and safety committees, remove themselves from danger where there is a serious and imminent risk, and not be penalised for these actions

29 Dinham, B., & Malik, S. (2003). Pesticides and Human Rights. *International Journal of Occupational and Environmental Health,* 9(1), 40-52.

5. The **ILO Convention 155** covers occupational health and safety of workers and calls for States to formulate, implement and periodically review a coherent national policy on occupational safety, occupational health and the working environment.

6. The **Convention on the Elimination of all Forms of Discrimination against Women (CEDAW)** provides the underpinning for women's equality in political and public life, the right to equal access to education, and the right to health and employment including the right to equal wages and free choice of profession and employment.

7. The **Convention on the Rights of the Child (CRC)** Articles 6 and 24 state that "every child has the inherent right to life," that the survival and development of the child must be ensured to the "maximum extent possible," and that "the right of the child to the enjoyment of the highest attainable standard of health" must be safeguarded and upheld.[30]

Adherence to the following globally-endorsed guiding principles and instruments were also assessed:

1. Guiding Principles on Business and Human Rights. The Special Representative of the Secretary-General further emphasised this duty of TNCs and other business enterprises in 2008[31] in a policy framework that comprises three core principles:
   a. the State duty to protect against human rights abuses by third parties, including business;
   b. the corporate responsibility to respect human rights;
   c. And the need for more effective access to remedies.

   Furthermore, the *"corporate responsibility to respect human rights … exists independently of States' human rights duties"* and includes the responsibility to protect and provide remedy.[32] These obligations require corporations to: prevent human rights violations; positively and proactively work towards avoiding practices and processes that constitute violations; and take immediate action to address problems arising from violations.

2. **Precautionary principle:** The Principle achieved global consensus at the 1992 UNCED, where governments established 27 principles to guide environmental and development policies. Principle

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30 *Convention on the Rights of the Child,* 20 November 1989 (entered into force 2 September 1990) [CRC]. Retrieved from https://www.ohchr.org/Documents/ProfessionalInterest/crc.pdf

31 Human Rights Council, *Implementation of General Assembly Resolution 60/2516 entitles "Human Rights Council""Business and Human Rights: Mapping International Standards of Responsibility and Accountability for Corporate Acts" Report of the Special Representative of the Secretary-General (SRSG) on the issue of human rights and transnational corporations and other business enterprises,* 9 February 2007, A/HRC/4/035, available at https://www.business-humanrights.org/sites/default/files/media/bhr/files/SRSG-report-Human-Rights-Council-19-Feb-2007.pdf

32 Human Rights Council, *Report of the Special Representative of the Secretary General on the issue of human rights and transnational corporations and other business enterprises,* John Ruggie. *Business and Human Rights: Further steps toward the operationalisation of the "protect, respect and remedy" framework,* 9 April 2010, A/HRC/14/27, available at https://www2.ohchr.org/english/issues/trans_corporations/docs/A-HRC-14-27.pdf

15 of the Rio Declaration on Environment and Development recognised that data submitted for regulation can lack scientific certainty and directed that: in order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

3. The **International Code of Conduct on Pesticide Management (the Code)**[33] adopted by the FAO's and WHO's governing bodies. It provides a framework that guides government regulators, the private sector, civil society and other stakeholders on best practice in managing pesticides throughout their lifecycle. It is a voluntary code that covers every aspect of pesticide management from production to disposal.

Using these tools to analyse the situation and in the context of chemicals management, PANAP is in the opinion that States and corporations have the obligation to ensure that chemicals are used in such a manner that they are not a threat to human health and the environment. Moreover, the realisation of the right to health requires proactive action to eliminate risks to health (and health risks from their presence in the environment) posed by chemicals and pesticides in their production, use, release and incorporation into products. This realisation requires the elimination of pesticides that are known to cause cancer and other chronic, irreversible effects and the distribution of information about these to the general public. This is further emphasised in the Code, which states that corporations have the responsibility to ensure pesticides are handled safely during their lifecycle[34] and disposed of in such a way that they do not constitute a threat to human health or communities living in their proximity.

Participating Organisations

The following organisations participated in this research:

- **Bangladesh:** Bangladesh Resource Centre for Indigenous Knowledge (BARCIK)
- **India:** Pesticide Action Network India (PAN India), Andhra Pradesh Vyvasaya Vruthidarula Union (APVVU), Sahanivasa, and Society for Rural Education and Development (SRED)
- **Indonesia:** Organisasi Penguatan dan Pengembangan Usaha-Usaha Kerakyatan (OPPUK)
- **Malaysia:** North South Initiative (NSI), Women's Force (Tenaganita), and Partners of Community Organisations in Sabah (PACOS Trust)

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33 FAO & WHO. (2014). *International Code of Conduct on Pesticide Management.* Retrieved from http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf. The Code, originally a FAO document, is now a joint initiative of FAO and WHO.

34 The life cycle covers a product from 'cradle-to-grave' including research and development; raw materials; manufacture, transport and distribution; use, re-use and maintenance; to final disposal. The approach is a tool for systematic analyses to estimate the environmental consequences of products and processes to establish the true cost and identify alternatives.

- **Pakistan:** Khoj-Society for People's Education
- **Philippines:** Kilusang Magbubukid ng Pilipinas (KMP) and Pesticide Action Network Philippines (PAN Philippines), and its partner organisations such as Kilusang Mayo Uno (KMU)-Caraga, Citizens Alliance Unified for Sectoral Empowerment Davao del Sur (CAUSE-DS), Sitio Buloy Indigenous People's Organization Davao Del Sur, BAYAN (Bagong Alyansang Makabayan)-SOCKSARGEN, Community Primary Health Care (CPHC)-SOCKSARGEN, KALUMBAY (Indigenous People's Organization, Northern Mindanao), and SENTRA (Sentro para sa Tunay na Repormang Agraryo)
- **Vietnam:** Research Centre for Gender, Family and Environment in Development (CGFED) and Centre for Sustainable Rural Development (SRD)

1.3 COUNTRY SITUATIONS AND OBJECTIVES

Bangladesh

Pesticides use increased by 328% from 1997 to 2008. A 2013 study by the Bangladesh Rice Research Institute (BRRI) revealed that harmful levels of pesticides could be found in vegetables and fruits indicating the continuous use of pesticides including the HHPs malathion, chlorpyrifos, and parathion-methyl. The CPAM conducted by BARCIK from April to May 2017 looked into the conditions of pesticides use, and the impacts of this on the health of the farmers and residents of five rice and vegetable-growing communities in Satkhira District.

India

The use of chemical pesticides increased from 55,540 tonnes in 2010-11 to 57,353 tonnes in 2014-15. In 2013-2014, pesticide use was 60,382 tonnes[35], a slightly higher number compared to 2014-2015. Over this time period, the imports of pesticides also increased from 53,996 tonnes to 77,376 tonnes.[36]

India is the world's second largest producer of flowers[37], and floriculture has expanded in several states with Tamil Nadu being first with its 25% share in production.[38] Children are employed as harvesters and usually work alongside their parents/relatives.

PAN India carried out investigations to determine the (i) conditions of paraquat use in Andhra Pradesh, Arunachal Pradesh, Assam, Madhya Pradesh, Telangana and West Bengal; (ii) paraquat's methods/

35 Consumption of Chemical Pesticides in Various States/UTs During 2010-11 to 2016-17. Directorate of Plant Protection Quarantine & Storage, Department of Agriculture, Cooperation and Farmers Welfare. Retrieved from http://ppqs.gov.in/divisions/pesticides-monitoring-documentation

36 Deshpande, T. (2017). *State of Agriculture in India*. Retrieved from http://www.prsindia.org/uploads/media/Analytical%20Report/State%20of%20Agriculture%20in%20India.pdf

37 Vashishtha, A. (2014, August 25). India is second largest flower producer after China. *India Today*. Retrieved from https://www.indiatoday.in/india/north/story/india-china-flower-producer-largest-in-world-205536-2014-08-25

38 Directorate of Horticulture and Plantation Crops Agriculture Department, Government of Tamilnadu. (2010). Flowers. Retrieved from http://tnhorticulture.tn.gov.in/horti/flowers

practices of sale and usage in West Bengal; (iii) the state of use and regulation of the herbicides atrazine, glyphosate and paraquat, and the insecticides chlorpyrifos and fipronil in Himachal Pradesh, Jharkhand, Karnataka, Tamil Nadu, Telangana and West Bengal; and (iv) root cause of the pesticide poisonings in Maharashtra's Yavatmal District.[39,40,41]

Sahanivasa looked into pesticide use, impacts, and conditions of sale in Chitoor District of Andhra Pradesh. It focused on small-landholder farmers, workers and daily wage earners in the mango orchards.

SRED investigated the conditions of children flower harvesters, their exposure to pesticides, and the ensuing health effects.

Indonesia

Oil palm plantations cover 11.9 million hectares[42] and are the country's major source of income, with 10.4 million employees, 70% of which are casual labourers.[43] The industry continues to expand especially with the Master Plan for Acceleration and Expansion of Indonesia's Economic Development that allocates an additional 29 million hectares for oil palm.[44]

As pesticides are used in the management of oil palms, OPPUK looked into the conditions of pesticide use and its impacts on workers, with a focus on women.[45]

Malaysia

The country accounts for 39% of world palm oil production and 44% of world exports,[46] with the palm oil industry employing an estimated 3.5 million workers.[47] The massive expansion of oil palm

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39 Kumar, D. (2015). *Conditions of Paraquat Use in India*. Retrieved from http://panap.net/2015/04/conditions-of-paraquat-use-in-india/

40 Kumar, D. (2017). *Paraquat Dichloride Retailing in India: A Case Study from West Bengal*. Retrieved from http://docplayer.net/49298071-Paraquat-dichloride-retailing-in-india-a-case-study-from-west-bengal.html

41 Kumar, D., & Reddy, D.N. (2017). *Pesticide Poisonings in Yavatmal District in Maharashtra: Untold Realities*. Retrieved from http://www.pan-india.org/wp-content/uploads/2017/10/Yavatmal-Report_PAN-India_Oct-2017_web.pdf

42 Der Schaar Investmenst B.V. (2017, June 26). *Palm Oil, Indonesian Investments*. Retrieved from https://www.indonesia-investments.com/business/commodities/palm-oil/item166?

43 Sawit Watch. (2015). *Menaker: Buruh perkebunan Sawit harus dilindungi.* Retrieved from http://sawitwatch.or.id/2015/08/menaker-buruh-perkebunan-sawit-harus-dilindungi/

44 Coordinating Ministry for Economic Affairs, Republic of Indonesia. (2011). *Master Plan: Acceleration and Expansion of Indonesia Economic Development 2011-2025*. Retrieved from https://www.dezshira.com/library/treaties/master-plan-acceleration-and-expansion-of-indonesia-economic-development-2011-2025-2764.html

45 PANAP. (2017). *The Price of Indonesia's Palm Oil: Vulnerable and Exploited Women Workers*. Retrieved from http://panap.net/2017/04/price-indonesias-palm-oil-vulnerable-exploited-women-workers/

46 Malaysian Palm Oil Council. (n.d.). *Malaysian Palm Oil Industry.* Retrieved from http://www.mpoc.org.my/Malaysian_Palm_Oil_Industry.aspx

47 Villadiego L. (2015, November 9). Palm oil: Why do we care more about orangutans than migrant workers? *The Guardian.* Retrieved from https://www.theguardian.com/sustainable-business/2015/nov/09/palm-oil-migrant-workers-orangutans-malaysia-labour-rights-exploitation-environmental-impacts

plantations, however, intensified the use of agrochemicals and exposes workers and communities to hazardous pesticides.

Tenaganita and PANAP found that most women oil palm sprayers in the states of Selangor, Kedah, Perak, and Penang were unaware of the hazards of pesticides, had no training on safe handling, and were suffering from pesticide poisoning. Both groups did interventions on behalf of the workers since the release of their findings in 1992 and 2002.[48,49] To find out if there is a change in the condition of workers, CPAM was conducted in three oil palm plantations in the Selangor State in 2015.

Oil palm expansion has reached Sabah and it is now considered a top palm oil-producing state. Most affected are the indigenous peoples, most of whom are employed by the plantations. To find out how the use of pesticides in oil palm plantations is affecting them, PACOS Trust carried out investigations in three different indigenous communities living within the vicinity of the plantations.

Pesticides are also used on food crops. To find out the extent of pesticide use and impacts among rice farmers and sprayers, NSI and PANAP conducted a CPAM at Kampung Sungai Sireh in Tanjung Karang (district Kuala Selangor, Selangor State).

Pakistan

Pakistan was among the top 10 countries in China's pesticide export market in 2016.[50] It is estimated that consumption of pesticides in the country was around 67.8 thousand metric tonnes in 2016.[51]

In August 2017, Khoj-Society for People's Education conducted a CPAM in 13 villages and one town located in the rice and wheat district of Sheikhupura, Punjab province to investigate the conditions of pesticides use and the impacts on the farmers.

Philippines

Cash crop production is concentrated in Mindanao. Twelve percent of the island's agricultural land are banana and oil palm plantations, which are under the control of various corporations.[52] These cash crops are produced with the use of pesticides, most of which are highly hazardous.

PANAP FFMs revealed that bananas were aerially sprayed two to three times a month. With the drift sweeping through the adjacent villages, communities suffered pesticide-related illnesses and could

48 Arumugam, V. (1992). *Victims without voice: A study of women pesticide workers in Malaysia*. Penang: Tenaganita & PANAP.

49 Tenaganita & PANAP. (2002). *Poisoned and Silenced: A Study of Pesticide Poisoning in the Plantations.* Penang: Tenaganita & PANAP.

50 AgroPages. (2017, March 7). Briefing on Export of Pesticides from China in 2016. Retrieved from http://news.agropages.com/News/NewsDetail---21285.htm

51 Mordor Intelligence. (2017). *Pakistan Crop Protection Chemicals Market - Growth, Trends and Forecasts (2017 – 2022).* Retrieved from https://www.mordorintelligence.com/industry-reports/pakistan-crop-protection-chemicals-market

52 Philippine Statistics Authority. (2015). *Selected statistics on agriculture.* Retrieved from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202015.pdf

hardly grow food crops and livestock.[53,54,55] Oil palm companies prohibited intercropping and planting of food crops. With oil palm expansion, hunting grounds disappeared and the water sources became heavily polluted especially affecting the indigenous people.[56]

Massive community actions and appeals to the corporations and government remain unheeded and the legislative proposals (House Bills) filed to stop aerial spraying and the use of HHPs were not passed by the Legislative Body.

PANAP and its local partners thus undertook several rounds of investigations in 2015 and 2016 to find out the current condition of the plantation workers and communities in four provinces of Mindanao – Davao del Sur, South Cotabato, Agusan del Sur, and Bukidnon.[57]

Vietnam

Pesticide use has increased significantly over the past decades. The Ministry of Industry and Trade estimates that about 30% to 35% of the pesticides currently used are imported illegally, many of which are banned for their high toxicity.[58]

In 2017, the State government banned paraquat, 2, 4-D and certain formulations of glyphosate. Still, high levels of pesticide residues have been found, particularly in vegetables. This affected a total of 7,647 people in 2002, causing 277 deaths in 37 provinces.[59] Aside from acute poisoning due to direct and indirect exposure to pesticides, chronic pesticide poisoning is estimated to have affected two million Vietnamese farmers.[60]

To capture ground realities pertaining to the use of pesticides, PANAP with its local partners conducted CPAM. SRD undertook the study in two villages of Thai Nguyen province in December 2016, while CGFED led the investigation in Hai Hau District of Nam Dinh province in 2015 and 2016.

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53 Quijano, I. (2002). *Kamukhaan: Report on a poisoned village.* Retrieved from http://panap.net/2002/12/kamukhaan-report-poisoned-village-philippines/

54 Quijano, I., & Quijano, R. (2006). *Kamukhaan Revisited: Heavens Antidote to Pesticide Poisoning.* Retrieved from http://panap.net/2006/03/kamukhaan-revisited-heavens-antidote-pesticide-poisoning/

55 PAN Philippines. (n.d.). *Kamukhaan: A Case Study.* Retrieved from http://www.panphils.org/community-based-pesticide-action-monitoring/kamukhaan-a-case-study/

56 Villanueva, J. (2011). Oil palm expansion in the Philippines: Analysis of land rights, environment and food security issues. In Colchester, M. And Chao, S. (Eds.), *Oil Palm Expansion in South East Asia: Trends and implications for local communities and indigenous peoples*. Retrieved from http://www.forestpeoples.org/sites/fpp/files/publication/2011/11/chapter-4-oil-palm-expansion-philippines.pdf

57 PANAP. (2017). *Community Pesticide Action Monitoring in Mindanao, Philippines.* Retrieved from http://panap.net/2017/01/community-pesticide-action-monitoring-mindanao-philippines/

58 Lan, V. (2008, October 13). 30-35% of pesticides are illegally imported. *Saigon Online.* Retrieved from http://www.sggp.org.vn/30-35-luong-thuoc-bao-ve-thuc-vat-nhap-khau-trai-phep-270818.html

59 Xuyen, N.T. (2003). Who will protect green vegetables? *TriThucTre Newspaper,* 101:14–16.

60 Oanh, N.K. (2005, April). *Information on chemical safety and environmental protection: a testing model applicable for safely pesticide management*. Paper presented at the Vietnam National Conference on Environmental Protection, Hanoi, Vietnam.

CHAPTER 2

Consolidated Results and Analysis

2.1 OVERVIEW OF THE DATA

This section presents the data culled from the ground investigation reports of PANAP and its local partners.[61] The focus of the research is on the pesticides reported by farmers and agricultural workers, the conditions of their use, and the signs and symptoms of poisoning, including for women and children, that occurred when using or being exposed to pesticides.

Data were obtained using a standard questionnaire. However, data sets collected varied because of the different situations in the study sites. Thus, the number of responses changed depending on the question and on the local partners' degree of data disaggregation.

Missing data could not be avoided in cases where respondents could not identify the pesticides they were using because the labels had been removed; the retailers sold pesticides in unlabeled plastic bags; or the plantation/management provided workers pesticides without the labels.

Whenever possible, the investigating teams cross-checked the information with individual farmers, and/or the available pesticide containers and packaging.

2.2 RESULTS

Demographic Profile of the Study Participants

The ground investigations were conducted in seven Asian countries: Bangladesh, India, Indonesia, Malaysia, Pakistan, Philippines, and Vietnam. A total of 2,025 respondents participated in the study (Table 2.1), most of whom were aged 30 to 59 years old (Figure 2.1). More than half (61%) attained elementary or high school education (Figure 2.2). Bangladesh, India, and Pakistan had the most number of respondents with no formal education (Annex 2.1 Consolidated Data).

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61 See Table 1.1

Respondents were in general, small-scale farmers or farm workers for large-scale plantations who were into the production of oil palms, grains, fruits, vegetables, and flowers (Figure 2.3). Farm workers were mostly on a contractual or casual basis, earning below the national minimum wage set for each country.

Table 2.1 Distribution of respondents per country

COUNTRIES	NUMBER OF RESPONDENTS[62]	MALES	FEMALES	UNSPECIFIED GENDER
BANGLADESH (BG)	599	559	40	0
INDIA (IN)	624	110	155	359
INDONESIA (ID)	71	24	47	0
MALAYSIA (MY)	64	35	29	0
PAKISTAN (PAK)	76	51	25	0
PHILIPPINES (PHL)	57	35	22	0
VIETNAM (VNM)	534	221	313	0
TOTAL	2025	1035	632	359
%		51.11	31.16	17.73

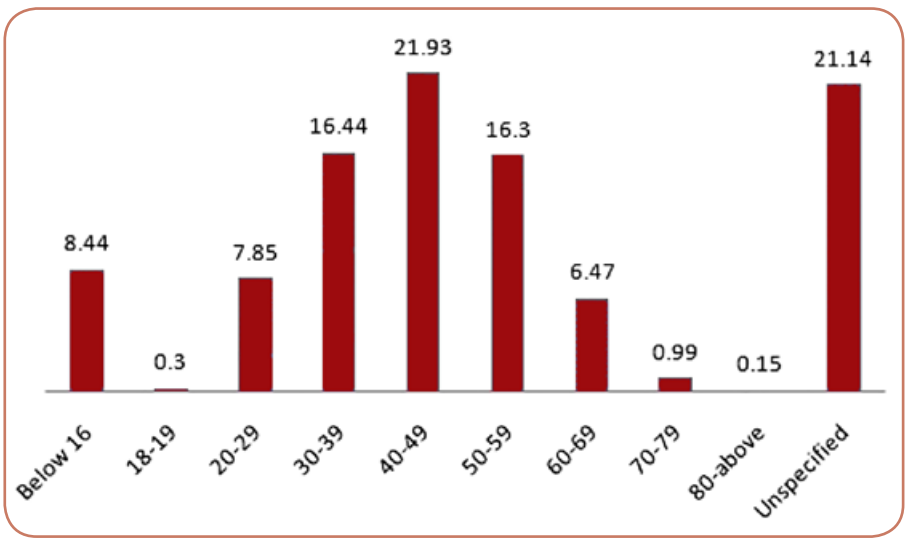

Figure 2.1 Age group of respondents (%)

62 Designated as N in succeeding tables.

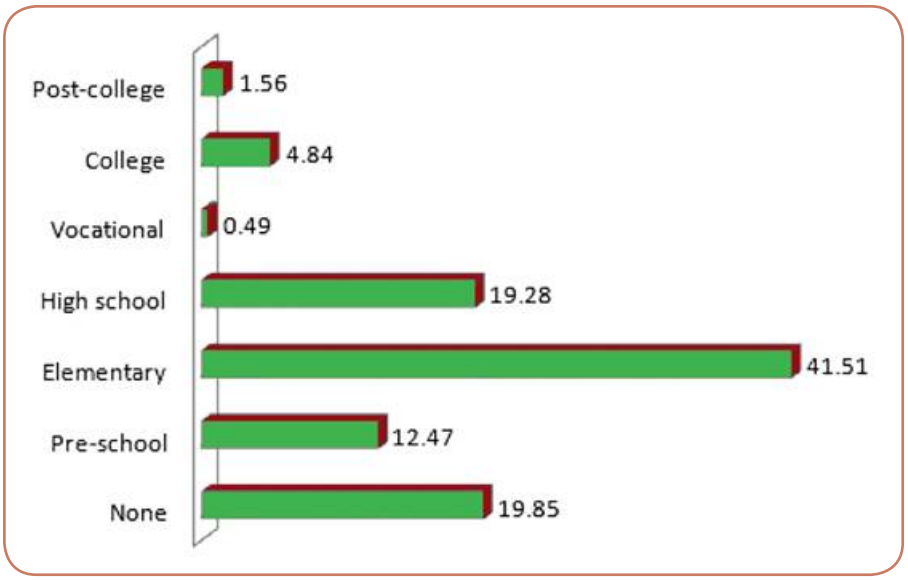

Figure 2.2 Respondents' education level (%)[63]

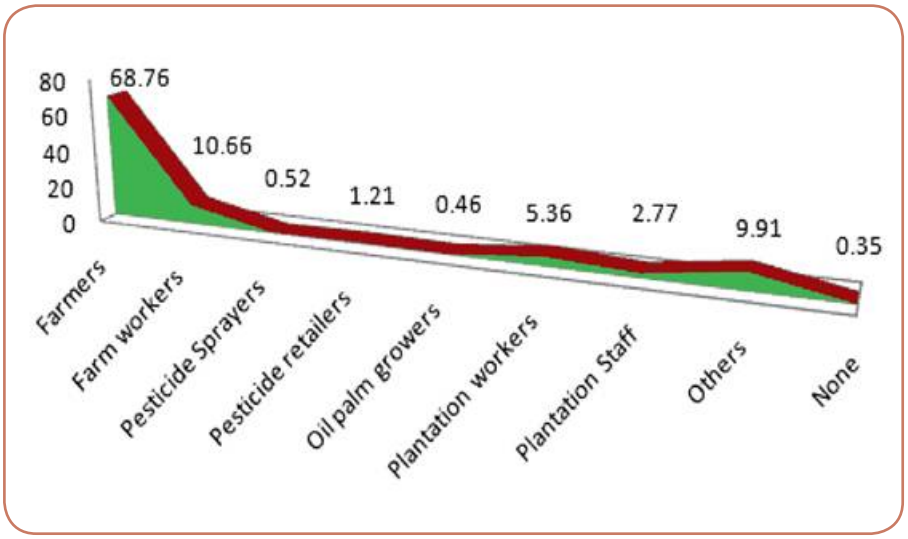

Figure 2.3 Respondents' occupation (%)

63 The data set from Indonesia did not include the educational profile of respondents..

Reported Use of Highly Hazardous Pesticides

The studies revealed that 50 HHPs[64] were in use in the seven countries (Annexes 2.3 and 2.4). India had 29 HHPs, 10 of which are extremely hazardous to children (Table 2.2) and are included in the T20 or Terrible Twenty list (Annex 2.2).

Table 2.2 Number of pesticides in use[65]

	BG	IN	ID	MY	PAK	PHL	VNM
Total number of pesticides	32	53	6	27	17	19	39
Number of HHPs	20	27	5	13	6	11	19
Number of T20	6	10	3	5	1	4	5
% HHPs	62.50	50.94	83.33	48.15	35.39	57.89	48.72

Lambda-cyhalothrin was found in six countries; glyphosate, paraquat, and cypermethrin were found in five countries; and chlorpyrifos in four countries (Table 2.3). Used in two countries were abamectin, acephate, chlorfluazuron, deltamethrin, dimethoate, emamectin benzoate, glufosinate-ammonium, mancozeb, and validamycin.

Table 2.3 Commonly-used HHPs and their manufacturers

HHPS/MANUFACTURERS	BG	IN	ID	MY	PAK	PHL	VNM	NUMBER OF COUNTRIES
Butachlor (Monsanto)				X	X[66]		X	3
Carbofuran (Bayer)	X			X		X		3
Chlorantraniliprole (DuPont, Syngenta)	X	X	X	X	X		X	5
Chlorothanolil (Syngenta)		X	X			X		3
Chlorpyrifos (Dow AgroSciences)	X	X				X	X	4

64 The PAN International List of Highly Hazardous Pesticides (HHPs) is based on the following criteria: high acute toxicity (e.g. fatal if inhaled), long term toxic effects (e.g. carcinogenic), endocrine disruptor, high environmental concern (persistent, bioaccumulative, and toxic to aquatic life), hazard to ecosystems (e.g. toxic to bees), and known to cause a high incidence of severe or irreversible adverse effects.

65 Based on the active ingredients. Pesticide brand names with unknown formulations were not included.

66 In Pakistan, butachlor is manufactured by Malaysian company Hextar Chemicals and Chinese companies Jiangsu Lulilai, Nantong Jiangshan Agrochemical and Chemmical Ltd., and Shandong Qiaochang Chemical Co. Ltd.

HHPS/MANUFACTURERS	BG	IN	ID	MY	PAK	PHL	VNM	NUMBER OF COUNTRIES
Cypermethrin (Syngenta)	X	X		X		X	X	5
Fenitrothion (Sumitomo)	X			X			X	3
Fipronil (BASF)	X	X		X			X	4
Glyphosate (Monsanto)		X	X	X		X	X	5
Imidacloprid (Bayer)		X			X		X	3
Lambda-cyhalothrin (Dow AgroSciences, Syngenta)	X	X		X	X[67]	X	X	6
Malathion[68]	X			X		X		3
Paraquat (Syngenta)		X	X	X		X	X	5
Thiamethoxam (Syngenta)	X	X			X		X	4

Several Chinese pesticide companies have made their presence increasingly felt in the region, and particularly so in Pakistan, where the industry has been taken over by Chinese manufacturers. Imidacloprid, the largest volume of pesticide that Pakistan imported in 2016, was from China.

Pesticide use and exposure

Almost all of the respondents (98%) used pesticides at home or at work (Figure 2.4). Majority of the respondents were most exposed to pesticides via applying and/or spraying pesticide, and through washing containers and/or personal protective equipment (PPE, Table 2.4).

A number of respondents also said that there were times when they were accidentally sprayed on with pesticides while passing by field premises.

67 In Pakistan, Lambda-cyhalothrin is manufactured by Malaysian company Hextar Chemicals and Indian company Modern Insecticides Limited.

68 American Cyanamid Co. was the first manufacturer of Malathion. Now there are at least 14 primary producers worldwide (source: http://nospray.org/malathion-fact-sheet/).

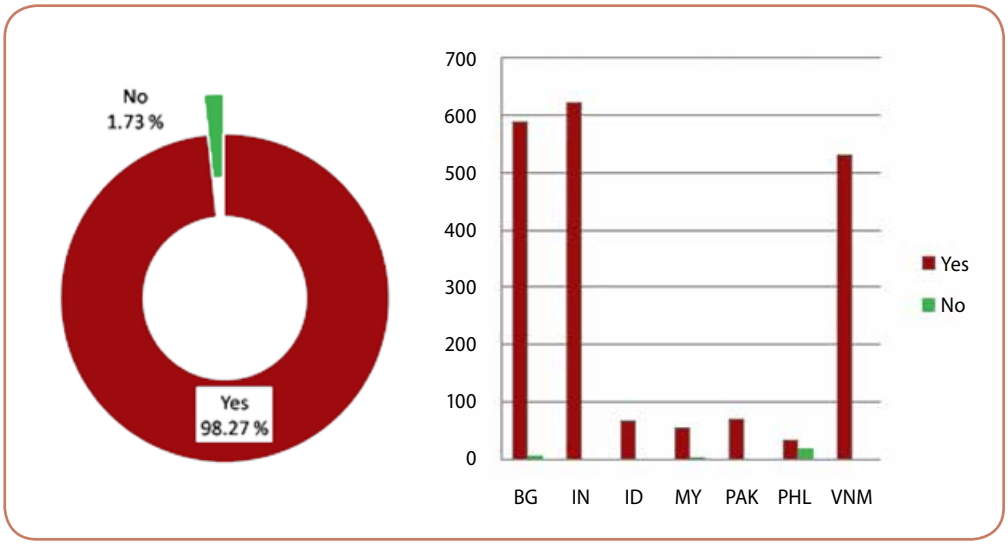

Figure 2.4 Use of pesticides at home and/or at work

Table 2.4 Activity with pesticides (N=1518)

	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
Applying/spraying	283	33	57	39	31	26	254	723	47.63
Mixing/decanting/ loading	3	31	0	0	37	36	64	171	11.26
Injecting	0	0	0	0	0	1	0	1	0.07
Bagging sprayed products	0	0	11	0	0	2	0	13	0.86
Washing	2	0	0	18	48	0	167	235	15.48
Purchasing/ transporting	3	0	1	4	17	0	22	47	3.1
Combination	238	0	0	0	0	0	0	238	15.68
Others	0	36	15	6	0	6	27	90	5.93

Respondents (92%) entered the field within the first three days of spraying (Figure 2.5). There were those who could not wait due to pending or urgent work, like harvesting or fertiliser application. This was especially the case in the Philippines where 88% said that they immediately entered a newly sprayed field.

Considering that HHPs were commonly used, this trend in the study areas is extremely alarming as studies revealed that pesticides usually remain active for 2-3 days. Most participants from Indonesia, Malaysia, Pakistan, and Philippines had been handling pesticides from 1-5 years, while those from Bangladesh, India, and Vietnam for a longer period of 6-20 years (Table 2.5).

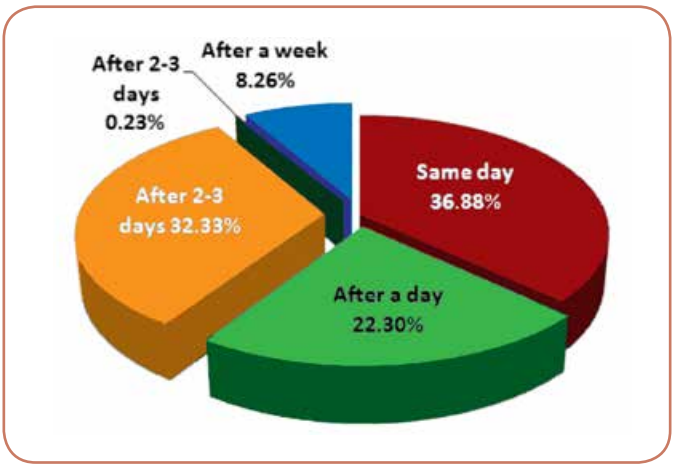

Figure 2.5 Entry to a newly sprayed field (N=1296)[69]

Table 2.5 Duration of exposure to pesticides

YEARS	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
1 to 5	108	32	21	10	11	12	2	196	20.18
6 to 10	225	17	21	5	6	5	5	284	29.25
11 to 15	69	5	7	1	9	3	36	130	13.39
16 to 20	99	80	3	3	7	5	13	210	21.62
21 to 25	43	0	0	0	7	0	12	62	6.38
26 to 30	35	0	1	0	4	1	11	52	5.36
31 to 35	11	0	0	3	0	0	11	25	2.58
36 to 40	2	0	0	0	0	0	10	12	1.24
N	592	134	53	22	44	26	100	971	

69 The Philippine data addressed respondents' entry to a newly sprayed field in general as Yes = 38, No=4, Not sure=1; this item was not addressed in Indonesia.

Almost all (96%) used backpack sprayers (Figure 2.6). Around 1% used squirt/hand sprayers. A major complaint was faulty sprayers that leak and result to the direct contact with the pesticides and consequent skin/eye burns and poisoning. Financial constraints hindered respondents from repairing their sprayers or buying new ones.

The study participants applied pesticides (Figure 2.7) once a week (42%) or once a month (23%). There were those who applied it daily (20%), which is the common practice in India, Indonesia, Malaysia, and the Philippines. Pesticide application depended on planting cycles or seasons.

In Pakistan, pesticides were applied only after the pest attacks or as a precautionary measure.

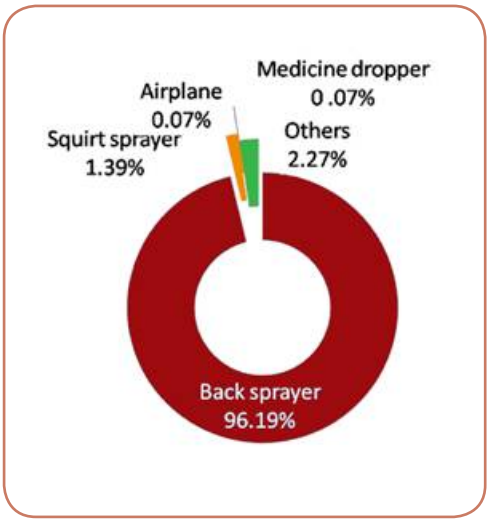

Figure 2.6 Pesticide applicators utilised by respondents

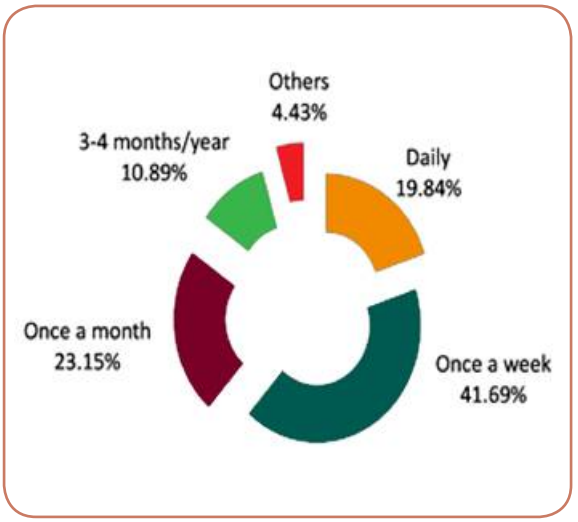

Figure 2.7 Frequency of pesticide use

Conditions of use

Pesticide exposures can be reduced by the use of PPE, as well as proper mixing and application practices. The Food and Agriculture Organization (FAO), WHO, and the Code recommend users to wear PPE, defined as "any clothes, materials or devices that provide protection from pesticide exposure during handling or application... it includes both specifically designed protective equipment and clothing reserved for pesticide application and handling".

For manual spraying, the most essential items are boots or covered shoes, a long-sleeved upper garment and garment that cover the legs, and a hat (if spraying high crops). Gloves and eye protection must be worn when pouring, mixing or loading pesticides.

In five out of seven countries (Bangladesh, India, Indonesia, Malaysia, and Pakistan), majority reported that they did not use PPE when handling pesticides at work or at home (Figure 2.8). Among the reasons cited were the cost, lack of awareness on the importance of PPEs, and lack of training on their proper usage. In India, wraparound attire for men in farming such as *dhoti* or *lungi,* or sari for women, were substituted for standard PPE items. A common complaint among respondents was that PPE were uncomfortable to wear due to hot and humid climate.

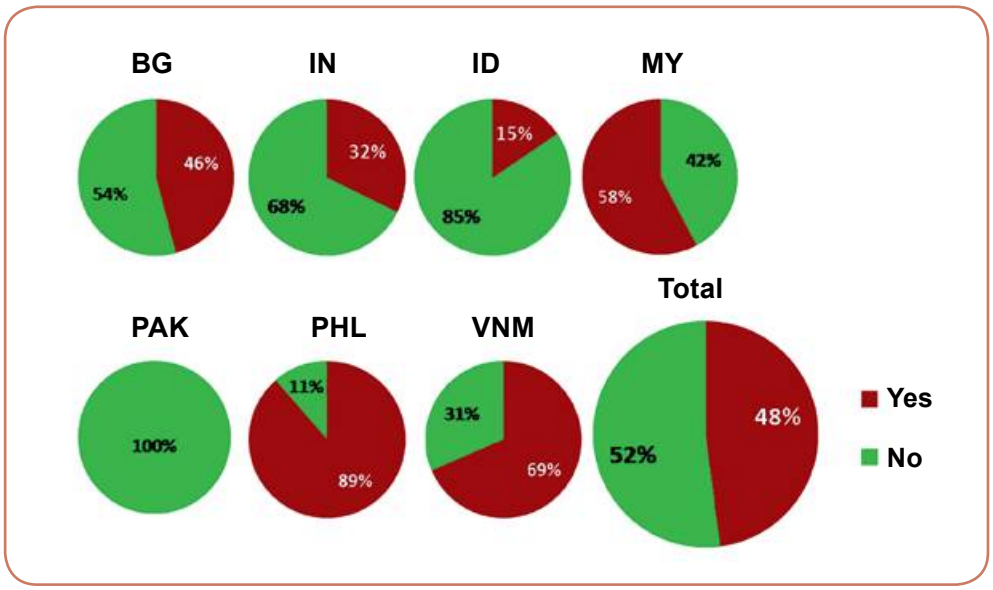

Figure 2.8 Use of personal protective equipment (PPE)

Focused group discussions (FGDs) revealed that none of the farmers used the standard or recommended protective clothing. There were those who said they were using PPE, but were only using a scarf or a handkerchief to cover their nose and mouth, or long pants and long-sleeved shirts.

Some respondents were issued PPE items by their employers, while a number had to buy their own. Women workers in Indonesia spent USD 11-48 for PPE. This is extremely appalling considering that casual farm workers in Indonesia were paid USD 6 per day and were not given health insurance and pension.

Company-issued PPE were not durable enough to last a year. Workers bought replacements with their own money. With wages below the minimum that barely cover their daily expenses, several participants improvised, such the use of bra cups as substitute for masks in the Philippines.

Washing facilities

Washing facilities were not generally provided in the workplace. If available, these facilities were far from the work areas. This was the reason why many (Figure 2.9) relied on natural water systems (i.e. brooks and creeks), wells and irrigation canals for washing their soiled bodies, work clothes, and equipment. In worst cases, workers washed near drinking water sources, never washed, or waited to do their washing at home. Such practices contaminate the environment, aggravate the workers' exposure to pesticides, increase take home exposures, which further put their communities at risk.

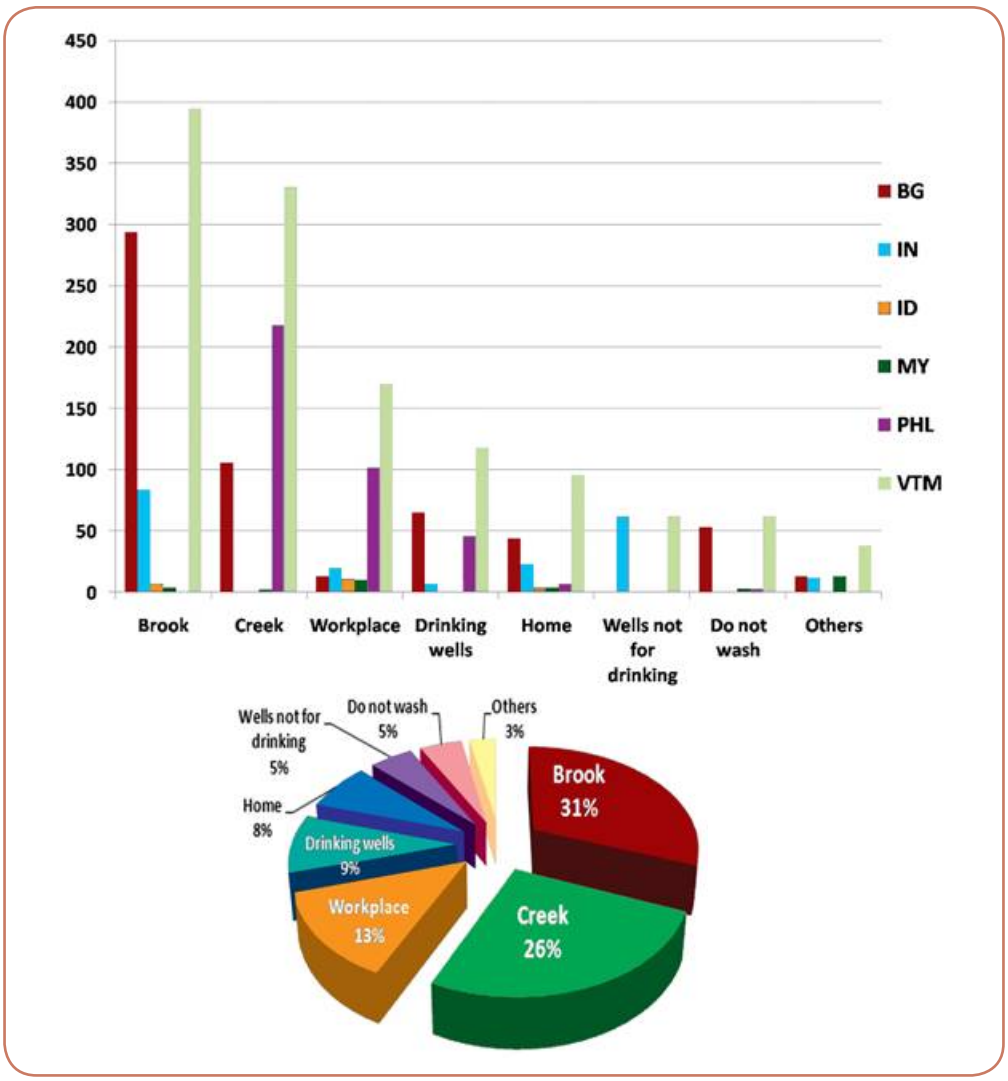

Figure 2.9 Place where respondents wash their bodies and PPE[70]

70 Individual accounts of respondents and general remarks of the researchers gave a similar trend in Pakistan.

Eighty percent of the respondents (Figure 2.10) had direct contact with pesticides while opening containers, mixing, loading the sprayer, and spraying. There were instances when spills happen while selling and buying pesticides decanted in plastic bags or reusable containers. Spills were also attributed to defective containers (such as loose bottle caps) and flimsy packaging.

Since PPE is not normally used when purchasing pesticides, spillages due to package defects and the practice of decanting are quite disturbing.

Pesticides were generally spilled on the faces, limbs, and eyes of workers (Figure 2.11). Accidental inhalation was of particular concern in the Philippines.

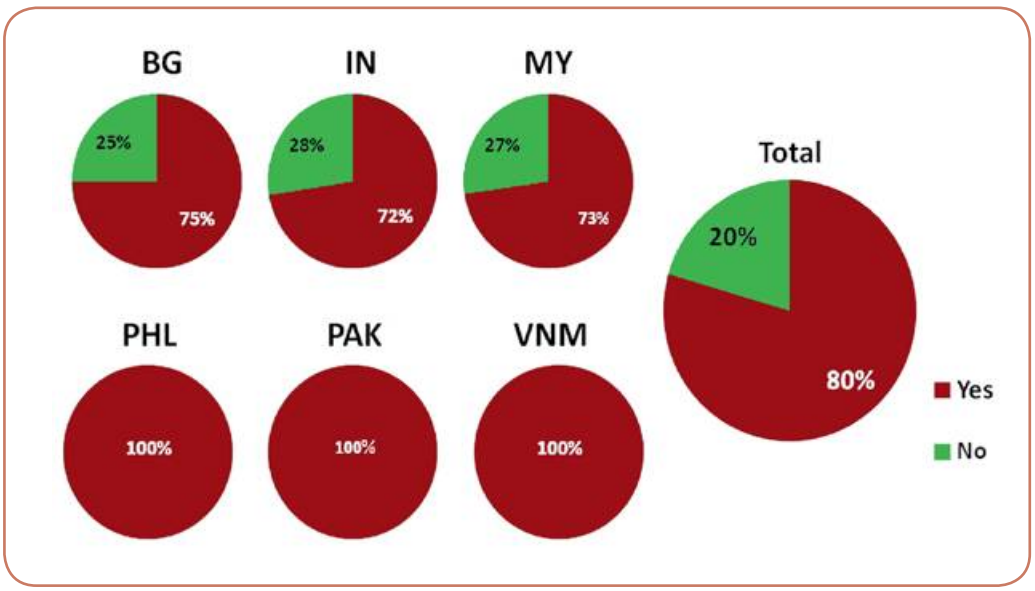

Figure 2.10 Respondents who experienced spillage of pesticide[71]

Wind direction

Spray drift can lead to a number of problems when using pesticides. It can pollute water, damage sensitive crops, and the environment, and result in poisoning of users.

Many respondents were aware of the need to consider wind direction when spraying pesticides. However, most of the respondents in Bangladesh, India, Pakistan, and Philippines still sprayed pesticides against the wind direction (Figure 2.12).

71 While the survey in Indonesia did not indicate the exact number of respondents who experienced spillage of pesticide, the general observation was that spillages occurred when workers loaded the sprayers on their backs.

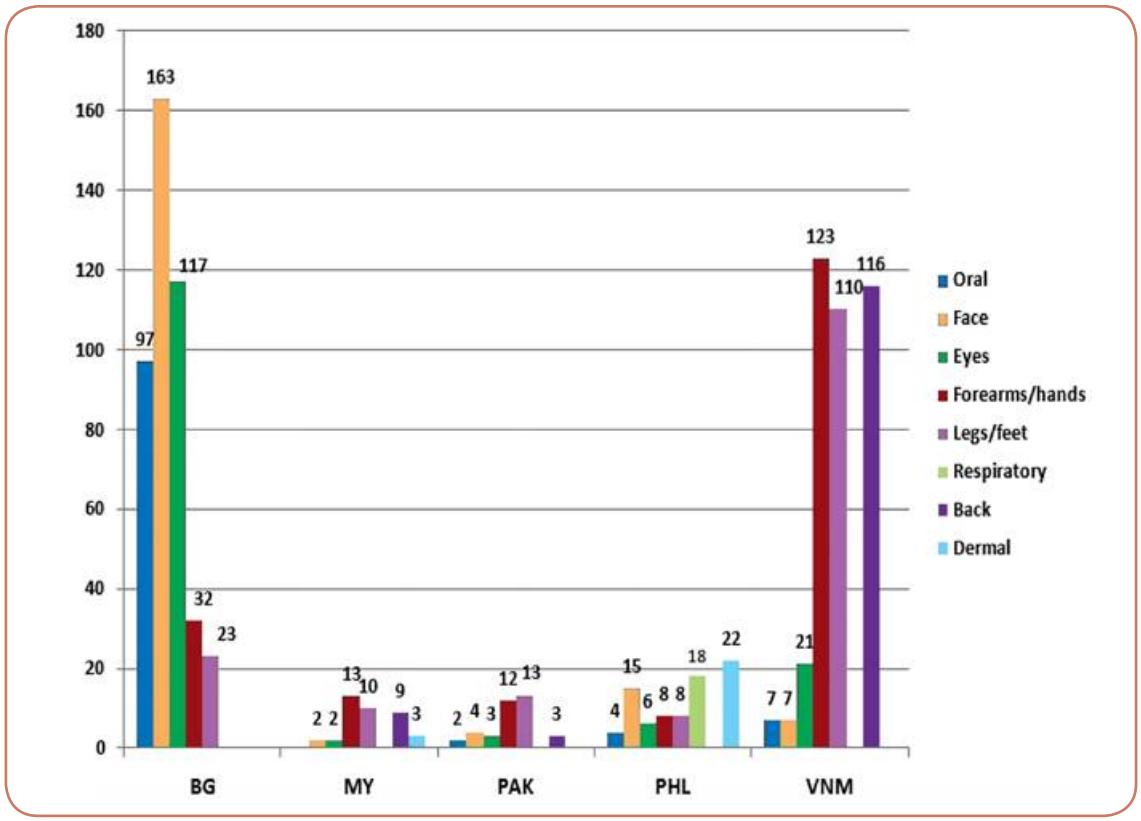

Figure 2.11 Body parts affected by spillage[72]

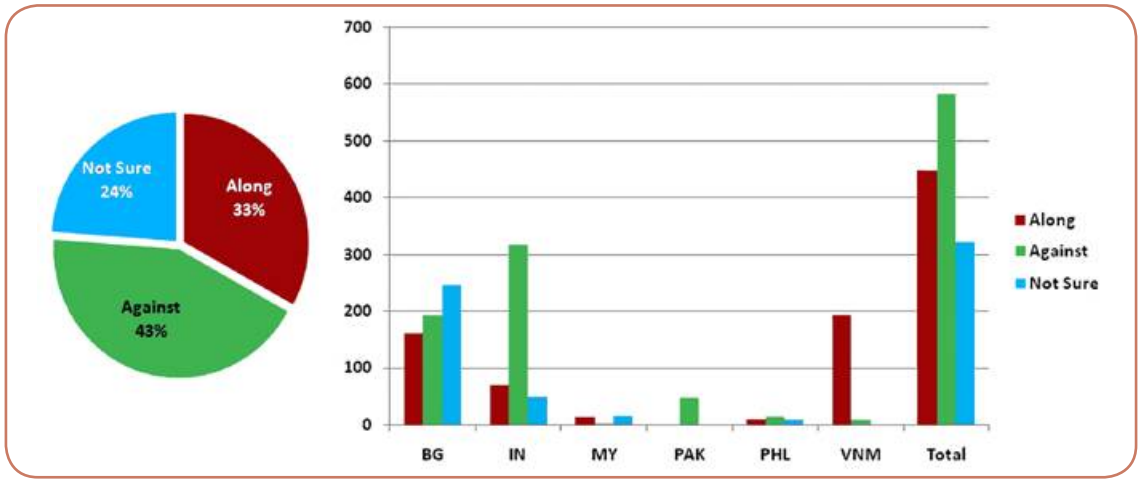

Figure 2.12 Spraying along or against wind direction

72 Respondents were allowed to give multiple answers, thus, the total numbers do not correspond to the total number of respondents.

Disposal method

The pesticide industry shares responsibilities under the Code in relation to the proper disposal of pesticides and used containers. Government and industry should also cooperate to establish services to collect and safely dispose used containers.

The country studies revealed the absence of a system to properly dispose unused pesticides, contaminated containers, and PPEs. In Bangladesh, India, and Pakistan, it is common for the respondents to throw unused pesticides, containers, or PPEs in open fields (Figure 2.13). During the conduct of the investigations, children were seen wandering in open fields and playing with empty pesticide containers. Some respondents reused empty pesticide containers for water jugs, while some sold these to scrap dealers.

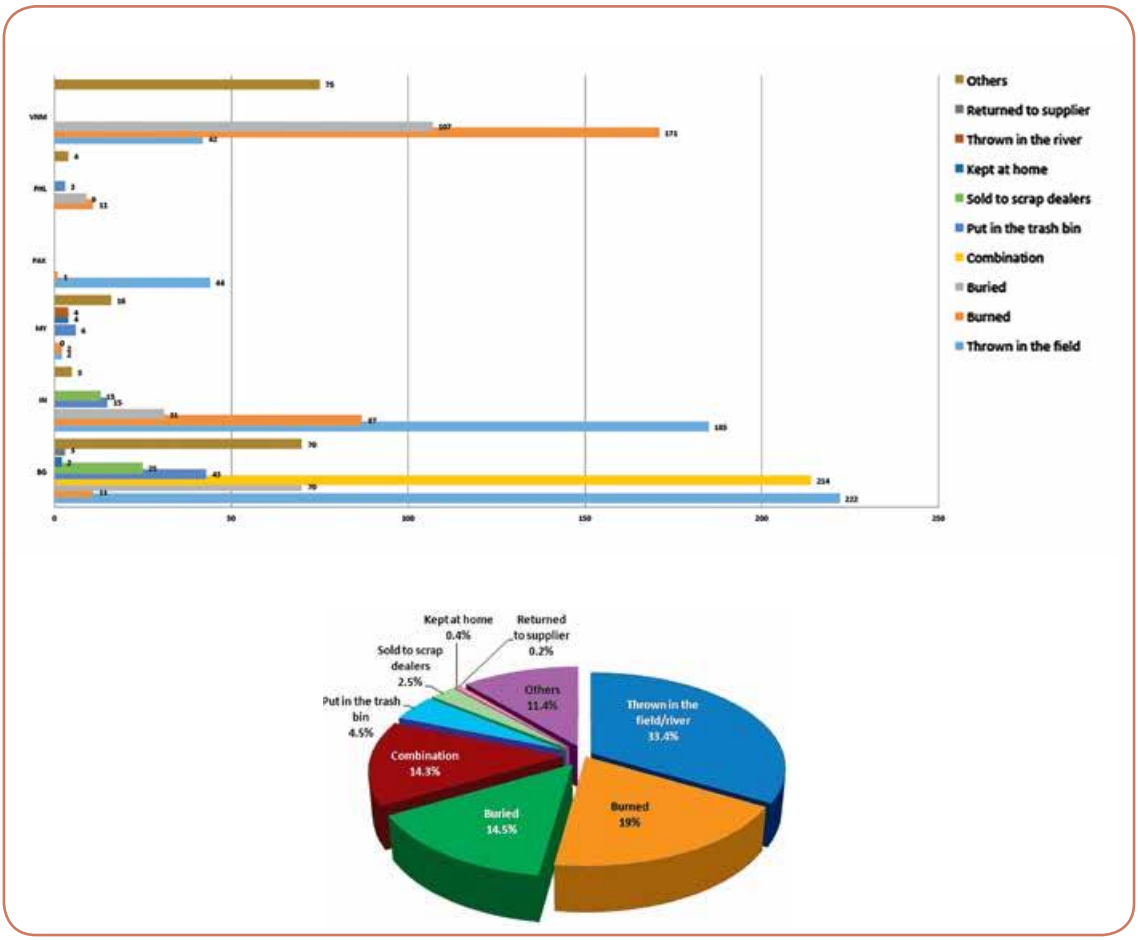

Figure 2.13 Disposal method of pesticide containers[73]

73 No data was culled for Indonesia, since oil plantation workers usually do not have access to containers for disposal.

Storage

Pesticides were usually stored at home, mostly in the general store room and veranda, kitchen, or along the lower edges of the roofing of the house (Figure 2.14). There was high awareness of the toxicity of pesticides especially in India and Vietnam, where respondents stored pesticides at places where children could not reach them.

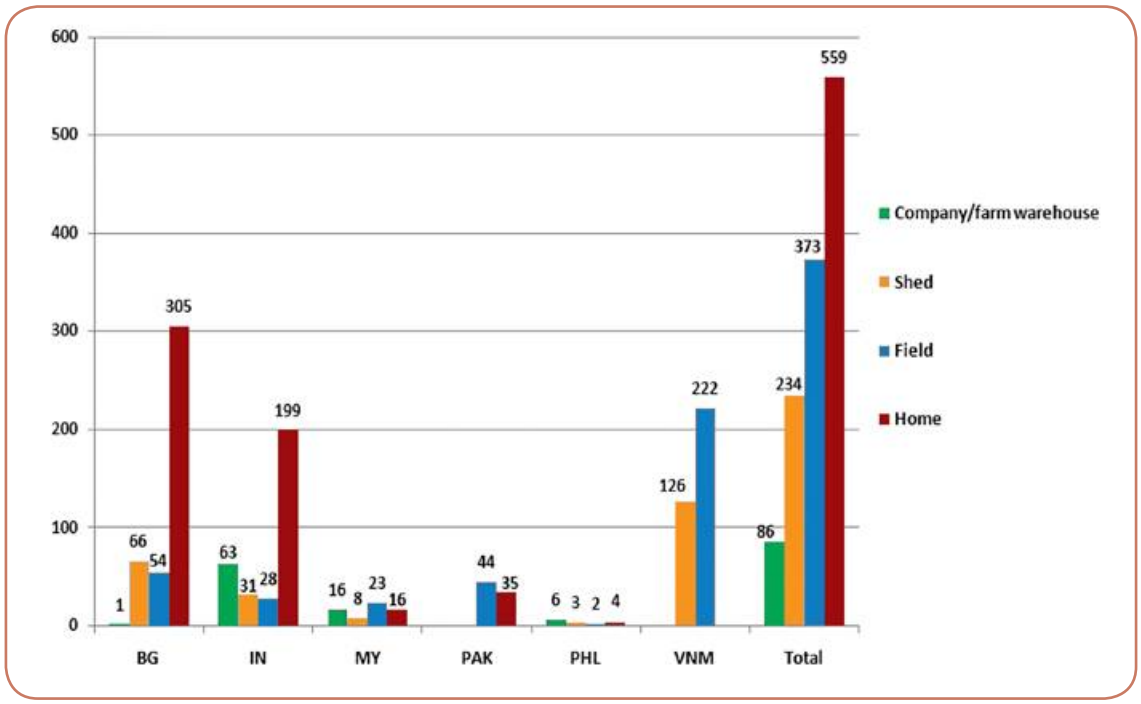

Figure 2.14 Storage location[74]

Training on Use of Pesticides and Personal Protective Equipment (PPE)

Majority of the (72%) of the study participants in Bangladesh, India, Indonesia, Pakistan, and Malaysia relayed that they did not receive any training on the proper use of pesticides and PPEs (Figure 2.15). If trainings were provided, these usually lasted for 1-2 hours. Their knowledge was largely drawn from experience or from the sharing of co-workers or friends. Some got instructions from retailers and government agencies upon request.

None of the Indonesian plantation workers received training on the use of pesticides. They were only briefed by the foreman to spray pesticides along the wind direction.

74 No data was culled from Indonesia, since oil palm plantations workers in the country might not have access to the storage area. Multiple responses were allowed in this item, thus the total numbers do not correspond to N.

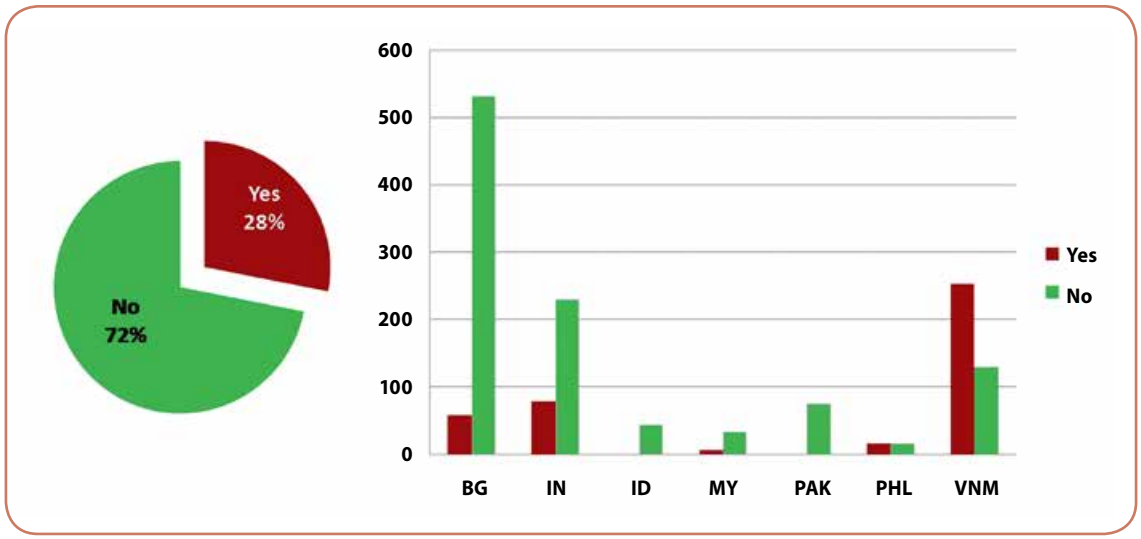

Figure 2.15 Training on the handling of pesticides

Access to labels and safety data sheets

Pesticide product labels provide critical information on the handling and use of pesticides to minimise health risks.

About 17% (Figure 2.16) bought pesticides with no labels or safety data sheets. This was so since many farmers bought pesticides in refill containers or clear plastic bags. Decanting of pesticides was a common practice among smallholder farmers who required only small quantities of pesticides for their crops.

In West Bengal, farmers got paraquat in small volumes of 100 ml or 200 ml from the retailers. Retailing of paraquat, especially putting it in plastic carry bags, poses high risk to handlers.

Some employers provided their workers with pesticide concoctions decanted in sprayers. Plantation workers in Indonesia reported that the company removed the labels on the jerry cans, and there were times when the pesticides were delivered to them premixed.

In the Philippines, oil palm plantation workers said that pesticides come in gallons with labels bearing the name of the pesticide and other chemical information but without pictograms to warn them of its hazards.

Half of the respondents did not read the pesticide labels (Figure 2.17). Plantation workers in Indonesia found the labels too small to read, and could not afford to scrutinise labels due to their workload. The illiterate respondents followed verbal instructions of dealers, retailers, or field staff.

Unreadable labels were also reported in Vietnam where 11% of the respondents said that the labels were in small print and in a foreign language.

In Malaysia, some illegal pesticides were labelled in Chinese.

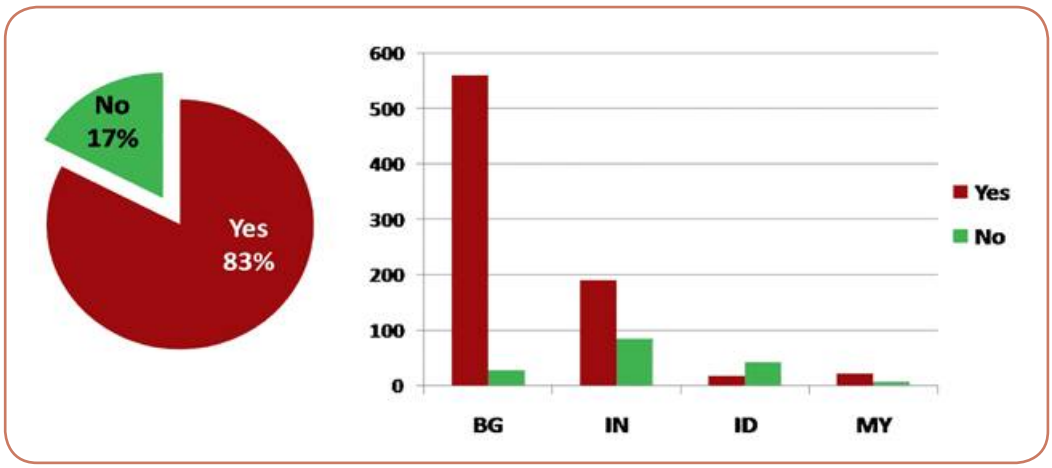

Figure 2.16 Availability of labels/leaflets[75]

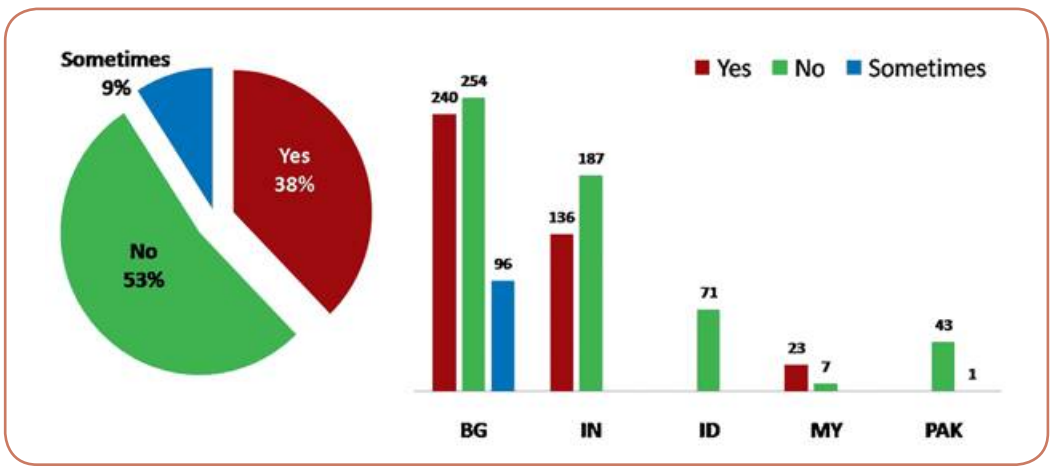

Figure 2.17 Reading of pesticide labels[76]

75 Data from Philippines and Vietnam were qualitative in nature, and thus, not included in this Figure. Access was not asked in the Pakistan study.

76 Data from Philippines and Vietnam were qualitative in nature, and thus, not included in this Figure.

Medical facilities or medical attention

Across all the countries, farmers and workers were not afforded medical care. Medical facilities were usually too far for access during emergencies and the transport fare was prohibitive.

The clinic within the Indonesia plantation premises did not have sufficient equipment or personnel. Patients had to seek medical attention in nearby town clinics at their own expense.

In place of professional medical care, some respondents resorted to self-medication or to alternative medicine per recommendation of relatives or friends. A number chose to simply ignore their condition and did not seek remedy.

Health effects

Commonly reported health symptoms were respiratory, integumentary, cardiovascular, gastrointestinal, EENT, and neurological. The top symptoms experienced were headaches, dizziness, excessive sweating, blurred vision, nausea, breathing difficulty, and skin rashes (Figure 2.18).

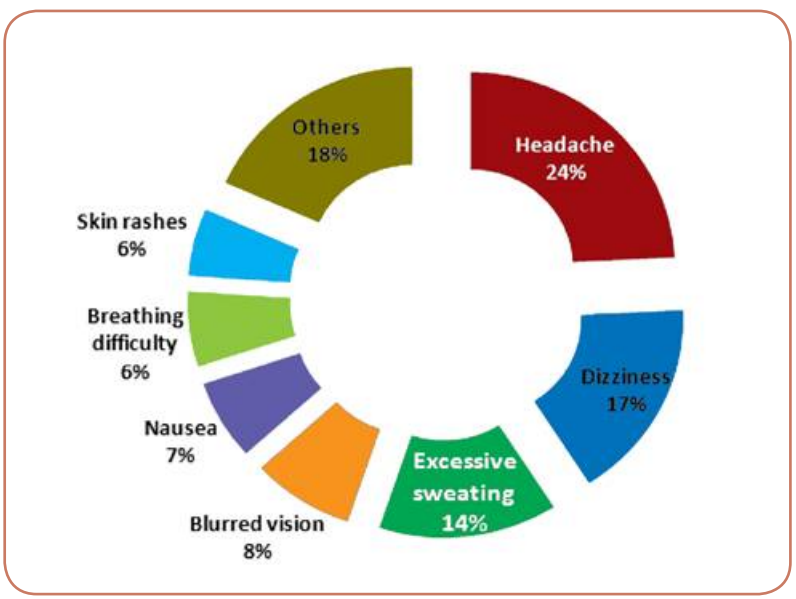

Figure 2.18 Symptoms experienced by the respondents[77]

77 Multiple responses were allowed in this item, thus the total numbers do not correspond to N.

Women and children's illnesses

The country reports include information on over 600 women and 217 children in the study areas.

Casual women workers predominated a palm plantation in Indonesia. They were directly exposed to pesticides via spraying, have no social security, and earned below minimum wage. They worked without adequate tools or PPE. The same was observed in Pakistan where women mixed chemical fertilisers and granular pesticides with bare hands.

Women were exposed to pesticides when washing their spouses' or relatives' pesticide-ridden clothing or PPEs while some assisted in mixing and filling pesticide containers.

Women and children are particularly vulnerable to pesticide exposure and poisoning.

In India and the Philippines, in addition to the acute symptoms and chronic illnesses, women workers experienced painful and longer duration of menstrual flow. There were also reports of increased incidence of stillbirths and miscarriages.

Children who handled pesticides directly were reported in India, Indonesia, and Pakistan. The 10 Pakistani children worked with pesticides as part of family chores. They did not wear any PPEs and were unaware of the hazards or of the safety measures needed to protect themselves from exposure while working in fields.

Children were further exposed via spray drifts, through the pesticide-contaminated clothing and PPEs of their household members, the pesticides stored at home, empty containers thrown in open fields, and through the contaminated land and water systems.

In India, 34 children lived 1-3 km from pesticide-treated farms. Three of these children fell ill directly due to pesticide exposure. Meanwhile, there are 11 cases where the children's illnesses are suspected to be linked to pesticide exposure. The number of affected children could be much greater considering that there are schools located within the plantation and farm premises.

Exposed children suffered from pesticide poisoning symptoms such as skin allergies, eye irritation, nausea, stomach aches, nostril irritations, and headaches. Learning and development problems were also noted.

Incidence rate of illnesses

The combined country data (Table 2.6) showed that seven out of 10 persons in the agricultural communities investigated have been ill due to pesticide exposure.

Table 2.6 Estimated incidence rate of affected people[78]

COUNTRIES	N	WITH ILLNESS/ SYMPTOMS	%
Bangladesh	599	363	60.60
India	255	151	59.22
Indonesia	57	55	96.49
Malaysia	64	48	75.00
Pakistan	76	76	100.00
Philippines	168	109	64.88
Vietnam	534	450	84.27
Total	**1753**	**1252**	**71.42**

78 The N for the Philippines includes the respondents' household members, which is 111. Out of this 111, there were 53 who were ill due to pesticide exposure giving an incidence rate of 47.75% for the households in the study site. For the all of the respondents, the incidence rate was 56/57 or 98.25%. Without the household members from the Philippines, the overall rate would be 71.44% (i.e. 993 affected out of 1390).

Annex 2.1 Consolidated data for the seven Asian countries studied

2.1.1 Age group of respondents

	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
Below 16	0	155	0	0	16	0	0	171	8.44
18-19	3	0	0	0	3	0	0	6	0.30
20-29	68	35	0	11	11	11	23	159	7.85
30-39	134	85	8	14	15	12	65	333	16.44
40-49	213	66	3	11	10	7	134	444	21.93
50-59	120	60	0	14	16	13	107	330	16.30
60-69	50	17	0	6	2	6	50	131	6.47
70-79	11	0	0	0	3	2	4	20	0.99
80-above	0	0	0	1	0	2	0	3	0.15
Unspecified	0	206	60	7	0	4	151	428	21.14
N	599	624	71	64	76	57	534	2025	

2.1.2 Respondents' education level

	BG	IN	MY	PAK	PHL	VNM	Total	%
None	166	31	5	40	0	0	242	19.85
Pre-school	95	11	0	0	0	46	106	12.47
Elementary	162	12	13	27	26	266	240	41.51
High school	110	16	8	8	23	70	235	19.28
Vocational	2	1	1	0	2	0	6	0.49
College	47	7	1	0	4	0	59	4.84
Post-college	17	2	0	0	0	0	19	1.56
N	599	80	28	75	55	382	1219	

2.1.3 Respondents' occupation

	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
Farmers	447	164	0	23	33	5	521	1193	68.76
Farm workers	0	155	0	7	4	19	0	185	10.66
Pesticide Sprayers	0	8	0	0	0	1	0	9	0.52
Pesticide retailers	0	5	0	0	3	0	13	21	1.21
Oil palm growers	0	0	0	7	0	0	0	8	0.46
Plantation workers	0	0	71	22	0	0	0	93	5.36
Plantation Staff	0	17	0	0	26	5	0	48	2.77
Others	152	0	0	3	0	18	0	172	9.91
None	0	0	0	0	0	6	0	6	0.35
N	599	349	71	62	66	54	534	1735	

2.1.4 Use of pesticides at work/home

	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
Yes	590	624	71	59	72	35	534	1985	98.27
No	9	0	0	5	0	21	0	35	1.73
N	599	624	71	64	72	56	534	2020	

2.1.5 Percentage of respondents who entered a newly sprayed field

	BG	IN	MY	PAK	VNM	Total	%
Same day	144	152	4	12	166	478	36.88
After a day	227	8	3	14	37	289	22.30
After 2-3 days	204	82	0	48	85	419	32.33
After 3-6 days	0	0	1	2	0	3	0.23
After 7 or more days	24	20	4	0	59	107	8.26
N	599	262	12	76	347	1296	

2.1.6 Pesticide applicator

	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
Backpack sprayer	574	105	42	10	31	18	534	1314	96.19
Squirt sprayer	0	18	0	0	0	1	0	19	1.39
Medicine dropper	0	0	0	0	0	1	0	1	0.07
Airplane	0	0	0	0	0	1	0	1	0.07
Others	0	0	0	0	31	0	0	31	2.27
N	574	123	42	10	62	21	534	1366	

2.1.7 Frequency of pesticide use

	BG	IN	ID	MY	PHL	VNM	Total	%
Daily	58	17	71	19	10	71	246	19.84
Once a week	346	0	0	5	0	166	517	41.69
Once a month	159	0	0	3	6	119	287	23.15
Every other day	0	0	0	0	0	0	0	0.00
Twice a week	0	0	0	0	1	0	1	0.08
1-2 months/year	0	0	0	0	2	1	3	0.24
3-4 months/year	0	0	0	0	2	133	135	10.89
Others	27	0	0	0	10	14	51	4.11
N	590	17	71	27	31	504	1240	

2.1.8 Use of PPE

	BG	IN	ID	MY	PAK	PHL	VNM	Total
Yes	271	120	11	22	0	31	348	803
No	319	252	60	30	47	4	160	872
N	590	372	71	52	47	35	508	1675
%Users	45.93	32.26	15.49	42.31	0.00	88.57	68.50	47.94

2.1.9 Place of washing

	BG	IN	ID	MY	PHL	VNM	Total	%
Brook	294	84	7	4	6	0	395	31.05
Creek	106	0	0	2	5	218	331	26.02
Workplace	13	20	11	10	14	102	170	13.36
Drinking wells	65	7	0	0	0	46	118	9.28
Home	44	23	4	4	14	7	96	7.55
Wells not for drinking	0	62	0	0	0	0	62	4.87
Do not wash	53	0	0	3	3	3	62	4.87
Others	13	12	0	13	0	0	38	2.99
N	588	208	22	36	42	376	1272	

2.1.10 Number of respondents who experienced spillage of pesticide

	BG	IN	MY	PAK	PHL	VNM	Total	%
Yes	449	58	32	20	57	101	717	79.58
No	150	22	12	0	0	0	184	20.42
N	599	80	44	20	57	101	901	

2.1.11 Body parts affected by spillage

	BG	MY	PAK	PHL	VNM	Total
Oral	97	0	2	4	7	110
Face	163	2	4	15	7	191
Eyes	117	2	3	6	21	149
Forearms/hands	32	13	12	8	123	188
Legs/feet	23	10	13	8	110	164
Respiratory	0	0	0	18	0	18
Back	0	9	3	0	116	128
Dermal	0	3	0	22	0	25

2.1.12 Spraying along or against wind direction

	BG	IN	MY	PAK	PHL	VNM	Total	%
Along	161	71	14	0	9	192	447	33.06
Against	192	318	3	47	14	9	583	43.12
Not Sure	246	50	16	0	10	0	322	23.82
N	599	439	33	47	33	201	1352	

2.1.13 Disposal method of pesticide containers

	BG	IN	MY	PAK	PHL	VNM	Total	%
Thrown in the field	222	185	2	44	0	42	495	33.11
Burned	11	87	2	1	11	171	283	18.93
Buried	70	31	10	0	9	107	217	14.52
Combination	214	0	0	0	0	0	214	14.31
Put in the trash bin	43	15	6	0	3	0	67	4.48
Sold to scrap dealers	25	13	0	0	0	0	38	2.54
Kept at home	2	0	4	0	0	0	6	0.40
Thrown in the river	0	0	4	0	0	0	4	0.27
Returned to supplier	3	0	0	0	0	0	3	0.20
Others	70	5	16	0	4	75	170	11.37

2.1.14 Storage location

	BG	IN	MY	PAK	PHL	VNM	Total	%
Company/farm warehouse	1	63	16	0	6	0	86	6.87
Shed	66	31	8	0	3	126	234	18.69
Field	54	28	23	44	2	222	373	29.79
Home	305	199	16	35	4	0	559	44.65
N							1252	

2.1.15 Training on the proper handling of pesticides

	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
Yes	59	79	0	7	0	17	253	415	28.10
No	531	230	44	34	76	17	130	1062	71.90
N	590	309	44	41	76	34	383	1477	

2.1.16 Availability of labels/leaflets

	BG	IN	ID	MY	Total
Yes	561	191	18	23	793
No	29	86	44	7	166
N	590	277	62	30	959
%Availability	95.08	68.95	29.03	76.67	82.69

2.1.17 Reading of pesticide labels

	BG	IN	ID	MY	PAK	Total	%
Yes	240	136	0	23	0	399	37.71
No	254	187	71	7	43	562	53.12
Sometimes	96	0	0	0	1	97	9.17
N	590	323	71	30	44	1058	

2.1.18 Symptoms experienced

	BG	IN	ID	MY	PAK	PHL	VNM	Total	%
Headache	329	36	39	3	3	30	322	762	24.24
Dizziness	245	19	47	2	1	17	194	525	16.70
Excessive sweating	193	18	37	1	3	13	181	446	14.19
Blurred vision	124	37	29	1	1	30	33	255	8.11
Nausea	77	28	14	1	6	27	56	209	6.65
Breathing difficulty	55	52	35	2	0	20	31	195	6.20
Skin rashes	84	34	9	1	2	12	34	176	5.60
Hand tremor	76	25	14	1	1	9	0	126	4.01
Vomiting	1	61	7	1	1	7	31	109	3.47
Insomnia	71	7	6	1	0	0	12	97	3.08
Excessive salivation	27	13	6	1	1	13	0	61	1.94
Diarrhoea	25	13	4	1	0	0	13	56	1.78
Irregular heartbeat	20	0	19	1	0	0	0	40	1.27
Convulsion	30	0	0	0	0	2	4	36	1.14
Narrowed pupils	19	1	9	0	0	1	0	30	0.95
Staggering	12	8	0	1	0	0	0	21	0.67

Annex 2.2 Terrible 20+1 Pesticides Still in Use in Asia-Pacific

PESTICIDE	TYPE	PRIMARY CROPS/USE	HAZARDS TO CHILDREN	NO. OF COUNTRIES WHERE BANNED*
Atrazine	Herbicide	Corn, soy, sorghum, sugarcane	Birth defects, cancer, endocrine disruption, immunotoxicant	37
Carbaryl	Insecticide	Tomatoes, eggplants, olives, oranges, apples	Birth defects, cancer, endocrine disruption, developmental toxicant, neurotoxicant, immunotoxicant	33
Chlorothalonil	Fungicide	Potatoes, peanuts, tomatoes	Cancer, endocrine disruption, immune and developmental effects	3
Chlorpyrifos	Insecticide	Cotton, corn, oranges, bananas, apples, vegetables	Acute poisoning, birth defects, cancer, endocrine disruption, neurotoxicant, immune and predisposal to obesity and diabetes	2
Cypermethrin	Insecticide	Onions, garlic, lettuce, broccoli, cereals/grains, oilseeds, fruits	Acute poisoning, cancer, endocrine disruption, behavioral effects and delayed mental development, Parkinson's disease later in life	0
DDT	Insecticide	Mosquito control	Endocrine disruption, neurotoxicant, predisposal to obesity and diabetes	71
Deltamethrin	Insecticide	Carrots, corn, rice, spinach, wheat	Cancer, endocrine disruption, neurotoxicant, immunotoxicant	0
Diazinon	Insecticide	Tomatoes, spinach, apples, peaches	Acute poisoning, cancer, developmental toxicant, neurotoxicant, endocrine disruption, predisposition to diabetes and Parkinson's disease	30
Dichlorvos	Insecticide	Beans, brassica seedlings, structural & commodity fumigation, poultry houses	Acute poisoning, cancer, neurotoxicant,endocrine disruption, immunotoxicant, predisposition to diabetes and Parkinson's disease	32
Lambda-cyhalothrin	Insecticide	Hay, pistachios, rice, lettuce	Acute poisoning, cancer, endocrine disruption, neurotoxicant	28†
Malathion	Insecticide	Strawberries, cherries, walnuts, lettuce	Acute poisoning, birth defects, cancer, endocrine disruption, neurotoxicant, predisposition to ADHD, diabetes and obesity	2

PESTICIDE	TYPE	PRIMARY CROPS/USE	HAZARDS TO CHILDREN	NO. OF COUNTRIES WHERE BANNED*
Mancozeb	Fungicide	Potatoes, walnuts, lettuce, pears	Acute poisoning, allergic sensitisation, birth defects, cancer, developmental toxicant, endocrine disruption	1
Maneb	Fungicide	Potatoes, lettuce, grapes, broccoli	Acute poisoning, behavioral effects, birth defects, cancer, developmental toxicant, endocrine disruption, immunotoxicant, predisposition to Parkinson's disease	31
Methamidophos	Insecticide	Cotton, rice, citrus, maize, grapes, soybeans, tobacco,vegetables, hops, peaches, bananas, pineapple	Acute poisoning, behavioral effects, death, developmental toxicant, neurotoxicant	49
Methyl parathion	Insecticide	Walnuts, potatoes, grapes	Neurotoxicant, endocrine disruption	59
Monocrotophos		Cotton, rice, pulses, groundnuts, tomatoes, eggplants, mangoes, grapes, chilies,cardamom, coconut, oil palms, coffee, tea,castor, citrus, olives, maize,sorghum, sugar cane, sugar beet, pea, potatoes, soybeans, cabbage, mustard, onion, pepper, ornamentals, tobacco	Birth defects, cancer, endocrine disruption, neurotoxicant, possible immunotoxicant	60
Paraquat	Herbicide	Cotton, oil palms, bananas, grapes, cereals, pulses, oil seeds, vegetables	Acute poisoning, death, endocrine disruption, immunological effects, neurotoxicant, implicated in diabetes	38
Parathion	Insecticide	Cereals, fruit, nuts, vines, vegetables, ornamentals, cotton, field crops	Acute poisoning, death, birth defects, cancer, neurotoxicant, immunotoxicant, predisposition to diabetes and obesity	63
Permethrin	Insecticide	Pistachios, lettuce, cotton, wheat, maize, alfalfa	Cancer, endocrine disruption, neurotoxicant, immunological effects	29

PESTICIDE	TYPE	PRIMARY CROPS/USE	HAZARDS TO CHILDREN	NO. OF COUNTRIES WHERE BANNED*
Propoxur	Insecticide	Structural, landscape sugar cane, cocoa, grapes, maize, rice, vegetables, cotton, alfalfa, forestry, ornamentals	Acute poisoning, cancer, developmental toxicant, endocrine disruption, immunosuppressant	29
Glyphosate	Herbicide	Soy, corn, cotton, canola, alfalfa, sugar beets	Birth defects, cancer, endocrine disruption, immunotoxicant, kidney damage, implicated in Parkinson's disease	1

For the full PAN International list of Highly Hazardous Pesticides and the full PAN International Consolidated List of Bans (PAN CL), see http://pan-international.org/resources

*** The PAN CL is not complete, as many countries do not publish lists of banned pesticides, and/or do not notify the Secretariat of the Rotterdam Convention, which is the only international body that keeps track of such bans.**

† Not banned in any country, but is not approved in the European Union.

Annex 2.3 List of HHPs reported in the seven Asian countries

	HHPS	BG	IN	ID	MY	PAK	PHL	VNM	Countries
1	**Abamectin**	X						X	2
2	**Acephate**	X	X						2
3	**Acetochlor**					X			1
4	**Atrazine**		X						1
5	**Benomyl**						X		1
6	**Brodifacoum**		X						1
7	**Bromoxynil**		X						1
8	**Butachlor**				X	X		X	3
9	**Carbendazim**	X							1
10	**Carbofuran**	X			X		X		3
11	**Carbosulfan**	X							1
12	**Chlorantraniliprole**	X	X		X	X		X	5
13	**Chlorfluazuron**		X					X	2
14	**Chlorothalonil**		X	X			X		3
15	**Chlorpyrifos**	X	X				X	X	4
16	**Cypermethrin**	X	X		X		X	X	5
17	**Deltamethrin**						X	X	2
18	**Diafenthiuron**		X						1
19	**Diazinon**	X							1
20	**Dichlorvos**		X						1
21	**Dimethoate**	X	X						2
22	**Diuron**				X				1
23	**Emamectin benzoate**		X					X	2
24	**Ethoprop**						X		1
25	**Fenitrothion**	X			X			X	3
26	**Fenvalerate**	X							1
27	**Fipronil**	X	X		X			X	4
28	**Glufosinate-ammonium**			X	X				2
29	**Glyphosate**		X	X	X		X	X	5
30	**Imidacloprid**	X	X			X		X	4

	HHPS	BG	IN	ID	MY	PAK	PHL	VNM	Countries
31	**Indoxacarb**		X						1
32	**Lambda-cyhalothrin**	X	X		X	X	X	X	6
33	**Malathion**	X			X		X		3
34	**Mancozeb**	X	X						2
35	**Metiram**		X						1
36	**Monocrotophos**		X						1
37	**Nitenpyram**							X	1
38	**Nitrobenzene**	X							1
39	**Paraquat**		X	X	X		X	X	5
40	**Permethrin**							X	1
41	**Phenthoate**	X							1
42	**Profenofos**		X						1
43	**Propagite**		X						1
44	**Pymetrozine**				X				1
45	**Quinalphos**		X						1
46	**Spinosad**		X						1
47	**Thiamethoxam**	X	X			X		X	4
48	**Thiourea**		X						1
49	**Trichlorfon**							X	1
50	**Validamycin**		X					X	2
	Total	20	29	4	13	6	11	19	

Annex 2.4 Highly hazardous pesticides reported in the seven Asian countries

PESTICIDES	WHO la	WHO lb	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox
Abamectin			Yes									Yes
Acephate								Yes				Yes
Acetochlor						Yes						
Atrazine							Yes					
Benomyl					Yes	Yes						
Brodifacoum	Yes		Yes			Yes						
Bromoxynil			Yes									
Butachlor				Possible								
Carbendazim					Yes	Yes		Yes				
Carbofuran		Yes	Yes					Yes				Yes
Carbosulfan			Yes					Yes				Yes
Chlorantraniliprole										Yes	Yes	
Chlorfluazuron											Yes	
Chlorothalonil			Yes	Possible					Yes			
Chlorpyrifos		Yes						Yes				Yes
Cypermethrin												Yes
Deltamethrin							Yes					Yes
Diafenthiuron												Yes
Diazinon				Possible				Yes				Yes
Dichlorvos		Yes	Yes					Yes				Yes
Dimethoate								Yes				Yes
Diuron				Possible								
Emamectin benzoate										Yes	Yes	Yes
Ethoprop	Yes		Yes	Possible				Yes				
Fenitrothion							Yes	Yes				Yes
Fenvalerate												Yes
Fipronil												Yes
Glufosinate-ammonium						Yes						
Glyphosate				Possible								
Imidacloprid												Yes

PESTICIDES	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox
Indoxacarb												Yes
Lambda-cyhalothrin			Yes				Yes					Yes
Malathion				Possible				Yes				Yes
Mancozeb				Possible			Yes					
Metiram				Possible		Yes						
Monocrotophos		Yes	Yes					Yes				Yes
Nitenpyram												Yes
Nitrobenzene						Yes	Yes					Yes
Paraquat			Yes									
Permethrin				Possible								Yes
Phenthoate								Yes				Yes
Profenofos												Yes
Propargite				Possible					Yes		Yes	
Pymetrozine				Possible								
Quinalphos							Yes					Yes
Spinosad												Yes
Thiamethoxam												Yes
Thiourea							Yes					
Trichlorfon							Yes					Yes
Validamycin												Yes

† Not banned in any country, but is not approved in the European Union.
WHO Ia: Extremely hazardous
WHO Ib: Highly hazardous
H330: Fatal if inhaled according to the Globally Harmonized System (GHS)
Muta EU 1, 2: Mutagenic; Probable Mutagen
Repro EU 1,2: Reproductive Toxin; Probable Reproductive Toxin
EDC: Endocrine Disruptor
ChEInh: Cholinesterase Inhibitor
vB: Very Bioaccumulative
vP: Very Persistent
POP: Persistent Organic Pollutants
PIC: Prior Informed Consent
HHP: Highly Hazardous Pesticide
T20: Terrible 20 pesticides extremely hazardous to children

Major References:

PAN International. (2017). *PAN International Consolidated List of Banned Pesticides* (3rd ed.). Retrieved from http://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

PAN International. (2018, March) *PAN International List of Highly Hazardous Pesticides.* Retrieved from http://www.pan-germany.org/download/PAN_HHP_List.pdf

CHAPTER 3: COUNTRY REPORTS

3.1 BANGLADESH

INTRODUCTION

Agriculture is the largest employment sector in Bangladesh. As of 2017, 41% of the country's total labour force is employed in agriculture.[79] Rice and jute are the country's primary crops, while wheat and tea are also assuming greater importance. Bangladesh's labour-intensive agriculture has achieved steady increases in food grain production despite the often unfavourable weather conditions. Improvements in infrastructure include better flood control and irrigation, and the establishment of better distribution and rural credit networks.

However, the use of toxic pesticides by Bangladeshi farmers has increased significantly. The study by the Bangladesh Rice Research Institute (BRRI) shows that from 1997 to 2008, pesticides use has increased by 328%.[80] Consumption of pesticides grew by a staggering 1340% from 3,135 metric tonnes of active ingredients in 1977 to 45,172 metric tonnes in 2009, the increase closely following the growth in production of high yield variety (HYV) rice and wheat. It peaked in 2008, and fell by 26.46% in 2014.[81]

In 2013, the National Food Safety Laboratory conducted a research with the Food and Agriculture Organization of the United Nations (FAO), which revealed harmful levels of pesticides in vegetables and fruits from Bangladesh. The study found eight types of pesticides in the samples, which included cauliflower, bean, red spinach, and eggplant. Very high levels of malathion, chlorpyrifos, and parathion methyl were detected in some samples.

In 2004, 84 active ingredients in 242 pesticide brand names were registered in the country.[82] Bangladesh imports, formulates, and does not produce active ingredients. Of the 124 officially registered companies,

79 International Labour Organization. (2017). *Employment in agriculture (% of total employment).* Retrieved from https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS

80 Islam, et al. (2016). Farm Level Pesticides Use in Patuakhali and Comilla Region of Bangladesh and Associated Health Risk. *Journal of Health and Environmental Research,* 2(4), 20-26. Retrieved from http://article.sciencepublishinggroup.com/pdf/10.11648.j.jher.20160204.11.pdf

81 Shammi, M, et al. (2017). Sustainable pesticide governance in Bangladesh: socio-economic and legal status interlinking environment, occupational health and food safety. *Environment Systems & Decisions,* 37(3),243-60.

82 Ahamed, M. (n.d.). *Report on Household Pesticides of Bangladesh.* Retrieved fromhttp://jbbc.co.jp/wp-content/uploads/2014/08/A-report-on-household-Pesticides-of-Bangladesh.pdf

six are multinationals. The marketing channel for pesticides in Bangladesh consists of pesticide companies, distributors, wholesalers, wholesaler-cum-retailers, retailers and farmers (Figure 3.1.1).

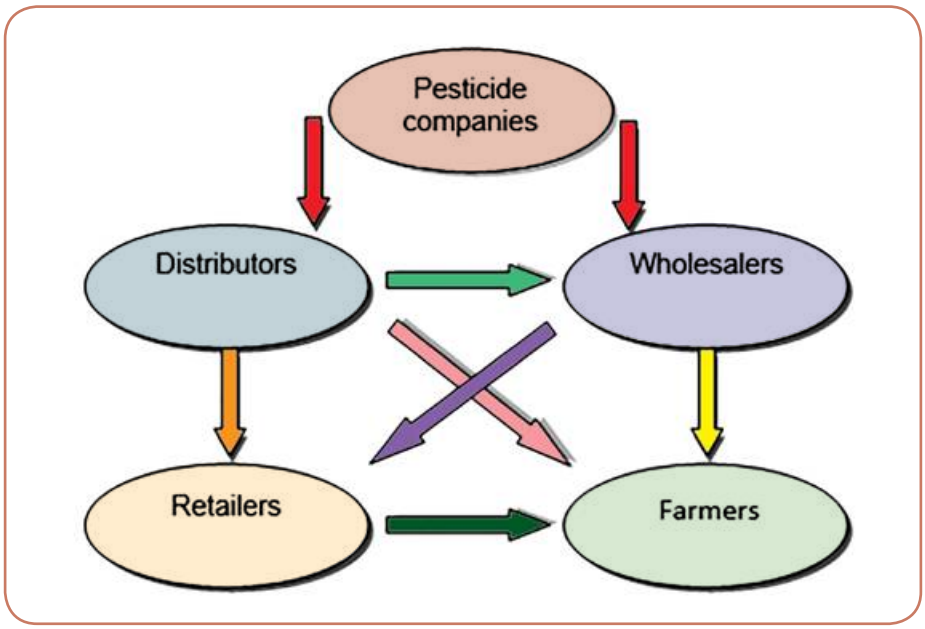

Figure 3.1.1 A simplified representation of pesticide marketing channels in Bangladesh

Bangladesh has banned the Persistent Organic Pollutants (POPs) including aldrin, chlordane, dieldrin, endrin, hexachlorobenzene (HCB), HCH/lindane and heptachlor. Also banned are alachlor, aldicarb, captafol, endosulfan, ethylene dichloride/1,2 ethylene dichloride, fluoroacetamide, monocrotophos, and parathion ethyl, all of which are listed under the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

On top of these bans, the State government cancelled the registration of various pesticide formulations, many of which are considered highly hazardous.[83]

This report presents the findings of a field study conducted by BARCIK on the use of pesticides and their health impacts in five sub-districts of Satkhira, district of Bangladesh.

83 The list of cancelled pesticides in Bangladesh can be accessed at http://dae.portal.gov.bd/sites/default/files/files/dae.portal.gov.bd/page/a71472c4_de10_4e51_b657_4fa3e9fe8dd1/Approved%20(66%20PTAC%20&%2095%20PTASC-PPW)%20Registered%20Pesticides_Banned%20List.pdf

METHODOLOGY

BARCIK translated and pre-tested the CPAM questionnaire before the actual interviews. Triangulation method was used, i.e., the data was validated through literature review, analysis of secondary data, and discussions with academicians and key informants.

The questionnaire was finalised by taking feedback from the field test. After that, the study areas and population were selected. The study area contains the five sub-districts of Satkhira district (Figure 3.1.2). Each sub-district had 120 farmers as respondents. Among them, 40 were women. The total sample size was 599. After finalising the questionnaire, the study area, and the sample size, BARCIK engaged some volunteers to conduct a survey in each of the selected areas.

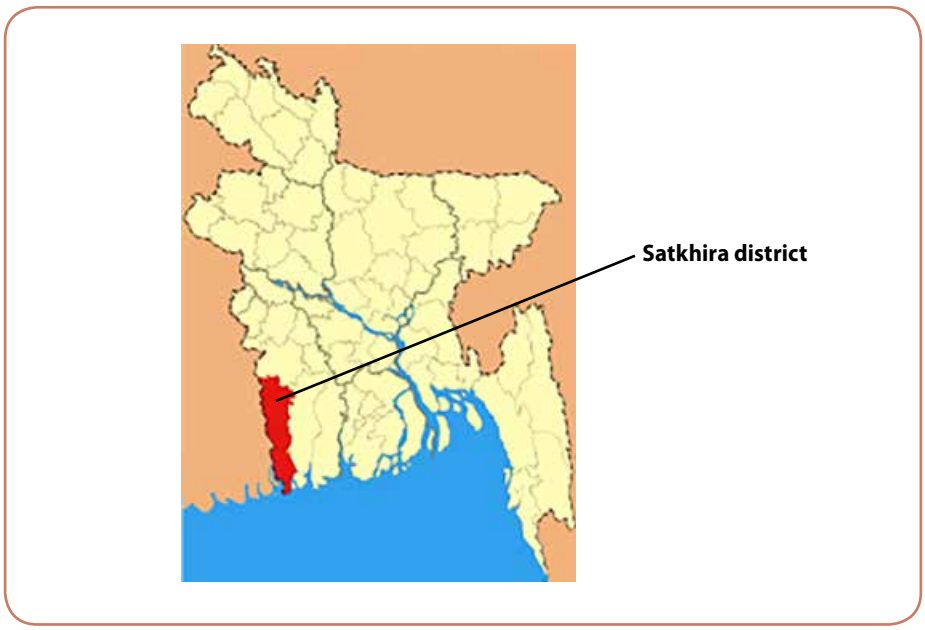

Figure 3.1.2 Map of Bangladesh showing the location of Satkhira (Photo from Wikimedia)

RESULTS

1. Demographics

A total of 599 farmers from rice and vegetable-growing communities were interviewed from April to May 2017. The majority (57.93%) of the respondents were in the range of 30 to 49 years old and 6.68% were women. As to educational status, 7.85% reached college, 18.36% were high school graduates, and

27.04% had elementary education. There were a few who had post-college education (2.84%) while 27.71% had no formal education. The rest went into vocational school.

Seventy-seven percent of the respondents were self-employed, while 23% have landlords or were under independent contractors. Of the employed farmers, 88% had no contract. They worked on a daily or monthly basis. Of the self-employed farmers, 93% owned the land. The remaining 7% lease the land and pay either in cash or in kind.

2. Exposure to Highly Hazardous Pesticides

Almost all respondents (98.5%) have been using pesticides, and around one third of them have been using pesticides for 6-10 years. Respondents were exposed to pesticides while spraying, mixing, loading, and decanting; purchasing or transporting pesticides; and washing equipment used for spraying or mixing pesticides. They were also exposed to pesticides by eating contaminated food, or by drinking or washing in contaminated water.

BOX 3.1.1 TESTIMONIES

The use of chemical fertilisers and pesticides is rampant as income generation is a main concern for farmers. They would rather choose chemical fertilisers and pesticides in order to gain better crops. Attested to by two farmers from Satkhira (district), Bangladesh:

"Long-term insecticide use affects soil fertility but if the soil is not utilised, then we will face financial loss. This situation forces everyone to use chemical fertilisers and pesticides instead. - *Farmer Jan**

"With pesticides and fertilisers, our crops look better and it means more income for our family. We're forced to use it because our livelihood is on the line." - *Farmer Abdul**

**Names have been changed.*

Communities, especially women and children, were exposed to pesticides due to the proximity of their houses to the paddy fields – generally within a 10-metre radius. The children, who play near the fields, are at a greater risk. Exposure also comes with the storage of pesticide spraying equipment together with household and food items in their homes.

Sixty-six pesticide brand names were reported (Table 3.1.1), with Virtako topping the list followed by Basudin (Table 3.1.2). Both are manufactured by Syngenta Bangladesh Limited. Basudin, which is 10% diazinon, is among the brand names banned in Bangladesh. The combined formulation of thiamethoxam and chlorantraniliporole has the most frequent number of users.

The 66 pesticide products contain 32 different active ingredients (See Annex 3.1.1 List of reported pesticides in Bangladesh 2016 - 2017). Seventeen of these are HHPs, and six are extremely hazardous to children and are in PANAP's "Terrible Twenty" list.

Table 3.1.1 Pesticide brand names, active ingredients, and manufacturer-distributors

	BRAND NAMES	ACTIVE INGREDIENTS	COMPANIES
1	**Fielder**	2, 4-D	ACI Formulations Limited
2	**Licar 1.8EC**	Abamectin	Corbel International Limited
3	**Vertimec 018 EC**		Syngenta Bangladesh Limited
4	**Koranda**	Acephate + Fenvalerate	Auto Crop Care Limited
5	**Manik 20 SP**	Acetamipirid	Mimpex Agrochemicals Limited
6	**Tundra 20SP**		Auto Crop Care Limited
7	**Amister Top**	Azoxystrobin + Difenoconazole	Syngenta Bangladesh Limited
8	**Chemocarb 50 EC**	BPMC (Fenobucarb)	ACI Formulations Limited
9	**Arba 50WP**	Carbendazim	Intefa
10	**Mine 50WP**		S.I. Agro International
11	**Furan 3G**	Carbofuran	ACI Formulations Limited
12	**Sinocarb 3 GR**		Global Agrovet Limited
13	**Marshal 20 EC**	Carbosulfan	FMC International S.A.
14	**Ricosulfan 20 EC**		Rico Agrovet
15	**Cartap 50 SP**	Cartap	Corbel International Limited
16	**Ferdan 50 SP**		Naboti Corporation Limited
17	**Filfil 50SP**		SAM Agro Chemicals
18	**Phartap 50 SP**		Farma & Farms
19	**Rider 50 SP**		Atherton Imbros Company Limited
20	**Marine 20 EC**	Chlorpyrifos	Mosco Marketing Company
21	**Surate 20 EC**		Asia Trade International
22	**Dare 55 EC**	Chlorpyrifos + Cypermethrin	Mosco Marketing Company
23	**Nitro 505EC**		Auto Crop Care Limited
24	**Sonali 505 EC**		Basic Agrovet
25	**Cyper 10 EC**	Cypermethrin	Mosco Marketing Company
26	**Fencord 10 EC**		Atherton Imbros Company Limited
27	**Ripcord 10 EC**		BASF Bangladesh Limited
28	**Shampad Plus 10EC**		S.I. Agro International
29	**Shincyper 10 EC**		Petrochem (Bangladesh) Limited
30	**Sicorin 10 EC**		SAMP Limited
31	**Suncot 10 EC**		Padma Agro Sprayers Company
32	**Basudin 10 GR**	Diazinon	Syngenta Bangladesh Limited

	BRAND NAMES	ACTIVE INGREDIENTS	COMPANIES
33	**Benzin 10G**		Bengal Agro Chemicals Industries
34	**Dianon 10 G**		Shetu Marketing Company
35	**Razdan 10 G**		ACI Formulations Limited
36	**Turab 60EC**		Intefa
37	**Score 250 EC**	Difenoconazole	Syngenta Bangladesh Limited
38	**Amgar 40 EC**	Dimethoate	Padma Agro Sprayers Company
39	**Freeze 5 SG**	Emamectin Benzoate	Atherton Imbros Company Limited
40	**Kasper 5 SG**		Marshal Agrovet Chemical Ind. Ltd.
41	**Proclaim 05 SG**		Syngenta Bangladesh Limited
42	**Emithion 50 EC**	Fenitrothion	Shetu Marketing Company
43	**Feniton 50EC**		ACI Formulations Limited
44	**Tiefen 20 EC**	Fenvalerate	Mosco Marketing Company
45	**Ferogen 3GR**	Fipronil	United Phosphorus (Bangladesh) Ltd.
46	**Imitaf 20 SL**	Imidacloprid	Auto Crop Care Limited
47	**Simida 20SL**		SAMP Limited
48	**Tiddo 20 SL**		ACI Formulations Limited
49	**G Clean 5 EC**	Kujapholp P Ethaile (Quizalofop-P-ethyl)	GMI Agro Limited
50	**Karate 2.5 EC**	Lambda-cyhalothrin	Syngenta Bangladesh Limited
51	**Ashation 57 EC**	Malathion	Goldchange Ind. Co. Ltd., China
52	**G.Thion 57 EC**		Global Agrovet Limited
53	**Hilthion 57 EC**		The Limit Agroproducts Limited
54	**Kilthion 57EC**		Padma Agro Sprayers Company
55	**Cymon Gold 72 WP**	Mancozeb + Cymoxanil	Alpha Agro Limited
56	**Ridomil Gold MZ 68 WG**	Mancozeb + Metalaxyl	Syngenta Bangladesh Limited
57	**Floora**	Nitrobenzene	ACI Formulations Limited
58	**Kiron 50 EC**	Phenthoate	Alpha Agro Limited
59	**Corozole 250 EC**	Propiconazole	Corbel Chemical Industries Ltd.
60	**Proven 250 EC**		SAMP Limited
61	**McSulphur 80 WP**	Sulfur	McDonald Bangladesh (Pvt) Limited
62	**Sulphur 80 WP**		Reximco Insecticides Limited
63	**Thiovit 80 WG**		Syngenta Bangladesh Limited
64	**Actara 25 WG**	Thiamethoxam	Syngenta Bangladesh Limited
65	**Virtako**	Thiamethoxam + Chlorantraniliprole	Syngenta Bangladesh Limited
66	**Ultima Plus 40 WG**	Thiamethoxam + Emamectin Benzoate	Goldchange Industries Co. Ltd., China

Table 3.1.2 Pesticides frequently used in Satkhira district

ACTIVE INGREDIENTS	TOTAL USERS	BRAND NAME	FREQUENCY	MANUFACTURERS
Thiamethoxam + Chlorantraniliprole	176	Virtako	162	Syngenta Bangladesh Limited
		Ultima Plus 40 WG	14	Goldchange Industries Co. Ltd., China
Diazinon	38	Basudin 10 GR	29	Syngenta Bangladesh Limited
		Turab	9	Intefa
Cypermethrin	30	Ripcord 10 EC	18	BASF Bangladesh Limited
		Suncot 10 EC	12	Padma Agro Sprayers Company
Azoxystrobin + Difenoconazole	17	Amister Top	17	Syngenta Bangladesh Limited
Lambda-Cyhalothrin	12	Karate 2.5 EC	12	Syngenta Bangladesh Limited
Chlorpyrifos + Cypermethrin	8	Dare 55 EC	8	Mosco Marketing Company
Carbosulfan	7	Marshal	7	FMC International S.A.

Thirty-seven companies were identified, notably Syngenta, ACI, Moscow, and Padma. Some respondents could not name the pesticides they used, or the manufacturers.

3. Hazardous Conditions of Use

Inadequate personal protective equipment (PPE)

More than half (54%) of the respondents said that they did not wear PPE. Those who said that they do, have no full protective gear and just wear long-sleeved shirts with long pants (58%), while others have face masks, long-sleeve shirts, and long pants (24%), or only one of these. The wearing of gloves, masks, eyeglasses, or head coverings does not seem to be the norm.

Inadequate washing facilities

Proper washing facilities were not available for 30.3% of the respondents. Those who said that washing facilities were not available used watercourses e.g. irrigation canals (86.1%), ponds (20.8%), and rivers (1.4%). Some washed in wells (3.1%) and at taps (1.1%).

Spillages

A significant number of respondents (75.2%) had incidents of spillages, with the pesticides directly coming in contact with their body (Figure 3.1.3). Spills occurred due to faulty spray equipment, faulty packaging, while decanting, and when they fell down while spraying (Figure 3.1.3). They just wash their hands (67%) and/or take a bath (66.3%) when they get spilled on. Not one of them sought medical help.

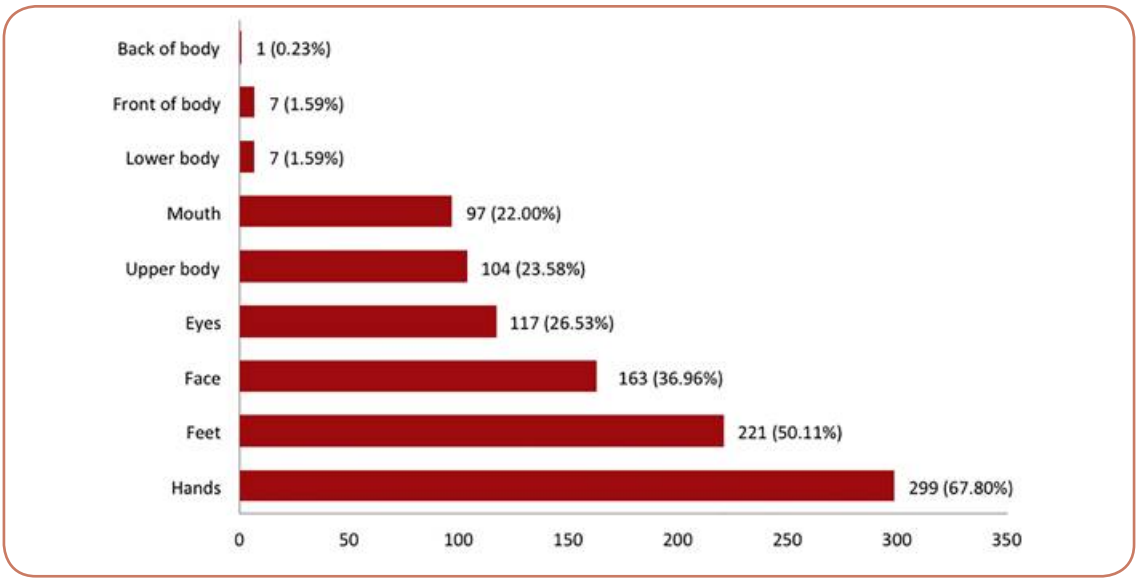

Figure 3.1.3 Body parts affected by the spill (N=441, Multiple answers)

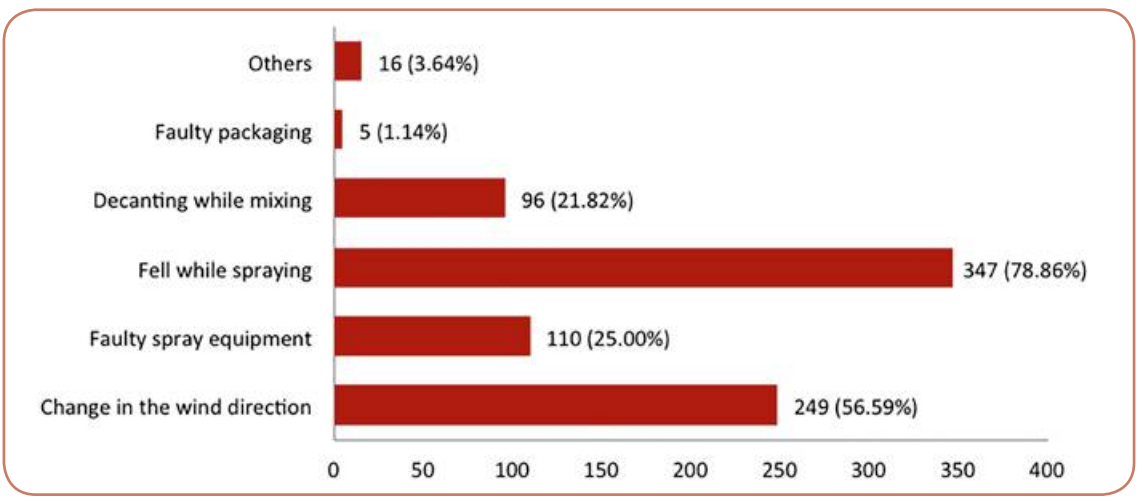

Figure 3.1.4 Reasons for the spill (N=440, Multiple answers)

Spraying and entry to newly sprayed field

Respondents sprayed pesticides on a weekly (58%), monthly (27%), and daily (10%) basis (Figure 3.1.5). They enter the fields (Figure 3.1.6) within the day of spraying (24%), the next day (38%), two days after (24%), or after more than three days (10%).

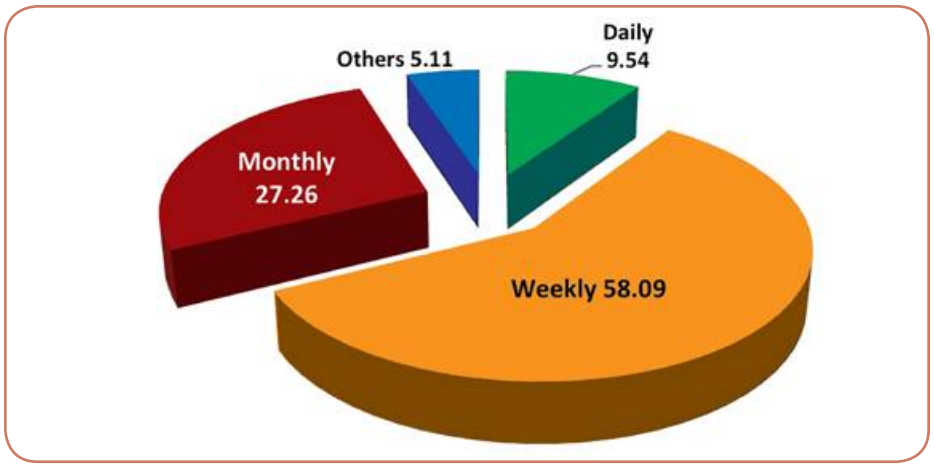

Figure 3.1.5 Regularity of pesticide use (N=587)

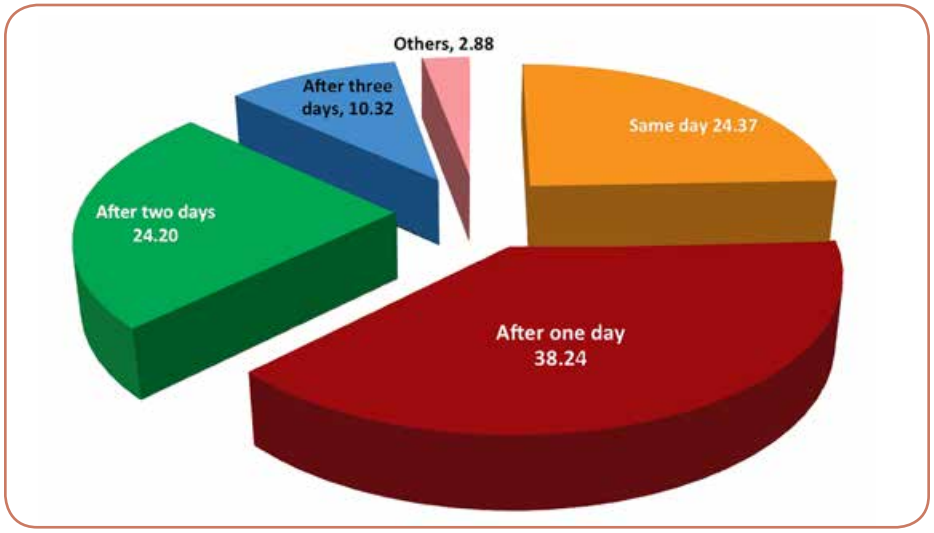

Figure 3.1.6 Entry to a newly sprayed field (N=591)

About 95% of the respondents had been exposed to ground spray. Only 27% conscientiously sprayed along the wind direction (Figure 3.1.7). There were times, too, that they were aerially sprayed while eating, or while on their way to the river to do laundry.

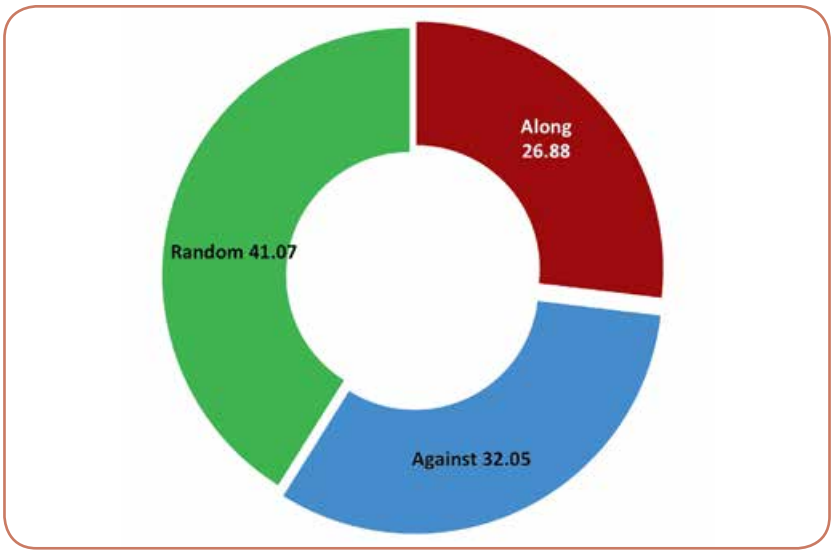

Figure 3.1.7 Spraying along or against wind direction (N=599)

4. Improper Storage and Disposal

Pesticides were mostly kept at home (72%), in the shed, field or company/farm house (Figure 3.1.8).

Most respondents (55%) used up the pesticides (Figure 3.1.9). Left-overs are kept at home, in the grain storage, thrown in the field or river, buried or burned.

Pesticide containers (Figures 3.1.10 & 3.1.11) were thrown in the fields , buried, placed in trash bins, sold to scrap dealers, burned, returned to supplier or kept at home (Figure 3.1.12).

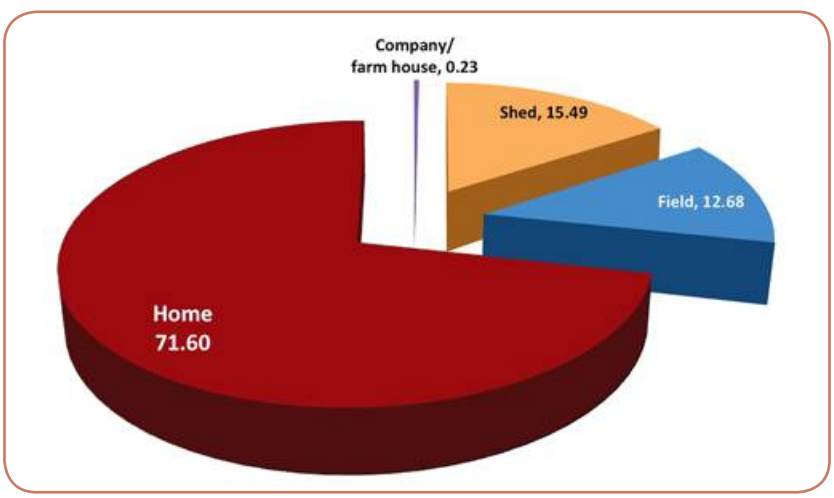

Figure 3.1.8 Storage location of pesticides

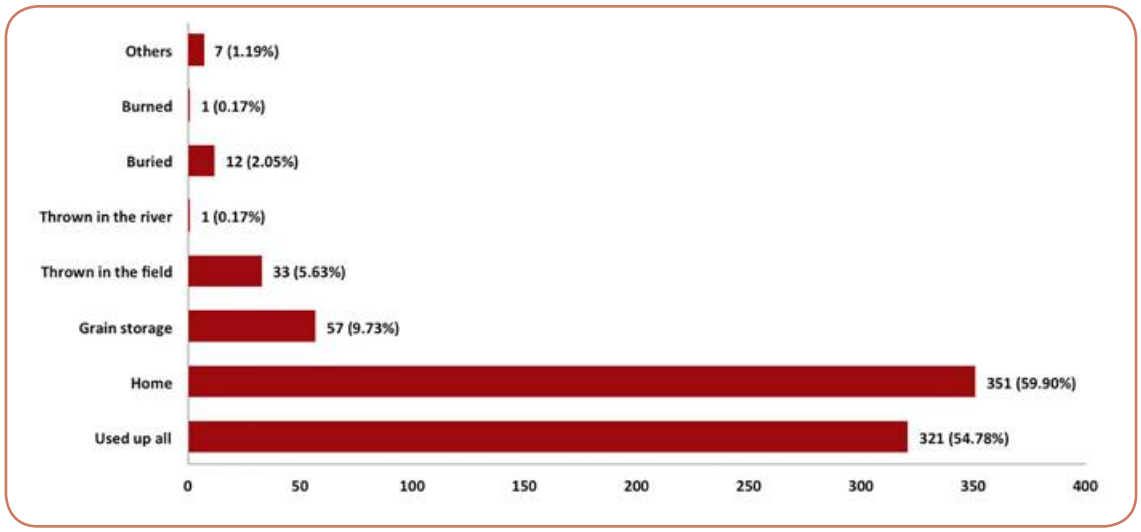

Figure 3.1.9 Pesticide left-over and what is done with it (N=586, Multiple answers)

Figure 3.1.10 Pack of pesticides found in the rice field (Photo by BARCIK)

Figure 3.1.11 Empty pesticide containers found in a dry pond (Photo by BARCIK)

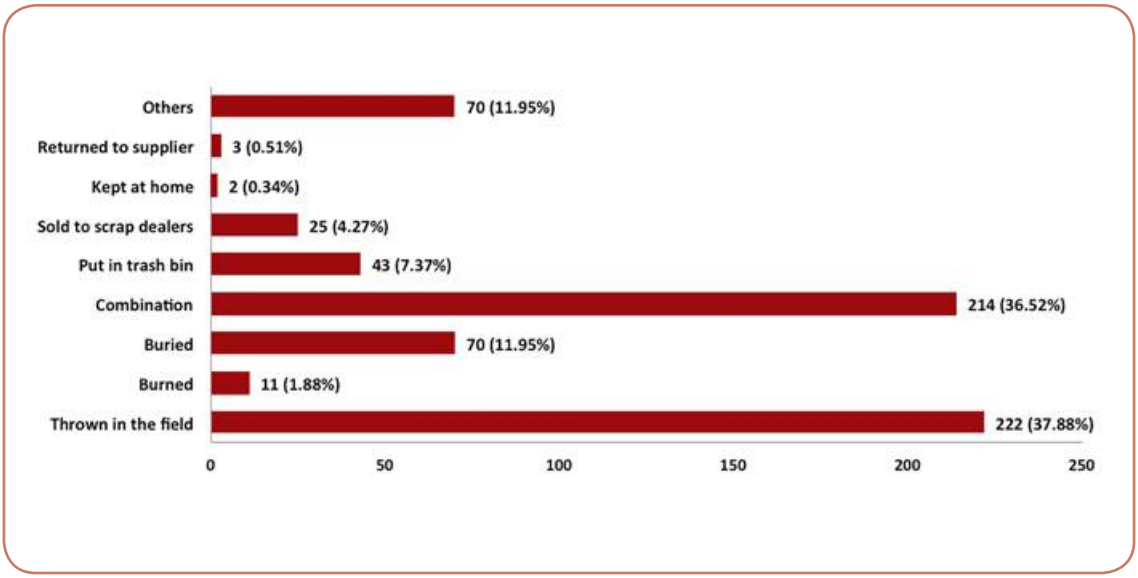

Figure 3.1.12 Disposal of pesticide containers (N=586, Multiple answers)

5. No Access to Training and Label/Safety Data Sheets

Ninety percent (90%) of respondents did not receive any training on pesticide use and handling. Of the 10% who did receive training, 51.7% said that it was in the form of a seminar, while the rest said that it was through a field demonstration. The training conducted by the workers' companies lasted generally for one to two hours.

Information on pesticides was received by respondents from the sellers (41%), or from an agriculture officer (5%). There were those who relied on their own experience (37%), and those who followed other people's recommendations (17%). As one farmer disclosed, "I do not know the amount of pesticide required to use. I just rely on whatever information the shopkeeper provides."

There are those who read pesticide labels (43%) but a big number (41%) never did due to a combination of factors like illiteracy (61%), lack of time (45%) or the text is too small (3%). The rest read (16%) occasionally. Majority of those who read labels (58%), found the labels useless.

Unaware of the hazards of pesticides, some respondents de-clogged the applicator nozzle with their mouth. There were those who even considered pesticides as "medicine" for their crops, or "farmers' best friend" in protecting their crops from insects, weeds, and fungi.

6. Illnesses of Respondents and their Households

All revealed that they or their family member/s suffer from at least one serious chronic disease (Figure 3.1.13). Most commonly reported were liver diseases, followed by diabetes, developmental disorders, learning disabilities, kidney diseases, and cancer. Some respondents suffered from at least two types of illnesses.

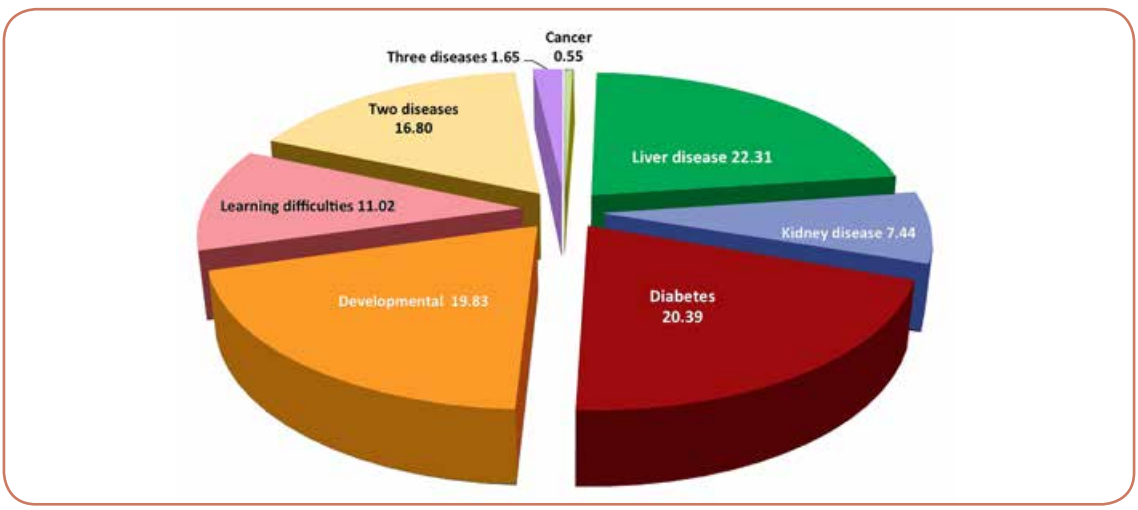

Figure 3.1.13 Illnesses suffered by the respondents and/or their households (N= 363)

Most respondents experienced at least one symptom of acute pesticide poisoning (Figure 3.1.14) such as headache, dizziness, excessive sweating, blurred vision, skin rashes, nausea, and hand tremors.

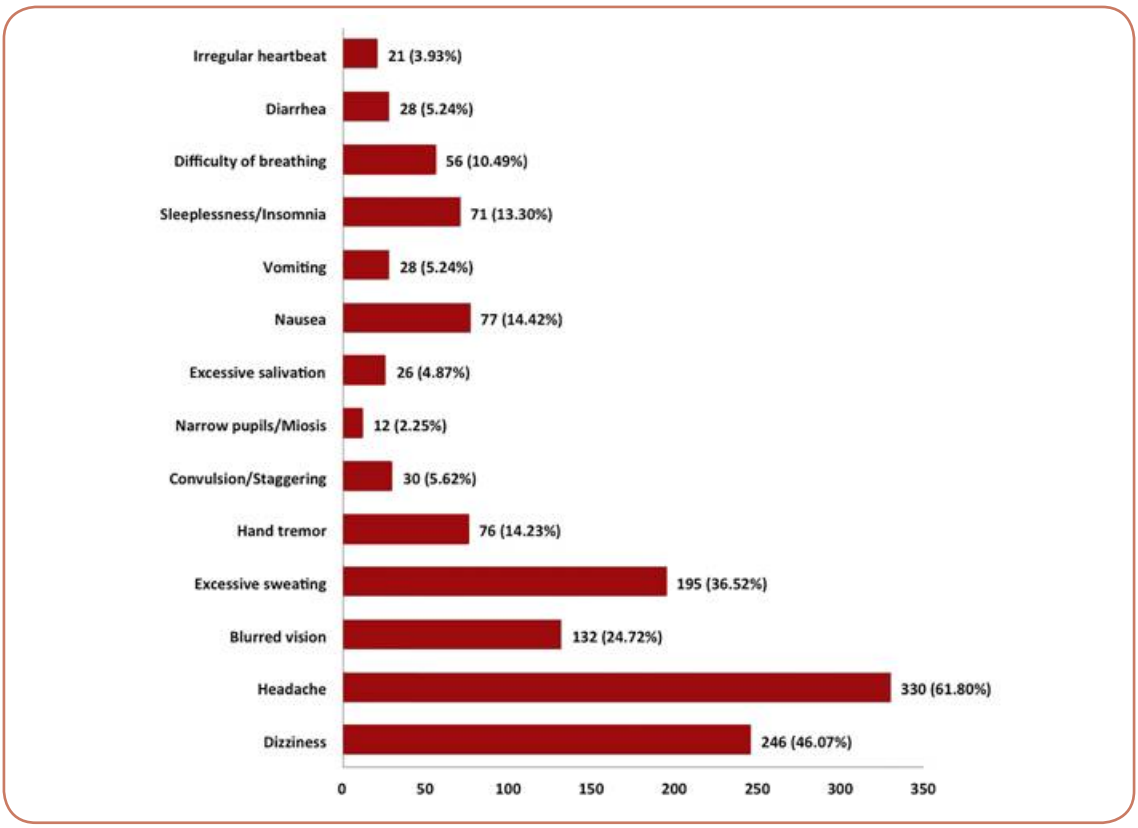

Figure 3.1.14 Signs and symptoms of poisoning suffered by the respondents and/or their households (N=534, Multiple answers)

Figure 3.1.15 A farmer and his spraying equipment (Photo by BARCIK)

VIOLATION OF HUMAN RIGHTS AND AGREEMENTS

Bangladesh adopted the Universal Declaration of Human Rights (UDHR), the UN Convention on the Rights of the Child (CRC), and the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW).

These legally binding tools are supposed to guarantee the rights of all peoples, especially children and women. The observed conditions and practice of pesticide use in the five rice and vegetable-growing sub-districts of Satkhira endangers the well-being of the communities, and the government's inaction to their plight transgresses the peoples' right to life and health.

To wit, although some formulations containing diazinon (a highly hazardous organophosphate that causes damage to the nervous system) are banned by the Bangladeshi government, other diazinon-containing trademarks are allowed – e.g. Basudin 10G was found to be the second most highly used pesticide in the study area. Yet, the users of these pesticides were not given the necessary knowledge and training to limit if not avoid exposure.

1. Violation of the International Code of Conduct on Pesticide Management

According to the Code, Article 7.5, the "Prohibition of the importation, distribution, sale and purchase of HHPs may be considered if, based on risk assessment, risk mitigation measures or good marketing practices are insufficient to ensure that the product can be handled without unacceptable risk to humans and the environment."

The findings of the research show that the situation of pesticide use in Bangladesh are not safe or healthy and are a risk to human, animals and all forms life (Figure 3.1.15). It infringes the Code.

Article 5.2.5 of the Code calls on the Industry to halt sale and recall products as soon as possible when handling or pose an unacceptable risk under any use direction or restrictions and notify the government.

The conditions of use of HHPs in Bangladesh indicate the unavailability and unaffordability of PPE, it being uncomfortable in the local hot and humid climate, as well as lack of washing facilities. Farmers and agricultural workers have no information on hazards and no training on proper and safe usage. Under these conditions, the 17 identified HHPs (Annex3.1.1) six of whom are also PANAP's list of "Terrible Twenties" pesticides should not be used. Corporations selling these pesticides should halt their sales as they pose an unacceptable risk to health and the environment.

The violation of the right to health is also exacerbated by the violation of their right to access to information. A vast majority of the respondents are without training on pesticides use and handling, which is vital considering that almost a third of the respondents are illiterate. The lack of information on the hazards of pesticides has led to appalling conditions of use. These include using their mouths to declog pesticide applicator nozzles, spraying against the wind direction, and entering newly sprayed fields. The lack of access to information also violates Article 9.2.1 of the Code, which urges the government to provide and implement legislation that permits public access "to information about pesticide risks and the regulatory process, while safeguarding intellectual property."

The right to a safe and healthy environment is violated with pesticide contamination of the air, soil and water sources. Improper storage and disposal practices, such as storing spraying equipment inside homes and throwing unused pesticides in the fields, further expose community members. These practices violate Article 5.1.9 of the Code, which urges states to "require that pesticides be physically segregated from other merchandise to prevent contamination or mistaken identity and where appropriate label require that pesticides are clearly marked as hazardous materials. Every effort should be made to publicise the dangers of storing pesticides and foodstuffs together."

2. Violation of Women's and Children's Rights

Since fields are only about 10 meters away from their homes, women and children are exposed to pesticide drift while eating and doing the laundry. As they are more vulnerable than men to the adverse effects of pesticides, women and children's rights are gravely violated by the use of HHPs.

The CEDAW, which affirms the reproductive rights of women (Articles 11 and 12), has been violated. These articles state that "Exposing people to toxic chemicals that can cause adverse human health impacts is a violation of human rights, particularly the rights to health and a safe environment. Pesticide exposure seriously undermines the reproductive rights of women and the rights of children." CEDAW affirms the reproductive rights of women and calls on states to take appropriate measures against all forms of exploitation of women.

In addition, under General Recommendation No. 34 on the rights of rural women, States should be "protecting the occupational health and safety of rural women by taking legislative and other measures to protect them against exposure to harmful chemicals. They should receive information about the health and environmental effects of the use of and exposure to chemicals, particularly hazardous chemicals, pesticides and other products used in agriculture, extractive, and other industries. State parties should develop and implement public awareness programmes on these effects and on alternatives, and ensure that no use, storage or disposal of hazardous materials or substances takes place without the explicit consent of rural women and their communities."

As a signatory to the UNCRC, the Bangladesh government should adhere to Article 7, which states that: "State Parties recognise that every child has the inherent right to life," and that "State Parties shall ensure to the maximum extent possible the survival and development of the child." In addition to the right to life, Article 24 expresses the signatory countries' recognition of children's right to enjoy the highest standard of health.

Moreover, the companies selling these pesticides are failing to take responsibility to adhere to the Code to minimise and eliminate the harm caused by pesticides; as well as to respect and support the rights of communities to good health and a safe environment.

CONCLUSION

The survey with 599 farmers and agricultural workers in the three farming villages in Bangladesh revealed rampant use of HHPs. As a result, the health and lives of farmers and their families are highly compromised.

The pesticide industry in breach of the International Code of Conduct on Pesticide Management; the rights of women and children; and numerous human rights by profiting from the sale and use of HHPs in the conditions of use in Bangladesh.

Furthermore, the international community agreed at the 4th International Conference on Chemicals Management in 2015, that urgent action should be taken to reduce and eliminate HHPs and that instead of the use of HHPs, priority should be given to agroecological practices to manage pests and agricultural production, and yet of date not much is being done.

Annex 3.1.1 List of Reported Pesticides in Bangladesh 2017

PESTICIDES	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
2,4-D	1				Possible			Yes					Slightly					3
Abamectin	2			Yes									Yes			Yes		
Acephate	1								Yes				Yes			Yes		31
Acetamipirid	2																	
Azoxystrobin	1																	
BPMC (Fenobucarb)	1								Yes									29
Carbendazim	2					Yes	Yes		Yes							Yes		29
Carbofuran	1		Yes	Yes					Yes				Yes		Yes	Yes		49
Carbosulfan	4			Yes					Yes				Yes			Yes		40
Cartap	5								Yes									28 †
Chlorpyrifos	5		Yes						Yes				Yes			Yes	Yes	2
Clorantriniliprole	1											Yes	Yes			Yes		
Cymoxanil	1																	
Cypermethrin	10				Possible			Yes					Yes			Yes	Yes	
Diazinon	5				Possible				Yes				Yes			Yes	Yes	30
Difenoconazole	2																	1
Dimethoate	1								Yes				Yes			Yes		4
Emamectin Benzoate	3											Yes	Yes					
Fenitrothion	2							Yes	Yes				Yes			Yes		28
Fenvalerate	2												Yes			Yes		28
Fipronil	1															Yes		8
Imidacloprid	3												Yes			Yes		
Lambda-cyhalothrin	1			Yes				Yes					Yes			Yes	Yes	28 †
Malathion	4				Possible				Yes				Yes			Yes	Yes	2

PESTICIDES	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Mancozeb	2				Possible			Yes								Yes	Yes	1
Metalaxyl	1																	1
Nitrobenzene	1						Yes	Yes					Yes			Yes		
Phenthoate	1								Yes							Yes		32
Propiconazole	2																	
Quizalofop-P-ethyl	1																	
Sulfur	4																	
Thiamethoxam	3												Yes			Yes		

α There are brand names that are cancelled in Bangladesh, e.g. the brand name Diazinon. Yet, other brand names with the active ingredient diazinon are allowed in the market.

† Not banned in any country, but is not approved in the European Union.

WHO Ia: Extremely hazardous
WHO Ib: Highly hazardous
H330: Fatal if inhaled according to the Globally Harmonised System (GHS)
Muta EU 1, 2: Mutagenic; Probable Mutagen
Repro EU 1,2: Reproductive Toxin; Probable Reproductive Toxin
EDC: Endocrine Disruptor
ChE Inh: Cholinesterase Inhibitor
vB: Very Bioaccumulative
vP: Very Persistent
POP: Persistent Organic Pollutants
PIC: Prior Informed Consent
HHP: Highly Hazardous Pesticide
T20: Terrible 20 pesticides extremely hazardous to children

Annex 3.1.2

Banned Pesticides in Bangladesh

1. Alachlor
2. Aldicarb
3. Captafol
4. Chlordane
5. DDT
6. Endosulfan
7. Ethylene dichloride / 1,2-dichloroethane
8. Fluoroacetamide
9. Hexachlorobenzene / benzene hexachloride (HCB/BHC)
10. Hexachlorocyclohexane (HCH)
11. Lindane
12. Monocrotophos
13. Parathion (ethyl)

Major References:

PAN International. (2017). *PAN International Consolidated List of Banned Pesticides* (3rd ed.). Retrieved from http://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

PAN International. (2018, March) *PAN International List of Highly Hazardous Pesticides*. Retrieved from http://www.pan-germany.org/download/PAN_HHP_List.pdf

3.2 INDIA

INTRODUCTION

India, with an estimated market size of around USD 4.9 billion in 2017, is the fourth largest global producer of pesticides after United States, Japan and China. India's share in the global pesticide market is around 10%.[84] There has been a vast expansion of pesticide use throughout India, especially among commercialised production in irrigated or bore well dependent systems. Data from the Department of Agriculture, Cooperation, and Farmers Welfare show that pesticide usage in India jumped from 47,020 tonnes in 2002 to 60,280 tonnes in 2014. Paddy accounts for the largest share of pesticide use (around 26 to 28%) followed by cotton (18 to 20%).[85]

Genetically-engineered Bt cotton, introduced in India in 2002, accounts for 95% of all cotton farming in the country. However, Bt cotton—due to expensive seeds and increased use of pesticides—has driven up the costs of cotton farming, leaving hundreds of thousands of small cotton farmers impoverished and in debt. Contrary to claims by agrochemical companies, like Monsanto, that genetically modified crops will reduce dependence on pesticides, the reality on the ground shows otherwise.

Pesticides use increased due to increased resistance to Bt toxin. Single gene (Cry1Ac) modified cotton was the first to be introduced, followed by dual-toxin cotton hybrids (Cry1Ac and Cry2Ab) which by 2015 became susceptible to the pink bollworm that had evolved resistance to the toxin.[86] This severely affected the Bt cotton fields in the state of Gujarat and some parts of the states of Andhra Pradesh, Telangana, and Maharashtra. Data from Maharashtra, a Bt cotton-growing state, shows that pesticide consumption increased from 10,969 metric tonnes in 2014 to 11,665 MT in 2016.[87]

A study by Dr. K. R. Kranthi, former director of Central Institute for Cotton Research, on insecticide usage in cotton in India from 2005 to 2013 showed that Bt cotton increased the infestation of whiteflies in North India and whiteflies, thrips and leaf hoppers across the country, and resulted in intensive application of insecticides. The study also found that "the rapid introduction of more than 1000 new cotton hybrids

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84 CARE Ratings. (2017, May 31). *Outlook of Indian Pesticide Industry.* Retrieved from http://www.careratings.com/upload/NewsFiles/SplAnalysis/Outlook%20of%20Indian%20Pesticide%20Industry.pdf

85 Gadhe, S. (2017). Trends in consumption of pesticides in India and Telangana. *BEST: International Journal of Humanities, Arts, Medicine and Sciences,* (5)1, 39-44. Retrieved from http://bestjournals.in/download.php?fname=--1485336820-5%20-%20IJHAMS%20-%20Trends%20in%20Consumption%20of%20pesticides%20in%20India%20and%20Telangana.pdf

86 National Academies of Sciences, Engineering, and Medicine. (2016). *Genetically Engineered Crops: Experiences and Prospects.* Washington, DC: The National Academies Press.

87 Information from Maharashtra State level website as of 28th October 2016.

after 2006 and the increase in the area of hybrid cotton from about 45% in 2006 to 95% in 2013 quite possibly led to increased infestation of sap-sucking insect pests and the concomitant insecticide usage to 11,598 MT (0.9 kg/ha) by 2013."[88]

Domestic consumption of pesticides is expected to grow at 6.5% per annum from 2015 to 2020.[89] However, the failure to regulate pesticide use — including the growth in imports and use of unregistered pesticides — is causing public and environmental health issues in rural areas. Furthermore, concerns over declining productivity due to soil degradation, insufficient land entitlements of small and marginal farmers, and indebtedness are critical problems for Indian agriculture. From 1997 to 2015 – a period of 18 years – it is estimated that around 300,000 farmers committed suicide across India. Various analysts agree that the primary reason for farmer suicides is the economic distress of being caught in a "vicious cycle of crop failures and indebtedness."[90] In one study, more than 60% of farmers said that input costs had doubled over the previous decade, while 10% of the farmers said that input costs had increased threefold.[91]

To determine the gravity of the problem, and to document the extent of pesticide use and impacts, PANAP local partners did preliminary explorations and identified specific issues for in-depth study. Study sites were selected based on a set criteria (e.g. where the pesticide is approved for use, where illegal trade were observed, where child labour was reported, etc.). A total of 624 study participants were identified through purposive sampling. A multi-pronged approach was utilised to get a holistic perspective of the agricultural communities' situation.

Pesticide Action Network (PAN) India conducted four studies on HHPs focusing on marketing and use practices, and the health impacts of these pesticides. One of these studies looked into the root causes of Yavatmal[92] tragedy that distressed the local and global community.

The Society for Rural Education and Development (SRED) investigated the conditions of children labourers in the floriculture industry, while Sahanivasa focused on the mango orchard communities.

Conducted in various states in India, the six studies revealed the widespread use of highly hazardous (HHPs).[93] Integration of all the information from these studies revealed the use of 53 pesticides, 27 of

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88 Kranthi, K.R. (2014, December 16). Cotton Production Systems - Need for a Change in India. *Cotton Statistics & News*. Retrieved from http://www.cicr.org.in/pdf/Kranthi_art/cotton_prod_system_dec_2014.pdf

89 Federation of Indian Chambers of Commerce and Industry. (2016). *Next Generation Indian Agriculture - Role of Crop Protection Solutions: A report on Indian Agrochemical Industry.* Retrieved from http://ficci.in/spdocument/20744/Agrochemicals-Knowledge-report-2016.pdf

90 Honkalaskar, V.H., Bagde, B.D., & Kedare, S.B. (2018). Understanding Agrarian Crisis: A Systemic Analysis. *Journal of Agricultural Studies*, 6(1). Retrieved from http://www.macrothink.org/journal/index.php/jas/article/view/12770

91 Indo-Global Social Service Society & Baitarani Initiative. (2017). *Why farmers quit? A study on farmers' suicides in Odisha*. Retrieved from http://igsss.org/wp-content/uploads/2017/02/Farmers-Suicide-Report-Final.pdf

92 Yavatmal is an eastern district in Maharashtra, India where Bt cotton is extensively grown. It captured the limelight in 2017 after media reports of massive poisoning and deaths of farmers and farm workers in a matter of three months.

93 PAN International. (2017). PAN International Consolidated List of Banned Pesticides (3rd ed.). Retrieved from http://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

which are HHPs (See Annex 3.2.2: List of reported pesticides in India 2015-2016). Ten of these HHPs are considered highly toxic to children and thus, included in PANAP's "Terrible Twenty" List.[94] Various agrochemical TNCs — including Syngenta, Bayer, Monsanto, and Dow Chemical, their subsidiaries — and Indian companies are approved by the government as manufacturers and importers of these pesticides.

This report puts together the significant findings of the six studies, and presents it in four parts:

3.2.1: PAN India Study: Use of paraquat and other HHPs

3.2.2: SRED Study: Child labourers exposed to HHPs used in the floriculture industry

3.2.3: SAHANIVASA Study: Effects of pesticides on mango orchard communities

3.2.4: Violations of Human Rights and Agreements

3.2.1 PAN India Study: Use of Paraquat and other HHPS

Between 2015 and 2017, PAN India conducted four studies on HHPs focusing on marketing and use practices, and the health impacts of these pesticides:

1. *Conditions of Paraquat Use in India* by Dileep Kumar, PAN India, 2015. A joint research with the Berne Declaration, IUF (International Union of Food and Allied Workers) and PANAP. The study was undertaken in eleven field sites in six States – Andhra Pradesh, Arunachal Pradesh, Assam, Madhya Pradesh, Telangana, and West Bengal. There were 82 participants including 50 farmers, 23 workers, five pesticide retailers, and four agricultural extension officers.[95]

2. *Paraquat Dichloride Retailing in India: A case study from West Bengal* by Dileep Kumar, PAN India, 2016. The study focused on two distributors-cum-retailers and three retailers.[96]

3. *Reality of Pesticide Use in India: A case study on five pesticides* (2017, unpublished) referred to as "Study on 5 HHPs". It put together secondary data on atrazine, glyphosate, paraquat, chlorpyrifos and fipronil; and primary data from 227 respondents from 11 districts across seven states – Andhra Pradesh, Jharkhand, Himachal Pradesh, Karnataka, Tamil Nadu, Telangana, and West Bengal. The Provisions of the Right to Information Act were used to obtain classified information from Central and State agriculture departments.

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94 PANAP. (n.d.). *Twenty Terrible Pesticides that are Toxic to Children.* Retrieved from http://files.panap.net/resources/20-Terrible-Pesticides-poster.pdf

95 Kumar, D. (2015). *Conditions of Paraquate Use in India.* Retrieved from http://panap.net/2015/04/conditions-of-paraquat-use-in-india/. For brevity, it will be cited as Conditions of Paraquat Use in this report.

96 Kumar, D. (2017). *Paraquat Dichloride Retailing in India: A Case Study from West Bengal.* Retrieved from https://docplayer.net/49298071-Paraquat-dichloride-retailing-in-india-a-case-study-from-west-bengal.html. For brevity, it will be cited as Paraquat Retailing in this report.

4. *Pesticide Poisonings in Yavatmal District in Maharashtra: Untold Realities,* PAN India, 2017. Report on the FFM in Yavatmal where Bt cotton farmers and farm workers died due to pesticide poisoning. It covered discussions with the dead victim's family members, poisoned farm workers in the hospital, farmers in the area, the doctors and nurses of the Yavatmal Medical College Hospital, meetings with an agricultural officer, local journalists and a wholesale dealer of pesticides.[97]

Results

Prevalence of HHP use even without adequate training and PPE

The *Study on Five HHPs* revealed that chlorpyrifos, glyphosate, fipronil, paraquat and atrazine were used at a disconcerting rate in India (Figure 3.2.1). All five are in PAN International List of HHPs, and except for fipronil, all are in PANAP's "Terrible Twenty" list of pesticides extremely hazardous to children. Despite the acknowledged hazards and its banning in many countries, India continues to manufacture and distribute these HHPs (Box 3.2.1). It is doubly disturbing that most of the users were not trained in their proper handling and the need to use PPE (Figure 3.2.2).

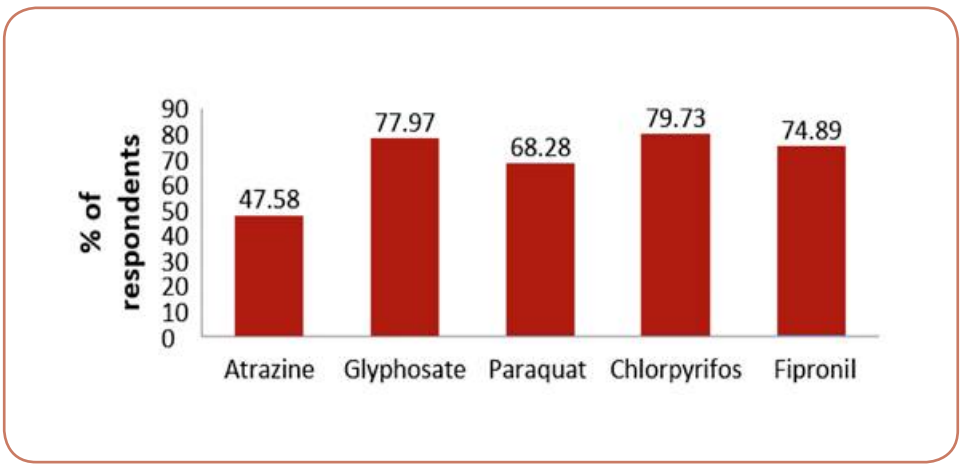

Figure 3.2.1 Use of pesticides in India, N= 227 (Source: Study on Five HHPs)

97 Kumar, D., & Reddy, D.N. (2017). *Pesticide Poisonings in Yavatmal District in Maharashtra: Untold Realities*. Retrieved from http://www.pan-india.org/wp-content/uploads/2017/10/Yavatmal-Report_PAN-India_Oct-2017_web.pdf

BOX 3.2.1 THE FIVE HIGHLY HAZARDOUS PESTICIDES FOUND TO BE IN USE IN INDIA, WITH APPROVED SOURCES OF IMPORT AND LOCAL MANUFACTURERS[98]

Paraquat

Banned in over 38 countries, including the European Union and Switzerland, Syngenta's home country, because of its adverse health effects,[99] it is the third most widely used herbicide in the world. It is known to harm farmers, farm workers and community members as a result of occupational and accidental exposure.[100] Less than one teaspoon, if ingested, is fatal. The European Commission has described the acute hazard of paraquat as very toxic by inhalation; toxic in contact with skin and if swallowed; irritant to the eyes, respiratory system and skin; and danger of serious damage to health by prolonged exposure.[101] However, Syngenta continues to sell the pesticide globally under the brand name Gramoxone. It is extensively used on plantations of bananas, cocoa, coffee, cotton, palm oil, pineapple, rubber, and sugar cane – even in small-scale farms. Paraquat poisoning has been reported in various states in India.[102] In 2011, the State of Kerala banned paraquat due to documented severe health consequences because of public health and environmental concerns.[103]

Only one company has been approved as source of import for Paraquat dichloride Technical 40% minimum, whereas two companies have approved for manufacturing the same indigenously (Table 3.2.1.1). For Paraquat dichloride Technical 42% minimum, two companies including the multinational giant Syngenta are approved as sources of import to India, where as a subsidiary of Syngenta – Syngenta India – has approved to manufacture it indigenously.

Table 3.2.1.1 Approved source for import and local manufacturers of paraquat

ACTIVE INGREDIENT	APPROVED SOURCES FOR IMPORT	LOCAL MANUFACTURERS
Paraquat dichloride Technical 40% min.	Comlets Chemical Industrial Co. Ltd., Taiwan	Crystal Phosphate Ltd., New Delhi United Phosphorus Ltd., Mumbai
Paraquat dichloride Technical 42% min.	Syngenta Limited, United Kingdom Sinon Corporation, Taiwan, Supplier: Sinon Corporation, Taiuchung	Syngenta India, Mumbai

98 Source: Study on Five HHPs

99 Watts, M. (2009). Paraquat [Monograph]. Penang, Malaysia: PANAP

100 Kumar, D. (2015). *Conditions of Paraquate Use in India.* Retrieved from http://panap.net/2015/04/conditions-of-paraquat-use-in-india/.

101 European Commission. (2016, April 7). Paraquat. *EU Pesticides Database.* Retrieved from http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=activesubstance.detail&language=EN&selectedID=1669

102 Kumar, D. (2015). *Conditions of Paraquate Use in India.* Retrieved from http://panap.net/2015/04/conditions-of-paraquat-use-in-india/.

103 Ibid

Atrazine

A selective, pre-emergence, and early post-emergence synthetic herbicide. It is banned in 37 countries including the European Union, yet it is still one of the most commonly used herbicides in the world. Atrazine interferes with hormonal activity in animals and humans even at extremely low doses. The human health and ecological risk assessments for atrazine indicate risks of concern; it has the most sensitive effects on the reproductive health as observed in atrazine toxicity tests.[104]

Seven sources of import and seven local manufacturers are approved for technical grade atrazine of 80%, 92%, 95% and 98% minimum (Table 3.2.1.2).

Table 3.2.1.2 Approved sources for import and local manufacturers of atrazine

ACTIVE INGREDIENT	APPROVED SOURCES FOR IMPORT	LOCAL MANUFACTURERS
Atrazine Technical **80%, 92% min. and 95% min*.98% min**	1. Agan Chemical Mfrs. Ltd., Israel 2. Makhteshim Agan Beer-Sheva, Israel. 3. Intrachem, SA, Switzerland 4. Fisons Ltd., Houston, UK 5. Oxon Italia, Italy. 6. Zhejiang Zhongshan Chemical Industry Group Co., Ltd. China (for 95%min) Supplier: M/s. Hebei Bestar Commerce and Trade Co. Ltd., China 7. Shandong Qiaochang Chemical Co. Ltd., China	1. Rallis India Ltd., Bangalore 2. Pesticides India, Udaipur 3. Nagarjuna Agrichem, Hyderabad 4. GSP Crop Science Pvt. Ltd. Ahmedabad 5. Insecticide India Ltd 6. Megmani Industries Ltd.* 7. Best Crop Science LLP, Gajraula, UP

Glyphosate

One of the most widely used herbicides in the world and was patented by Monsanto under the brand name 'Roundup' in 1974. In 2015, the International Agency for Research on Cancer (IARC) classified glyphosate as a probable human carcinogen. Doctors in Argentina have reported a dramatic upsurge in long-term effects in areas where genetically modified soy crops are aerially sprayed with glyphosate. These include cancer, infertility, pregnancy problems, birth defects, and respiratory diseases.[105] Other symptoms of glyphosate exposure are cough, redness of skin, redness and pain in eyes, and a burning sensation in throat and chest.[106]

104 US Environmental Protection Agency. (2013). *Atrazine Updates.* Retrieved from https://archive.epa.gov/pesticides/reregistration/web/html/atrazine_update.html

105 Watts, M., et al. (2016). *Glyphosate* [Monograph]. Retrieved from http://pan-international.org/wp-content/uploads/Glyphosate-monograph.pdf

106 The National Institute for Occupational Safety and Health. (2005). Glyphosate. *Centers for Disease Control and Prevention.* Retrieved from https://www.cdc.gov/niosh/ipcsneng/neng0160.html

Five companies including the multinational giant Monsanto are approved as sources of import for technical grade glyphosate of 95% minimum and Glyphosate IPA salt technical 62% minimum (Table 3.2.1.3). For the same chemicals, 26 companies are approved to manufacture locally.

Table 3.2.1.3 Approved source for important and local manufacturers of glyphosate

ACTIVE INGREDIENT	APPROVED SOURCES FOR IMPORT	LOCAL MANUFACTURERS
Glyphosate Tech. 95% min. **Glyphosate IPA Salt Technical 62% min.**	1. Monsanto Chemicals Co. Ltd., USA 2. Hebei Golhil Chemical, Co. Ltd, China(95% Min) 3. Cheminova Denmark. 4. M/s Hubei Sanonda Co. Ltd. China. 5. M/s Jiangxi Jinlong Chemical Co. Ltd., China with supplier name M/s Willowood China.	1. Atul Ltd., Valsad 2. Excel Crop Care Ltd. Ltd., Mumbai 3. Gharda Chemicals Ltd., Mumbai. 4. Chemtura Chemicals India Pvt. Ltd 5. Ravi Organics Ltd. 6. Meghmani Industries Ltd. 7. Insecticide India Ltd. 8. Crystal Phosphates Ltd 9. Hyderabad Chemicals Products Ltd., Hyderabad 10. Krishi Rasayan Pvt. Ltd., Kolkata 11. United Phosphorus Ltd., Vapi 12. Punjab Chemicals & Crop Protection Ltd 13. Rotam India Ltd 14. G S P Crop Science Ltd 15. Siris Crop Science Ltd., New Delhi 16. Jai Shree Rasayan Udyog Ltd, Sonepat (Haryana) 17. Heranba Industries Ltd, Mumbai 18. Shivalik Rasayan Ltd, New Delhi 19. Sharda worldwide Exports Pvt Ltd, Mumbai 20. Cheminova Inida Ltd., Gujtrat 21. Sabero Organics Gujarat Ltd. 22. Bharat Rasayan Ltd. , Delhi (95%) 23. Exel Industries Ltd., ROHA (Maharastra) 24. HPM Chemicals & Fertilizers Ltd., N. Delhi 25. Maheshwari Biochemical Pvt. Ltd., Sirsa 26. Best Crop Science LLP, Gajraula, UP

Fipronil

A broad-spectrum neurotoxic insecticide. It belongs to the chemical group phenylpyrazole. It is included on PAN International's list of HHPs (2018) for global phase-out because of its toxicity to bees. Its use in rice seed treatment caused massive crawfish kills in USA when the rice field tailwater was released into canals and used to irrigate fish ponds.[107] Its metabolite, fipronil-sulfone is more toxic than fipronil to mammals.[108]

There are three companies with two of them belonging to BASF and are approved as sources of import for Fipronil Technical 90% and 92%, whereas 15 companies are approved for manufacturing them locally. Bayer SAS, Bayer Environmental Science, France is the source of import for Fipronil 0.03% gel, 0.05% gel, there are no local manufacturers for them. Bayer Crop Science LP, USA, and Bayer Crop Science Ltd. Mumbai are approved as source of import and indigenous manufacture respectively (Table 3.2.1.4).

Table 3.2.1.4 Approved sources for import and local manufacturers of fipronil

ACTIVE INGREDIENT	APPROVED SOURCES FOR IMPORT	INDIGENOUS MANUFACTURERS
Fipronil Technical 90% and 92% min	1. BASF Agri. Production SAS, France (90%). 2. Bayer CropScience Hangzhou Co. Ltd., China (90%). 3. Anhui Huaxing Chemical Industry Co. Ltd., China	1. Gharda Chemical Ltd., Mumbai 2. Insecticides India Ltd. 3. Bhagiratha Chemicals & Industries Ltd. 4. Punjab Chemicals and Crop Protection Pvt Limited 5. PI Industries Limited 6. Coromandal International Ltd., 7. Bharat Rasayan Ltd., New Delhi (92% min.) 8. Hyderabad Chemicals Products Ltd., Hyderabad 9. Pest Control India (Pvt) Ltd, Mumbai (92% min.) 10. Atul Ltd., Valsad 11. Meghmani Organics Ltd., Ahmedabad 12. Tagros Chemicals India Ltd., Chennai (92%) 13. Rallis India Ltd. 14. HPM Chemicals & Fertilizers Ltd., 15. Best Crop Science LLP, Gajraula, UP
Fipronil 0.03% gel, 0.05% gel	Bayer SAS, Bayer Environmental Science, France	
Fipronil 80% WG	Bayer Crop Science LP, USA	Bayer Crop Science Ltd. Mumbai.

107 Watts, M. (2012). *Highly Hazardous Pesticide: Fipronil* [Fact sheet]. Retrieved from http://archive.panap.net/sites/default/files/pesticides-factsheet-hhps-fipronil.pdf

108 Ibid

Chlorpyrifos

A broad-spectrum organophosphate insecticide, acaricide, and nematicide. A PAN HHP, chlorpyrifos affects the nervous system by inhibiting the breakdown of the neurotransmitter, known as acetylcholine (ACh). Chlorpyrifos has a greater adverse effect on neural cell replication and is inherently more toxic to the developing brain than the more acutely toxic organophosphates such as diazinon and parathion. It is toxic to children at doses that are not toxic to adults.[109] Five companies are approved as sources of import for Chlorpyrifos Technical 94% including the company, Dow Agrosciences, while 28 companies are approved for local manufacture (Table 3.2.1.5). Only one company, Dow Agrosciences UK is the approved source of import, and De-Nocil Crop Protection Ltd., Mumbai is approved for local manufacture of Chlorpyrifos Methyl Technical 96%.

Table 3.2.1.5 Approved sources for import and local manufacturers of chlorpyrifos

ACTIVE INGREDIENT	APPROVED SOURCES FOR IMPORT	LOCAL MANUFACTURERS
Chlorpyrifos Technical 94% min.	1. Dow AgroSciences LLC, USA 2. Dow AgroSciences LLC, UK 3. Mekhteshim Chemical Works, Israel 4. FMC Corporation, USA 5. Cheminova Denmark	1. De-NOCIL Crop Protection Ltd., Mumbai 2. Excel Crop Care Ltd. Ltd., Mumbai 3. Gharda Chemicals Ltd., Mumbai 4. Montari Industries Ltd., Delhi 5. Siris India Ltd., Hyderabad. 6. Vantech Industries Ltd., Hyderabad. 7. GSP Crop Science Ltd., Ahmedabad 8. Sabero Organics Gujrat Limited, 9. India Pesticide Ltd, Lucknow 10. Punjab Chemicals and Crop Protection Ltd, Chandigarh 11. Rotam India Limited, Mumbai 12. Heranba Industries Limited 13. GSP Crop Science Ltd., Ahmedabad 14. Insecticides India Ltd., 15. Shivalik Rasayan Ltd., New Delhi 16. Bonagri Life Science Ltd, Hubli. 17. Coromandel International Ltd. 18. Hyderabad Chemical Products Pvt. Ltd. 19. Cheminova Inida Ltd., Gujarat 20. Netmatrix Ltd. Hyderabad 21. Megmani Organics Ltd., Ahmedabad 22. Bharat Rasayan Ltd., Delhi 23. Gujarat Insecticides Ltd. Ankleshwar 24. Sudarshan Chemical Industries Ltd., Pune 25. Bhagiratha Chemicals & Industries Ltd. 26. HPM Chemicals & Fertilizers Ltd., 27. Jubilent Life Sciences Ltd., UP 28. Best Crop Science LLP, Gajraula, UP
Chlorpyrifos Methyl Technical 96% min.	Dow AgroSciences LLC, UK	De-Nocil Crop Protection Ltd., Mumbai

109 Watts, M. (2013). *Highly Hazardous Pesticide: Chlorpyrifos* [Fact sheet]. Retrieved from http://www.pananz.net/wp-content/uploads/2014/09/Chlorpyrifos-factsheet-.pdf

Hazardous conditions of Use

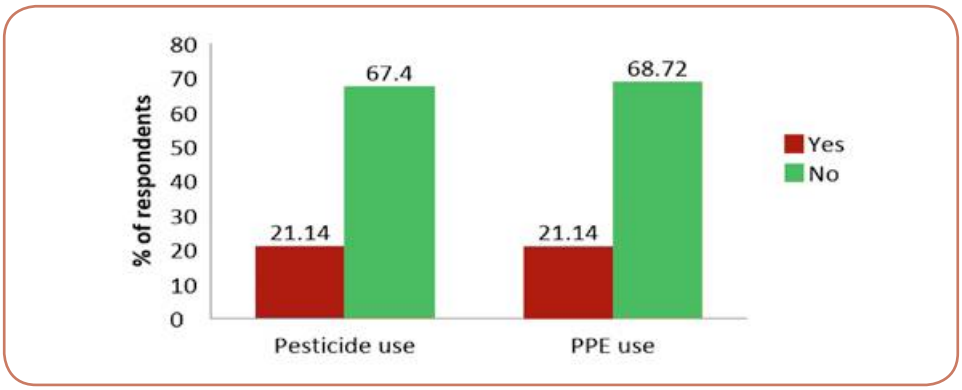

Figure 3.2.2 Training on pesticide and PPE use (Source: Study on Five HHPs)

Farmers trained (21%) on pesticide use and safety measures were mainly from Andhra Pradesh, Himachal Pradesh and Karnataka, where such awareness programmes were organised by agriculture offices.

While 21% were instructed on the use of PPE, only 11% undertook protective measures which fall short of wearing of the standard PPE. The least protection for the eyes, hands, and legs was noted. They use a hat, towel, or cloth as head cover; mask and cloth wrapped around the mouth and nose as face cover; some sort of spectacles and goggles as eye cover; raincoat and cloth as body cover; gloves, plastic sheet and full sleeved shirts as hand cover; and full length trousers and shoes as leg cover while mixing, spraying, broadcasting/dispersing and washing equipment.

The same practice was reported in *Conditions of Paraquat Use.* Only 40% of the respondents received training on pesticide application from agriculture officers, pesticide retailers and agents; and 82% were not instructed on the need to use PPE. Farmers (76%) handled paraquat with their daily clothes. Some do not even use foot wear while spraying or working in paraquat-sprayed fields. Quite a few (6%) used plastic sheets like an apron, while 18% occasionally wear gloves, full sleeved shirts, long trousers and shoes, or cover their mouth and nose with a piece of cloth.

The FFM in Bt cotton-growing areas of Yavatmal, revealed the use of 11 pesticides (Table 3.2.1), nine of which are HHPs - diafenthiuron, profenofos, cypermethrin, monocrotophos, imidacloprid, fipronil, spinosad, glyphosate, and acephate. Not one of the Yavatmal poisoning victims interviewed use safety equipment apart from the casual work clothes. They do not even use a full-sleeved shirt or pants, as they feel suffocated while working under the hot sun.

Paraquat Retailing revealed that the standard PPE were not sold or exhibited in pesticide shops as required. According to one retailer, some manufacturers provided gloves and goggles a couple of years ago, but this was stopped.

Table 3.2.1 Pesticides reported to have been used in cotton production in Yavatmal (Adopted from original report)

BRAND NAMES	MANUFACTURERS	ACTIVE INGREDIENTS	CHEMICAL GROUPS
Polo	Syngenta	Diafenthiuron 50%W/W	Thiourea
Pager	Dhanuka Agri Tech	Diafenthiuron 50%WP	Thiourea
Profex super	Nagarjuna Agri Chem	Profenofos 40% + Cypermethrin 4% EC	Organophosphate + pyrethroid
Monocil	Insecticides India	Monocrotophos	Organophosphate
Stick	Gharda chemicals	Diafenthiuron 50%WP	Thiourea
Monophos	BSH Agritech	Monocrotophos 36% SL	Organophosphate
Monostar	Swal / United Phosphorous Limited (UPL)	Monocrotophos 36% SL	Organophosphate
Police	Gharda chemicals	Imidacloprid 40% + Fipronil 40%	Neonicotinoid + Pyrazole
Celcron	Excel crop care	Profenofos 50% EC	Organophosphate
Blue copper	Syngenta	Copper oxychloride	Copper compound
Tracer	Dow	Spinosad 44.03% w/w	Spinosyn
Glycel	Excel crop care	Glyphosate 41% SL	Phosphonoglycine
Impool	M/S Nissan Chemical Industries Japan, Imported by Dhanuka Agri Tech, Marketed by Godrej Arovet	Quizalofop-ethyl 5% EC	Aryloxyphenoxy propionic acid
Lancer gold	UPL	Acephate 50% + imidacloprid 1.8% SP	Organophosphate + Neonicotinoid
Starthene	Swal Corporation	Acephate 75% SP	Organophosphate
Starthene Power	Swal Corporation	Acephate 50%+ Imidacloprid 1.8% SP	Organophosphate + Neonicotinoid

Illegal sale and use of pesticides

Of the 11 pesticides used in the cotton fields of Yavatmal, two were not approved by the CIBRC for use on cotton. These are the fungicide, copper oxychloride and the highly hazardous herbicide, glyphosate.

Paraquat Dicloride Retailing in India disclosed that only one of the three retailers who claimed having licenses to sell, stock, or exhibit pesticides, was able to show a valid license. Authorised to sell only three brands, the licensed retailer sold four other brands without permit documents from manufacturers.

The *Study on Five HHPs* found the five HHPs were being used on crops and in formulations not approved by the Central Insecticide Board and Registration Committee (CIBRC, Annex 3.2.1).

Atrazine in India, for example, is approved for weed control in only one crop that is for maize production and only one formulation is approved. However, it was found that agriculture officers and retailers are recommending its use in crops that are not approved. In fact, agriculture officers were giving recommendation for its use in wheat, barley, corn, soybean, and sugarcane; while retailers advised its use in the production of bananas and jower (a variety of sorghum).

The use of glyphosate is approved only for tea and non-crop weed control. However, agriculture officers and retailers have been recommending glyphosate to be used for weed control in several crops including vegetables, non-cropped areas, bushes, and general weed control, while the State Agriculture Department recommended seven uses of glyphosate. The actual field use was for 17 crops that did not include use in tea production, indicating that all uses of glyphosate noted in this study were for non-approved uses.

A significant variation was observed between the CIBRC- approved use of paraquat and the recommendations by the various State agriculture departments, commodity boards, and manufacturers. For example, in violation of the Indian Insecticides Act, Syngenta advised the use of paraquat on 12 crops beyond what is approved by the CIBRC in 2015.

There was also major deviation for chlorpyrifos which is used in more than 20 crops, with many of them not approved by CIBRC. Similarly, fipronil is used in 27 crops in the field. However, only seven crops are approved and the other 20 crops are not approved by CIBRC.

Spraying is the only method approved for paraquat application. Yet, 26% of farmers apply it by dispersion, i.e. it is mixed with sand, fertilisers, or salt and then spread by hand. This is extremely dangerous since none of the farmers wear PPE while mixing or dispersing.

In the widely-used application method of spraying, paraquat is mixed with 2, 4-D and other materials such as salt, kerosene, shampoo, and adhesives in the belief that these materials improve the pesticide's effectiveness. Such practice is recommended by retailers or agents of distributors, not by the CIBRC, agriculture officers, or manufacturers.

No maximum residue limit (MRL) and waiting periods were set for the non-approved crops which further endangers and exposes the farmers, workers, and the consumers.

Improper storage and disposal of pesticides and containers

Majority (78%) of the respondents in *Conditions of Paraquat Use* store paraquat at home, 18% in the farm shed, while 4% in cattle sheds (Figures 3.2.3 and 3.2.4). Empty paraquat containers and bottles were thrown into the fields (74%), used as containers or water vessels in toilets and bathrooms, sold to scrap dealers and ice cream vendors, buried or burned.

The same practice was observed in *Study on Five HHPs* where majority (66%) stored pesticide containers at home (kitchen, wall shelf, veranda, near the window, store room, etc.). Containers were reused to store seeds, kerosene and oils; as water vessels in toilets and bathrooms; and as a night lamp.

According to the retailers, there is no system in place for proper disposal of pesticide containers, and that they do not collect the empty containers or facilitate safe disposal as required.

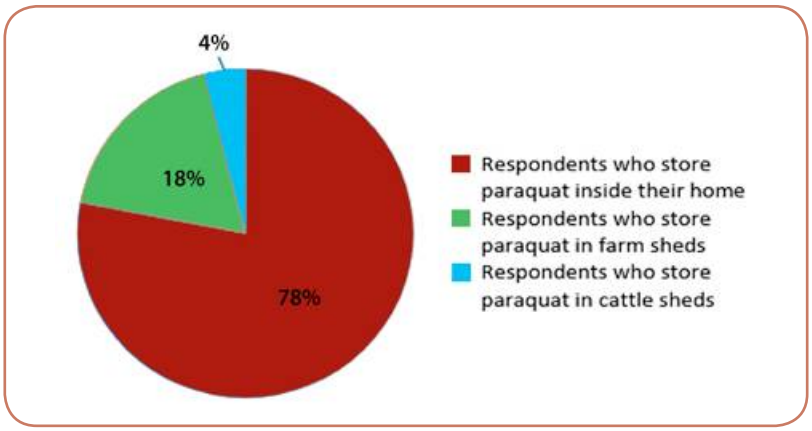

Figure 3.2.3 Place of storage of pesticides

Figure 3.2.4 Farmer in a storage room of pesticides (Photo by Bhariab Saini for PAN India)

Decanting of HHPs and use of unauthorised containers

About half of the respondents in *Conditions of Paraquat Use* bought paraquat in containers without label and instructions. This is so because small-scale farmers require only a small volume – mostly 200 ml, 100 ml or 50 ml – and since most of the brands are sold in big volumes, retailers decant the required quantity into empty pesticide bottles or plastic carry bags.

The study, *Paraquat Dichloride Retailing in India,* reported that decanting has been done for long and often in front of the customers. During the study, a retailer was observed decanting, handling, and

refilling containers carelessly, with paraquat either smeared around the containers or dropped onto the floor or table. He collected and poured leftovers back into the containers or used it to refill the containers with bare hands.

Figure 3.2.5 Paraquat decanted into plastic bags (Photo by PAN India)

The *Study on Five HHPs* revealed that decanting of glyphosate, paraquat, chlorpyrifos, and fipronil was indeed common in West Bengal where small-scale and marginal farmers predominate.

Improper or inadequate labelling

The lack of labels and instructional leaflets was reported in Andhra Pradesh, Jharkhand, and Karnataka.

Many respondents who bought pesticides in their original containers did not read the label or information leaflet, 60% in *Conditions of Paraquat Use* and 49% in the *Study on 5 HHPs*. This is because either the details (Figure 3.2.6) are given in very small text that they are unable to read, it is in a language they do not understand (e.g. all 10 paraquat brands found in West Bengal retail shops contain information in English, Hindi, and other Indian languages, not in Bengali), or they are illiterate.

Figure 3.2.6 Pesticides found in the field (Photo by PAN India)

The labels did not give clear instructions on the use of PPE. Some products stated "wear full protective clothing while mixing, spraying and broadcasting," or simply, "wear protective clothing" but no specifics on the required "full protective clothing". Information on protective clothing was not found on the labels of Gramoxone (Syngenta) and Uniquat (United Phosphorous Limited).

PAN India's analysis of selected product labels of four HHPs – Dursban (chlorpyrifos 20%EC) from Dow AgroSciences; Reagent SC (fipronil 5% SC), Reagent GR (fipronil 0.3%GR) and Jump (fipronil 80% WG) from Bayer Crop Science; RoundUp (glyphosate IPA salt 41%SL) from Monsanto; and Gramoxone (paraquat dichloride 24% SL) from Syngenta revealed the following:

- All except Dow provided the names of crops as per the uses approved by CIBRC. Dow gave general recommendations for use, but did not mention specific crops approved by the CIBRC which could lead to non-approved uses.
- Only Dow and Monsanto provided information on treatment in case of pesticide poisoning on the labels. Information on antidotes was noted on the labels of five products, except Monsanto's RoundUp.
- A precautionary statement (such as avoid contact with skin and eyes, keep away from foodstuffs, avoid inhalation, handle with care, etc.) was noted on the label of five brands, except Bayer's product, Jump. Detailed information regarding protective clothing (such as wear protective clothing like apron, gloves, face shield and boots) was noted on the label of Dow's product, while a general statement (such as wear full protective clothing while spraying or broadcasting) was noted on two Bayer products. One Bayer product as well as products of Monsanto and Syngenta did not have such details on their labels.

- Guideline information on storage was noted on the labels of four products, but was lacking on Bayer's Reagent GR (Figure 3.2.7) and Syngenta's Gramoxone.
- Guidelines on disposal of containers was noted on Dow's Dursban and Monsanto's Roundup. Dow stated "The empty containers should never be re-used and should be destroyed and buried in a safe place. Dispose of packages or surplus material and washings in a safe manner so as to prevent environmental and water pollution." But Monsanto's labels simply stated "Destroy empty containers" without information on how the container can be safely disposed.

Figure 3.2.7 A farmer with a bottle of the pesticide Reagen (Photo by Bhariab Saini for PAN India)

Incidents of exposure and pesticide poisoning

Incidents of exposure to pesticides, especially to atrazine and glyphosate, was reported by 7% of respondents in the *Study on 5 HHPs*. Most of the exposure happened when the wind direction changed while spraying, and when spillage occurred while opening container lids, mixing, and loading pesticides into the sprayer.

Of the farmer respondents in *Conditions of Paraquat Use,* 40% reported experiencing ill effects after exposure to the pesticide (Figure 3.2.8). Among these were headache, burning sensation, itching and irritation, lethargy, breathing difficulty, toe nail damage, muscle pain, vomiting, nausea, tiredness and discomfort, abdominal discomfort, pain and stomach upset, giddiness, fever, burning eyes, dizziness and skin allergy.

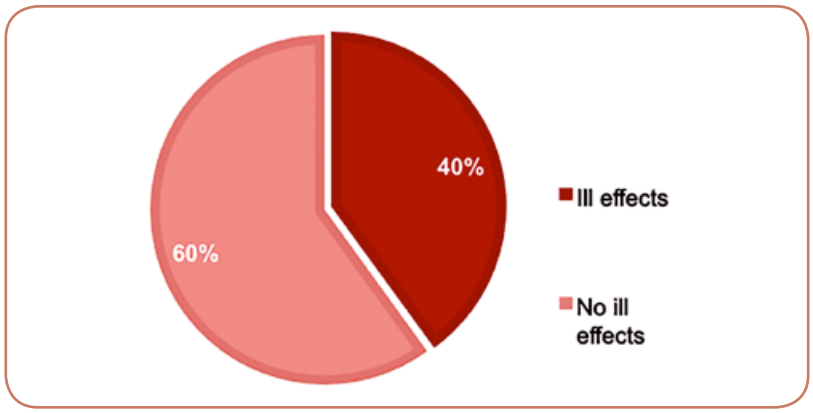

Figure 3.2.8 Ill effects reported by farmers after working with paraquat

Massive deaths and poisoning due to pesticides: The Yavatmal (Maharashtra) tragedy

PAN India's FFM covered the dates from 6, July to 5, October 2017. During this period, 450 poisoning cases and 23 deaths were reported in Yavatmal Medical College Hospital (YMCH). Impaired vision, eye burns, loss of memory, nausea, vomiting, headache, sweating, restlessness, fasciculation (muscle twitch), respiratory distress, pupil constriction, and shivering among others, were common among the victims. Respiratory paralysis occurred in severe cases, which accounted for most of the deaths.

The YMCH doctors noted that pesticides with the brand names Polo, Profex Super, Monocil were the major pesticides reported by most of the patients (all working in Bt cotton fields), as well as Starthene, Police, Gayathri and Tonic (Table 3.2.2). These brand names contain HHPs (diafenthiuron, profenofos, cypermethrin, monocrotophos, imidacloprid, fipronil, and acephate).

Table 3.2.2 Pesticides reported by poisoned Bt cotton farmers and the manufacturers (Adopted from original report)

ACTIVE INGREDIENTS	BRAND NAME/ MANUFACTURERS	CHEMICAL GROUPS
Diafenthiuron	Polo / Syngenta	Thiourea
Profenofos 40% + cypermethrin	Profex Super	Organophospate + pyrethroid
Acephate	Starthene / Swal Corporation	Organophospate
Monocrotophos	Monocil / Insecticides India	Organophosphate
Imidacloprid + Fipronil	Police / Gharda Chemicals	Neonicotinoid + Pyrazole
	Gayathri*	
	Tonic*	

** Could not trace the active ingredient or manufacturer.*

PAN India noted that the hospital considers all inhalational poisoning cases as due to organophosphate pesticides (OP) and do not perform the standard blood tests to determine the actual cause of poisoning. This resulted to mistreatment and aggravated the victims' condition who use a cocktail of pesticides, mostly a combination of OPs and pyrethroids. Such practice of mixing pesticides is per advice of retailers and other farmers, and is approved by the state of Maharashtra.[110]

The team also discovered that the victims used different Bt cotton hybrids, that include Bollgard III. Also known as Roundup Ready Flex, this herbicide tolerant hybrid is not yet approved and has made its entry into the country illegally.

Farmers blamed the unusual height of Bt cotton plants for their poisoning, as the pesticide released from the sprayer is at the approximate height of the sprayer's face and this exposes the farmers to greater contact through inhalation.

PAN India encountered several cases of severe pesticide poisoning during the FFM (Box 3.2.2).

BOX 3.2.2 TWO OF THE MOST SEVERE CASES OF POISONING IN YAVATMAL

A 50-year-old farmer from Ghatanji Taluka in Yavatmal grows cotton on eight acres of land. He sprays the cotton crop once a week. Besides spraying his own field, he also undertakes hired spraying work in other farmers' fields. Every week, on average, he sprays for about eigth hours for three days. Just before he was taken to the hospital, he sprayed a mixture of two pesticides, named Polo (active ingredient diafenthiuron) and Gayatri (unable to trace the technical ingredient), on cotton. He was using a manually operated backpack sprayer and was spraying from 10:00 a.m. to 3:00 p.m. By evening, he had developed eye irritation and suffered impaired vision. "I was unable to see and felt burning sensation on my eyes and face," he said. The spray fell back on his face several times because of the wind and the height of the cotton plant, which had grown to nearly six feet that year. He had never used personal protection equipment. He was in the hospital for about a week, and suffers from restlessness and shivering hands. PAN India learned that it could be due to atropine, a medication used to treat certain types of nerve agent and pesticide poisonings. The farmer's wife attested PAN India that the farmer has been spraying for 10 years and this is the first time he developed such illness.

A 30 year-old farmer from Dongargaon, Wani Taluka in Yavatmal suffered from eye burns after spraying pesticides. He has 12 acres of cotton field and has been spraying pesticides for about 15 years. Usually cotton is sprayed once a fortnight, two days continuously. This man normally sprays in two shifts a day, from 7:00 a.m. to 10.30 a.m. and from 4:00 p.m. to 6:00 p.m. These timings are normally recommended. However, he

110 Maharashtra gives guidelines on pesticide mixtures in its website according to the PAN India Report on Yavatmal. See Kumar, D., & Reddy, N.D. (2017). *Pesticide Poisonings in Yavatmal District in Maharashtra: Untold Realities.* Retrieved from http://www.pan-india.org/wp-content/uploads/2017/10/Yavatmal-Report_PAN-India_Oct-2017_web.pdf

developed eye burns and irritation after spraying the pesticides Polo and Profex Super (a.i.s) in combination for two days continuously.

He has also not used any protective measure and was using a battery-powered sprayer. "Cotton plant has grown beyond six feet height this year, and do not know why it has happened," he said. Besides the eye injury, his hands were shivering. He was wincing whenever he had to shift himself. When asked, the farmer said he would avoid pesticides once he goes back to work. We wondered how much support this government would give him to do safe and healthier farming.

A Special Investigation Team (SIT) was appointed by the Maharashtra government to probe the death of cotton farmer and workers in Yavatmal district after spraying pesticides. In its findings released on January 2018, the SIT affirmed that "farmers and the farm labourers did not use the protective gears" to cover their faces and upper bodies. This was especially crucial since the farmers had to lift the spraying pumps above their height, as the cotton plants were taller. The SIT also pointed out the use of "cheaper and unscientific mixtures of pesticides" in increased concentration, and the use of high-volume pumps, for which pesticide distributors are liable.

As a whole, the SIT called the pesticide-related deaths in Yavatmal a "man-made disaster," citing a complete failure of administration and regulation at the state level, which allowed the sale and use of banned pesticides, leading to the large number of deaths and cases. It recommended a ban on monocrotophos and asked authorities not to give license for the sale of any chemical for which antidotes are not available.

3.2.2 SRED Study: Child Labourers Exposed to Hazardous Pesticides in the Floriculture Industry

Background and Methodology

Due to the rising demand for cut and loose[111] flowers locally and internationally, both small households and big plantations in India are increasingly utilising land for floriculture. According to the National Horticulture Database 2010, the area under floriculture production in India was 0.183 million hectares, with a production of 1.021 million loose flowers and 666.7 million cut flowers.

The state of Tamil Nadu has the highest hectarage in India in flower cultivation as well as loose flowers production. A total of 25,610 hectares are dedicated to floriculture. The major flowers grown are jasmine, mullai or Arabian jasmine, rose, crossandra, chrysanthemum, marigold, tuberose, Arali or oleander, and Jathimalli.[112]

Floriculture is one of the fastest growing agricultural industries because of its potential to provide quick returns to farmers. However, it uses vast amounts of toxic pesticides in all stages of production. The floriculture industry uses children in its employ, with their small hands ideal for picking flowers. These child labourers thus become exposed to HHPs as a result.

Figure 3.2.9 Interview with child labourers (Photo by SRED)

111 Cut flowers are fresh flowers harvested along with their stems and leaves. Loose flowers are usually harvested without stalk and used for prayers and garlands.

112 *Jasminum grandiflorum L. Oleaceae*

The Society for Rural Development and Education (SRED) conducted a study on the impact of pesticides on children working in floriculture plantations in the villages of Thazhavedu and Nemili in Tiruvallur district, Tamil Nadu. Field interviews were held with 103 women, six men and 121 children (Figure 3.2.9). The women and men included parents of child labourers, teachers and former representatives of local self-governance. Most of the children working in floriculture were aged below 16.

Results

Exposure to HHPs and hazardous work since early childhood

Children are mainly exposed while working in the fields plucking the flowers, and by living in the neighbourhood where pesticides are sprayed. The children, aged 10 to 17, start working as early as 5:30 a.m. to 6:00 a.m. and continue to pluck flowers till 8:00 a.m. They work 10 to 15 hours per week.

The children interviewed said that they started working in the floriculture fields since early childhood to assist their parents in making a living (Box 3.2.3). Since employing children is a punishable offence in India, everyone that employs children in the floriculture industry say that the children are their own or their relatives. These children are paid far below the minimum wage levels.

BOX 3.2.3 CHILDREN'S TESTIMONIES ON THEIR WORK AS FLOWER PLUCKERS

"I have been supporting my parents with plucking flowers since the age of eight. Now I can pluck flowers very fast. I wake up at 5:00 a.m. and go to pluck flowers. I pluck around two kilos of flowers before 8:00 a.m. After which I take a bath, have breakfast, and then walk to the school which is half a kilometre from my house. My house is situated near the flower cultivation field. I often suffer from stomach ache and have nausea. My parents do not take me to doctor. My mother gives herbal medicines. I am interested in studies and will study until my parents stop me schooling." *Malathi, 10, from Nemili village*

"Our family is very poor and hence along with my elder sibling I also go for plucking flowers. I started to go to the fields with my parents when I was young. I wake up at 5.30 am and go to the field. Till 7.30 I work and then I prepare for the school. I can pluck flowers very fast. I often suffer from head ache and I have skin allergies. My teachers tell me that it is due to the uncleanliness and they advise me to keep myself clean. Even though I keep myself clean, the problem persists. My parents do not have time to deal with this. I get medicine from the primary health centre but it does not help. Other children from my school also suffer the same problem." *Jansi, 9, from Nemili village*

"We are poor and my parents are coolie workers. When I started in my early childhood to pluck flowers, I could get only Rs. 2 per day (USD 0.19). But now I am able to earn more. On holidays I work till 12:00 a.m. and I am able to earn Rs. 50 (USD 0.78). I give the money to my mother who saves the money for buying food and clothes for me. I often fall ill due to nausea and stomach ache. Sometimes I could not go to school because of my stomach ache. I get medicine from the primary health center but I am not completely cured." *Ramesh, 12, from Thazhavedu village*

There were 20 pesticide brand names reported to be in use in the study area (Table 3.2.3). Among the active ingredients identified were the HHPs paraquat, cypermethrin, and chlorpyrifos.

Table 3.2.3 Pesticide brand names reported in the study area

BRAND NAMES	PESTICIDE TYPE	ACTIVE INGREDIENTS
Ahtrseol	No info	
Alanto	Insecticide	Thiacloprid
Anusan-50	No info	
Atabron	Insecticide	Chlorfluazuron; Isophorone; Napthalene
Chandika-505	Insecticide	Chlorpyrifos 50% + Cypermethrin 5%
Chohigon	No info	
Custodia	Fungicide	Azoxystrobin 11% + Tebuconazole 18.3% w/w SC
Cypermethrin	Insecticide	Cypermethrin
Danfuron	No info	
Doom	Insecticide	Plant-based, natural
Fosmite	Insecticide	Ethion 50%
Ghatak	Insecticide	Lambda cyhalothrin 2.5% EC
Interpld Profigon Plus	Insecticide	Profenophos 40% EC + Cypermethrin 4% EC
Kapiq	Herbicide	Paraquat Dichloride 24 % SL
Laruamster	No info	
Marker	Insecticide	Pyrethroid ester
Methrin	Insecticide	Alpha cypermethrin
Permasect	Insecticide	Permethrin 25%w/v
Phoskill	Insecticide	Monocrotophos 36% SL
Plethora	Insecticide	Novaluron 5.25% + Indoxacarb 4.5% w/w SC
Pretigan	Herbicide	Pretilachlor 50% EC
Quaride Success	No info	
Superkiller	Insecticide	Pyrethroid
Super 505	Insecticide	Chlorpyriphos 50% + Cypermetherin 5% EC
Talus	Insecticide	Buprofezin 70%
Valigan	Fungicide	Validamycin 3%
Volta-80	Herbicide	Sulfonylurea

Children use their bare hands and wear no protective gloves while plucking flowers. They were observed in some occasions to enter and work in the fields immediately after the spraying of pesticides.

Child labourers also mix pesticides without protection. The survey team witnessed child labourers mixing a type of poisonous chemical powder that is used to preserve the whiteness of the flowers with their bare hands.

Figure 3.2.10 Child labour in the floriculture farms (Photo by SRED)

The child labourers, as well as the other workers in the floriculture areas surveyed, had not undergone any training and thus had very little or no knowledge about the hazards of the pesticides that they are using. This explains why they handle pesticides with no protective gears (Figures 3.2.10 to 3.2.12).

Figure 3.2.11 A woman sprayer in her daily clothes (Photo by SRED)

Figure 3.2.12 A pesticide applicator mixing pesticides with water without PPE (Photo by SRED)

Pesticide poisoning

Various symptoms of pesticide poisoning were identified among the child respondents. These included eye irritation, nausea, stomach ache, headaches, skin allergies, excessive sweating, blurred vision, body pain, and lack of appetite, tiredness, burning sensation, coughing and vomiting. The team found that the legs of one child labourer who used to work in the fields have been affected with incurable sores. The children did not receive medical attention or treatment.

One child labourer said, "I often suffer from stomach ache and have nausea. My parents do not take me to doctor. My mother gives me herbal medicines."

In a similar condition, Jansi, aged nine, testified "I often suffer from headache and also have skin allergy. I do not know the reason for both. My teachers tell me that it is due to the uncleanliness and hence they advised me to keep myself clean. In spite of doing so, I have the same problem. My parents do not have time to care for this."

Schooling of children is affected

Children's homes and school are within a radius of less than one kilometre from the fields where pesticides are sprayed.

Nurses from the Primary Health Centres who conduct regular medical check-ups, revealed that most child labourers are malnourished. According to the teachers, child labourers are often absent from class. Ramesh affirmed this, saying, "On few occasions I could not go to school because of stomach ache." Teachers further said that children working in the floriculture fields are slow learners compared to the other students.

Improper disposal and reuse of pesticide containers

Empty containers are thrown in open fields or are reused at home. During the survey, a woman was seen using an empty pesticide container for washing clothes.

3.2.3 SAHANIVASA Study: Effects of Pesticides in Mango Orchard Communities

Background and Methodology

Over the past 10 years, the pattern of agricultural production in Chittoor District (State of Andhra Pradesh) drastically changed from producing minor millets to mango production. The Government promoted mango production to increase exports.

Mango orchards are the main form of agricultural productivity. The work and wage system is 'resident family labour'. One or two families reside in huts in the middle of a mango orchard, taking care of all the trees. A family of two adults, with two to three children and one or two dependent senior citizens, take care of about 50 trees. In mango orchards, pesticides are used from the first stage of flowering until the fruit develops.

Figure 3.2.13 Interview with mango plantation workers (Photo by SAHANIVASA)

Paddy, maize, millet, and vegetables such as cauliflower and tomato are also grown by farmers in small landholdings, usually one acre. Others work as agricultural labourers either in mango orchards or on small-scale farms.

A study of pesticide effects on these agricultural communities was conducted by SAHANIVASA, an organisation working with agricultural workers and tribal people and supporting the unionisation of agricultural workers.

There were 80 respondents comprising of farmers/farm owners, agricultural workers, community workers, government officials, and health workers. The study also separately covered 34 children in the age group of six to 11. The child respondents — 21 boys and 13 girls — were studying in schools in Chittoor, Saddam, and GD Nellore. Data collection was done by the local units of APVVU, an agricultural workers union (Figure 3.2.13). Technical and resource support for the study was provided by PANAP.

Results

Exposure to HHPs and banned pesticide endosulfan

All the respondents in this study have been using pesticides for the last 20 years and do calendar spraying, i.e. for mangoes production, they spray every three months.

Two techniques are used for pesticide spraying. One is using tractor tanks. In this method, pesticide is mixed in tanks of 6,000 liters capacity and sprayed through sprayer guns. The second is spraying through pedal pumps or backpack sprayers. The spray guns are held vertically or horizontally by the sprayer, depending on the height of the tree. When held vertically to reach higher branches of trees, the pesticide contact (shower effect) with the person applying the spray is direct and high. In the horizontal holding of the sprayer gun, the shower effect is determined by the wind, angle at which the spray gun is held and the velocity of the gun. In all these conditions, pesticide exposure for the person spraying is inevitable.

Families working in mango orchards live under the canopy of mango trees, which are sprayed with pesticides almost every day of the crop cycle from flowering, to fruiting, to harvest. This means that they are constantly exposed to pesticides. This is especially hazardous considering that some varieties of commercial mango trees are bred to be short or as shrubs.

Figure 3.2.14 Pesticides found in the mango plantation (Photo by SAHANIVASA)

The survey among community members (Figure 3.2.14) and retailers revealed that various brands and types of pesticides are being used including the HHPs endosulfan,[113] dimethoate, monocrotophos, propargite, and quinalphos. Under the Stockholm Convention, endosulfan is being phased out globally and is currently banned in more than 80 countries.

The HHPs metiram and mancozeb were also in two brand names sprayed by the respondents in the mango orchards (Table 3.2.4). Mancozeb has been identified as a probable human carcinogen by the US EPA.[114]

113 The 2011 interim order banning endosulfan (but with exemptions) for the next five years by India's Supreme Court has expired. See Misra, S.S. (2011, June 21). The Ban of Endosulfan and After. *Centre for Science and Environment.* Retrieved from https://www.cseindia.org/the-ban-of-endosulfan-and-after-2678

114 US Environmental Protection Agency Office of Pesticide Programs. (2017). *Chemicals Evaluated for Carcinogenic Potential: Annual Cancer Report 2017.* Retrieved from http://npic.orst.edu/chemicals_evaluated.pdf

Table 3.2.4 Brand names reported by the respondents

BRAND NAMES	ACTIVE INGREDIENTS	MANUFACTURERS
Curzate M8	Cymoxanil 8% + Mancozeb 64%	DuPont
Cabrio Top	Metiram + Pyraclostrobin	BASF

Lack of Protective Personal Equipment

The pesticide sprayers do not use PPE while applying pesticides and the most common "protective" clothing is a towel wrapped around the head to cover the nose, ears, and mouth. Usually, farmers are minimally attired for agricultural work. Men usually wear loincloths or "lungi". Women meanwhile only use a wraparound to cover themselves. The provision of PPE is not part of the agreement of agricultural workers with their employers. 'Contracts' are informal and usually just verbal agreements and there is nothing in the agreement for contingencies, unforeseen incidents, or illness due to pesticide poisoning.

Meanwhile, the retailers interviewed said that they do not sell protective clothing. They claimed that they do not stock such items since there is no demand for it from the consumers. The respondents said that they did not use PPE because it is either too expensive, not available, and most of all, uncomfortable. The lack of proper PPE leads to clear cases of pesticide poisoning.

BOX 3.2.4 A POISONING CASE IN THE MANGO ORCHARD

Anitha was wearing a sari with which she had covered her head, with special attention to covering of eyes, nose and mouth. She was wearing the long sleeved shirt of her husband. In addition, she had used a towel to cover the exposed parts of the hands. While spraying on the mango trees, the sudden change of wind direction turned the pesticide spray on Anita. The pesticide went to her face and drenched her dress. Within 10 minutes, Anitha felt dizzy. She had headache and vomiting. The skin in her face and neck became reddish.

Health effects of pesticide exposure

All of the 80 respondents handling pesticides have experienced adverse health effects (Figure 3.2.15) over the past years, which include headache (31.08%), skin rashes (24.28%), and dizziness (21.62%).

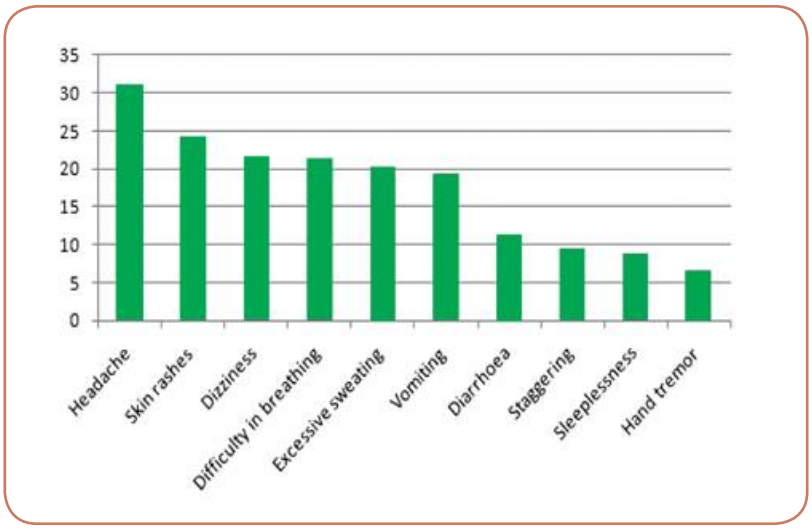

Figure 3.2.15 Health effects of pesticide exposure

Improper disposal of pesticide containers

Seventy percent (70%) of respondents reused pesticide containers (Figure 3.2.16). Buckets, drums, and large bins are used mostly as containers for storing water and grain. Smaller containers are reused for packaging items including food (30%), storage of general household items like clothes and utensils (32%), and storing animal feed (21%).

The retailers interviewed do not see the disposal of containers as part of their responsibility, and say that it is up to the farmers what to do or how to dispose these.

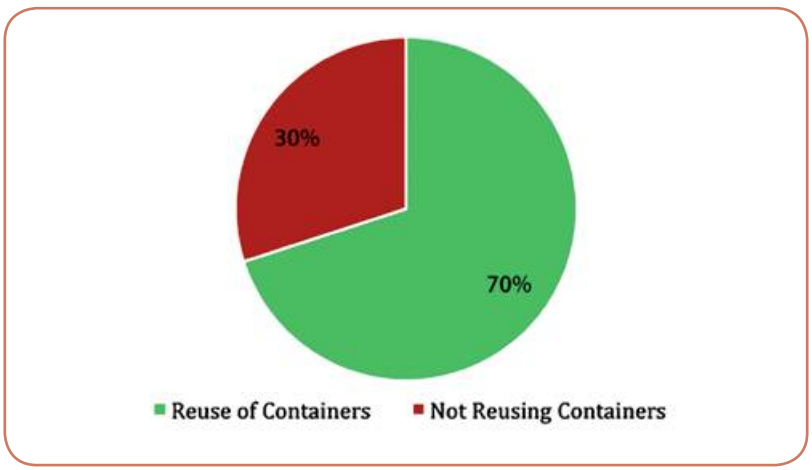

Figure 3.2.16 Reuse of pesticide containers

Pesticide labels not read

Shops that sell pesticides do have instruction leaflets available if requested. However, 62% of the respondents do not read the labels or leaflets, mainly because they rely on oral and informal sharing of information on the use of pesticides.

Pesticide companies do not provide training on safe use

Pesticide retailers — shop owners and sales persons — have not undergone any training on the safe use of pesticides. Their knowledge and information is based on experience and information shared by pesticide manufacturers, farmers and agricultural technicians. Pesticide companies conduct workshops and seminars to introduce new products as part of their sales promotion. Only technical information about a new brand or product is shared with the participants. No information about the hazards or safe use and handling of the product is shared.

All the surveyed retailers are aware that some of the pesticides banned in other countries are manufactured for sale in India. However, their knowledge of this is minimal. Specific lists of the banned and permitted pesticides are not available with the shop owner.

Effects on children

The children were studying in schools and were living at a distance of one to three kilometres from farms where pesticides are used. The surrounding farms grew vegetables and mangoes.

Three of the 34 children respondents suffered direct ill health effects: vomiting, skin itching, breathlessness, and dizziness. In all these cases, they were provided local remedies like coconut water and juice of the banana bark as first aid. In case of skin irritation, the affected area was washed in clean water, wiped dry, and applied with coconut oil. All the affected children were taken for medical help, which consisted of administration of liquids including oral rehydration solution. All the respondents said that the fear of death predominated more than the physical discomfort. Their fear is based on the knowledge that pesticides can kill. Eleven of the 34 children suspected that their symptoms including dizziness, flu-like symptoms and cough could be due to pesticides exposure.

3.2.4 Violation of Rights and Agreements

The rights to life and health are violated with the conditions of use of HHPs in India. Pesticide manufacturers that have sold and recommended the use of pesticides in crops beyond that which has been approved by the CIBRC are culpable. There is currently no mechanism in India to monitor and ensure that paraquat and other pesticides are used only on crops for which they are legally approved.

All these pesticides are highly hazardous and have health and environmental impacts. And yet; manufacturers, distributors, and retailers are producing, selling, and promoting these HHPs knowing full well that these cannot be used without risk under conditions of use in developing countries such as India. The government of India is also responsible in allowing such dangerous pesticides to be available and sold to farmers who have no information about hazards, do not use any PPE, and do not have access or are illiterate to read labels. Worse, children as young as nine years old are forced due to poverty to work in the floriculture industry and are exposed to these HHPs. These vulnerable group of young children face a lifetime of chronic impact such as hormonal disruption caused by the specific HHPs.

Violation of National Regulations

The *Study of Five HHPs* on the actual use of atrazine, glyphosate, paraquat dichloride, chlorpyrifos, and fipronil in India revealed violations of the provisions of national laws and rules. The application of these pesticides to crops not approved by CIBRC, per recommendation of state agriculture departments, was noted in the study.

The sale of pesticides without labels and instruction leaflets, and the decanting into bottles and plastic bags violate Insecticide Rules 16-19. Insecticide Rule 39 sub rules 1-4 on the standard PPE have been violated as these are not available either in the villages, retail points or agriculture offices. None of the interviewees wear the recommended PPE.

Majority of the farmers (Figure 3.2.17) have been using pesticides without proper training, and this violates Insecticide Rule 42 which states that "manufacturers and distributors of insecticides and operators should arrange suitable training in observing safety precautions and handling safety equipment provided to them".

Rule 44 sub rule 1, that states "it shall be the duty of manufacturers, formulators of insecticides and operators to dispose packages or surplus materials and washing in a safe manner so as to prevent environmental or water pollution" (Figure 3.2.18) was infringed, too, as no proper disposal mechanism nor washing facility was noted in the field.

Pesticide poisoning and death of small scale farmers and farm workers while spraying pesticides in the cotton fields violates the Insecticides Act 1968 and the Insecticide Rules 1971 which are meant "To regulate the import, manufacture, sale, transport and distribution and use of insecticides, with a view to prevent risk to human beings and animals."

Farmers and agricultural workers in Tamilnadu, Andhra Pradesh, and other cotton-growing states suffer a litany of health impacts due to continuous exposure to pesticides. The 2017 tragedy in Yavatmal District in the State of Maharashtra recorded more than 40 deaths and 500 victims that had to be hospitalised in a matter of three months.

Figure 3.2.17 Workers eating their meals near spraying equipment and pesticide containers (Photo by Bhariab Saini for PAN India)

Figure 3.2.18 Farmer washing his spraying equipment in the canal (Photo by Bhariab Saini for PAN India)

Some pesticide containers in Yavatmal do not have information in Marathi. This makes the pesticide manufacturers liable of violating Rule 19 of the Insecticide Rules 1971, requiring all pesticide containers to have information in the local State language, i.e. Marathi.

The following Rules have also been violated:

- Rule 37: on medical examination of workers;
- Rule 38: on the need to educate workers regarding the effects of poisoning and the first aid treatment to be given; and that in all cases of poisoning, first-aid treatment be given before the physician is called;
- Rule 41: on antidote and first aid measures; and
- Rule 42: on the requirement for manufacturers and distributors of insecticides and operators to arrange suitable training for workers in observing safety precautions and handling safety equipment provided to them.

In addition, Rule 39 of Insecticide Rules 1971, specifies the use of a respiratory devise and that "the protective clothing shall be made of materials, which prevent or resist the penetration of any form of insecticides formulations. The materials shall also be washable so that the toxic elements may be removed after each use." A complete PPE shall consist of a protective outer garment/overalls/ hood/ hat, rubber gloves or such other protective gloves extending half-way up to the forearm, made of materials impermeable to liquids; dust-proof goggles and boots. Contrary to these, the equipment used by the study participants do not provide the required protection. None of the respondents reported using a respiratory devise.

Violations of the International Code of Conduct on Pesticide Management

The conditions of use of HHPs in India are problematic and as such violate the Code.

Article 7.5 makes governments responsible of "Prohibiting the importation, distribution, sale and purchase of HHPs if, based on risk assessment, risk mitigation measures or good marketing practices are insufficient to ensure that the product can be handled without unacceptable risk to humans and the environment." When unprecedented number of poisonings and deaths occur due to pesticides, the causative pesticides should be prohibited by the government and withdrawn from the market.

Per Article 1.7.3, the Indian government has the responsibility to "promote practices which reduce risks throughout the life cycle of pesticides, with the aim of minimising adverse effects on humans, animals and the environment and preventing accidental poisoning resulting from handling, storage, transport, use or disposal, as well as from the presence of pesticide residues in food and feed."

With the widespread pesticide use, the Indian government and pesticide companies have a responsibility to minimise its adverse impacts on people and the environment. Article 3.13 requires governments to have well-developed programmes to regulate and manage pesticides throughout their life cycles; and to work with the pesticide industry and the application equipment industry to "develop and promote

the use of pesticide application methods and equipment that minimise the risks from pesticides to human and animal health and/or the environment." Such methods and equipment to minimise pesticide exposure are non-existent on the ground, and put communities — especially the farmers, agricultural workers, women, and children — at risk of pesticide poisoning due to prolonged exposure. This is aggravated by the lack of training, availability, and provision of PPE either by pesticide retailers/ manufacturers, plantation owners, and agriculture officers. The lack of PPE also violates the right to a safe and healthy working environment of pesticide applicators in plantations. This is in violation of Article 5.2.5, which calls on the industry to "halt sale and recall products as soon as possible when handling or pose an unacceptable risk under any use directions or restrictions and notify the government."

The complete set of good quality PPE needs to be available to farming communities that apply pesticides. If this is not ensured, the government should ban such pesticides that require its use, as put forth in Article 3.6. Article 3.5.6 states that the pesticide industry must "retain an active interest in following their products through their entire life cycle, keeping track of major uses, and the occurrence of any problems arising from the use of their products, as a basis for determining the need for changes in labelling, directions for use, packaging, formulation or product availability." This makes the agrochemical corporations liable for the pesticide-related deaths in the cotton fields of Yavatmal, and the Indian government should make these corporations acknowledge this. Likewise, the government should exercise strict regulation over the use and sale of hazardous and unapproved pesticides. Lack of proper knowledge and training transgress the farmers' right of access to information. Decanting practices of retailers encourage unsafe handling, and deprive farmers of labels that contain safety information. Even original containers are improperly labelled, or if labelled, are inadequate due to a high level of illiteracy among farmers.

Manufacturers of HHPs, including the Big Four agrochemical TNCs are directly responsible for labels that are written in language incomprehensible to its users, and contain incomplete or misleading information. Farmers are also provided the wrong information by retailers, such as mixing paraquat with other substances and dispersing it with their bare hands, further contributing to unsafe use. This violates the Articles 5.2.4.4, using returnable and refillable containers where effective container collection systems are in place; 5.2.4.5, using containers that are not attractive for subsequent reuse and promoting programmes to discourage their reuse, where effective container collection systems are not in place; 5.2.4.7, using clear and concise labelling; and 8.2.7, ensuring that persons involved in the sale of pesticides are trained adequately, hold appropriate government permits or licences (where they exist) and have access to sufficient information, such as safety data sheets, so that they are capable of providing buyers with advice on risk reduction as well as judicious and efficient use.

Violation of children and human rights

Children's rights are transgressed with the employment of children in the floriculture industry where they are exposed to hazardous pesticides without their knowledge, and with their schools and homes in the vicinity of sprayed fields. Their rights to life, health and education are violated, as children are

more vulnerable than adults to the adverse effects of pesticides. Exposure to pesticides in the fields and at home, and subsequently suffering from illnesses negatively impacts the quality of life and schooling, and violate the following articles in the CRC:

- Article 3.3 State Parties shall ensure that the institutions, services and facilities responsible for the care or protection of children shall conform to the standards established by competent authorities, particularly in the areas of safety, health, in the number and suitability of their staff, as well as competent supervision;
- Article 6.1 State Parties recognise that every child has the inherent right to life;
- Article 6.2. State Parties shall ensure to the maximum extent possible the survival and development of the child.

These rights are also enshrined in India's Constitution under Article 24 which states, "No child below the age of fourteen years shall be employed to work in any factory or mine or engaged in any other hazardous employment." Unfortunately, children in the floriculture are seen as helping their parents and this is fully exploited by the floriculture farm owners.

In addition, Directive Principles of State Policy 39(e) of the Indian Constitution states "that the health and strength of workers, men and women, and the tender age of children are not abused and that citizens are not forced by economic necessity to enter avocations unsuited to their age or strength; and Article 39 (f) that children are given opportunities and facilities to develop in a healthy manner and in conditions of freedom and dignity and that childhood and youth are protected against exploitation and against moral and material abandonment." The situation of children in the floriculture industry in Tamil Nadu violates this Article in the Indian Constitution.[115] Children as young as 9 years of age are working due to poverty and in an industry that is not only unsuited to their age but also exposed to hazardous conditions and HHPs. This jeopardises their health, intelligence and their future and consequently the future of the nation.

3.2.5 Conclusion

The six studies covered comprehensive issues on pesticides and its impact to human health and the environment in 11 States[116] in India, delving on the aspects of retailing, packaging, handling, storage, and disposal. It revealed how different rural sectors such as farmers, farm workers, women, and children suffer from the risks and effects of pesticide exposure.

The influx and use of HHPs curtail the rights of the Indian people to health and life, threaten the survival and development of children and trample on social and environmental justice.

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115 The Constitution of India. (1949). https://www.india.gov.in/sites/upload_files/npi/files/coi_part_full.pdf

116 Andhra Pradesh, Arunachal Pradesh, Assam, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu, Telangana, and West Bengal.

Annex 3.2.1 Approved and actual field use of HHPs and formulations on crops (Source: Study of Five HHPs)

PESTICIDE	APPROVED USE BY CIBRC	ACTUAL FIELD USE
Paraquat	Approved for use for only 12 crops: apple, cotton, grape, maize, potato, rice, rubber, tea coffee, sugarcane, sunflower, and wheat as well as for aquatic weed control. Only one formulation approved.	Used on 25 crops including cereals, pulses, oil seeds, vegetables and cash crops.
Atrazine	For weed control only in maize, with only one formulation.	Used on 16 non-approved crops; agriculture officers have given recommendations for wheat, barley, corn, soybean and sugarcane, while retailers advised it to be used for banana and jower as well.
Glyphosate	For tea and non-crop weed control only; seven formulations approved.	Used on 17 non-approved crops; agriculture officers and retailers have been recommending glyphosate to be used for weed control in several crops including vegetables, non-cropped area, bushes and general weed control.
Chlorpyrifos	Nine formulations approved for use; for 17 crops and for termite control. Apple, ber, bean, brinjal, cabbage, citrus, gram, ground nut, mustard, onion, paddy, sugarcane, tobacco, cotton, barley, wheat, and rice.	Various formulations are used on more than 20 crops, with many of them non-approved (e.g. chlorpyrifos 50% + cypermethrin 5%EC is approved for only two crops, but field use was noted among 16 crops).
Fipronil	Approved for only 7 crops. Cabbage, chillies, rice, sugarcane, cotton, grapes and onion. And for termite control in non-agriculture use.	There are 27 uses in the field, 20 of which are unapproved (e.g. fipronil 5% SC is approved for five crops, while field use was noted in 19 crops; fipronil 0.3% GR is approved only for rice and sugarcane, but actual use was noted in 17 crops).

Annex 3.2.2 List of reported pesticides in India 2015-2017

PESTICIDES	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Acephate	3								Yes				Yes			Yes		31
Alphamethrin	1																	
Asulam	1																	
Atrazine	35							Yes								Yes	Yes	37
Azoxystrobin	1																	
Brodifacoum	1	Yes		Yes			Yes									Yes		30
Bromoxynil	1			Yes												Yes		
Buprofezin	1																	
Cartap Hydrochloride	2																	
Chlorantraniliprole	2										Yes	Yes				Yes		
Chlorothalonil	1			Yes	Possible											Yes	Yes	3
Chlorpyrifos	46		Yes						Yes				Yes			Yes	Yes	2
Chlorfluazuron	1									Yes		Yes				Yes		28 †
Clodinafop-propargyl	1																	
Cloquintocet-mexyl	1																	
Copper oxychloride	1																	
Cyflumetofen	1																	
Cymoxanil	1																	
Cyromazine	1																	1
Cypermethrin	1															Yes	Yes	
Diafenthiuron	5												Yes			Yes		29
Dichlorvos	1		Yes	Yes					Yes				Yes			Yes	Yes	32
Difenoconazole	1																	1
Dimethoate	1								Yes				Yes			Yes		4

PESTICIDES	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Emamectin benzoate	1										Yes	Yes	Yes			Yes		
Fipronil	27												Yes			Yes		8
Glyphosate	35				Possible											Yes	Yes	1
Imidacloprid	3												Yes			Yes		
Indoxacarb	1												Yes			Yes		
Lambda-cyhalothrin	4			Yes				Yes					Yes			Yes	Yes	
Mancozeb	6				Possible			Yes								Yes	Yes	1
MCPA	1																	2
MCPB	1																	2
Methylesters	1																	
Metiram	1				Possible											Yes		
Monocrotophos	2		Yes	Yes			Yes		Yes				Yes			Yes	Yes	60
Napropamide	2																	
Paraquat	36			Yes												Yes	Yes	38
Phenmedipham	3																	1
Pinoxaden	1																	
Pretilachlor	1																	
Profenofos	4												Yes			Yes		29
Propargite	1				Possible					Yes		Yes				Yes		29
Propiconazole	1																	
Pymetrozine	1				Possible													2
Pyraclostrobin	1																	
Quinalphos	2							Yes					Yes			Yes		31
Quizalofop-ethyl	1																	

PESTICIDES	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Spinosad	1												Yes			Yes		
Sulphor	1																	
Tebuconazole	1																	1
Thiacloprid	1				Possible													
Thiamethoxam	3						Yes						Yes			Yes		
Thiourea	1							Yes								Yes		28
Triazophos	1		Yes															40
Validamycin	1												Yes			Yes		28 †

† Not banned in any country, but is not approved in the European Union.

? The active ingredients of pesticides Laruamster, Ahtrseol, Yieldsmor, Quaride Success, Profigon Plus, Danfuron, Libocin, Jasmite, Biozyme , Chohigon, Anusan -50, Humirich, Kinodon Plus, Super Amino, and Micronol are not known and are not included here.

WHO Ia: Extremely hazardous
WHO Ib: Highly hazardous
H330: Fatal if inhaled according to the Globally Harmonised System (GHS)
Muta EU 1, 2: Mutagenic; Probable Mutagen
Repro EU 1,2: Reproductive Toxin; Probable Reproductive Toxin
EDC: Endocrine Disruptor
ChE Inh: Cholinesterase Inhibitor
vB: Very Bioaccumulative
vP: Very Persistent
POP: Persistent Organic Pollutants
PIC: Prior Informed Consent
HHP: Highly Hazardous Pesticide
T20: Terrible 20 pesticides extremely hazardous to children

Annex 3.2.3

Banned pesticides in India

1. Aldicarb
2. Ammonium sulphamate
3. Calcium arsenate
4. Copper acetoarsenite / Paris green
5. Lead arsenate
6. Monosodium methyl arsonate/MSMA
7. Azinphos-ethyl
8. Azinphos-methyl
9. Calcium cyanide
10. Chinomethionate / oxythioquinox / quinomethionate
11. Chlordane
12. Dicrotophos
13. Disulfoton / thiodemeton
14. EPN
15. Ethylene dibromide / EDB / 1,2-dibromoethane
16. Fentin acetate / triphenyltin acetate
17. Fentin hydroxide / triphenyltin hydroxide
18. Hexachlorobenzene / benzene hexachloride (HCB/BHC)
19. Lindane
20. Maleic hydrazide
21. Ethyl mercury chloride
22. Phenylmercury acetate
23. Mevinphos
24. Nicotine sulfate
25. Paraquat dimethyl sulphate
26. Parathion (ethyl)
27. Pentachlorophenol (PCP) and salts
28. Quintozene / PCNB / pentachloronitrobenzene
29. TCA / trichloroacetic acid
30. Tetradifon
31. Vamidothion

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3.3 INDONESIA

BACKGROUND

Indonesia dominates global palm oil production.[117] In 2014, 52% (31.3 million tonnes) of the total global supply of palm oil was sourced from Indonesia.[118] The industry is a major source of the country's income. Total production of palm oil, including palm kernel oil, increased to 42 million tons in 2017 from 35.6 million tons in 2016, generating USD 22.9 million export revenue.[119]

Oil palm plantations cover 11.9 million hectares[120] with an estimated 10.4 million people employed[121], 70% of which are casual labourers[122].

The palm oil industry continues to expand following the State government's new investment law (No. 25/2007), which encourages foreign investments in vast plantations. This is further enhanced by the 2011 Master Plan for Acceleration and Expansion of Indonesia's Economic Development (MP3EI) which allocated an additional 29 million hectares for palm oil.

Along with the rapid expansion of palm oil production is also the increase in the use of pesticides for weed and pest control, which is integrated into the core work of oil palm production.

To determine the extent of pesticide use and how it impacts oil palm plantation workers, PANAP collaborated with Organisasi Penguatan dan Pengembangan Usaha-Usaha Kerakyatan (OPPUK)[123], an NGO involved in advocacy, education and organising of oil palm plantation workers in North Sumatra, the fourth most populous province, and one of Indonesia's top palm oil producers.

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122 Ibid.

123 Organisasi Penguatan dan Pengembangan Usaha-Usaha Kerakyatan or Organisation to Strengthen and Develop Community's Struggle.

METHODOLOGY

Oil palm plantation companies

Four oil palm plantation companies were included in the study, and designated as Companies A, B, C and D in this report primarily to protect the identities of the study participants.

Company A is a member of the Roundtable on Sustainable Palm Oil (RSPO) and Indonesian Sustainable Palm Oil System (ISPO) and is a subsidiary of a global company. It was established in 1993 and has four plantations.

Company B is a permanent supplier for an RSPO certified global company and is a member of the ISPO as well. It was established in 1982 with a total area of more than 8,000 hectares.

Company C has been in business since 1906 and has plantations and mills in three (3) provinces in Indonesia. This company has children "workers" who help the harvesters (who may be a family member).

Company D was established in 1993 and has four (4) plantations in various provinces. It is now partly owned by a big Indonesian food company with global shareholders. One of its plantations, which employs around 1,300 workers was chosen in the study.

Companies A and B were the focus of study in 2016, while the study on Companies C and D were undertaken in 2017.

Figure 3.3.1 Map of Indonesia showing the location of North Sumatra (Photo from Wikipedia)

Study process

OPPUK members were trained on how to conduct a Community-based Pesticide Action Monitoring (CPAM). After gaining the skill on the CPAM process, they conducted the study using the CPAM questionnaire and guidelines, with accompanying photo-documentation. Focused group discussions (FGDs) were carried out to address data gaps in the survey.

Target participants

Women workers were the focus of the study. However, involvement of men workers in the investigation was necessary to gain access to women workers, as it was not common to speak with women in public without their spouses' knowledge or involvement.

RESULTS

1. Demographics

There was a total of 71 plantation workers (Table 3.3.1), 47 of whom were women. Respondents from Companies A and B were aged 21 to 50 years and have worked in the plantations from 3 to 18 years. The women were employed as maintenance workers (sprayers and fertiliser applicators), while the men were either harvesters or foremen. The 44 respondents from Companies C and D were sprayers, aged 20 to 59 years and have worked in the plantations from 6 months to 30 years.

Table 3.3.1 Gender of study participants

STUDY YEAR	COMPANIES	FEMALE	MALE	TOTAL
2016	A	8	3	11
	B	7	9	16
2017	C	24	2	26
	D	8	10	18
Total		47	24	71

2. Exposure to Highly Hazardous Pesticides (HHPs)

As maintenance workers, women's daily work involve constant exposure to pesticides. Sprayers were required to spray seven to eight tanks to cover 1.5 hectares per day, while fertiliser applicators are tasked to apply up to one (1) ton of fertiliser daily. The workers were exposed to HHPs, including paraquat (limited use pesticide)[124] and glyphosate (See Annex 3.3.1. List of reported pesticides in Indonesia 2015-2016).

124 As a limited use product under Indoneisan law, product requires the applicator to be trained and to strictly follow PPE recommendations.

It is significant to note, however, that many of the respondents do not know what type of pesticides they use. In Company D, only one respondent was able to identify the pesticides.

Paraquat

Company A has reportedly banned the use of pesticides containing paraquat, in compliance with the RSPO. However, Syngenta's Gramoxone was used by workers in Companies B and D. In Company B Gramoxone is mixed with metsulfuron-methyl (brand name: Ally) in jerry cans. The women workers take these mixed pesticides in plastic bottles to the river or the ditch and fill their knapsack sprayers with water and mix in these pesticides. They shake the mixture and lift the sprayers on to their shoulders, sometimes spilling the mixture on themselves.

Figure 3.3.2 Gramoxone is found in one of the plantations (Photo by OPPUK)

Figure 3.3.3 Women plantation workers at work (Photo by OPPUK)

Glyphosate and glyphosate mixed with metsulfuron-methyl

All companies were found to use glyphosate (Table 3.3.2). Monsanto's Roundup was used by workers in Company B. Glisat, Elang, and Amyphosate were used by Companies A, C, and D respectively.

In Company A, Glinat, (active ingredient: ammonium glufosinate) was also used to control weeds, ferns, and wild palm trees.

These liquid herbicides are packed in 25-litre jerry cans and are used with Ally (active ingredient: metsulfuron-methyl) which is a white powder herbicide packed in 500-gram plastic bowls. Ally is poured into the glyphosate in jerry cans, and the entire mixture is transferred into a 1000-litre tank of water.

Chlorothalonil

Company A uses Bravo which is sprayed on trees as fungicide.

Table 3.3.2 Pesticides used in the plantations

ACTIVE INGREDIENTS	COMPANY A	COMPANY B	COMPANY C	COMPANY D
Paraquat		Gramoxone	Gramoxone	
Glyphosate	Glisat	Roundup	Elang	Amyphosate
Metsulfuron-methyl	Ally			
Flufenacet	Tiara			
Chlorothalonil	Bravo			

3. Hazardous Conditions of Use

Lack of Adequate Work Tools and Personal Protective Equipment (PPE)

Respondents use hazardous pesticides under poor working conditions that increase their risks of exposure.

Not all workers were provided with adequate work tools and PPE.

Pesticide sprayers in Company A are provided PPE, but fertiliser applicators have to purchase their own. Since many women cannot afford the PPE, they work without the proper safety equipment for fertiliser application.

Company B required their workers to purchase their own PPE and work tools. Fertiliser applicators on average would need to spend IDR 228,000 (USD 17) to purchase PPE and tools while sprayers would need to spend around IDR 645,000 (USD 48.5). Thus, all the women workers do not use PPE. Instead, they wrap scarves around their faces to protect them from the strong pesticide fumes.

Workers in Companies C and D are provided with gloves, overall, goggles, mask, boots, long sleeves shirt and pants. However, workers feel uncomfortable wearing these. Company C workers complain that the PPE are “heavy” and that the size provided does not fit them. They also say that the goggles are “dewy” or obstruct their vision. Workers in Company D said that wearing the PPE makes them feel hot and causes them shortness of breath. In general, workers do not wear their PPE – which they find inappropriate – since it makes them miss their work target.

Table 3.3.3 PPE provided to plantation workers

PPE	COMPANY A	COMPANY B	COMPANY C	COMPANY D
Gloves	√		√	√
Overall			√	√
Goggles	√		√	√
Masks	√		√	√
Boots	√		√	√
Long sleeves shirt				√
Long pants				√
Apron	√			√

This is a direct violation of Manpower Ministry's decree number PER.08/MEN/VII/2010 Article 7 on PPE that decrees that (Article 1) Employer or management must manage PPE in workplace. PPE management includes (Article 2):

- identification of PPE needs and requirement;
- selection of appropriate PPE that is suitable to type of risk and worker's/labour's needs/comfort;
- training;
- application, maintenance and storage;
- disposal and management or removal;
- coaching;
- inspection; and
- evaluation and reporting.

Inadequate washing facilities

In the four (4) companies surveyed, only Company A provided their workers washing facilities, with bathing water sourced from an artesian well and antiseptic soap. Women workers In Company B had to bring their own water for drinking and cleaning their faces.

Washing facilities in Companies C and D are located in the division office, and are far from the working area. Thus, workers rely on a nearby river to wash their hands and bathe.

4. No Access to Information on Pesticides Used and Inadequate Training on Handling Pesticides

The plantation companies did not conduct adequate trainings to fully inform workers about the pesticides they were handling. Workers have very limited or zero knowledge about the pesticides they are using, as well as the hazards of these pesticides.

Figure 3.3.4 A woman plantation worker (Photo by OPPUK)

Women workers knew the pesticide and fertiliser brand names based solely on the product labels, which were in English and with text too small to read. The women mixing the pesticides admitted not bothering to read the labels to meet their work targets.

In Companies B, C and D, the foreman mixes the pesticide at the central office, which is then poured into water tank trucks and distributed to sprayers in the field in unlabelled jerry cans. Thus, the women had no way of knowing the pesticides they were using.

There are one to two-hour training sessions on pesticide application once every three to six months in Company A. These are mostly theoretical, and given by the foreman and field assistant. In Company D, workers are only given a two-hour field practice on how to spray pesticides following the wind direction.

The trainings do not tackle the names and potential hazards of the pesticides they are using. Workers are not instructed on what to do in case of accidental spills.

Several respondents who had incidents of spills while lifting the sprayer tanks onto their shoulders said that they ignore these spills as they consider the spillage to be minor; or if they itch, wash themselves in the river and continue to work in their wet clothes afterwards.

Table 3.3.4 Signs and symptoms of pesticide poisoning reported by respondents[125]

SIGNS AND SYMPTOMS	FREQUENCY	%
Dizziness	47	82.46
Blurred vision	29	50.88
Difficulty breathing	35	61.4
Headache	40	70.17
Excessive sweating	37	64.91
Irregular heartbeat	19	33.33
Nausea	14	12.28
Skin rashes	9	15.79
Hand tremor	14	24.56
Shivering	4	7.7
Miosis	9	15.79
Excessive salivation	6	8.77
Vomiting	7	12.28
Diarrhoea	4	7.02
Nose bleeding	1	1.75
Insomnia	6	12.28
Anemia	1	1.75

5. Health Effects of Pesticide Poisoning and Lack of Medical Facilities

Dizziness, headache, excessive sweating and difficulty in breathing (Table 3.3.4) were the most reported signs and symptoms of pesticide poisoning.

Pesticide poisoning was more widespread in Company B, which provided less protection for its workers compared to the rest. Out of the 57 participants interviewed regarding their health, 55 have health concerns due to pesticide exposure. One woman worker from Company D complained of suffering from a cyst.

Workers who experienced symptoms usually did not inform the management, feeling that it would be "useless." This is so because whenever they report exposure or poisoning incidents to the foreman, the response was slow.

Clinics located inside the plantation did not provide sufficient medical attention, and only prescribed medicines for headache, regardless of health symptoms. The women, thus, preferred to seek medical attention outside the plantation at their own expense.

125 Out of the total 71 respondents in the surveys, only 57 respondents were interviewed for the health impacts of pesticides.

BOX 3.3.1 TESTIMONIES

Aida*, 38, has been working at Company A since 1990. For 26 years, Aida has been consistently exposed to pesticides at work. She recalled an incident when, while spraying, a 25-litre tank filled with Gramoxone spilled and covered her body. Immediately, she jumped into the pond to wash off the chemical. After the accident, Aida continued working as sprayer until about six (6) months ago. A medical examination by the company doctors revealed that chemicals poisoned Aida's blood. However, she was never informed by the doctors as to what caused the blood poisoning and its short and long-term effects on her health. Since then, Aida was no longer allowed by the company to work as a sprayer. Instead, the company assigned her to remove weeds. Currently, she has no health complaints but hopes to undergo blood examinations and know what really happened to her.

Bina*, has worked in Company B for three years. According to her, two workers – Reena* and Fiona* – suffered acute poisoning from spraying pesticides. Both sought medical attention from outside, and shouldered the costs themselves, as they did not get any treatment from the plantation clinic. According to the doctor who examined both women, pesticides poisoned them. Reena's hands were rotting from pesticide exposure. She has worked in the plantation since 2011 as a sprayer. Meanwhile, Fiona coughed blood for a week and did not report for work until the interview took place. Fiona is 36 years old and also worked as a sprayer.

**Names have been changed.*

6. Casual and Underpaid Workers

An overwhelming majority of workers in the four (4) companies were casual workers. As such, they receive less than the mandated minimum wage in their district and have no social security benefits, i.e. health insurance, accident insurance, life, old age and pension insurance. Workers interviewed earn on the average IDR 1,880,000 (USD 139) per month, while the minimum monthly wage rate is IDR 2,491,618 (USD 185).

The women workers found it difficult to speak up about their problems and to openly participate in discussions and respond to questions. It is only with the encouragement of the men folks or other men workers that the women were able to share their experiences and to respond to questions.

All the women in the 2016 study were casual, working less than 21 days in a month — a strategy employed by the companies to avoid giving them permanent status. They had no work contracts or agreements, and were paid IDR 59,000 (USD 4.50) to IDR 80,000 (USD 6.00) per day.

In the 2017 study, 19 out of 22 women sprayers at Company C were casual workers, even if some of them were with the company for 10 years. In Company D, all sprayers had permanent status.

Unlike the permanent workers in the plantation sector who have rice provisions and housing, casual workers do not receive any provisions.

The practice of casualisation of the workforce violates Labour Law Number 13/2003, article 59 paragraphs 1 and 2 that state: (1) Working agreement is made based on specific or unspecific time. (2) Specific time working agreement as mention in article (1) based on time period; or completion of a work.

The participating workers' recommendations are:

1. Women and men workers must receive sufficient trainings on the pesticides they are using, including its proper use, hazards, and measures to minimise the risks of exposure of workers.
2. The government must closely monitor and ensure compliance of companies to labour laws including taking actions to make them liable.
3. Enact policies on HHPs including the ban on the trade, distribution and use of HHPs.
4. Oil palm plantations must cease the use of HHPs to protect their workers.

VIOLATIONS OF HUMAN RIGHTS AND AGREEMENTS

This study documented the exposure to and the adverse effects of HHPs on mostly women workers in palm oil plantations in Indonesia. This violates the right to life and health of these workers. As the Indonesian government adopted the International Code of Conduct on Pesticide Management; affirmed acceptance of the Universal Declaration of Human Rights (UDHR), and ratified the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW), the government is disregarding the worsening health, safety and living conditions of plantation workers. Using these HHPs under the conditions of use in the plantations, the oil palm plantation companies are jeopardising the health and safety of workers. Additionally, agrochemical corporations by selling these HHPs for profits are also complicit in the violations of the rights of workers.

1. Violation of the International Code of Conduct on Pesticide Management

Article 5.2.5 of the Code calls on the industry to "halt sale and recall products as soon as possible when handling or use pose an unacceptable risk any use direction or restrictions and notify the government." Reviewing the conditions of use of HHPs in Indonesia in the oil palm plantations, including unavailability and affordability of PPE and PPE being uncomfortable in the local hot and humid climate; as well as lack of washing facilities in case of poisonings; the lack of training; and lack of information about the pesticides, these HHPs should not be used.

According to the Code, prohibition of the importation, distribution, sale and purchase of HHPs may be considered if, based on risk assessment, risk mitigation measures or good marketing practices are insufficient to ensure that the product can be handled without unacceptable risk to humans and the environment.

Hazardous working conditions, marked by lack of appropriate Personal Protective Equipment, washing and medical facilities, violate the workers' right to a safe working environment. It also violates Indonesian labour laws—Law No. 1 of 1970 on Occupational Safety and Manpower Ministry decree number PER.08/MEN/VII/2010—which state that employers must provide appropriate PPE suitable to type of risk that the worker is exposed to, free of charge.

In addition, these practices particularly in Company B where the workers have to purchase their own PPE violates the Code Article 3.6, which states: "Pesticides whose handling and application require the use of PPE that is uncomfortable, expensive or not readily available should be avoided, especially in the case of small-scale users and farmer workers in hot climates."

Again, the Code outlines the need to carry out health surveillance programmes of those who are occupationally exposed to pesticides and investigate, as well as document, poisoning cases (Article 5.1.3) by the government. Unfortunately, there are no such surveillance programmes initiated even though more than 10.4 million workers are exposed to pesticides. No reliable data and statistics on health effects of pesticides and pesticide poisoning incidents are maintained (Article 5.1.6). The conditions of use of HHPs also violates the ILO Convention, 'Safety and Health in Agriculture Convention, 2001 (No. 184)' which identifies the following rights of workers in agriculture to be:

a. Informed and consulted on safety and health matters, including risks from new technologies;

b. Participate in the application and review of safety and health measures and, in accordance with national law and practice, to select safety and health representatives and representatives in safety and health committees; and

c. Remove themselves from danger resulting from their work activity when they have reasonable justification to believe there is an imminent and serious risk to their safety and health and so inform their supervisor immediately. They shall not be placed at any disadvantage as a result of these actions.

2. Violation of CEDAW

Women's rights are further violated, as women are more affected by pesticide poisoning than men due to the amount of fatty tissues in their bodies. In addition, under the General recommendation No. 34 on the rights of rural women under CEDAW, it states that, "parties should implement agricultural policies which support rural women farmers, recognise and protect the natural commons, promote organic farming, and protect rural women from harmful pesticides and fertilisers".

Plantations also do not comply with minimum wage levels in the district and employ casual workers beyond terms that are stipulated by law. The workers' status as casual employees makes them even more vulnerable to rights violations.

Workers' lack of knowledge of the names and hazards of the pesticides they are using, as well as lack of training on their proper use and handling, violate their right to access to information.

CONCLUSION

The study in Indonesia clearly shows that plantation workers are confronted by the threats of HHPs, putting their safety and health under jeopardy. Meanwhile, women workers suffer health risks that, if go unnoticed and untreated, may compromise their lives further. The conditions of use of HHPs in the plantations in Indonesia are horrendous. There is lack of information of the hazards of pesticides used, lack of training on how to protect the workers from exposure, very little PPE is used, and washing facilities are lacking. All workers including the women workers applying pesticides suffer a litany of signs and symptoms of pesticide exposure. The impact of HHPs on women's health are not taken seriously and there is a lack of medical support to deal with their health concerns.

Given that the use of HHPs are difficult especially in a developing country where resources are not available to protect the plantations workers, such HHPs should not be used.

The inaction of the government on labour issues such as contractualisation, low wages, and the lack of social and health benefits aggravate the occupational hazards as well as their living conditions. The indifference of the agrochemical industry and agribusiness of the health impacts suffered by the workers, and the industry's lack of compliance to the labour laws and the Code makes them accountable and responsible for the worsening state of the worker's health, welfare, and quality of life.

Annex 3.3.1 List of reported pesticides in Indonesia 2016-2017

PESTICIDE	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Chlorothalonil	1			Yes												Yes	Yes	3
Glufosinate-ammonium	1						Yes									Yes		
Flufenacet	1																	
Glyphosate	3				Possible											Yes	Yes	1
Metsulfuron methyl	1																	1
Paraquat	1			Yes												Yes	Yes	38

Annex 3.3.2

Banned Pesticides in Indonesia

1. 2,4,6-T
2. 2,4,6-T sodium salt/Sodium tribromophenol
3. Alachlor
4. Aldicarb
5. Arsenic compounds
6. Monosodium methyl arsonate/MSMA
7. Captafol
8. Chlordane
9. Sodium Chlorate
10. Chromium compounds
11. Cyhexatin
12. DDT
13. Dichlorvos / DDVP
14. Dicofol
15. Di-nitro-ortho-cresol / DNOC
16. Endosulfan
17. EPN
18. Ethylene dibromide / EDB / 1,2-dibromoethane
19. Ethylene dichloride / 1,2-dichloroethane
20. Ethylene oxide
21. Fluoroacetamide
22. Formaldehyde
23. Hexachlorobenzene/Benzene hexachloride (HCB/BHC)
24. Hexachlorocyclohexane (HCH)
25. Lindane
26. Mercury compounds
27. Methoxychlor
28. Methyl parathion
29. Mevinphos
30. Monocrotophos
31. Parathion (ethyl)
32. Pentachlorophenol (PCP) and salts
33. Phosphorus
34. Salmonella-based [rodenticide]
35. Sodium dichromate
36. Strychnine
37. Sulfuric acid/sulphuric acid
38. Tributyltin compounds
39. Bis(tributyltin) oxide

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Isenring, R. (2017). *Adverse Health Effects Caused by Paraquat.* Retrieved from http://issuu.com/pan-uk/docs/adverse_health_effects_caused_by_pa?e=28041656/44629977

3.4 MALAYSIA

INTRODUCTION

The country is divided into Peninsular Malaysia and East Malaysia (a part of the island of Borneo) with a total population of 32 million. Malaysia is the 12th most megadiverse country in the world with more than 15,000 species of vascular plants and 152,000 species of animal life.[126]

Pesticides are extensively used in oil palm, paddy, vegetable, fruits, and rubber cultivation and are controlled by a handful of transnational corporations, pegging the Malaysian pesticides market at RM 55 million (USD 14 million) in 2015.[127] The country currently accounts for 39% of world palm oil production and 44% of world exports.[128]

Considered as the "economic backbone of the country", the industry produces the refined oil found in around half of consumer and food products. It employs an estimated 3.5 million workers.[129] The land area planted with oil palms has increased from 1.5 million hectares in 1985 to about five million hectares.[130] Such rapid expansion brought forth massive deforestation, land conflicts, and use of toxic pesticides in plantations.

Sabah, located in the northern part of Borneo, is a top palm oil-producing state responsible for 30% of Malaysia's palm oil[131] and 10% of the world's palm oil supply.[132] Home to some of the world's oldest rainforests, it has been identified as a "global hot spot of forest loss and degradation" due to oil palm expansion. Most affected are the indigenous peoples (39 ethnic groups) who make up around 61% of the population.[133]

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126 Ting, W.L. (2016, May 22). Defending Malaysia's rich biodiversity. *The Star Online*. Retrieved from https://www.thestar.com.my/news/nation/2016/05/22/defending-malaysias-rich-biodiversity/

127 George, L.J. (2016, December). *Pesticide Management in Malaysia*. Paper presented at the 5th CAC Asia Summit, Bangkok, Thailand. Retrieved from http://www.cacasiasummit.com/Uploads/Download/5-Pesticides%20Management%20in%20Malaysia.pdf.

128 Malaysian Palm Oil Council. (n.d.). *Malaysian Palm Oil Industry*. Retrieved from http://www.mpoc.org.my/Malaysian_Palm_Oil_Industry.aspx

129 Villadiego, L. (2015, November 9). Palm oil: Why do we care more about orangutans than migrant workers? *The Guardian*. Retrieved from https://www.theguardian.com/sustainable-business/2015/nov/09/palm-oil-migrant-workers-orangutans-malaysia-labour-rights-exploitation-environmental-impacts

130 Malaysian Palm Oil Council. (n.d.). *The Oil Palm Tree*. Retrieved from http://www.mpoc.org.my/The_Oil_Palm_Tree.aspx

131 Vanar, M. (2009, December 26). Need incentives for oil palm industry in Sabah. *The Star Online*. Retrieved from https://www.thestar.com.my/news/nation/2009/12/26/need-incentives-for-oil-palm-industry-in-sabah/

132 Sario, R. (2017, November 17). Measures under way to ensure sustainability of palm oil production. *The Star Online*. Retrieved from https://www.thestar.com.my/metro/metro-news/2017/11/17/measures-under-way-to-ensure-sustainability-of-palm-oil-production/

133 Chao, S. (2016, December 12). Malaysia: the Murut struggle against palm oil, for land and life.The Ecologist. Retrieved from https://theecologist.org/2016/dec/12/malaysia-murut-struggle-against-palm-oil-land-and-life

Along with oil palm and rubber, rice is among the main agricultural products of the country. There are an estimated 300,000 rice farmers in Malaysia and a total of 426,260 hectares of rice paddies.[134] In 1960, the Agricultural Department introduced high-yielding rice varieties that facilitated the entry of agrochemicals. Use of imported pesticides, such as the highly toxic herbicide paraquat, became the norm in the 1990's.

Several studies reveal the severity of the pesticide problem. In Sekinchan in the state of Selangor, farmers use a cocktail of pesticides that have contaminated the irrigation canals and paddies. Fish from these sources had traces of organochlorines including the banned endosulfan.[135] In Sabak Bernam, Selangor, use of paraquat, glyphosate, fipronil, and lambda-cyhalothrin is rampant and has been linked to chronic illnesses.[136] Blood tests showed evidence of pesticide poisoning in Tanjung Karang children who performed poorly in school compared to the unexposed group.[137] Children aged 10 to 11 living near rice paddies were found chronically poisoned by an organophosphate and tested poor on motor skills, hand/eye coordination, attention speed and perceptual motor speed.[138]

The Malaysian government decided to phase out paraquat in 2002 and is now restricted for use in plantations. The plan is to ban it by the year 2020.

To determine how the use of pesticides in the expanding oil palm industry is affecting the oil palm workers and the people living in the surrounding communities, PANAP in collaboration with its local partners did ground investigations, the objective was to document how community members' and workers' rights are being violated due to the widespread use of toxic agrochemicals to grow oil palm.

METHODOLOGY

Oil palm plantations in Sabah and Selangor, and a rice paddy community in Tanjung Karang (Table 3.4.1) were selected as study sites. After selecting the villages, the teams sought permission from the communities and the local government units for the conduct of the research. Interactions with the

134 Masso, W.Y.A. and Man, N. (2016, March). Leadership in Malaysian Paddy Farming. *Academic Journal of Interdisciplinary Studies*, 5(1), 257-263. MCSER Publishing, Rome. Retrieved from http://www.mcser.org/journal/index.php/ajis/article/download/8974/8666

135 Rahman, N.A.A., & Omar, M.A. (2012). Detection of organochlorine compound in puyu, sepat and haruan fish caught from irrigation canals in paddy fields in Selangor and Perak, Malaysia. Paper presented at the Seminar in Veterinary Sciences, Selangor, Malaysia. Retrieved from http://psasir.upm.edu.my/id/eprint/26776/1/PROCEEDING%207.pdf

136 Hod, R., Aizuddin, A.N., Shah, S.A., Hassan, M.R., Safian, N., & Jaafar, M.H. (2011). Chlorpyrifos Blood Level and Exposure Symptoms among Paddy Farmers in SabakBernam, Malaysia. International Journal of Public Health Research, 1(1), 1-6. Retrieved from http://spaj.ukm.my/ijphr/index.php/ijphr/article/download/2/1

137 Miswon, N.H., Hashim., How, V., & Chokeli, R. (2015). Blood Cholinesterase Level and Learning Ability of Primary School Children in an Agricultural Village, TanjungKarang, Malaysia. British Journal of Medicine and Medical Research, 8(1), 52-60. Retrieved from http://www.journalrepository.org/media/journals/BJMMR_12/2015/Apr/Hasim812015BJMMR16804.pdf

138 Hashim, Z., & Baguma, B. (2015). Environmental exposure of organophosphate pesticides mixtures and neurodevelopment of primary school children in TanjungKarang, Malaysia. Asia Pacific Environmental and Occupational Health Journal, 1(1), 44-53. Retrieved from https://www.researchgate.net/publication/282850726_Environmental_Exposure_of_Organophosphate_Pesticides_Mixtures_and_Neurodevelopment_of_Primary_School_Children_In_Tanjung_Karang_Malaysia

communities and data gathering were done through fact finding mission (FFM) and Community-based Pesticide Action Monitoring (CPAM) with PANAP providing support and guidance.

Figure 3.4.1 Map of Malaysia with where the study was done

FFM and CPAM in the plantations were carried out by PACOS Trust and Tenaganita. The North South Initiative (NSI) in collaboration with the Agro Tourism Cooperative of the Sungai Sireh Village did the study on the rice paddy community.

Where possible, photos of labels found on empty and in-use pesticide containers, as well as disposal and storage in and around the communities and plantations, were taken.

Table 3.4.1 Study sites and survey/FFM dates

STATE/ORGANISATION	VILLAGES	COMMUNITIES	DATES OF FIELD STUDY
Sabah (PACOS Trust)	Ansuan, Telupid Imusan, Tongod Kalampun, Keningau	Oil palm plantation ethnic groups • Dusun Labuk • Sungai • Murut • Sino-Kadazan • Tombonuo/Tambonuo	26-28 April 2016 17-19 May 2017 9 June 2017
Selangor (Tenaganita)	Ladang Selatan, Pulau Carey, Jugra Bukit Cerakah, Jeram Ladang Shalimar, Pekan Bukit rotan	Oil palm plantation workers/residents	March 2015
Selangor (NSI)	Sungai Sireh, Tanjung Karang	Rice paddy farmers and agricultural workers	5-7 September 2016

The PACOS Trust Study Sites

In the three villages or *kampungs,* most palm oil plantations have been operating for more than 10 years through lease agreements with members of the indigenous community. Local farmers who choose to farm their own lands also predominantly grow palm oil.

Kampung (Kg) Ansuan is situated about 40 kilometres (km) from Telupid Town, 200 km towards the east from Kota Kinabalu. It is an indigenous community of the Dusun Labuk ethnic group. Kg Imusan is about 100 km south of Telupid town. It is an indigenous community of the Sungai ethnic group. Kg Kalampun is about 70 km from Keningau Town and another 100 km from Kota Kinabalu. It is an indigenous community of the Murut ethnic group.

The Tenaganita Study Sites

Selangor is on the west coast of Peninsular Malaysia. It is subdivided into districts, which are then subdivided into divisions called *mukim.* The oil palm plantations investigated are located in:

- mukim Jugra, district Kuala Langat;
- mukim Jeram, district Kuala Selangor; and
- mukim Pekan Bukit Rotan, district Kuala Selangor.

The plantations in Jugra and Jeram are owned by the world's largest plantation company, with the Malaysian government as the largest stockholder.[139] This company was founded in 1910 by European businessmen when rubber was in great demand. Initially into rubber plantation, it later diversified into oil palm and cocoa, intensifying its growth and expansion in Malaysia and other countries. It was incorporated in Malaysia in 1978, and is into oil palm cultivation management, crude palm oil and palm kernel processing, production of palm oil derivatives and biofuel, refining and trading.

The plantation in Pekan Bukit Rotan is owned by a company which is incorporated in Sri Lanka. This company engages in the cultivation of oil palm, selling of fresh fruits, as well as managing and holding of an investment portfolio. It was founded in 1909 and together with three other Colombo-listed companies, is controlled by a corporation that altogether owns 1,386 ha of prime oil palm.

The NSI Study Site

Kg Sungai Sireh in Selangor is an agricultural community with an estimated area of 1,039 acres. Fifty percent of the households are small-holder farmers, owning at most four acres of land. Seventy-five percent of the farmlands are rice paddies while the rest are for vegetable/fruit production.

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139 PANAP. (2010). *Communities in Peril: Asian regional report on community monitoring of HHPs used.* Retrieved from http://archive.panap.net/sites/default/files/PANAP-Asian-Report.pdf

Pesticide use started in 1980's to get rid of rats and common pests. The introduction of Green Revolution for rice production led to the use of more potent pesticides, among which is paraquat. It was also in the 1980's that input of chemical fertilisers began.

The dependency on agrochemicals led to unprecedented increase in pesticide-related illnesses and in the reduction of crop yield. Long-suffering farmers have leased out their farms for a more steady income. Conversion to oil palm production became prevalent. This has further aggravated the problem. Due to poverty, the women were forced to take jobs at the oil palm plantations as pesticide sprayers and fertiliser applicators.

RESULTS

1. Demographics

There were 64 study participants with an almost equal number of male and female (Table 3.4.2) participants. Mostly farmers and plantation workers (Table 3.4.3), the group can be considered young with almost half of the respondents below 50 years old. At least 23 of them had formal education. Household size was relatively big (Table 3.4.4).

Table 3.4.2 Gender of study participants per study report

STATE/ORGANISATION	STUDY YEAR	N	MALE	FEMALE
Sabah (PACOS Trust)	2016	21	16	5
	2017	15	3	12
Selangor (Tenaganita)	2015	13	2	11
Selangor (NSI)	2016	15	14	1
Total		64	35	29

Table 3.4.3 Occupation of study participants

STATE/ORGANISATION	PACOS	TENAGANITA	NSI	TOTAL
Plantation workers	9	13		22
Farmers	10		13	23
Farm workers	5		2*	7
Oil palm growers (OPG)	7			7
OPG & Teacher	1			1
Teacher	1			1
Cleaner & Cook	1			1
N	34	13	15	62

**Pesticide sprayers.*

Table 3.4.4 Integrated demographics of study participants

N	FREQUENCY	CHARACTERISTICS
15		*Marital status*
	11	Married
	3	Single
	1	Widow/er
57		*Age group*
	11	20 – 29
	14	30 – 39
	11	40 – 49
	14	50 – 59
	6	60 – 69
	0	70 – 79
	1	<80
28		*Level of Education*
	5	None
	13	Grade school
	8	High school
	1	Vocational
	1	College
29		*Household size*
	1	1 - 3
	12	4 - 6
	14	7 – 9
	2	10 – 11

2. Use of Highly Hazardous Pesticides

A total of 13 HHPs were found in the study sites (Annex 3.4.1), five of which are extremely toxic to children (i.e. in the list of PANAP's Terrible Twenty pesticides).

Figure 3.4.2 Bayer pesticides found in Kampung Sungai Sireh (Photo by NSI)

HHPs found commonly used in the oil palm plantations were paraquat and glyphosate (Table 3.4.5).

Table 3.4.5 List of pesticides reported in oil palm plantations

ACTIVE INGREDIENT	BRAND NAMES	MANUFACTURERS
2,4 – D dimethylammonium	HC-Amine	Kenso Corporation
Allethrin	Esbiothrin	
Glyphosate*	PALMOL GP1	Ancom Crop Care Sdn Bhd.
	RoundUp, StartUp and Spark	Monsanto
	Sentry	Crop Protection Sdn Bhd.
	Shoot	Imaspro Resources Sdn Bhd.
	Supremo	Hextar
Glufosinate*	Basta	Bayer
Metsulfuron-methyl	Ally	DuPont
Paraquat*	Gramoxone	Syngenta
	HextarParaquat 13	Hextar

*HHP

Figure 3.4.3 Paraquat found in Kampung Sungai Sireh (Photo by NSI)

In Kg Sungai Sireh, 20 different pesticides (Annex 3.4.3), nine of which are HHPs, including glufosinate-ammonium (Figure 3.4.2) and paraquat (Figure 3.4.3), were reported. Most commonly used HHPs were lambda-cyhalothrin (Karate, a product of Syngenta) and chlorantraniliprole (Prevathon, a product of Du Pont). Illegal or unregistered pesticides with labels in foreign languages were also found in the village. Their active ingredients could not be ascertained (Figure 3.4.4).

Figure 3.4.4 Pesticide label in foreign language (Photo by NSI)

3. Hazardous Conditions of Use

Lack of Personal Protective Equipment

Oil palm plantation

Most plantation workers in Sabah did not receive personal protective equipment (PPE) from their company and had to buy it themselves. Those that were provided PPE considered it inadequate, consisting of "gloves, a towel to cover [your] mouth, and rubber shoes" and "long sleeves shirt, long pants, and hat."

Workers also reported not wearing the provided PPE because it was uncomfortable. Local oil palm growers in the area also opt not to wear PPE or just wear inadequate protective gear.

In Selangor, the workers were provided with PPE but they admitted to not using it all the time. They said that the PPE was not comfortable to wear for long hours because of the hot, humid weather. The personal protective clothing given to sprayers is of plastic material.

The rice paddy community

Seven of the 15 respondents said they have PPE but four of them never wear it because it is not comfortable. Those who have PPE did not wear the full or proper attire (Figure 3.4.5).

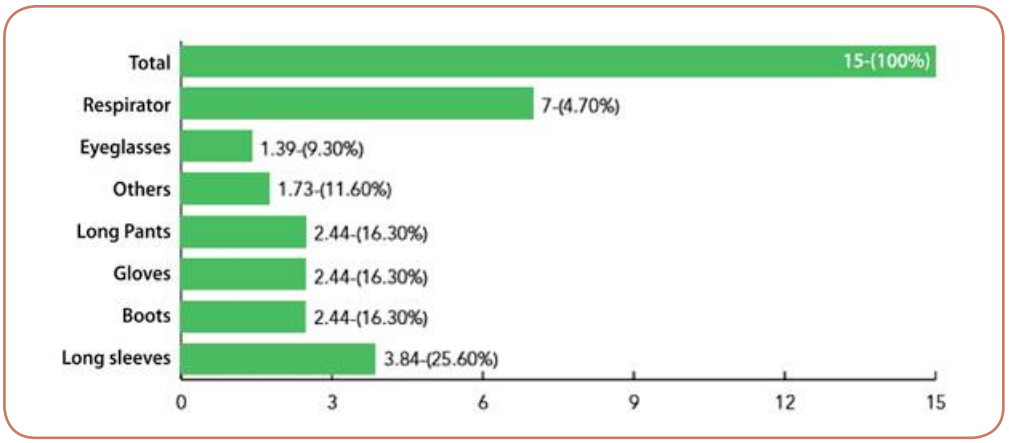

Figure 3.4.5 PPE worn by the farmers and farm workers at Kg Sungai Sireh

Spraying against the wind direction

Most of the oil palm plantation workers surveyed in Sabah did not pay attention to wind direction while spraying. Only two workers followed the direction of the wind. One worker in Imusan revealed that such safety precaution is a luxury. "If we follow the wind or wait until the direction of the wind is right, we will be left behind by our co-workers," one respondent said. Similarly, in the rice paddy community, most of the respondents could not tell in which wind direction they spray.

Incidents of spillage

Oil palm plantation

Workers in Sabah reported incidents of spillage while mixing pesticides, loading or carrying the spraying tank or spraying. The common causes of spills were the breaking or clogging of spraying hose, or when workers fall because the ground is slippery. Victims of spillage could not wash off the pesticides immediately due to inadequate washing facilities.

The rice paddy community

All 15 respondents in the rice paddy community have spilled pesticides on themselves. Six of them experienced accidental spills (Figure 3.4.6) while spraying, three while loading, and five while mixing. The most common parts of the body on which pesticides were spilled were the hands, back, face, upper body, and feet. The reasons cited for accidental spillages were faulty equipment, faulty sprayer packs, falling, and loose bottle caps. After spilling pesticides, only 53% washed the affected body part.

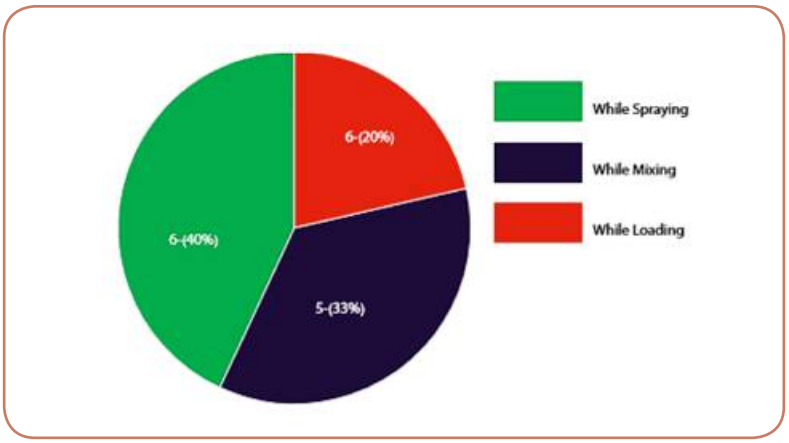

Figure 3.4.6 Incidents of pesticide spillage

Lack of medical facilities

The oil palm plantations in the three Sabah villages lack medical facilities. The nearest clinic or medical facility is 100 km away in Ansuan; 70 km away in Kalampun; and a dangerous boat ride away in Imusan. Employers do not shoulder medical expenses - local growers deduct these from workers' wages or the sales of palm oil.

The rice paddy community in Kg Sungai Sireh has medical facilities but the health assistants usually provide the same medication (e.g. paracetamol or Panadol) for all illnesses and sickness.

3. Improper Storage and Disposal of Pesticides and Pesticide Containers

Oil palm plantation

In Sabah, pesticides were usually stored in the field/farm hut or stored at home or in other places such as storage rooms.

Majority of the respondents finished-up the pesticides (Figure 3.4.7) while others bury, burn, or put the leftover pesticide in rubbish/trash. Likewise, pesticide containers were thrown in rubbish bins together with the other wastes, buried, burned, or thrown in the field. None of the respondents had ever returned containers or unused pesticide to the company or distributor.

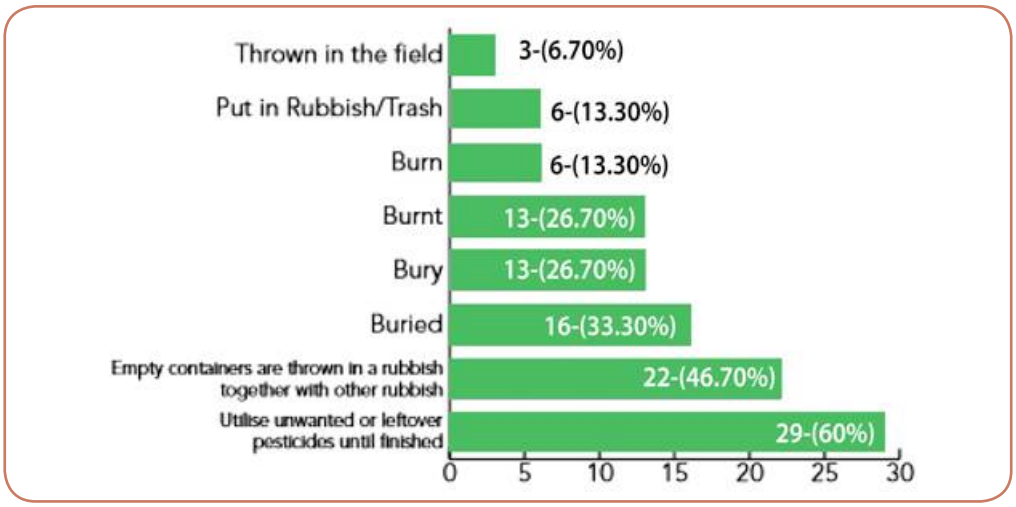

Figure 3.4.7 Disposal of pesticides and empty pesticide containers in Sabah oil palm plantations

The rice paddy community

Most of the respondents said that pesticides were not locked away from children (Figure 3.4.8). Leftover pesticides were buried, thrown into the river, or burned.

Some respondents used pesticide containers for other purposes such as for storing toys and household items (Figures 3.4.9 & 3.4.10). Containers were disposed of by throwing them in the rubbish bin, in the fields, by burying, and by burning. During the survey, empty pesticide bottles were found in the stream, rubbish bins, and paddy fields and in open spaces.

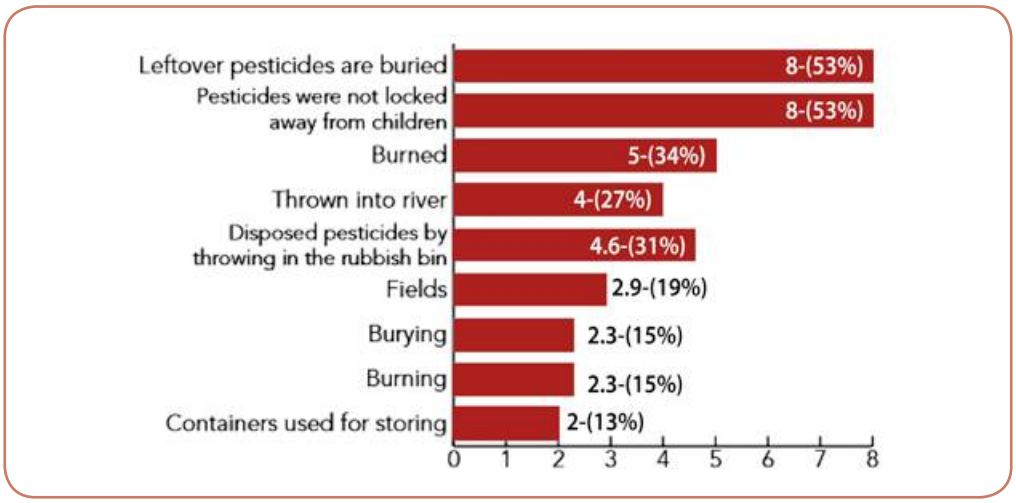

Figure 3.4.8 Disposal of pesticides and empty pesticide containers in Kg Sungai Sireh

Figure 3.4.9 Reusing pesticide containers for water storage (Photo by PACOS)

Figure 3.4.10 Pesticide containers reused for water storage (Photo by PACOS)

4. Lack of Training on Pesticide Use

Only one among the oil palm plantation respondents was given training on the proper use and storage of pesticides. Company supervisors only instructed workers on how to measure pesticides for mixing.

Less than half of the respondents from the rice paddy community received training, albeit lasting only for one to three hours.

5. Lack of Access to Pesticide Labels

Oil palm plantation workers did not see the labels or the original pesticide containers. The pesticides were decanted or distributed to them in small bottles by their supervisor, which they then dilute

for spraying. Some local oil palm growers reported not reading pesticide labels, and only follow the instructions of the pesticide sellers.

A large majority of the respondents from the rice paddy community had access to the pesticide labels and read the labels. Labels were printed mostly in the local language and large enough to read.

6. Exposure to Pesticides and Health Symptoms

The rice paddy community

In Kg Sungai Sireh, more than half of the respondents experienced symptoms of poisoning due to pesticide exposure. The most common symptoms were headache, dizziness, insomnia, convulsions, and breathing problems. Respondents were also observed to have peeled and damaged skin and nails.

Oil palm plantation

In Selangor, more than half of the respondents displayed one or more symptoms of pesticide poisoning. Almost all female respondents reported a burning sensation and itchiness in the genital area. In a male dominated workplace, women workers suffer in silence, as they are too shy to disclose their situation.

BOX 3.4.1 PERSONAL ACCOUNTS OF PESTICIDE POISONING

Meena*, 38, has been spraying pesticides, including Gramoxone (paraquat), for seven hours daily for several years. She complained of burning sensations on her face, nose, lips, hands, vagina and other parts of the body. The pain is unbearable at times, and it affects her work performance. Her supervisor has ignored her complaints, saying that these are "normal."

Mara*, 42, has sprayed pesticides continuously for several years. She has developed skin rashes, dryness and peeling on her hands and feet. Her health situation worsened and she felt itchiness all over her body and vagina, coupled with a burning sensation. In 2012, she resigned from the plantation and worked as a cleaner instead.

**Names have been changed.*

The most common symptoms of poisoning among the oil palm workers in Sabah were headache, followed by dizziness, and excessive sweating. The workers also reported experiencing difficulty in breathing, itchiness, nausea, vomiting, skin rashes, blurred vision, hand tremors, stomach ache, cough, and flu.

7. Decrease in Soil Quality and Poisoning of Water Sources, Aquatic Life, Wildlife and Livestock

Plantations do not have proper sewage systems and so they dump chemical fertilisers into the streams.

Almost all respondents in the three oil palm communities in Sabah observed river pollution, which according to them, may be due to soil erosion and pesticide contamination (Figure 3.4.11). Aquatic life, a community food source, has been depleted.

"The poison infiltrates the soil and flows to the Kalampun River. It's black, dirty and smells like rotten banana," said one local oil palm grower.

Figure 3.4.11 A farmer sprays pesticides near a river (Photo by PANAP)

Since villagers are forced to drink water from the river when there is no rain, they experience stomach aches and diarrhoea.

Villagers also claimed that they could no longer plant crops because the soil quality and fertility have been adversely affected by pesticide use. They found it difficult to raise livestock, which frequently die. The indigenous peoples also could neither hunt nor gather food, as the wildlife in the area has dwindled. The bee population has considerably declined as well, making honey unavailable.

"When extinction occurs, the next generation will not be able to recognise the wildlife or fish species and our cultural way of life," a villager from the Murut ethnic group said.

8. Land-grabbing and Encroachment on Indigenous Land Due to Oil Palm Expansions

Some of the villagers, all belonging to ethnic groups, recalled how the oil palm plantations forcibly took away their lands more than a decade ago. No consultations were held with the community members. Forested areas that the indigenous villagers depend on for livelihood were also cleared. There are also concerns over violations of the lease agreement that many villagers have with the palm oil company, as well as the unfair terms of the agreement.

9. Low Wages and Restrictive Labour Policies in Oil Palm Plantations

Respondents in Sabah shared that plantation workers receive low wages (e.g. piecemeal rate of RM 18 or USD 4 per hectare and RM 200 or USD 48 monthly wage for sprayers). Most are undocumented migrant workers, who do not have security of tenure and are subject to restrictive labour policies. Migrant workers are made to shoulder medical costs in case of illnesses, even those caused by pesticide exposure.

In Selangor, workers receive a salary of about RM 700 (USD 180) per month, with an extra RM 200 (USD 51) as allowance. When the Government increased the minimum wage to RM 900 (USD230), the company made the allowance a part of the salary to meet the standard. In the event the worker is not able to come to work due to illness or emergencies, deductions are made accordingly. Deductions range from RM 50 (USD 13) to RM 150 (USD 38).

10. Schoolchildren in the Rice Paddy Community are Exposed to Hazardous Pesticides

Of the pesticides used in Kg Sungai Sireh, three are particularly harmful to children and are in PANAP's "Terrible Twenty" list: glyphosate, paraquat, and lambda-cyhalothrin.[140]

School children are likely exposed to these hazardous pesticides considering that two primary schools are located in Kg Sungai Sireh. One is facing the paddy fields while another one is next to the water canal where the oil palm plantation is. Children are specially exposed as they wait on the roadside to be picked up from school.

VIOLATION OF HUMAN RIGHTS AND AGREEMENTS

Malaysia has affirmed the Universal Declaration of Human Rights (UDHR), adopted the International Code of Conduct on Pesticide Management, and ratified the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW) and the Convention on the Rights of the Child (CRC).

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140 PANAP. (n.d.) *Twenty terrible pesticides that are toxic to children.* Retrieved frpm http://files.panap.net/resources/20-Terrible-Pesticides-poster.pdf

However, the Malaysian government's inaction on pesticide use and its impacts, violates salient points in all these treaties.

Pesticide companies such as Syngenta continue to sell paraquat and Gramoxone even though they know the impact of their pesticide and the condition of use in Malaysia in the oil palm plantations and the rice farms. This violates the right to health of plantation workers and farmers. In 2002, when the Malaysian government announced the ban on paraquat, Syngenta and the palm oil industry successfully repealed the ban on paraquat through active lobbying and pressuring of politicians and government officials. This repeal of the ban puts the health of workers and farmers on the line.

The use of HHPs in oil palm plantations and rice paddy communities in the states of Selangor and Sabah violate the Code and a number of human rights agreements.

1. Violations of the International Code of Conduct on Pesticide Management

Oil palm plantation workers and rice farmers are exposed to pesticides through lack of, or inability to use, adequate PPE. They also lack training on handling of pesticides, leading to harmful practices such as spraying against the wind direction and improper storage and disposal of pesticides and pesticide containers. They suffer from various symptoms of pesticide poisoning.

One of the most important articles of the Code, Article 3.6, states "Pesticides whose handling and application require the use of PPE that is uncomfortable, expensive or not readily available should be avoided, especially in the case of small-scale users and farm workers in hot climates."

Further, Article 7.5 of the Code states that "the Prohibition of the importation, distribution, sale and purchase of HHPs may be considered if, based on risk assessment, risk mitigation measures or good marketing practices," while Article 5.2.5 calls on the industry to "halt sale and recall products as soon as possible when handling or use pose an unacceptable risk under any use direction or restrictions and notify the government."

The study clearly shows that the conditions of use of pesticides in Malaysia is appalling and the pesticide industry has the responsibility to act to halt sale and recall products particularly paraquat and other HHPs including carbofuran, fipronil, lambda-cyhalothrin, and fenitrothion (see full list in Annex 3.4.1. List of reported pesticides in Malaysia 2015-2016).

Simply put, under conditions of use in Malaysia, HHPs should not be used in Malaysia. The Code provides for the pesticide industry to halt sales and recall them, and for the Government to ban them.

The pesticide industry should (Article 3.5.6) retain an active interest in following their products through their entire lifecycle, keeping track of major uses and the occurrence of any problems arising from the use of their products, as a basis for determining the need for changes in labelling, directions for use, packaging, formulation or product availability.

Article 9.2.1 of the Code, and the right of access to information, are violated with workers' lack of awareness of the hazards of the pesticides they are exposed to. This results from the failure of plantation companies, pesticide sellers, manufacturers and the responsible government departments to provide appropriate training. Plantation workers lack access to proper labels due to the practice of decanting by palm oil companies, and this further violates their right to information. Article 9.2.1 urges governments to provide and implement legislation that permits public access "to information about pesticide risks and the regulatory process, while safeguarding intellectual property". The Malaysian government has not adequately implemented this article.

Article 1.7.3 of the Code and the rights to food and livelihood are violated with pesticides affecting soil quality and the ability of farmers to plant crops for their consumption and livelihood. Other traditional food sources such as fish and other aquatic life, livestock, and wildlife have also been severely affected by pesticides. Article 1.7.3 sets the standard for private and public entities to "promote practices which reduce risks throughout the lifecycle of pesticides, with the aim of minimising adverse effects on humans, animals and the environment and preventing accidental poisoning resulting from handling, storage, transport, use or disposal, as well as from the presence of pesticide residues in food and feed."

Illegal or unregistered pesticides with labels in foreign languages were also found in the rice paddy community, violating the Code Article 6.1.13, which calls on governments "to detect and control counterfeiting and illegal trade in pesticides through national inter-agency and intergovernmental cooperation and information sharing."

2. Violations of the ILO Convention 184

The condition of use of HHPs also violates the ILO Convention, 'Safety and Health in Agriculture Convention, 2001 (No. 184)' which identifies agricultural workers rights as the following:

- right to be informed and consulted on safety and health matters including risks from new technologies;
- right to participate in the application and review of safety and health measures and, in accordance with national law and practice, to select safety and health representatives and representatives in safety and health committees; and
- right to remove themselves from danger resulting from their work activity when they have reasonable justification to believe there is an imminent and serious risk to their safety and health and so inform their supervisor immediately. They shall not be placed at any disadvantage as a result of these actions.

Oil palm plantation workers' right to a safe working environment is violated as well by the companies' requiring the use of HHPs, which cannot be used without PPE to minimise the risks of exposure. The

owners and corporations disregard the safety and health of workers when PPE is inadequate, unavailable and/or not suitable for the climatic conditions and for providing defective spraying equipment, failing to provide washing and medical facilities and refusing to pay for consequent medical expenses of workers. The low wages and lack of benefits for undocumented migrant workers doing hazardous work also violate labour rights.

3. Women's Rights

The majority of women workers in the oil palm plantations experienced symptoms of pesticide poisoning, which were ignored or underestimated by the management and no direct health intervention took place. It is a clear violation of women's rights as guaranteed in CEDAW, which affirms, amongst others, the reproductive rights of women:

- CEDAW Article 11 - States Parties shall take all appropriate measures to eliminate discrimination against women in the field of employment in order to ensure, on a basis of equality of men and women, the same rights.
- CEDAW Article 12 - States Parties shall take all appropriate measures to eliminate discrimination against women in the field of health care in order to ensure, on a basis of equality of men and women, access to health care services, including those related to family planning.

These articles affirm the reproductive rights of women and call on states to take appropriate measures against all forms of exploitation of women. Pesticide exposure seriously undermines the reproductive rights of women and the rights of children.

4. Children's Rights

Children's rights are violated by their exposure to hazardous pesticides within and beyond the school premises and their homes because of the lack of a buffer zone between the school and paddy fields as shown in the studies in Sabah and Selangor. Specifically, the violations of the CRC include:

- Article 3.3 - States Parties shall ensure that the institutions, services and facilities responsible for the care or protection of children shall conform to the standards established by competent authorities, particularly in the areas of safety, health, in the number and suitability of their staff, as well as competent supervision.
- Article 6.1 - States Parties recognise that every child has the inherent right to life.
- Article 6.2. - States Parties shall ensure to the maximum extent possible the survival and development of the child.

CONCLUSION

The surveys undertaken in oil palm plantations and rice paddy cultivation areas found the widespread use of HHPs, under inappropriate conditions of use, and resulting in unacceptable adverse health effects. Pesticide manufacturers and sellers, and the government of Malaysia are not adhering to the Code and the rights of women and children are being affected by facilitating the selling and use of HHPs.

Furthermore, the international community, including Malaysia, agreed at the 4th International Conference on Chemicals Management, that action should be taken against HHPs, and the focus should be on replacing them with agroecological practices.

Annex 3.4.1 List of reported pesticides in Malaysia 2015-2017

PESTICIDES	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
2,4 –D dimethylammonium	1																	
Allethrin	1																	
Azoxystrobin	2																	
Buprofezin	2				Possible													
Butachlor	1				Possible											Yes		31
Carbofuran	1			Yes				Yes	Yes				Yes		Yes	Yes		46
Chlorantraniliprole	4										Yes	Yes				Yes		
Cypermethrin	1															Yes	Yes	
Difenoconazole	11																	1
Diuron	1				Possible											Yes		1
Fenitrothion	2							Yes	Yes				Yes			Yes		28†
Fenobucarb	2								Yes									29
Fipronil	2								Yes				Yes			Yes		8
Flubendiamide	2																	
Glufosinate-ammonium	1						Yes									Yes		
Glyphosate	6				Possible											Yes	Yes	1
Isoprothiolane	4																	
Lambda-cyhalothrin	4			Yes				Yes					Yes			Yes	Yes	28†
Malathion	1				Possible				Yes				Yes			Yes	Yes	2
Metsulfuron-methyl	1																	1
Paraquat	2			Yes				Yes					Yes			Yes	Yes	38
Pretilachlor	1																	
Propanil	2				Possible			Yes										29

PESTICIDES	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Propiconazole	2				Possible			Yes			Yes							
Propineb	4																	
Pymetrozine	4				Possible											Yes		2
Pyribenzoxim	1																	

†Not banned in any country, but is not approved in the European Union.
WHO Ia: Extremely hazardous
WHO Ib: Highly hazardous
H330: Fatal if inhaled according to the Globally Harmonized System (GHS)
Muta EU 1, 2: Mutagenic; Probable Mutagen
Repro EU 1,2: Reproductive Toxin; Probable Reproductive Toxin
EDC: Endocrine Disruptor
ChEInh: Cholinesterase Inhibitor
vB: Very Bioaccumulative
vP: Very Persistent
POP: Persistent Organic Pollutants
PIC: Prior Informed Consent
HHP: Highly Hazardous Pesticide
T20: Terrible 20 pesticides extremely hazardous to children

Annex 3.4.2

Banned pesticides in Malaysia

1. Alachlor
2. Aldicarb
3. Azinphos-Methyl
4. Butachlor
5. Calcium Cyanide
6. Captafol
7. Chlordane
8. DDT
9. Di-Nitro-Ortho-Cresol / Dnoc
10. Endosulfan - See Footnote *
11. Ethylene Dibromide / Edb / 1,2-Dibromoethane
12. Ethylene Dichloride / 1,2-Dichloroethane
13. Ethylene Oxide
14. Fluoroacetamide
15. Folpet
16. Hexachlorobenzene / Benzene Hexachloride (HCB/BHC)
17. Hexachlorocyclohexane (HCH)
18. Lindane
19. Mercury Compounds
20. Methomyl
21. Methyl Parathion
22. Parathion (Ethyl)
23. Pentachlorophenol (PCP) And Salts
24. Phenthoate
25. Phosphamidon
26. Profenofos
27. Prothiofos
28. Quinalphos
29. Triazophos
30. Tributyltin Compounds

Major References:

PAN International. (2017). *PAN International Consolidated List of Banned Pesticides* (3rd ed.). Retrieved from http://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

PAN International. (2018, March). *PAN International List of Highly Hazardous Pesticides*. Retrieved from http://www.pan-germany.org/download/PAN_HHP_List.pdf

Annex 3.4.3 Pesticides used at Kampung Sungai Sireh, Tanjung Karang and Selangor State

ACTIVE INGREDIENT	No.	WHO	H330	Carcinogen	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	Vp	Vb	High bee tox	POP	PIC	HHP	T20	No. of countries banned
Azoxystrobin	2	U									Slightly					
Buprofezin	2	III		possible							Slightly					
Carbofuran	1	Ib	yes				Yes*	Yes			Yes		yes	yes		46
Chlorantraniliprole	4	U							yes		Slightly			yes		
Difenoconazole	11	II		possible			Yes*		Yes		Slightly					1
Diuron	1	III		yes			Yes*				Yes			yes		1
Fenitrothion	2	II					Yes!	Yes						yes		28†
Fenobucarb	2	II						Yes			Yes					29
Fipronil	2	II		possible			Yes*							yes		8
Flubendiamide	2															
Glyphosate	2	III		yes										yes	yes	1
Isoprothiolane	4	II									yes					
Lambda-cyhalothrin	4	II	yes				Yes!				yes			yes	yes	28
Paraquat	2	II	yes				Yes*							yes	yes	38
Pretilachlor	1	U									Slightly					
Propanil	2	II		yes			Yes*				Slightly					28
Propiconazole	2	II		possible			Yes*		Yes							
Propineb	4	U									Slightly					
Pymetrozine	4			yes			Yes*							yes		2
Pyribenzoxim	1															

* Listed as endocrine disruptor by pesticideinfo.org†Not banned in any country, but is not approved in the European Union.

Legend

- **WHO:** world health organization Recommended Classification of Pesticides by Hazard 2009: http://www.who.int/ipcs/publications/pesticides_hazard_2009.pdf?ua=1Ia: extremely hazardous, Ib: highly hazardous, II moderately hazardous, III slightly hazardous, U: unlikely to pose an acute hazard in normale use, O: obsolete, FM: fumigant.
- **H330:** fatal if inhaled
- **Carcinogen:** HHP or pesticideinfo.org
- **EU EDC:** http://eng.mst.dk/topics/chemicals/endocrine-disruptors/the-eu-list-of-potential-endocrine-disruptor
- **ChEInh:** pesticideinfo.org
- **Vp:** very persistent water, soil or sediment
- **Vb:** very bio accumulated
- **High bee tox:** Slightly toxic is stated such
- **POP:** Persistent Organic Pollutant
- **PIC:** http://www.who.int/ipcs/publications/pesticides_hazard_2009.pdf?ua=1
- **T20:** Terrible 20 pesticides that are Toxic to Children (PANAP)

3.5 PAKISTAN

INTRODUCTION

The pesticide industry in Pakistan is worth PKR 50 billion, or approximately USD 452 million.[141] In 2016, 25.3% of pesticides were imported, with the country consuming around 67.8 thousand metric tonnes, and making it to China's top 10 countries in pesticide export market.[142] Crop-based pesticides make up 97% of the market share.

The major pesticide companies operating in Pakistan are Bayer Crop Science, Syngenta International, ICI Pakistan, Four Brothers Chemicals, FMC Corporation, and Ali Akbar. Together, they all account for 75% of the market share. Dow Agro Sciences and DuPont wound up their operations in the country due to fierce competition from the generic pesticide market and are now operating through local distributors. ICI Pakistan, for one, is DuPont's supplier.[143]

The Agriculture Pesticides Ordinance of 1971 and the Agricultural Pesticides Rules of 1973, with a number of subsequent amendments, govern the import, manufacture, formulation, sale, distribution and use of pesticides. Under these laws, the State government has the duty to ensure that pesticide manufacturers, importers and distributors follow proper licensing, packaging, storage, and disposal practices; as well as ensure that employers observe safety precautionary measures to protect their workers from harmful pesticide exposure.[144]

METHODOLOGY

Khoj - Society for People's Education, an organisation based in Lahore, Pakistan that advocates for agroecology and safe environment, conducted the field study in Punjab province. There were 76 respondents from 13 villages and one town located in Sheikhupura district, the country's rice and wheat belt.

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141 Awan, M.L. (2015). *Marketing Channels in Pakistan's Pesticide Industry.* Retrieved from https://crc.lums.edu.pk/crcsearch/04-2357-2015-2/details

142 AgroPages. (2017, March 7). Briefing on Export of Pesticides from China in 2016. Retrieved from http://news.agropages.com/News/NewsDetail---21285.htm

143 Mordor Intelligence. (2017). *Pakistan Crop Protection Chemicals Market - Growth, Trends and Forecasts (2017 – 2022).* Retrieved from https://www.mordorintelligence.com/industry-reports/pakistan-crop-protection-chemicals-market

144 Ministry of Food and Agriculture. (1973). Agricultural Pesticides Rules of 1973. Retrieved from http://www.punjabcode.punjab.gov.pk/index/showarticle/ref/137e730f-92b5-46b7-a4a3-9a033dc8eacc

RESULTS

1. Demographics

Agriculture is the ancestral occupation of all respondents. They grow wheat and rice for their family consumption and their surplus produce is sold in the market. Some of them specialise in vegetable and/or fruit production. All respondents also grow berseem,[145] maize, and jawar (sorghum) as fodder for their livestock. Fifty-two percent owned one to five acres. Thirteen percent of the respondents were landless. Twenty percent owned six to 10 acres, and 11% had land titles of 10.5 to 20 acres. Fifty-three percent of the respondents were illiterate. The educational attainment of 36% was between grades 1 and 8; 59% of who were school children while 11% finished high school.

2. Exposure to Highly Hazardous Pesticides

All respondents, except four women, have been using pesticides. The 72 respondents and their families have been using pesticides for the past 12 to 30 years. They use liquid and granular pesticides. Liquid pesticides are sprayed using a backpack while the granulars are applied using the broadcast system. Generally, herbicides are applied three days after transplanting, while insecticides are used when the rice grain starts to form. They spray pesticides as "insurance".

Pesticides are distributed and marketed under different brand names by a range of distributors. Of the 17 pesticides found to be in use, six (6) are highly hazardous. (Table 3.5.1 and Annex 3.5.1).

Table 3.5.1 List of pesticides reported to be used in the study areas

INSECTICIDES	HERBICIDES
Cartap hydrochloride	Bispyribac sodium
Monomehypo	Butachlor*
Lambda-cyhalothrin*	Sulphur
Thiamethoxam*	Bensulfuron methyl
Chlorantraniliprole*	Bispyribac sodium
Imidacloprid*	Pretilachlor
	Acetochlor*
	Pyrezosulfuran ethyl

**Highly hazardous*

According to Dr. Muhammad Iqbal Zafar, current Vice-Chancellor University of Agriculture Faisalabad, more than 50% of marketed pesticides in the country were highly hazardous, causing toxicity to the skin and nervous system.[146]

145 Berseem is a pasture legume. For further description, see https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/156068/berseem-clover.pdf

146 Excessive use of pesticides causing health, environment hazards. (2018, May 18). *The News*. Retrieved from https://www.thenews.com.pk/print/318253-excessive-use-of-pesticides-causing-health-environment-hazards

Most manufacturers are Chinese companies while most distributors are local companies. Of the agrochemical TNCs, Syngenta companies in India, Switzerland, and France are listed as the brand manufacturers of thiamethoxam and pretilachlor, while Syngenta Pakistan Limited is listed as their distributor.

Farmers depend on pesticide vendors or fellow pesticide users' advice in choosing pesticides. They also depend on vendors who suggest mixing different types of pesticides together. They try different brand names of a pesticide at the same time or in succession. They also use the surfactant, alkyl ether sulfate, to enhance the pesticides' potency. Cost influences their choice, as shown when they stopped using the once favoured Padan (a cartap hydrochloride brand name) when its price became comparatively higher.

3. Hazardous Conditions of Use

Figure 3.5.1 A farmer mixing pesticides with bare hands (Photo by Khoj)

Unsafe handling and lack of personal protective equipment

None of the respondents reported using personal protective equipment (PPE) or observing precautionary measures while buying, carrying, and storing pesticides; opening pesticide containers; mixing, loading, spraying, and broadcasting pesticides; washing pesticide equipment; and disposing of empty containers. Shopkeepers do not use gloves while handling the pesticides. Sometimes, pesticide bags fall and burst open, scattering the granules. In one such instance, it was observed that the pesticide granules were swept together using a household broom. Farmers also open pesticide containers using bare hands. One farmer was witnessed opening a granular pesticide bag using his teeth.

Granular pesticide is mixed with fertiliser and broadcasted with bare hands. Women and girls also mix these pesticides and fill up the jhola (a sling-like arrangement of a piece of cloth used to broadcast seeds or fertilisers) for their husband or father. Furthermore, liquid pesticides are mixed near a water source, and are mixed in such a way that it leaves a small puddle of pesticide-contaminated water. This puddle

splashes on the clothes of the pesticide sprayer, as well as the person helping to mount the backpack on the sprayer.

Farmers spray the paddy fields wearing only light summer clothes. Their hands, forearms, face, neck, feet, and lower legs are exposed when spraying pesticides. When pesticide spraying is done in the paddy fields, liquid and granular pesticides instantly mix in the water and flood the field. As a sprayer walks barefoot, or even with shoes on, his or her feet and lower legs are fully exposed to the poison. After spraying, the farmers wash themselves at the watercourse, further contaminating water sources. Women and girls wash the pesticide-soaked clothes at home.

Entering newly sprayed fields

Sixty-four percent of the respondents said that they enter fields two to three days after spraying. Eighteen percent said that they returned to the fields one day after spraying, while 16% entered the fields on the same day it was sprayed with pesticides.

Lack of training and unlicensed shops

Regular pesticide shops in the nearby town had training and licenses but some pesticide sellers do not have regular shops, do not have licenses, and have not received any training on the hazards of pesticides and safety precautions. Farmers have not received any training at all. They do not know anything about the pesticides they are using and what to do in case of poisoning. Most are not even aware that there is a need to use safety clothing and equipment.

Improper storage, disposal, and labelling of pesticides

Thirty-five (46.05%) respondents stored pesticide containers inside their homes while forty-four (57.89%) threw empty pesticide containers in the fields.

The team that went to the rice paddies collected empty pesticide bags and bottles of 42 brands of pesticides, all of which carry labels that include information on the uses, active ingredients, formulation, manufacturers, and distributors (Table 3.5.2). The labels are in Urdu and English, and on some containers, are in very small print without information on antidotes and what to do in case of poisoning.

Considering that the local language is Punjabi and that more than half of the respondents are illiterate, such labels could not be read. Only five (6.57%) of the respondents read the labels.

Table 3.5.2 Label information on empty pesticide containers collected from the fields from 20-23 August 2017

ACTIVE INGREDIENTS	BRAND NAMES	FORMULATION	MANUFACTURER	DISTRIBUTOR	USES
Acetochlor	Welacelor		Shandong Vicome Greenland Chemical Co. China	Warble (Pvt.) Ltd., Lahore.	Weeds in rice
Bensulfuron Methyl + Acetochlor	Miaoyou	16% KPP (4% + 12%)	Shandong Qiaochang Chemical Co. Ltd., China	Chem & Chem (Pvt.) Ltd., Lahore.	
				Ventus Agro (pvt) Ltd, Multan Cantt.	
Bensulfuron Methyl + Bispyribac Sodium	Winsta	30% WP (18% + 12%)	Jiangsu Institute of Ecomones Co. Ltd., China	Scion Crop Sciences, Bahawalpur	Rice weeds
				Target Agro Chemicals, Lahore	
				Agrow Limited, Lahore	
Bensulfuron 12% (w/w) + Bispyribac Sodium 18%(w/w)	Melano Super	30WP		Greenlet International, Dera Ghazi Khan	Weeds of rice
Bensulfuron Methyl 12% + Bispyribac Sodium 18%	Pyranex Gold	30% WDG	Kanzo AG, Multan	Kanzo AG, Multan	
Bensulfuron Methyl 12% + Bispyribac Sodium 18% + alkile ether sulfate 26.62%	Pyranex Gold + Bio-enhancer				
Bispyribac Sodium	Bingo	10% SC	Jiangsu Institute of Ecomones Co. Ltd., China	Auriga Chemical Enterprises, 33km Multan Road, Lahore	Rice weeds
Bispyribac Sodium 18%(w/w)	Bemisal	20%WP			
Butachlor	Matrix	30% WP (18% + 12%)		Warble (Pvt.) Ltd., Lahore.	Weeds of rice
				Sonero CS Private Ltd, Lahore	Rice weeds
	Butachlor	59% w/w	Jiangsu Lulilai Co. Ltd, China	Patron Chemicals, Multan	Weeds in rice
	Mechete	60% EC w/v	Nantong Jiangshan Agrochemical & Chemicals Ltd., China.	FMC United (pvt) Ltd, Lahore	
	Primechlor	60% EC w/v	Shandong Qiaochang Chemical Co. Ltd., China.	Tara Crop Sciences (pvt) Ltd., Lahore.	
	Razex	4% G w/w & 98% Tech	Jiangsu Tianrong Group Co. Ltd., China	Agrow Limited, Lahore	Rice stem borers @ 9 kg/acre.
	Kapple	4%G		Sungro (pvt) Limited, Fac 8A, Industrial Estate, Multan	Rice stem borer

ACTIVE INGREDIENTS	BRAND NAMES	FORMULATION	MANUFACTURER	DISTRIBUTOR	USES
Imidacloprid	Imidacloprid	25%WP w/w	Hextar Chemicals Sdn. Bhd., Malaysia	Arrow International, Lahore	Plant hopper in rice, thrips, white fly, green aphid in cotton and black aphid in apples
Lambda-Cyhalothrin	Garrison	2.5% EC 2.75%w/w	Hextar Chemicals Sdn. Bhd., Malaysia	Hextar Chemicals Pakistan (Pvt.) Ltd., Lahore	Cotton bollworms, jassid, whitefly and thrips, gram pod borers, mango hopper, rice stem borers and leaf folders, brinjal and lady finger fruit borers
	Zega Super	10% EC & 90% Tech.	Modern Insecticides Limited, India	Sungro (pvt) Limited, Multan	Cotton spotted bollworm
Monomehypo	Tara Gold*	5% G & 95% Tech.	Tara Imperial Industries (Pvt.) Ltd., Lahore, Pakistan	Tara Imperial Industries (Pvt.) Ltd., Lahore	Rice borers @ 7 kg/acre. * Note: Only import of technical grade material for local formulation of Tara Gold 5% G
	Monomehypo	5% G w/w	Jiangsu Tianrong Group Co. Ltd., China	Scion Crop Sciences, Bahawalpur	Rice borers, rice leaf roller and sugarcane borers
		5% G & 95% Tech.	Anhui Huaxing Chemical Industry Co. Ltd., P.R. China	Agrow Limited, Lahore	
				Crown Star Agro Chemicals, Sahiwal	
			Hunan Haohua Chemicals Co., Ltd, China	Arrow International, Lahore	
	Tango	5% G & 95% Tech.	Jiangsu Tianrong Group Co. Ltd., China	Greenlet International Dera Ghazi Khan	
	Hyposun			4F, Chemicals, Lahore	
	Descent	5% G w/w & 95% Tech.		Warble (Pvt.) Ltd., Lahore	
	Sol-Hypo		Not given on the bag	Solex Chemicals (pvt) Ltd, Multan	
	Coupon		Jiangsu Anpon Electrochemical Co. Ltd., China	Auriga Chemical Enterprises, Lahore	Rice stem borers
Orthosulfamuron	Kelion	50WG 50%w/w	M/S Schirm GmbH, Germany	Jaffer Agro Services (Private) Ltd., Karachi	Weeds in rice

ACTIVE INGREDIENTS	BRAND NAMES	FORMULATION	MANUFACTURER	DISTRIBUTOR	USES
Pretilachlor	Rifit	500 EC 50%w/w	Syngenta India Ltd	Syngenta Pakistan Limited	Weeds in rice @ 400-500 ml/acre
Pyrezosulfuran ethyl	Eraser	10%w/w	Jiangsu Lulilai Co. China	Sonero CS Private Ltd, Lahore	Weeds in rice
Sulphur	Kumulus DF	80% WG	BASF Aktiengesell-schaft, Germany	FMC, Lahore	Fungicide for fruits
	Sulfex		Hebei Shuangji Chemical Co. Ltd., China	Greenlet International, Dera Ghazi Khan	Powdery mildew in apples, grapes, cucumber and watermelon
	Sulphur	80WG	M/S Meghmani-Industries Limited, Ahmadabad, India	Agrow Limited, Lahore	Fungicide for water melon, melon, cucumber, apples and grapes
Thiamethoxam	Actara	25 WG	Syngenta Participations, AG Basel, Switzerland	Syngenta Pakistan Limited	Cotton jassid, thrips & mealy bug, potato and okra jassid, tobacco aphid, mango hoppers, rice white backed plant hopper, brinjal jassid, citrus psylla & leaf miner, chili aphid (Myzus pursicae),.
Thiamethoxam 17.54% w/w + Chlorantraniliprole 8.77% w/w	Voliam Flexi	300SC	Syngenta Production, France		Fruit and stem borers of fruits and vegetables – tomato, brinjal, potato, okra, cauliflower and cabbage

4. Illnesses from Pesticide Exposure

The health profile of the respondents and their families paint a grim picture. Out of 37 (48.68%) interviews conducted on health status, the most common reported illness is diabetes. The other illnesses reported were: stomach problems, liver problems, arthritis, weakness, body aches, fever, headache, giddiness, back pain, low blood pressure, high blood pressure, asthma, heart problem, muscular pain, piles, kidney stones, psychiatric problems, and irregular menstruation.

Respondents were able to identify cases of acute poisoning related to the use of specific pesticides. Twenty respondents (26.31%) said that they experienced pesticide spillages.

BOX 3.5.1 PERSONAL ACCOUNTS OF PESTICIDE POISONING

Lambda-cyhalothrin (brand names: Garrison, Zega Super, Karate)

1. "I poured 20 litres of water in the backpack and added two capfuls of lambda-cyhalothrin (Garrison). I was spraying the 5th acre of paddy crop when I felt unwell. I experienced giddiness, itching."
2. "I poured 20 litres of water in the backpack sprayer and added two capfuls of lambda. I sprayed one acre of Jawar field for four times in July at 11:00am. I suffered from itchiness and red rashes on the skin."
3. "I poured 15 litres of water in the backpack sprayer and added one litre of diluted lambda (Karate). I sprayed the paddy crop in September. After the third round of spraying, I felt dizzy and nauseated, had excessive sweating, itchiness, red pimple, and fell unconscious."
4. "I poured 15 litres of water in the backpack sprayer and added half litre of diluted Lambda. I sprayed the paddy crop in September from 8:00am to 10:00am. Because of the tall paddy plants, I was spraying at a height, which resulted in drift of spray in my eyes. I felt giddy and nauseated."

Methamidaphos

5. "I poured 15 litres of water in the backpack and added one glass of diluted methamidaphos. I sprayed the pesticide four times on one acre of paddy crop. I experienced itchiness and pimples grew on my back. It was so painful, as if chili powder had been applied on my skin."
6. "I sprayed the paddy crop from 9:00am to 3:00pm. The wind direction changed and the fumes drifted towards me, affecting my eyes, mouth and skin and nose. I felt nauseated and giddy."

Cartap Hydrochloride (brand names: Cartap, Kapple)

7. "I was broadcasting Cartap on paddy fields. My skin became red and red pimples emerged. I was in severe pain."
8. "I broadcasted granular pesticide Cartap (Kapple) in three acres starting at 8:00am. After broadcasting one acre, I felt giddy but continued to work. After the third acre, my giddiness and itchiness got worse and pimples emerged".
9. "I started broadcasting Cartap on paddy crop at about 9:00am. After 20 minutes, I was poisoned. I had headache, excessive salivation, excessive sweating, hand tremors, itchiness, and red pimples."

Monomehypo

10. "I broadcasted granular pesticide in five acres starting at 6:00am. When I started spraying in the sixth acre I felt poisoned, staggered, and fell unconscious. "

Clodinafop + propargyl (brand name: Topic)

11. "I poured 15 litres of water in the backpack and added 1/3 litre of diluted Topic. When I started spraying in the fourth acre, the wind changed its direction and the drift was on me. I had a headache, felt dizzy and nauseated"

Figure 3.5.2 Young women working in a pesticide-laden rice fields (Photo by Khoj)

5. Women's Exposure to Hazardous Pesticides

Women were found to be exposed to pesticides in many ways: transplanting rice seedlings, washing pesticide-contaminated clothes, working in the sprayed fields, storing pesticides, washing empty pesticide containers and reusing them. The study further reveals that, with the increasing use of granular pesticides, women are in much more direct contact with pesticides. Girls and women reported mixing chemical fertilisers, liquid, and granular pesticides with bare hands.

6. Children's Exposure to Hazardous Pesticides

Interviews with ten children (equal number of girl and boy respondents) revealed that children between the ages of 11 and 15 assist their parents in the paddy fields. The girls help in transplanting paddy and in harvesting crops like rice and wheat. They open bags of chemical fertilisers and granular pesticides and prepare the jhola used by their fathers for broadcasting. They also mix the liquid pesticides with water. The boys assist in spraying pesticides and in other agricultural work.

None of the respondents reported using gloves or other protective clothing. They did not have any knowledge of the pesticides they handle, which the team found to include ethoxysulfuron, and the HHPs, cartap hydrochloride, butachlor, and lambda-cyhalothrin. The last is especially toxic to children and is included in PANAP's "Terrible Twenty" pesticide list.

The schools in the villages are very close to the fields. Five of the ten schools included in the research are located right in the fields, which could mean maximum exposure of children to pesticide drift. The other schools are also near the paddy fields, with distances ranging from 9.14 to 22.86 metres. The location of the schools poses a serious threat to the health and life of the school children. The wind can carry the sprayed pesticides not only to these schools but also to far off places. A study conducted jointly by the scientists of Quaid-i-Azam University, Islamabad, and Lancaster University, United Kingdom in

November 2017 reveals the presence of the pesticides far away from the fields where they are applied. The dust in and around Lahore contains pesticides that pose a serious health risk to the people.[147]

Children have been observed to play with empty pesticide bottles. They fill the bottles with water to splash on other children or make a toy train out of these.

Table 3.5.3 Distance of schools from sprayed agricultural fields

NAME OF SCHOOL	VILLAGE	DISTANCE
Government Primary School	Kot Mughal	0 metres from the east and north
Government Primary School	Nizampura	0 metres from three sides
Government Primary School	Chak Pawar	9.14 metres from the front
Khoj School for Community Education	Thathi Bhanguaan	0 metres from 3 directions, 3.05 metres from the front
Hafiz School System	Thatha Raghuwan	21.34 metres from 3 sides
Government Primary School	Burhanaywala	0 metres from left and right sides
Government Primary School	Jhandaywala	0 metres from all sides
Government Girls' Elementary School	Essan	12.19 metres from the west
Government High School for Boys	Essan	22.86 metres from right side
Government Primary School	Adheray	0 metres from east and south

VIOLATION OF HUMAN RIGHTS AND AGREEMENTS

1. Universal Declaration of Human Rights

In contrary to the UDHR 1948 that ensures "Everyone has the right to life, liberty and security of person", the right to life and health of women and men farmers and children in the surveyed areas in Pakistan are at risk with exposure to pesticides, which have been shown in the study to cause various illnesses. In some recorded cases, specific pesticides have been linked to acute poisoning. Extremely unsafe practices, such as mixing pesticides with bare hands, increase exposure and associated risks.

2. State Inaction

Article 4 of the Constitution of Pakistan affirms this right in the following words: "No action detrimental to the life, liberty, body, reputation or property of any person shall be taken except in accordance with law."

The findings of the research very clearly show that the conditions under which the pesticides are used are neither safe nor healthy and are a risk to human, animal, and other forms of life. Therefore, it shows that conditions of pesticide use contravene the constitution of Pakistan.

147 Mughal, F.H. (2018, May 7). Environmental impact of pesticide overuse. *Dawn*. Retrieved from https://www.dawn.com/news/1406013.

Unsafe practices are brought about by lack of awareness, compounded by illiteracy. The people's right to access to information is violated through lax regulation that allows for unlicensed pesticide sellers who lack training and themselves demonstrate unsafe handling of pesticides.

No precautionary measures were taken while buying, carrying, storing, opening the containers, mixing, loading, spraying, broadcasting, washing the pesticide equipment, and disposing off empty containers. Pesticides are carried home from the vendor without any precaution taken. The containers are carried, loaded, and off-loaded from the vehicle using bare hands. Shopkeepers also do not use gloves or any other protective equipment while handling the pesticides.

According to Pakistan's Agricultural Pesticides Rules 1973:

1. No person shall store for sale or put on sale any pesticide unless he is duly licensed for this purpose.
2. A person licensed as dealer or vendor shall, undertake in writing to, maintain a ledger of sales of pesticides and record therein the names of buyers.
3. The license shall only be issued to those who have been duly trained by the Federal Agencies, Provincial Government or Pakistan Agricultural Pesticides Association in safe handling, storage, transportation and use of pesticides.

This research indicates that these rules are being ignored. There are pesticide vendors in the villages that do not have regular shops, do not have licenses, and have not received training. No vendor, even in the towns, keeps a record of the names of the buyers.[148]

3. International Code of Conduct on Pesticide Management

The selling of pesticides without proper training is a violation of Article 3.11 of the Code that states "governments, pesticide industry, and the application equipment industry should develop and promote the use of pesticide application methods and equipment that minimise the risks from pesticides to human and animal health and/or the environment and that optimise efficiency and cost-effectiveness and should conduct periodic practical training in such activities. The application equipment industry should also provide users with information on proper maintenance and use of application equipment."

The labels are not in the local language. Also, pesticides have not been packaged appropriately and caused spillages. This is not in compliance with article 8.2.7 of the Code whereby pesticide industries should "ensure that persons involved in the sale of pesticides are trained adequately, hold appropriate government permits or licenses (where they exist), and have access to sufficient information, such as safety data sheets, so that they are capable of providing buyers with advice on risk reduction as well as judicious and efficient use."

148 Akram, M.S. (2017, October 23). The vendor's dilemma. *The Nation.* Retrieved from https://nation.com.pk/23-Oct-2017/pesticide-business-the-vendor-s-dilemma

4. International Covenant on Economic, Social, and Cultural Rights

Clause b of the Article 7 of the ICESCR is also violated. It states that "the States Parties to the present Covenant recognise the right of everyone to the enjoyment of just and favourable conditions of work which ensure, in particular: (b) Safe and healthy working conditions.

Agricultural Pesticides Rules 1973 requires employers "not to employ a worker aged below 18 and over 60 years for working with pesticides." But children between the ages of 11 and 15 years were also found applying pesticides. With the involvement of children in handling hazardous pesticides, and with the proximity of schools to sprayed fields, children's rights are violated. Additionally, workers above 70 years were also found spraying pesticides.

5. Convention on the Rights of the Child

Pakistan is a signatory of the CRC. Article 7 of the CRC states that States Parties "recognise that every child has the inherent right to life" and that they "shall ensure to the maximum extent possible the survival and development of the child."

In addition to the right to life, Article 24 expresses the signatory countries' recognition of children's right to enjoy the highest standard of health, and to facilities for the treatment of illness and rehabilitation of health. They should provide, within the framework of primary health care, "adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution."

Article 32 further reiterates "the right of the child to be protected from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development."

In order to actualise the rights of children, the CRC emphasises the need to take all appropriate legislative and administrative measures by the states so that the best interests of the child shall be a primary consideration and to ensure the child such protection and care as is necessary for his or her well-being."

Unfortunately, the findings of the research show us a totally different picture. Being totally exposed to pesticides at home, in fields they work in, and in schools that are in close proximity to the fields children's life and health are at a risk and the environment they live in is poisoned and polluted.

6. Convention on the Elimination of all Forms of Discrimination against Women

Women's rights are violated when they are exposed not just while spraying and mixing pesticides, but also when doing domestic tasks such as washing pesticide-contaminated clothes and empty pesticide containers. CEDAW under General Recommendation No. 34 on the rights of rural women recommends that States should be protecting "the occupational health and safety of rural women by taking

legislative and other measures to protect them against exposure to harmful chemicals. They should receive information about the health and environmental effects of the use of and exposure to chemicals, particularly hazardous chemicals, pesticides, and other products used in agriculture, extractive, and other industries. States parties should develop and implement public awareness programmes on these effects and on alternatives, and ensure that no use, storage or disposal of hazardous materials or substances takes place without the explicit consent of rural women and their communities."

CONCLUSION

Farmers and their families in the 14 study sites in Sheikhupura district (Punjab province) are severely affected by the continuous use of pesticides, six of which are highly hazardous especially to women and children. The quality of life and holistic development are impeded by pesticide drift and contamination of soil and water sources; unsafe practices such as mixing of pesticides with bare hands; spraying and broadcasting without taking safety measures; and improper disposal of pesticide containers and reuse of the empty containers.

The close physical proximity of the houses, schools, and animal sheds to the fields where pesticides are applied threatens the safety of their environment. The lack of strict implementation of human rights enshrined in the Pakistani constitution and international human rights agreements further aggravate the worsening state of health, life, and environment of the people. Pesticide producers and distributors have a responsibility to ensure that their pesticides throughout their life-cycle do not cause health and environmental impacts.

Annex 3.5.1 List of reported pesticides in Pakistan 2017

PESTICIDE	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Acetochlor	3							Yes								Yes		28
Alkyl Ether Sulphate	1																	
Bensulfuron Methyl	8																	
Bispyribac Sodium	7																	
Butachlor	4				Yes											Yes		31
Cartap hydrochloride	5																	
Chlorantraniliprole	1										Yes	Yes				Yes		
Ethoxysulfuron	1																	
Imidacloprid	1												Yes			Yes		0
Lambda-Cyhalothrin	2			Yes				Yes					Yes			Yes	Yes	28 †
Methamidaphos	1																	49
Monomehypo	10																	
Orthosulfamuron	1																	
Pretilachlor	1																	
Pyrazosulfuron ethyl	1																	
Sulphur	3																	
Thiamethoxam	2												Yes			Yes		

† Not banned in any country, but is not approved in the European Union.

WHO Ia: Extremely hazardous
WHO Ib: Highly hazardous
H330: Fatal if inhaled according to the Globally Harmonized System (GHS)
Muta EU 1, 2: Mutagenic; Probable Mutagen
Repro EU 1,2: Reproductive Toxin; Probable Reproductive Toxin
EDC: Endocrine Disruptor

ChE Inh: Cholinesterase Inhibitor
vB: Very Bioaccumulative
vP: Very Persistent
POP: Persistent Organic Pollutants
PIC: Prior Informed Consent
HHP: Highly Hazardous Pesticide
T20: Terrible 20 pesticides extremely hazardous to children

Annex 3.5.2

Banned Pesticides in Pakistan

1. Captafol
2. DDT
3. Endosulfan
4. Ethylene Dichloride/1,2-Dichloroethane
5. Hexachlorobenzene /Benzene Hexachloride (HCB/BHC)
6. Hexachlorocyclohexane (HCH)
7. Mercury Compounds
8. Monocrotophos
9. Parathion (Ethyl)

Major References:

PAN International. (2017). *PAN International Consolidated List of Banned Pesticides* (3rd ed.). Retrieved from http://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

PAN International. (2018, March). *PAN International List of Highly Hazardous Pesticides.* Retrieved from http://www.pan-germany.org/download/PAN_HHP_List.pdf

3.6 PHILIPPINES

INTRODUCTION

The island of Mindanao in the Philippines has vast plantations of banana, oil palm, sugar cane, cacao, and various cash crops. Abundant with natural resources, Mindanao has since the 1920s served as host to plantations producing export crops, which are controlled by local and transnational corporations.

Eighty percent of the Philippines' oil palm areas are in Mindanao.[149] Four companies play key roles in the continuing expansion of oil palm in the country – Filipinas Palm Oil Plantations Inc. (FPPI), Agusan Plantations Inc. (API), Kenran Industries Inc. (KII), and A. Brown Company Inc. (ABERDI).

Banana plantations occupy 450,000 hectares in Southern Mindanao alone. The total investment in bananas is said to reach USD 2.8 billion. The plantations employ thousands of rural workers.[150] Banana companies are the following:

1. Sumifru
2. Banana Brothers Inc.
3. Evita Banana Trading Company Inc.
4. Nader and Ibrahim S/O Hassan Phils. Inc.
5. Tagum Agricultural Development Trade Co. Inc.
6. TVEM Links International Co.
7. Stanfilco Division of DOLE Philippines Inc.
8. Continental Farm Corporation
9. Philpack Corporation
10. Lapanday Diversified Products Corporation (LADC)

PANAP carried out its first investigation in LADC's adjacent village of Kamukhaan in Digos, Davao del Sur in 1997. This was followed by a series of fact-finding missions led by the Citizens Alliance Unified for Sectoral Empowerment and PANAP, which revealed the following:

- Aerial spraying: LADC aerially-sprayed pesticides 2-3 times a month, with the drift sweeping through the entire village.

149 Oil Palm Facts at a Glance. (n.d.). Retrieved from http://rboi.armm.gov.ph/uploads/Background%20on%20Oil%20Palm%20in%20the%20Phils.pdf

150 The Philippine Star. (2016, October 10). *Duterte supports Banana Industry Development Council*. Retrieved from https://www.philstar.com/business/2016/10/10/1631915/duterte-supports-banana-industry-development-council

- Acute health effects: Residents complained of suffocation, weakness, nausea, painful stinging of the eyes, fever, vomiting, cough, body aches and skin itchiness. Labourers who backpack sprayed Gramoxone/paraquat were hospitalised, one of them died.
- Chronic health effects: Villagers were diagnosed of various illnesses including cancers; neurologic, reproductive, respiratory, and skin disorders; and impairment of immune functions. Some suffer from asthma, anaemia, and goitre. Deaths in the village became frequent.
- Abnormalities and deaths in children: Incidence of stillbirths and deformed/abnormal babies increased.
- Death of livestock: Raising pigs, chickens and other animals proved very difficult as many of them die every time spraying occurred. Animals that wandered into the plantation and/or grazed on the grasses die.
- Contaminated river systems and canals: Animals refused to drink from the river and those that drank eventually die.
- Fish kills and low fish catch: Regular occurrence of fish kills and diminished fish catch from 300 kilos to barely 2 kilos.

Oil palm companies prohibit planting vegetables and intercropping with sweet potato, cassava, and other root crops. Hunting grounds disappeared and the water sources became heavily polluted.

The unabated use of pesticides continued even after massive community actions and appeals to the government and LADC were made. Thus, PAN Philippines undertook a study together with PANAP, KMP, KMU-CARAGA, CAUSE-DS, Sitio Buloy Indigenous People's Organization-Davao del Sur, BAYAN-SOCKSARGEN, Community Primary Health Care-SOCSKSARGEN, KALUMBAY (Indigenous People's Organization) Northern Mindanao, SENTRA, the European Center for Constitutional and Human Rights (ECCHR), and Center for International Law (CIL).

METHODOLOGY

Banana plantations in the provinces of Davao del Sur and South Cotabato, and oil palm plantations in Agusan del Sur and Bukidnon were chosen as study sites (Figure 3.6.1). Identities of the plantation companies are withheld and all names mentioned in this study are aliases to protect the study participants.

Community-based Pesticide Action Monitoring (CPAM) was used as a participatory action research process to document and create awareness of pesticide impacts on human health and the environment. Individual interviews and focus group discussions (FGDs) were carried out by village health workers or community organisers from participating organisations in two cycles – from May to September 2015, and from June to July 2016.

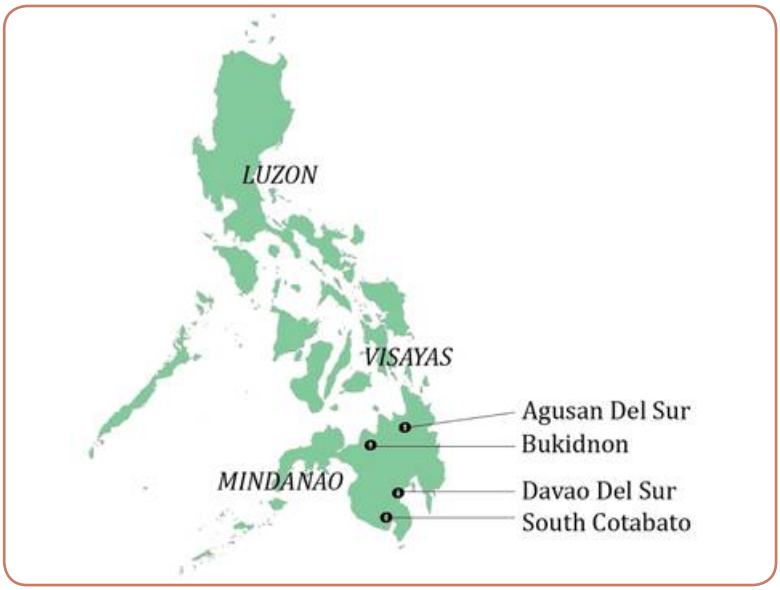

Figure 3.6.1 The study sites are located in Mindanao, southernmost island of the Philippines

A total of 57 plantation workers and community members near (most within a 10 meter radius) or within the plantations were selected using purposive sampling.

Additional data were gathered during the International Fact Finding Mission (FFM) on the use of paraquat in oil palm plantations, from 8-12 June 2016.

For this study, names of the plantation companies are withheld and pseudonyms are used to protect the workers.

RESULTS

1. Demographics

There were 35 males and 22 females (Table 3.6.1). The mean age was 49 (Table 3.6.2). Twenty respondents were connected with the plantation either as a general worker or as aerial crew at the time of the interview. Another 20 of the respondents did odd jobs such as a harvester, sprayer, feed processor, or guard. Three of them have worked in the plantation for 25-26 years. The rest were residing within or in areas adjacent to the plantations.

The number of respondents (N) for each interview question varied because there were questions that may not be applicable to all, or that some respondents did not answer the query.

Table 3.6.1 Demographic profile of study participants

N	FREQUENCY	CHARACTERISTICS
57		*Sex*
	35	Male
	22	Female
57		*Marital status*
	41	Married
	11	Single
	4	Widow/er
	1	Separated
53		*Age group*
	0	18 – 19
	11	20 – 29
	12	30 – 39
	7	40 – 49
	13	50 – 59
	6	60 – 69
	2	70 – 79
	2	<80
55		*Level of Education*
	26	Grade school
	23	High school
	2	Vocational
	4	College
54		*Occupation*
	19	Plantation Worker
	5	Farmer
	14	Housekeeper
	2	Driver
	1	Laborer
	1	Thatch Shingle Sewer
	1	Shellfish Gleaner & TSS
	1	Aerial Crew
	2	Health Worker
	2	Pensioner
	6	None (Residents)

Table 3.6.2 Age and residency of study participants

MAX	MIN	MODE	SD	SE	Mean	N	Characteristics
93	24	25	16.00	2.38	48.87	45	Age
93	1	5	27.32	4.27	30.98	41	Length of Residency in the Area
1200	0	10	251.69	38.84	132.48	42	House Distance from Plantation (m)

2. Regular Exposure to Highly Hazardous Pesticides

Of the 19 pesticide brand names (Table 3.6.3) used in the study sites – categorised as herbicides, insecticides, nematicides, and fungicides – 11 are highly hazardous. These are paraquat, glyphosate, deltamethrin, cypermethrin, lambda-cyhalothrin, chlorathalonil, malathion, chlorpyrifos, ethoprop, carbofuran, and benomyl (Annex 3.6.1).

Table 3.6.3 Pesticides used in the banana and oil palm plantations in Mindanao

TOTAL	ADS*	B*	SC*	DDS*	Brand Names and Active Ingredients
					Herbicides
4	0	4	0	0	Clear-Out (Glyphosate)
5	3	2	0	0	Round-Up (Glyphosate)
10	4	6	0	0	Gramoxone (Paraquat)
4	0	4	0	0	Shadow (dimethenamid-p ++)
4	4	0	0	0	2,4-D
2	2	0	0	0	Garlon^{TM} (Triclopyr)
					Insecticides
10	4	0	4	2	Decis (Deltamethrin)
5	2	0	3	0	Malathion
1	0	1	0	0	Karate (Lambda-cyhalothrin)
2	2	0	0	0	Cymbush (Cypermethrin)
1	0	0	0	1	Lorsban (Chlorpyrifos)
					Nematicide
3	3	0	0	0	Furadan (Carbofuran)
1	0	0	0	1	Mocap (Ethoprop))
					Fungicide
7	2	0	4	1	Daconil (Chlorothalonil)
2	0	0	1	1	Antracol (Propineb)
1	0	0	0	1	Banguard (Thiram)
1	0	0	0	1	Benlate (Benomyl)
					Alternative/Natural
1	0	1	0	0	Jackpot (Bacillus thuringiensis)
2	2	0	0	0	Green Mustard

*ADS – Agusan del Sur; B – Bukidnon, SC – South Cotabato, DDS – Davao del Sur

Thirty-five of the respondents were directly exposed to these pesticides as sprayers, mixers, injectors, loaders, field applicators, and baggers. Workers' exposure to pesticides was for a mean duration of nine years. Most of them handled/sprayed pesticides 4-8 hours a day.

Communities near the banana plantations were regularly exposed to aerial spraying. Two respondents got directly aerially sprayed – one while passing through the plantation to do laundry in the river, the other while eating within the plantation premises.

2. Hazardous Conditions of Use

Inadequate Personal Protective Equipment

Of the 35 participants who answered the query on the use of personal protective equipment (PPE), 31 said that they do wear these. This normally consisted of personal caps, long sleeves, long pants, boots, and a cloth face towel. The towel served both as a respirator and a mask. Coveralls or apron, gauntlet gloves, and respirators were provided to some. Only six had goggles to protect their eyes. According to the workers, the masks and gloves lasted barely one month, while the aprons for about five months.

Oil palm plantation workers in Agusan del Sur were provided with PPE only after the workers' union asked for it. PPE was given once a year. Torn PPE was not replaced, as the company emphasised that it is the workers' responsibility to ensure that the PPE does not break. Thus, several workers resorted to the use of bra cups as substitutes to masks.

Inaccessible washing facilities

Most respondents said that washing facilities were provided in the workplace but were not always accessible. Thirty-three of the workers washed their hands after handling pesticides and 17 bathed immediately after. The three who said they do not wash reasoned that they were too tired to wash and were scared of *pasma,* a local belief of becoming ill if they wash or bathe immediately after work.

There were times that workers could not wash when the stored water ran out. On these occasions, they washed in rivers, brooks or creeks, or at home. Such practice contaminates ecosystems and increases "take home" exposure to pesticides.

Brian, a worker from an oil palm plantation in Bukidnon, said that the washing area of the company was restricted and off-limits to him and his co-workers. Thus, they used the creek to wash themselves and their equipment. His co-worker, Brendan, never washed after mixing pesticides.

PPE and work tools are generally washed at the workplace or at home by the respondents themselves or their spouses (Tables 3.6.4 & 3.6.5)

Table 3.6.4 Place where PPE is washed

FREQ.	LOCATION
6	Brook
5	Creek
3	Workplace: Faucet
11	Workplace: Stored water
14	Home: Faucet
3	Do not wash PPE

Table 3.6.5 Person who washes the PPE

FREQ.	PERSON RESPONSIBLE
10	Respondent
13	Spouse
1	Respondent & Spouse
1	Spouse & child
2	Laundrywoman
27	N

Spillages

All respondents who handle pesticides experienced spillage either while backpack spraying, circle spraying, or loading and mixing. The body parts affected include the eyes, face, and limbs.

Figure 3.6.2 Paraquat decanted into a sardine can (Photo by PANAP)

Adriana did not realise that her backpack sprayer was leaking until she felt pain in her buttocks. The pesticide burned her skin and left a scar on her buttocks. Maria shared that during spraying, the pesticide would flow from her knees towards her feet. This caused discolouration/blackening of her nails and toes. Brian used sardine cans (Figure 3.6.2) to measure pesticides, which normally spilled and got in contact with his hands.

The workers usually try to fix broken back sprayer parts on their own whenever it was impossible to return it to the company. Brendan reported that he wraps the nozzle with tissue and unclogs it with his mouth.

Spraying against wind direction

Of the 33 pesticide applicators (Figure 3.6.3), nine sprayed against the wind direction, 10 were not mindful of the wind movement, and 14 made sure that they spray along the wind direction. Yet, being conscious of the wind movement did not spare Brian who got sprayed with pesticide due to the sudden changes in wind direction.

Figure 3.6.3 A plantation worker demonstrating the usual pesticide spraying technique in the plantation. Workers often lack access to personal protective equipment (Photo by PAN Philippines)

Improper storage and disposal

Pesticides used in the fields were usually stored in the company warehouse, in a shed, or in the fringes of the field. Meanwhile, pesticides for home use were stored in a shed, placed beside the house, or buried. Two workers burned the pesticides while four of them said they simply put it in a proper place without specifying where. Pesticide containers were usually buried, burned, and placed in the ordinary rubbish bin. None returned containers to the warehouse or retailers.

No access to training and label/ safety data sheets

Fifty percent of the plantation workers had training on pesticide use and handling, but this was basically on how to measure/mix and apply pesticides, and nothing on health and safety measures.

Pesticide labels bear the name of the pesticide and other chemical information but without pictograms or information on safety and proper use.

Illnesses of respondents and their household members

The respondents' households had at least one diseased member and suffering from two types of illnesses (Table 3.6.6). The most common illnesses (Figure 3.6.4) were hypertension, allergy, and asthma. Some had ailments of the kidney, heart, and thyroid.

Table 3.6.6 Frequency of household illnesses

MAX	MIN	MODE	SD	SE	MEAN	N	
3	0	1	0.69	0.11	1.33	40	Number of Household Members with Illness
6	0	2	1.35	0.21	2.49	43	Number of Household Illnesses

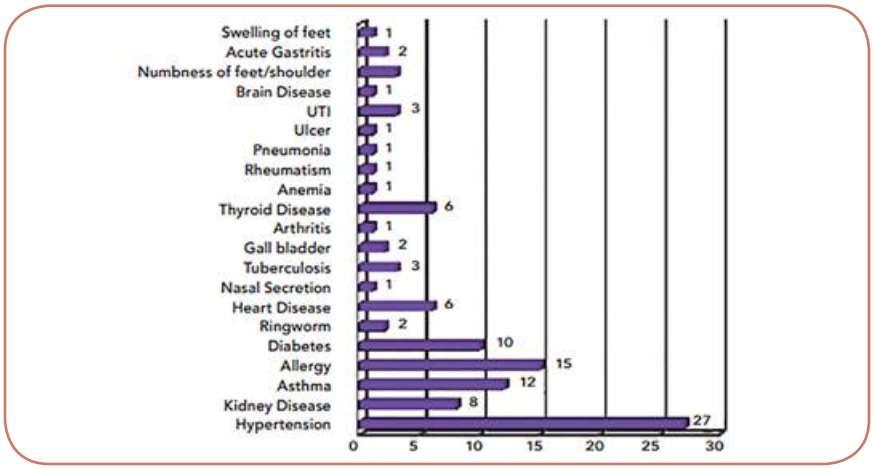

Figure 3.6.4 Illnesses reported by the respondents

Nine of the respondents have fallen ill for six or more times in the last 12 months while 13 fell ill at least twice. Headache, blurring of vision, nausea, coughing, eye pain, and skin itchiness were the most common ailments. Most experienced chest pains, painful urination, palpitations, calf pains, gastritis, tremors, and pulmonary secretions. One became mentally handicapped, and three suffered paralysis.

A total of 73 specific illnesses (Figures 3.6.5 & 3.6.6) were identified in the study sites, ranging from respiratory, integumentary,[151] cardio-vascular, genito-urinary, gastro-intestinal, EENT (eyes, ears, nose, throat), and neurological.

Figure 3.6.5 A health worker examines a plantation worker who complains of a skin irritation (Photo by PANAP)

151 According to the US National Library of Medicine Medical Subject Headings (MeSH), the integumentary system comprises the skin and its appendages.

Figure 3.6.6 A worker heavily exposed to paraquat is suffering from an eye condition (Photo by PAN Philippines)

Eighteen of the 24 respondents who had health symptoms at the time of the study did not receive medical attention, as they could not afford the transportation fare to the clinic. Those who sought medical advice did not receive proper diagnosis and treatment.

3. Women and Children's Illnesses

Maria started working at the oil palm plantation in 1980. In 2004, she started coughing and her eyes became blurred. She had headaches and bouts of losing consciousness. Her skin became very dry and her fingers would feel numb. Adriana, also a plantation worker, had the same complaints. In addition, she has breast cysts and myoma, and finds it painful to urinate. Her vagina itches as well. She attributed her symptoms to pesticides, since she used to urinate on newly sprayed ground.

Of the wives of plantation workers included in the study, 25 had children. Of these, two women had miscarriages while three had a stillborn child or a child that died shortly after birth – that's 20% with reproductive problems of unsuccessful births.

There were 80 children below 18 years old in the households interviewed. At least 10 children were at the vulnerable ages of 6 years old and below. All the children were exposed to pesticide drift in their homes. One interviewee had a normal and healthy child who became mentally handicapped at the age of three after exposure to aerial spray.

Banana and oil palm plantation workers attested to the prevalence of child labour. Adriana and her husband began working as cleaners and fruit pickers in the oil palm plantation at 12 years old.

VIOLATION OF HUMAN RIGHTS AND INTERNATIONAL AGREEMENTS

The right to life, health, and a healthful ecology are basic human rights enshrined not only in the Universal Declaration of Human Rights (UDHR) but also in the Philippine Constitution. Various international and national laws protect it.

1. Government Inaction

The Fertilizer and Pesticides Authority (FPA) have regulations on aerial spraying but these are routinely ignored, with the government incapable of policing the practice. Not addressing the call to stop aerial spraying of pesticides and for the FPA to not seriously look into the situation is a gross violation of the right to life and health of workers, and the community within and near the plantations who are long-suffering from various ailments that could be linked to pesticide exposure. The greater vulnerability of women and children to the hazards of pesticide further aggravates such human rights violations.

Despite the strong evidence and protests from severely affected communities, aerial spraying is continuously practiced in banana plantations. Appeals to stop it were quashed and the House Bills (HBs) on Aerial Spraying Ban filed in the 14th and 16th Congress never progressed. Re-filed as HBs 4491 and 339 in the 17th Congress, these have sat with the Committee on Ecology since June and November 2016, respectively.

2. International Covenant on Economic, Social, and Cultural Rights

The ICESCR protects the rights of citizens from exposure to toxics like HHPs. Aerial spraying contaminates the air, water, land and adjoining ecosystems, thereby putting at risk the lives of Filipinos, especially the more vulnerable population of women and children.

3. Convention on the Rights of the Child

Incidents when children were exposed to pesticide drift due to their homes' proximity to the plantation and their ensuing illness; children becoming mentally impaired after an aerial spray; women giving birth to stillborn and deformed/abnormal babies due to pesticide exposure; trample on Articles 6 and 24 of the CRC, which state that "every child has the inherent right to life," that the survival and development of the child must be ensured to the "maximum extent possible," and that "the right of the child to the enjoyment of the highest attainable standard of health" must be safeguarded and upheld. Children's

rights are violated, with the employment of children as young as 12 years old in the oil palm industry where they are exposed to hazardous pesticides without their knowledge. Their right to health is violated, as children are more vulnerable than adults to the adverse effects of pesticides.

4. International Labour Standards

The right to access to information is violated. Workers were not given proper and adequate knowledge/ training on the use and handling of pesticides. Labels on pesticide containers do not give safety precautions and were not even accessible to them. This lack of access to information leads to relaxed and dangerous practices of mixing pesticides with bare hands, spraying pesticides against wind direction, not using PPE, and lack of conscious effort to avoid spills.

5. United Nations Framework for Business and Human Rights

Limited and inaccessible washing facilities make immediate washing impossible after direct contact with pesticide. This violates the right to a safe working environment, and completely disregards the UN "Protect, Respect and Remedy" Framework for Business and Human Rights.

The lack of washing facilities results to the practice of washing pesticide-laden bodies/equipment in rivers, brooks, and creeks. As a result, it contaminates the environment together with the improper storage and disposal of pesticide containers, and the ensuing pesticide drift from spraying violates the right to a safe and healthy environment.

6. Non-adherence to the International Code of Conduct on Pesticide Management

The Code (FAO, WHO 2014) is a voluntary framework endorsed by the Philippines and other FAO members. Since the original Code's approval in 1985, PANAP through its local partners has monitored the member countries' adherence.

The PANAP FFMs surfaced vital gaps, which led to several revisions of the Code. Passed in June 2013, the current Code gives greater attention to health and environmental aspects of pesticides, and is reoriented to support sustainable agricultural production through integrated pest management (IPM).

This 2015-2016 study on the conditions of pesticide use and its impacts in Mindanao revealed that the Philippines, an endorsing country, did not adhere to the salient Articles of the Code.

The use of HHPs in the banana and oil palm plantations in Mindanao, Philippines is in direct violation of Article 3.6 which states that "Pesticides whose handling and application require the use of PPE that is uncomfortable, expensive or not readily available should be avoided, especially in the case of small-scale users and farm workers in hot climates."

Article 5.3.1 calls on the government and industry to promote "the use of PPE which is suitable for the tasks to be carried out, appropriate to the prevailing climatic conditions and affordable." Yet, the workers were not provided with PPE until after they requested for it. The PPE provided were neither sufficient nor durable, lasting only a few months. Workers were expected to buy the replacement, and since they could not afford it, many opted not to wear PPE.

Labels on pesticide containers do not give adequate information on safety. This is contrary to what Articles 3.5.1 and 3.5.4 dictate, i.e., that all pesticides must be appropriately and adequately packaged and labelled for each specific market to ensure effective use, and minimise risks to users, the public and the environment.

The Philippine Government did not "provide guidance and instructions … on the prevention of exposure and poisoning" (Article 5.1.4) to the workers and affected communities; did not establish a mechanism for regular and proper disposal, and collection of pesticide containers (Article 5.2.4.4); and did not "carry out health surveillance programmes of those who are occupationally exposed to pesticides and investigate, as well as document poisoning cases (Article 5.1.3). Failing to carry out its own monitoring, the State Government could not call on the "Industry to halt sale and recall products as soon as possible when handling or use pose an unacceptable risk …" (Article 5.2.5).

CONCLUSION

The Philippine study proves that the use of HHPs carries health and safety risk to plantation workers, thus the necessity and urgency to protect their rights and welfare. However, the impact of HHPs goes beyond the workplaces. It contaminates the environment and poisons the air, water, and food sources thereby threatening the health and quality of the lives of women and children in the communities. The accountability lies both on the State and the agribusinesses that remain passive to the worrying circumstance of the workers, their families and their community.

The corporations that run the banana and palm oil plantations do not comply with national and international regulations pertaining to the use of agrochemicals and do not abide by their corporate responsibility of ensuring the safety of their workers and the nearby communities. The safety precautions taken by the plantation management are inadequate. The PPE are neither sufficient nor durable.

It is appalling that workers are expected to buy their own PPE. Since workers could not afford it, they resort to handling pesticides with bare hands and use bra cups as face masks. The agrochemical corporations violate human rights as they continue to produce, sell, and profit from highly hazardous pesticides without ensuring that their products are handled with the necessary safeguards and properly managed throughout their lifecycle.

Annex 3.6.1 List of reported pesticides in the Philippines 2015-2016

PESTICIDE	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
2,4-D	1				Possible			Yes					Slightly					3
Bacillus thuringiensis toxin	1																	
Benomyl	1					Yes	Yes								Yes	Yes		
Carbofuran	1		Yes	Yes					Yes				Yes		Yes	Yes		49
Chlorothalonil	1			Yes	Possible											Yes		
Chlorpyrifos	1		Yes						Yes				Yes			Yes	Yes	2
Cypermethrin	1				Possible			Yes					Yes			Yes	Yes	
Deltamethrin	1							Yes					Yes			Yes		
Dimethenamid-p	1																	
Ethoprop	1	Yes		Yes	Possible				Yes							Yes		8
Glyphosate	2				Possible											Yes		1
Lambda-cyhalothrin	1			Yes				Yes					Yes			Yes	Yes	28 †
Malathion	1				Possible				Yes				Yes			Yes	Yes	2
Metazachlor	1																	
Paraquat	1			Yes												Yes		38
Propineb	1								Yes									
Quinmerac	1																	
Thiram	1																	
Triclopyr butotyl	1																	

The active ingredient of the reported brand name *Green Mustard* is not known and thus, not included here.
† Not banned in any country, but is not approved in the European Union.

WHO Ia: Extremely hazardous
WHO Ib: Highly hazardous
H330: Fatal if inhaled according to the Globally Harmonized System (GHS)
Muta EU 1, 2: Mutagenic; Probable Mutagen
Repro EU 1,2: Reproductive Toxin; Probable Reproductive Toxin
EDC: Endocrine Disruptor
ChE Inh: Cholinesterase Inhibitor
vB: Very Bioaccumulative
vP: Very Persistent
POP: Persistent Organic Pollutants
PIC: Prior Informed Consent
HHP: Highly Hazardous Pesticide
T20: Terrible 20 pesticides extremely hazardous to children

Major References:

PAN International. (2017). *PAN International Consolidated List of Banned Pesticides* (3rd ed.). Retrieved from http://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

PAN International. (2018, March). *PAN International List of Highly Hazardous Pesticides.* Retrieved from http://www.pan-germany.org/download/PAN_HHP_List.pdf

Annex 3.6.2

Banned Pesticides in Philippines

1. Copper acetoarsenite/Paris green
2. Azinphos-ethyl
3. Chlordane
4. EPN
5. Ethylene dibromide/EDB/1,2-dibromoethane
6. Hexachlorobenzene /Benzene hexachloride (HCB/BHC)
7. Hexachlorocyclohexane (HCH)
8. Mercury compounds
9. Methyl parathion
10. Organotin compounds
11. Parathion (ethyl)
12. Phosphorus
13. Sodium fluoroacetate/1080
14. Strychnine
15. Thallium sulfate

3.7 VIETNAM

INTRODUCTION

Pesticide use has significantly increased over the past decades in Vietnam. When Vietnam started to reorient its economy and agriculture towards a market-based system by the mid-1980s, private entrepreneurs were allowed to participate in the import, distribution, and use of pesticides for the agricultural sector[152].

Pesticide imports into Vietnam are also increasing. Between 2005 and 2012, the average growth rate of pesticide imports in terms of value was 18.8% per year. The Ministry of Industry and Trade estimates that about 30-35% of the pesticides that are currently used in Vietnam are imported illegally, many of them banned for their high toxicity.[153]

While Vietnam adopted the International Code of Conduct on the Distribution and Use of Pesticides of the Food and Agriculture Organization in 1990 and issued a comprehensive decree on pesticide management in 1993, efforts to regulate and address the effects of hazardous pesticides have been limited. From 1999 to 2008, endosulfan was the only pesticide that the government removed from the market, while methomyl was the only pesticide that was restricted in its use.[154] In 2017, the government of Vietnam announced a ban on paraquat, 2, 4-D and certain formulations of glyphosate.[155]

Despite stricter regulations, high levels of pesticide residues have been found, particularly in vegetables. In 2002, many cases of food poisoning by pesticide residues were reported. These cases involved a total of 7,647 people and were found to cause 277 deaths in 37 provinces.[156] Aside from acute poisoning due to direct and indirect exposure to pesticides, chronic pesticide poisoning is estimated to have affected 1 million Vietnamese farmers.[157]

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152 Pham, V.H., Mol, A.P., Oosterveer, P., & van den Brink, P.J. (2009) Pesticide distribution and use in vegetable production in the Red River Delta of Vietnam. *Renewable Agriculture and Food Systems*, 24(3), 174–185. Retrieved from http://edepot.wur.nl/11889

153 Lan, V. (2008, October 13). 30-35% of pesticides are illegally imported. *Saigon Online.* Retrieved from http://www.sggp.org.vn/kinhte/2008/10/168183/

154 Pham, V.H., Mol, A.P., & Oosterveer, P. (2013). State governance of pesticide use and trade in Vietnam. *NJAS - Wageningen Journal of Life Sciences,* (67), 19-26. Retrieved from https://www.sciencedirect.com/science/article/pii/S1573521413000535

155 Govt bans 2,4-D, paraquat in Vietnam. (2017, February 16). *Vietnam Investment Review.* Retrieved from Link http://www.vir.com.vn/govt-bans-24-d-paraquat-in-vietnam-47486.html

156 Xuyen, N.T. (2003). Who will protect green vegetables? *TriThucTre Newspaper*, 101:14–16.

157 Oanh, N.K. (2005, April). *Information on chemical safety and environmental protection: a testing model applicable for safely pesticide management.* Paper presented at the Vietnam National Conference on Environmental Protection, Hanoi, Vietnam.

Study reports in 2009 revealed that rural famers, especially women in Hai Hau District of Nam Dinh Province, have been continually poisoned by pesticides.[158] The 2015 statistics for the district showed that on average, farmers were exposed to more than 42 tonnes of pesticides per rice crop season or 84 tonnes per year[159].

This information triggered a series of discussions between Pesticide Action Network Asia Pacific (PANAP) and its local partners to conduct awareness raising workshops and trainings on how to monitor pesticide use and impacts in the area.

PANAP, in partnership with CGFED, worked with the women farmers from Hai Hau. Farmers from Ao Sen and Dong Cham Villages were also engaged, through SRD.

The main goal of the research project was to reduce the health and environmental impacts of pesticides on the affected communities. The project was specifically meant to educate the communities on the hazards of pesticides, build their capacity in monitoring and documenting the use and impacts of these agrochemicals, and empower them to shift to a farming-system that would not endanger their health and survival.

3.7.1 Methodology

The study is a participatory-action research. Study sites were selected based on the severity of the pesticide problem and the need for immediate intervention. Exploratory visits to the affected areas were undertaken to assess the communities' receptiveness to learn about the hazards of pesticides and to undergo trainings on the process of CPAM.

Once the communities' commitment was ascertained, CGFED, and SRD through the support and guidance of PANAP, designed and conducted the CPAM trainings (Figure 3.7.1). The trainings led to the formation of the Women's Pioneer Group (WPG) in Hai Hau, which soon undertook the CPAM in the Hai Hau District. WPG soon gained the support of the district Women's Union (WU). Through the trainings, the villagers of Ao Sen and Dong Cham were also able to undertake the CPAM in their respective communities.

158 Women farmers face high pesticide risks. (2009, May 25). *Viet Nam News*. Retrieved from https://vietnamnews.vn/society/188378/women-farmers-face-high-pesticide-risks.html

159 Statistics of Department of Plant Protection of Hai Hau District, 2015 cited in Hai Hau's Women's Pioneer Group, Women's Union of Hai Hau, & CGFED. (2015). *A Community-Based Pesticide Action Monitoring Report*. Retrieved from http://files.panap.net/resources/CPAM-HaiHau-CGFED-and-PANAP.pdf

Figure 3.7.1 A woman participates in a CPAM training (Photo by SRD)

The study sites

Hai Hau is a rural district in Nam Dinh Province (Figure 3.7.2) where high yielding rice and vegetables are grown. Many of the men in the district have left for the capital to work to augment their household's income. Thus, the farmers were mostly women. The first CPAM survey in Hai Hau District was undertaken in 2015, while the follow-up survey was in 2016. Both surveys were done by the Hai Hau women through the help and guidance of CGFED.

The villages of Ao Sen and Dong Cham are in Thai Nguyen province. Investigations in the villages of Dong Cham and Ao Sen were undertaken by the community together with SRD in December 2016.

The CPAM survey was enhanced by photo-documentation and in-depth interviews of victims of pesticide spillages and/or poisonings.

Figure 3.7.2 Map of study sites
(Photo from Wikipedia)

3.7.2 Results

Demographics

There were a total of 534 respondents, 58.61% of which were women farmers (Table 3.7.1). Most (62.92%) of them 40 to 59 years old (Table 3.7.2). Majority had formal education, with 69.63% having finished grade school.

The Thai Nguyen farmers belong to three ethnic tribes – the Kinh, Tay, and Nung. Most of them grew rice, tea, and vegetable. Farmers from Nam Dinh grew high-yielding rice varieties and vegetables.

Table 3.7.1 Occupation and gender of study participants

PROVINCES	FIELD SITE	STUDY YEAR	STUDY PARTICIPANTS	N	MALE	FEMALE
Nam Dinh (CGFED)	Hai Hau District	2015	Farmers	320	126	194
			Pesticide Sellers*	10	7	3
		2016	Farmers	100	32	68
			Pesticide Sellers*	3	3	
Thai Nguyen (SRD)	Ao Sen Village	2016	Farmers	101	53	48
	Dong Cham Village					
Total				534	221	313
%					41.39	58.61

*Not all respondents gave the information being asked.

Table 3.7.2 Integrated demographics of study participants*

N	FREQUENCY	CHARACTERISTICS
383	23 65 134 107 50 4	*Age group* 20-29 30-39 40-49 50-59 60-69 70-79 <80
382	46 266 70	*Level of Education* Pre-school Grade school High school
534	521 13	*Occupation* Farmers Pesticide retailers

Exposure to highly hazardous pesticides

All respondents use pesticides at home or at work. Exposure was mainly due to direct handling of pesticides and entry to newly-sprayed fields (Tables 3.7.3 and 3.7.4). They use backpack sprayer in applying the pesticides on a regular basis (Table 3.7.5). A total of 39 pesticides were reported in the study sites (See Annex 3.7.1: List of reported pesticides in Vietnam 2015-2016), 19 of which were HHPs. Five of these – chlorpyrifos, cypermethrin, glyphosate, lambda-cyhalothrin, and paraquat – are in PANAP's list of "Terrible Twenty" pesticides deemed extremely toxic to children.[160]

160 PANAP. (n.d.). *Twenty Terrible Pesticides that are Toxic to Children*. Retrieved from http://files.panap.net/resources/20-Terrible-Pesticides-poster.pdf

Table 3.7.3 Activity with pesticides

ACTIVITIES	FREQUENCY	%
Applying/spraying	254	47.57
Mixing/decanting/loading	64	11.99
Washing work clothes and/or equipment	167	31.27
Purchasing/transporting	22	4.12
Others	27	5.06

Table 3.7.4 Entry to pesticide-sprayed fields

ACTIVITIES	FREQUENCY	%
Same day	166	47.84
After a day	37	10.66
After two to three days	85	24.50
After seven or more days	59	17.00
N	347	

Table 3.7.5 Frequency of pesticide use

ACTIVITIES	FREQUENCY	%
Daily	71	14.09
Once a week	166	32.94
Once a month	119	23.61
1 to 2 months/year	1	0.20
3 to 4 months/year	133	26.39
Others	14	2.78
N	504	

Table 3.7.6 Exposure duration in years

YEARS	%
1 to 5	2
6 to 10	5
11 to 15	36
16 to 20	13
21 to 25	12
26 to 30	11
31 to 35	11
36 to 40	10
N	100

Almost all farmers said that they mix two to four kinds of pesticides together. Respondents (94%) said that they try to use up left-over pesticides on their fields to avoid taking them home or throwing them away. If it is not practical to do so, they take the pesticides home (15%) or bury them in the fields (14%) for future use.

BOX 3.7.1 HHPS USED IN THE STUDY SITES

Hai Hau District, Nam Dinh: Abamectin, chlorantraniliprole, chlorothalonil, chlorpyrifos (ethyl), cypermethrin (alpha), deltamethrin, fipronil, imidacloprid, nitenpyram, paraquat, permethrin, thiamethoxam, trichlorfon and validamycin

Ao Sen and Dong Cham Villages, Thai Nguyen: Butachlor, chlorpyrifos, cypermethrin, cypermethrin (alpha), deltamethrin, glyphosate, lambda-cyhalothrin, paraquat, and thiamethoxam.

Hazardous conditions of use

Incidents of spillages and accidental direct contact with pesticides

Almost all (95.52%) of the farmers were conscious of spraying along the wind direction (Table 3.7.7). All the Thai Nquyen farmers experienced spillages (Figure 3.7.3), mostly while spraying pesticides (78%). These were due to defects in the spray equipment, spraying against the wind direction, or when they fell while spraying (Table 3.7.8). In cases of pesticide spillages, the hands, back, and feet were identified to be most frequently affected (Table 3.7.9). When they get spilled on or come in contact with pesticides, farmers remove their soiled clothes and wash it, wash the affected areas or shower, and get into fresh clothing.

Table 3.7.7 Wind direction

ACTIVITIES	FREQUENCY	%
Along	192	95.52
Against	9	4.48
N	201	

Table 3.7.8 Causes of pesticide spills while spraying

	%
Leaking backpacks	44.3
Falling while spraying	9
Spraying against wind direction	33.6
Faulty Nozzle	6.6
Leaking of bottle cap/aerosol cans	2.5
Faulty packages	0.8

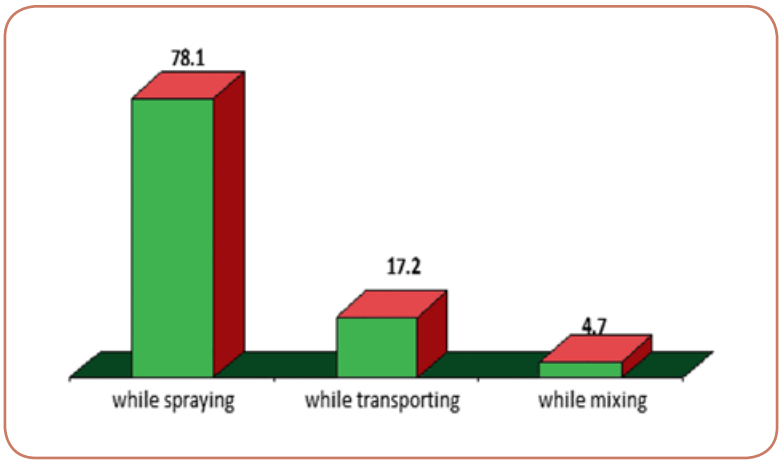

Figure 3.7.3 Occurrence of spillages

Table 3.7.9 Body parts affected by spillage[161]

	FREQUENCY	%
Oral	7	1.82
Face	7	1.82
Eyes	21	5.47
Forearms/hands	123	32.03
Legs/feet	110	28.65
Back	116	30.21

Table 3.7.10 Use of PPE

	FREQUENCY	%
Yes	348	68.50
No	160	31.50
N	508	

Lack of PPE

PPE was generally worn by the respondents (Table 3.7.10), but the rate of use varied in the sites. Most Hai Hau farmers (83%) said that they wear PPE, but these were basic items such as gloves, masks, long shirt, trousers, and boots and eye glasses.

In Ao Sen village in Thai Nguyen province, 24% of respondents were provided with PPE by state agencies. These were mainly rain coats, masks, and gloves. Yet, 72% of them did not wear it because these were often very thick and heavy and often caused discomfort.

Households in Dong Cham village in Thai Nguyen province could afford to buy their own protective gears such as goggles, masks, gloves, and rain coats. This explains why most (84%) of the respondents wear PPE when spraying even if only 2% of the respondents received PPE from the state.

161 Respondents were allowed to give multiple answers, thus, the total numbers do not correspond to N.

Farmers who did not wear PPE, even if they had it for free, reasoned that PPE was inconvenient, uncomfortable, "hot", unavailable, and expensive.

Lack of washing facilities

Study participants in Dong Cham and Ao Sen villages, in Thai Nguyen province washed their pesticide spray equipment mostly in irrigation canals (57%), on the fields (27%), or at the village wells (12%). Seventy percent of them washed their work clothes in canals, irrigation culverts, and wells near the field. Because tap water was not readily available in the village, those who wash their clothes at home were less than 4%.

Improper storage and disposal of used pesticides containers

Respondents from Dong Cham and Ao Sen villages, in Thai Nguyen province stored pesticides in their garden (58%), like in their storage room (33%), and in other places (9%) like the pig-sty or the hen-shed. They disposed used pesticides containers (Figure 3.7.4) mostly by burning, throwing into the garbage pit located in fields, burying or throwing in the fields.

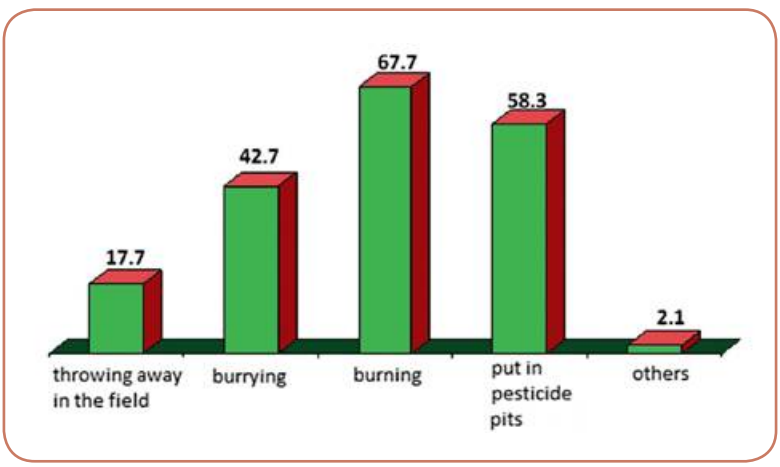

Figure 3.7.4 Methods of disposal of empty pesticide containers

Lack of information and training on handling pesticides

Farmers from all the study sites got their information on pesticides mostly from their own experiences, from pesticide sellers, or from pesticide labels (Table 3.7.11).

Almost all farmer respondents in Thai Nquyen Province (96%) were able to read the label before buying. Labels were mostly (97%) in Vietnamese. There were respondents (11%) who said that some pesticide

labels were in small print and were in a foreign language. Sixty-six percent of the respondents were trained on the use of pesticides either by the District Pesticides Station, District Extension Station, or by the pesticide companies.

Table 3.7.11 Sources of information on the pesticides to be applied

	PERCENTAGE OF RESPONDENTS		
	HAI HAU 2015	HAI HAU 2016	THAI NGUYEN 2016
From their own experiences	71.2	64.6	70.8
Information from pesticide sellers	56.4	77.1	58.3
From the label of pesticide containers	46.8	37.5	6.2
From the guidance of others	33.4	26.0	18.8
Others			1.0

Unsafe purchasing practices

Famers from Ao Sen and Dong Cham villages, in Thai Nquyen province purchased pesticides mostly from local sellers and government agencies. They call the suppliers via telephone, who then delivers the pesticides to their homes. Suppliers sell bottles and jars of herbicides with volumes ranging from 0.5 litres to five litres and put no limit on the amount of pesticides one could purchase.

There were households (40%) who transfer pesticides into smaller bottles for use in each spraying period. At certain times, there were farmers who buy their supply from households that re-sell the pesticides.

Effects of pesticide poisoning: Women are more vulnerable

Almost all respondents exhibited signs and symptoms of pesticide poisoning (Table 3.7.12), with headache, dizziness, and excessive sweating topping the list. Out of the 534 respondents in the three study sites, 450 had illness and/or symptoms of pesticide poisoning, putting the incidence rate at 84%.

Women were more vulnerable to the effects of pesticides (Figure 3.7.5). There were more Hai Hau women who reported having headaches after pesticide exposure, i.e. 69% of them. This is higher than the 47% in the male group. More of the Hai Hau women (44%) also experienced excessive sweating as opposed to the men (37%).

Table 3.7.12 Symptoms experienced[162]

	% RESPONDENTS IN THE STUDY SITES		
	HAI HAU 2015	HAI HAU 2016	THAI NGUYEN 2016
Headache	87.9	62.6	62.2
Dizziness	78.3	28.3	93.6
Excessive sweating	57.7	42.4	5.6
Vomiting	35.6	4.0	14.5
Blurred vision	33.1	8.1	
Nausea			55.6
Itchiness			33.3
Shortness of breath			31.0
Diarrhoea			13.3
Insomnia			12.2
Shivering			7.8
Convulsion			4.4

BOX 3.7.2 SHARING OF HAI HAU WOMEN DURING A WORKSHOP IN 2015

"I spray 60-70 containers of pesticides per season for rice. My hands and feet are numb, while my nails are rotting. Even the provincial doctor, said that these symptoms are linked to spraying pesticides" – *Miss Men*

"I spray 30 to 40 containers of pesticides everyday as usual. In the summer, I really cannot wear a raincoat because it is too hot. I got poisoned one day, I had headaches and had excessive salivation. Now my limbs are numb and I get heart palpitations" – *Miss Ngo*

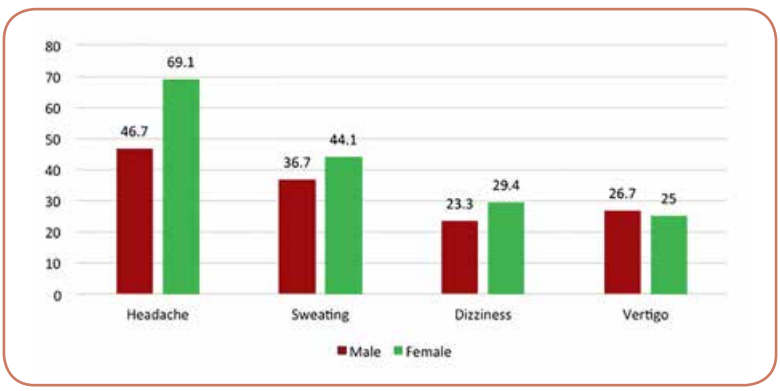

Figure 3.7.5 Gender differences as to number of reported symptoms in 2016 Hai Hau District study

162 Multiple responses were allowed in this item, thus the total numbers do not correspond to N.

In-depth interview findings in the 2015 Hai Hau field visit

Seven cases of pesticide poisoning were reported by seven farmers, five of whom were women. Six of them were poisoned while spraying in the rice field while one was exposed while uploading and mixing pesticides.

The farmers reported experiencing headache, sweating, dizziness, blurred vision, trembling hands, light-headedness and nausea within one to 24 hours after back spraying. One farmer who sprayed glyphosate had immediate poisoning symptoms. Another had to be rushed to the hospital after spraying buprofezin. There was one who had blurred vision two months after spraying alpha-cypermethrin.

The pesticides they were using when they experienced the poisoning symptoms were:

- Buprofezin 250g/kg + Imidacloprid 50g/kg, (Brand name: Babsax)
- Glyphosate (Unknown brand name)
- Emamectin benzoate, a derivative of Abamectin
- Imidacloprid 10% (Brand name: Anvodo)
- Imidacloprid 5% + Nitenpyram 45% + Pymetrozine 25% (Brand name: Ramsuper)
- Alpha-cypermethrin (Brand name: Fastac)

One pesticide could not be identified and was designated as "unknown" by the respondents.

3.7.3 Violation of Human Rights and Agreements

The right to life and health of Vietnamese farmers in the studies were violated through their exposure to various kinds of HHPs such as glyphosate, paraquat, chlorpyrifos, alpha-cypermethrin, and lambda-cyhalothrin, among others. Symptoms of acute and chronic pesticide poisoning are evident. Cases of accidental pesticide exposure while spraying were documented. Being exposed due to spraying in the opposite direction of the wind could have been avoided, if farmers had sufficient knowledge and training on pesticides use. The lack of availability or provision of appropriate PPE also violates their right to life and health.

In addition, Article 7.5 of The Code states that "Prohibition of the importation, distribution, sale and purchase of HHPs may be considered if, based on risk assessment, risk mitigation measures or good marketing practices are insufficient to ensure that the product can be handled without unacceptable risk to humans and the environment."

The climate in Vietnam is also hot and humid, which discourages farmers from using thick and uncomfortable PPE. Personal protective equipment is also expensive for farmers in Thai Nquyen province and only a limited amount is given freely by the state. Without the proper use of PPE, farmers are further exposed to the hazards of pesticides. In addition, these practices violate Article 3.6 of the Code, which states, "Pesticides who's handling and application re-quire the use of PPE that is uncomfortable,

expensive or not readily available should be avoided, especially in the case of small-scale users and farmer workers in hot climates." Article 5.2.5 of the Code calls on the Industry to "halt sale and recall products as soon as possible when handling or use pose an unacceptable risk under any use direction or restrictions and notify the government."

Figure 3.7.6 Examining a pesticide container found in the field (Photo by SRD)

The farmers' right to access to information was violated with the lack of training and low level of awareness on the dangers of pesticides. This resulted to unsafe practices, such as re-packaging pesticides and buying them from neighbours, or unauthorised suppliers. Additionally, the lack of information leads to a dangerous practice of using up pesticides beyond the recommended dosage.

The right to a healthy and safe environment was violated by the lack of washing facilities that forced villagers to wash their pesticide-laden equipment and clothes in rivers and other water tributaries. Improper disposal of used pesticides containers in fields and canals also contribute further to environmental poisoning, which violates this right.

Illegal pesticides with foreign labels were found in Thai Nquyen Province, which makes it difficult for Vietnamese farmers to understand the hazards of the pesticide being used. Illegal pesticides labelled in foreign language are also against the law.

In Vietnam, the Ministry of Agricultural and Rural Development (MARD) regulates pesticides under the authority of the Ordinance on Plant Protection and Quarantine (OPPQ), endorsed by the National Assembly Standing Committee in 1993. Under the OPPQ, MARD requires that pesticides labels should be in Vietnamese.

Article 6.1.13 of the Code urges relevant government authorities "to detect and control counterfeiting and illegal trade in pesticides through national inter-agency, and intergovernmental cooperation and information sharing."

Article 4.1.4 of the Code also urges pesticide companies to comply with and to ensure that the proposed use, label claims and directions, packages, safety data sheets, technical literature, and advertising truly reflect the outcome of these scientific tests and assessment.

Farmers are forced to use repackaged pesticides by retailers even though such practices are in violation of Article 10.3.2 of the Code, which states that "packaging or repackaging is carried out only on licensed premises that comply with safety standards where the responsible authority is satisfied that staff are adequately protected against toxic hazards, that adequate measures are in place to avoid environmental contamination, that the resulting product will be properly packaged and labelled, and that the content will conform to the relevant quality standards."

Women's right to health is particularly violated as a study clearly established that women suffer from more symptoms of pesticide poisoning than men. Doing household chores like washing pesticide-soiled clothes and spraying equipment also increases their exposure to hazardous chemicals putting their health at greater risk. Most of the women respondents from Nam Dinh province had headaches after being exposed to pesticides, while only a small number of men reported this symptom.

3.7.4 CONCLUSION

The surveys undertaken in Hai Hau District of Nam Dinh province, and the villages of Ao Sen and Dong Cham in Thai Nquyen province found the widespread use of HHPs, under inappropriate conditions of use and resulting in unacceptable adverse health effects. The pesticide poisoning incidence rate of 84.27% is unacceptably high.

Pesticide manufacturers and sellers, and the government of Vietnam are not complying to the International Code of Conduct on Pesticide Management as the sale of HHPs is affecting the health of women and children, and the community.

Furthermore, the international community, including Vietnam, agreed at the 4th International Conference on Chemicals Management that urgent action should be taken to reduce HHPs, with an emphasis to replacing them with agroecological practices.[163]

163 International Institute for Sustainable Development. (2015, October 1). ICCM-4 Highlights: Wednesday, 30 September 2015. Earth Negotiations Bulletin. Retrieved from http://enb.iisd.org/vol15/enb15234e.html

Annex 3.7.1 List of reported pesticides in Vietnam 2015-2016

PESTICIDE	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Abamectin	23			Yes									Yes			Yes		
Acetamiprid*	3																	
Alpha-Cypermethrin	33																	
Bensulfuron	3																	
Buprofezin	9																	
Butachlor	1				Possible											Yes		31
Chlorfluazuron*	1									Yes	Yes					Yes		28†
Chlorpyrifos	3								Yes				Yes			Yes	Yes	2
Chlorothalonil	5			Yes	Possible													3
Chlorantraniliprole	2										Yes	Yes				Yes		
Cypermethrin	1												Yes			Yes	Yes	
Cyproconazole	1																	
Deltamethrin	2							Yes					Yes			Yes		
Difenoconazole	2																	1
Emamectin benzoate	1										Yes	Yes	Yes			Yes		
Fenitrothion	1							Yes	Yes				Yes			Yes		28†
Fipronil	18								Yes				Yes			Yes		8
Glyphosate	1				Possible											Yes	Yes	1
Hexaconazole	48																	29
Indoxacard	1																	
Imidacloprid	52												Yes			Yes		
Iprobenfos*	1								Yes									28†
Isoprothiolane*	9																	28†
Lambda-cyhalothrin	1			Yes				Yes					Yes			Yes	Yes	28 †

PESTICIDE	No. of brands with pesticide	WHO Ia	WHO Ib	H330	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChEInh	vB	vP	Very toxic to aq. organisms	High bee tox	POP	PIC	HHP	T20	Total Bans (number of countries)
Nereistoxin*	1																	
Niclosamide olamine*	1																	
Ningnanmycin*	1																	
Nitenpyram	17												Yes			Yes		
Paraquat	1			Yes												Yes		38
Permethrin	1				Possible								Yes			Yes		29
Polyxin	1																	
Propiconazole	3																	
Pymetrozine*	3				Possible													
Quinclorac	3																	
Sulphur*	1																	
Thiamethoxam	16												Yes			Yes		
Trichlorfon	9							Yes					Yes		Yes	Yes		32
Tricyclazole	8																	
Validamycin	1												Yes			Yes		

† Not banned in any country, but is not approved in the European Union.
*Reported in 2015 but not in 2016 Hai Hau study.

WHO Ia: Extremely hazardous
WHO Ib: Highly hazardous
H330: Fatal if inhaled according to the Globally Harmonized System (GHS)
Muta EU 1, 2: Mutagenic; Probable Mutagen
Repro EU 1,2: Reproductive Toxin; Probable Reproductive Toxin
EDC: Endocrine Disruptor

ChE Inh: Cholinesterase Inhibitor
vB: Very Bioaccumulative
vP: Very Persistent
POP: Persistent Organic Pollutants
PIC: Prior Informed Consent
HHP: Highly Hazardous Pesticide
T20: Terrible 20 pesticides extremely hazardous to children

Annex 3.7.2

Banned Pesticides in Vietnam

1. 2,4-D
2. Alachlor
3. Arsenic compounds
4. Captafol
5. Captan
6. Carbofuran
7. Chlordane
8. DDT
9. Edifenphos
10. Endosulfan
11. Ethoprophos/Ethoprop
12. Hexachlorobenzene/benzene hexachloride (HCB/BHC)
13. Hexachlorocyclohexane (HCH)
14. Lead compounds
15. Lindane
16. Mercury compounds
17. Methamidophos
18. Methomyl
19. Methyl parathion
20. Monocrotophos
21. Paraquat
22. Parathion (ethyl)
23. Pentachlorophenol (PCP) and salts
24. Phosphamidon
25. Strobane/Polychloroterpenes
26. Thallium sulfate
27. Triazophos

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Pesticide Properties DataBase. (n.d.). *Isoprothiolane*. Retrieved from https://sitem.herts.ac.uk/aeru/ppdb/en/Reports/408.htm

Isenring, R. (2017). *Adverse Health Effects Caused by Paraquat*. Retrieved from http://issuu.com/pan-uk/docs/adverse_health_effects_caused_by_pa?e=28041656/44629977

CHAPTER 4

Conclusions and Recommendations

4.1 CONCLUSIONS

The country reports from Bangladesh, India, Indonesia, Pakistan, Philippines, Malaysia, and Vietnam show that agrochemical TNCs and their subsidiaries as well as local pesticide manufacturers and distributors are producing and distributing highly hazardous pesticides (HHPs) that cause acute and chronic health effects particularly to children and other vulnerable people. These pesticides are also known to cause environmental damage and loss of biodiversity. From the country reports, it is clear that agrochemical corporations are responsible for violating the human rights to: life and health; access to information; safe and healthy environment; and livelihood. They violate children's rights, women's rights, and indigenous peoples' rights.

In addition, plantation company owners and managements are violating workers' rights to a safe working environment when HHPs are used in the workplace. Rarely met are the workers' needs for regular and sufficient information and training on pesticide use to minimise the risks to their health and well-being.

Governments are also not adequately protecting farmers and workers from the ill effects of HHPs. Despite the availability of safer, non-chemical alternatives to pesticides and less hazardous forms of agricultural production like agroecology and organic farming, plantation workers and farmers are forced to use hazardous agrochemicals. There is an apparent lack of efforts, resources, and support for the promotion of these alternatives that would safeguard the health of people.

Meanwhile, as consumers, everyone is exposed to HHPs through residues in food, as well as through the contamination of soil, water, and air.

Eight years ago, PANAP launched its first report *"Communities in Peril: Asian regional report on community monitoring of highly hazardous pesticide use"*, which documented the impact of HHPs on 12 communities from eight countries. More than 1,300 farmers and agricultural workers were involved in that first report, and it revealed that 66% of the pesticide active ingredients reported were HHPs based on the PAN International criteria. While some positive changes have been evident, particularly the bans or non-registration of many of the WHO Class 1 pesticides in certain countries such as Vietnam, not much has

changed in terms of the use of HHPs today. The horrendous exposure of women and men farmers, agricultural workers, children, and indigenous communities to these pesticides continues.

This second report, *"Of Rights and Poisons: Accountability of the Agrochemical Industry"* documented the HHPs used and the conditions of use in seven countries with 2,025 respondents surveyed. It focused on the lack of corporate accountability and responsibility of producers and distributors of pesticides and the need for urgent action to address the harm they cause and that is actually easily preventable. It also identifies some areas where States are being negligent in allowing the human rights abuses, and provides recommendations to address them.

Violations of the right to life and health

The Universal Declaration on Human Rights (UDHR) enshrines the right to life for every person. In Article 25, it says, "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family."

The right to life and health of farmers, agricultural workers, indigenous peoples, and community residents, including women and children, in various agricultural communities in the seven countries, was violated through exposure to pesticides, many of which are classified as HHPs. Knowing full well that many of these HHPs cause acute and chronic effects, corporations still continue to produce and sell these poisons under appalling conditions of use in developing countries. While exposed communities suffer health problems and the environment is damaged, the corporations are making huge profits from these pesticides.

Agrochemical TNCs Syngenta, Dow, Monsanto, Bayer, and BASF are exposing communities to pesticides by producing HHPs such as paraquat, lambda-cyhalothrin, monocrotophos, carbofuran, glyphosate, mancozeb, chlorpyrifos, diazinon, fipronil, chlorothalonil, and glufosinate-ammonium. Indian and Chinese manufacturers are also producing and distributing these HHPs in the countries surveyed, and thus are accountable as well in the violations of human rights.

Some of the HHPs found in the countries surveyed include:

- **Paraquat**[164] is acutely toxic when swallowed, absorbed through damaged skin or inhaled. Thousands have died from ingestion (mainly suicide) or dermal exposure (mainly occupational). A teaspoon of paraquat concentrate can cause death. Paraquat is corrosive to the skin and is easily absorbed once the skin is damaged. It is a neurotoxicant and a likely endocrine disruptor. Syngenta, a TNC based in Switzerland and acquired by ChemChina in 2017, produces the paraquat brand Gramozone which has been found in the surveys in India, Indonesia, Malaysia, Philippines, and Vietnam. Moreover,

164 Watts, M. (2012). *Highly Hazardous Pesticides: Fipronil* [Fact sheet]. Retrieved from http://archive.panap.net/sites/default/files/pesticides-factsheet-hhps-fipronil.pdf

farmers and agricultural workers exposed to paraquat complain of skin irritation, eye damage, nail discolouration and erosion as well as other conditions. Paraquat has been banned in at least 38 countries. A paraquat formulation has been found by the Conference of the Parties to the Rotterdam Convention to meet the listing requirements of that Convention, but a small handful of countries and massive lobbying efforts by Syngenta have prevented it being listed.

- **Lambda-cyhalothrin**[165] is a pyrethroid pesticide that is a possible carcinogen, teratogen and neurologic toxicant as well as an endocrine disruptor. It was found in six of the seven countries surveyed. Karate, a lambda-cyhalothrin brand of Syngenta, was found in the surveys in India, Malaysia, the Philippines and Pakistan. In Pakistan, two farmers reported poisoning when they used Karate. They suffered dizziness and excessive sweating, with one falling unconscious. Elsewhere, extensive acute poisoning has been reported in Canada, Chile, Georgia, Germany, Switzerland, Tanzania, Turkey, UK and USA.[166]

- **Monocrotophos** poisoning has signs and symptoms that include coughing, difficulty breathing, blurred vision, vomiting, diarrhoea, abdominal cramps, headache, dizziness, salivation, sweating and confusion, slurred speech, involuntary muscle contractions, and eventually paralysis of the body extremities and the respiratory muscles.[167] Severe cases of poisoning cause unconsciousness, convulsions, coma, and death.[168] Monocrotophos, banned in 60 countries, has been responsible for numerous deaths from contaminated food and occupational exposures, particularly in India. Following WHO's 2009 review of monocrotophos in India – which identified poisonings and deaths in India, Sri Lanka, Indonesia, Brazil, Egypt and Central America[169] – the WHO recommended that the Government of India ban it. Since then, 23 Indian school children have died from monocrotophos-contaminated food and it was also implicated in the epidemic of occupational deaths in Yavatmal, India in 2017.

- **Carbofuran** poisoning includes signs and symptoms of muscle weakness, incoordination, and slurred speech. Hypertension, cardiorespiratory, and pulmonary oedema may occur in severe cases of exposure. In the country reports, carbofuran was found being used in the rice fields of Malaysia and a banana plantation in the Philippines. FMC, an American company, produces carbofuran under the brand name Furadan and distributes it in the Philippines. Interestingly, "FMC acquired a significant portion of DuPont's crop protection business that Dupont had to divest to comply with European

165 Watts, M. (2014). *High Hazardous Pesticides: Lambda Cyhalothrin* [Fact sheet] Retrieved from http://files.panap.net/resources/pesticides-factsheet-hhps-cyhalothrin.pdf

166 Watts, M. 2017. Information provided to the Rotterdam Convention Secretariat: SHPF Lambda-cyhalothrin emulsifiable concentrate 50g/L; Comments by PAN International on the CRC Task Group Report, October 2017.

167 Watts, M. (2011). *Highly hazardous Pesticides: Monocrotophos* [Fact sheet]. Retrieved from http://files.panap.net/resources/pesticides-factsheet-hhps-monocrotophos.pdf

168 Ibid

169 World Health Organization, Regional Office for South-East Asia. (2009). *Health implications from monocrotophos use: a review of the evidence in India*. Retrieved from http://apps.who.int/iris/bitstream/handle/10665/205225/B4293.pdf?sequence=1&isAllowed=y

Commission ruling related to its merger with the Dow Chemical Company."[170] Numerous examples of poisoning have been reported including 408 cases in Colombia in 2011[171] and 96 cases in Thailand in 2005-2010.[172] Carbofuran is banned in 49 countries, and was listed under the Rotterdam Convention in 2017.

- **Glyphosate** has been declared as a probable human carcinogen by the International Agency for Research on Cancer (IARC) of the WHO.[173] It is listed as an endocrine disruptor. Roundup, the brand name of Monsanto's glyphosate was found in India, Indonesia, Malaysia, Philippines, and Vietnam. In August 2018, a court in California found Monsanto fully liable for health damages caused by Roundup to a groundskeeper chronically exposed to glyphosate and suffering non-Hodgkin's lymphoma, ordering the company to pay the man USD 289 million in damages.[174]

- **Chlorothalonil** is a human carcinogen and a reproductive toxin.[175] Plantation workers are exposed to chlorothalonil produced by Syngenta that is available under the brand name Bravo in Indonesia and as Daconil in the Philippines.

- **Chlorpyrifos** is a potent developmental neurotoxin at low levels of exposure, causing delayed cognitive and motor development, and reduced IQ.[176] It is extremely toxic to children's developing brains and is listed on PANAP's "Terrible Twenty" pesticides that are toxic to children. Lorsban, the brand name for Dow's chlorpyrifos, was found in the Philippines. Chlorpyrifos is also available in Vietnam.

- **Glufosinate-ammonium** is a broad-spectrum herbicide that carries unacceptable risks to humans, especially to the neurological development of the foetus, to agricultural biodiversity, and to the environment. Operator exposure during crop spraying is unacceptably high even when protective clothing is worn.[177] Bayer's glufosinate-ammonium brand, Basta, was in the list of pesticides used in the oil palm plantations surveyed in Malaysia. The use of this HHP by workers is worrisome given the unsafe working conditions existing in the plantations.

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170 FMC Corporation. (2017, November 1). *FMC Corporation Completes Transformative Transactions with DuPont* [Press release]. Retrieved from http://phx.corporate-ir.net/phoenix.zhtml?c=117919&p=RssLanding&cat=news&id=2313346

171 Notification of final regulatory action by Colombia to the Rotterdam Secretariat, 2016.

172 Tongpoo, A., Sriapha, C., Wongvisawakorn, S., Rittilert, P., Trakulsrichai, S., & Wananukul, W. (2015). Occupational carbamate poisoning in Thailand. *Southeast Asian Journal on Tropical Medicine and Public Health*, (46)4, 798-804. Retrieved from http://www.tm.mahidol.ac.th/seameo/2015-46-4/28-631329.pdf

173 International Agency for Research on Cancer. (2017). Some Organophosphate Insecticides and Herbicides. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans,* 12. Retrieved from https://monographs.iarc.fr/wp-content/uploads/2018/07/mono112.pdf

174 Gillam, C., & Donley, N. (2018, August 12). A story behind the Monsanto Cancer Trial — Journal sits on retraction. E*nvironmental Health News*. Retrieved from https://www.ehn.org/monsanto-science-ghostwriting-2597869694.html

175 Watts, M. (2014). *Highly hazardous pesticides: Chlorothalonil* [Fact sheet]. Retrieved from http://files.panap.net/resources/pesticides-factsheet-hhps-chlorothalonil.pdf

176 Watts, M. (2013). *Highly Hazardous Pesticide: Chlorpyrifos* [Fact sheet]. Retrieved from http://www.pananz.net/wp-content/uploads/2014/09/Chlorpyrifos-factsheet-.pdf

177 Watts, M. (2008). *Glufosinate-Ammonium* [Monograph]. Retrieved from http://archive.panap.net/sites/default/files/monograph_glufosinate.pdf

- **Fipronil**[178] poisoning signs and symptoms include dizziness, seizure, confusion, vomiting, diarrhoea, abdominal pain, palpitations, difficulty in breathing, skin rash, and blurred vision. It is considered a potent toxin for the human liver and is also a neurotoxin. In addition, fipronil is very highly toxic to fish and other aquatic organisms, and to honeybees. Of the countries surveyed, fipronil was found in Bangladesh, India, and Vietnam. Dow's and Bayer's fipronil products were identified in India as not having proper label information.

The surveys reported that pesticide users are not able to protect themselves against exposure to the pesticides they are spraying. While the use of PPE is mandated in international conventions and agreements such as the ILO Conventions and International Code of Conduct on Pesticides Management (the Code) as well as in national laws, conditions on the ground have proven that such guidelines are not followed and are in fact nearly impossible to follow. Full PPE is not worn in any of the areas and countries surveyed in this study, except in two oil palm plantation in Indonesia that provides PPE to its workers.

Pesticide manufacturers, distributors, and retailers; as well as plantation operators, are liable for their failure to provide protective equipment. Article 5.3 of the Code[179] clearly states that PPE must be "suitable for the tasks to be carried out, appropriate to the prevailing climatic conditions and affordable." Such is not the case on the ground, even in instances where PPE is provided.

The health and well-being of persons exposed to pesticides are greatly affected, showing various symptoms of acute and chronic poisoning with an estimated incidence rate of 71% of those surveyed affected. A vast number of agricultural households is found to suffer from serious illnesses. Cases of death due to poisoning, particularly in India, have been noted. Some of the pesticides reported in the deaths of farmers and workers in Yavatmal, India were Polo (active ingredient: diafenthiuron), a product of Syngenta, and Monocil (active ingredient: monocrotophos), a product of Indian manufacturer Insecticides India Ltd, as well as other products produced by local Indian manufacturers.

Article 3.6 of the Code states "Pesticides whose handling and application require the use of personal protective equipment that is uncomfortable, expensive or not readily available should be avoided, especially in the case of small-scale users and farm workers in hot climates". Further, the Code in Article 5.2.5[180] calls on the pesticide industry to "halt sale and recall product as soon as possible when handling or use pose an unacceptable risk under any use direction or restrictions and notify the government." And yet, given the hazardous conditions of use of the HHPs in the countries surveyed, no such actions have been taken by the pesticide companies, nor have the governments moved to prevent this use.

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178 Watts, M. (2008). *Highly hazardous pesticides: Fipronil* [Fact sheet]. Retrieved from http://archive.panap.net/sites/default/files/pesticides-factsheet-hhps-fipronil.pdf

179 FAO & WHO. (2014). *International Code of Conduct on Pesticide Management.* Retrieved from http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf.

180 FAO & WHO. (2014). *International Code of Conduct on Pesticide Management.* Retrieved from http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf.

Violations of the right to life and health are exacerbated by lack of access to information. *(See next section below)*

The violation of the right to health can also be attributed to non-approved uses of pesticides. In India, for instance, paraquat and other HHPs are used in crops beyond those which have been approved by the government's Central Insecticide Board and Registration Committee (CIBRC). Pesticide manufacturers and distributors (including the Big Six), which advise non-approved uses of pesticides, should be made accountable for knowingly providing false information. The situation is worsened by the current lack of an effective regulatory mechanism to monitor pesticide usage. Stricter monitoring and legal action is thus urgently required.

The Code generally promotes that both States and companies adopt a life cycle approach to pesticides. This should include effective container collection systems. Until such collection systems are in place, pesticide companies, under Article 5.2.4.5, must ensure that containers are not attractive for subsequent reuse and must promote programmes that discourage their reuse.[181] Failure of pesticide companies to ensure responsibility for the life cycle of their products has led to improper disposal: the haphazard disposal of pesticide containers and used packages in the fields or in nearby rivers, or the reuse of containers for everyday household use, are common in the countries surveyed, resulting in risks of environmental contamination and threats to human health.

Agrochemical TNCs and government regulatory agencies also do not address the problem of pesticide drift. Pesticide drift refers to the diffusion of pesticides from an area of application to any unintended site either through aerial or ground spraying. Aerial spraying of pesticides is routine in the Philippines and is noted in Bangladesh. Many rural communities are affected by this drift which may cause injury to farm workers, farmers and other people, especially children. It harms as well nearby crops or other non-target plants, livestock and wildlife, and may cause environmental contamination including in the soil and water. Some of these pesticides are persistent and stay in the environment for years. As a consequence, the right to a healthy environment of rural communities is violated by pesticide drift and by contamination of soil and water sources through the use of HHPs.

Violations of the right to freedom of information and right to know

The first session of the United Nations (UN) General Assembly in its resolution 59(I) established that freedom of information is a fundamental human right and is the touchstone of all the freedoms which the UN has consecrated.[182] Freedom of information confers the right to gather, transmit and publish

181 Ibid

182 UN General Assembly, *Calling of an International Conference on Freedom of Information,* 14 December 1946, A/RES/59, available at http://www.refworld.org/docid/3b00f0975f.html

information, ideas, and opinions. The right of access to information is based on Article 19 of the UDHR and International Convention on Civil and Political Rights (ICCPR). Freedom of information is critical for public participation in decision-making and policy development. Public participation in environmental matters is defined by three 'pillars', namely: (1) access to information, (2) access to decision-making, and (3) access to justice.

The UN Special Rapporteur (SR) on the promotion and protection of the right to freedom of opinion and expression, Abid Hussain, in 2001 went further by endorsing the principles[183] of the "public's right to know" based on Article 19 of the UDHR.[184] The principles were adopted by the Commission on Human Rights in its resolution 2000/38 on the right to freedom of opinion and expression.[185]

In the studies undertaken in the seven countries, it was fairly common for farmers and agricultural workers to not even know the names of the pesticides they were using due to lack of awareness, access to labels, and the practice of decanting. There is an overwhelming lack of training on the use and hazards of the pesticides being sold, which is the responsibility of pesticide manufacturers, distributors and retailers, and plantation owners, as well as government agencies.

Thus, farmers are mostly uninformed of the nature of the pesticides they are handling, and do not exercise the necessary safety precautions, leading to hazardous conditions of use. Aside from not wearing PPE, safety precautions that are often disregarded include spraying against the wind direction and not entering newly sprayed fields.

The agrochemical corporations were found to not provide complete safety information in their product labels. These companies violate guidelines on packaging and labelling, which require texts to be readable and in local languages. The bigger problem, however, is illiteracy, which taken together with lack of training and other forms of awareness raising, inevitably leads to hazardous use.

Even the choice and dosage of pesticides used by farmers are not based on any scientific information but usually just based on advice from retailers, who in turn get information solely from manufacturers whose main interest is selling more of their products.

For pesticide users, access to information and the right to know are vital to their health and well-being and denying this right thus has grave health risks.

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183 UN Commission on Human Rights, *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, submitted in accordance with Commission resolution 1999/36,* 18 January 2000, E/CN.4/2000/63, available at http://undocs.org/E/CN.4/2000/63

184 Article 19. (1999). *The public's right to know: Principles on freedom of information legislation.* Retrieved from https://www.article19.org/data/files/pdfs/standards/righttoknow.pdf

185 UN Commission on Human Rights, Commission on Human Rights resolution 2000/38 The right to freedom of opinion and expression, 20 April 2000, E/CN.4/RES/2000/38, available at http://ap.ohchr.org/documents/E/CHR/resolutions/E-CN_4-RES-2000-38.doc

Violations of the right to a safe working environment and labour rights

Working conditions on plantations are often dangerous and inhumane. Hazardous working conditions are marked by lack of appropriate PPE, where PPE is not available or not affordable. But even if available, it is inappropriate for use in a hot and humid tropical climate. The surveys have shown the lack of washing and medical facilities. All these situations violate the right to a safe working environment for agricultural workers. Employers fail in their responsibilities to prevent occupational hazards by providing sufficient and appropriate PPE and proper training. They fail to ensure that spraying equipment is working properly, leading to incidents of spills. Many employers also fail to provide free medical treatment for their workers.

Wages of agricultural workers are low to keep the costs of production down and to benefit owners, landlords, or the plantation industry. Cheaper, older, and more hazardous pesticides such as paraquat and monocrotophos are used in farms and plantations to reduce the cost of production, resulting in the exposure of agricultural workers to HHPs. The failure to provide training and information on the dangers of these pesticides compounds the violations.

The cases of oil palm plantation workers in Malaysia and Indonesia demonstrate the problems of workers exposed to dangerous conditions. One HHP, paraquat, is still being used in the plantations in Malaysia and Indonesia. Syngenta, which produces the paraquat brand Gramoxone, used its power to prevent the implementation of the Malaysian government's ban on paraquat announced in 2002. Working with public relations companies that organised a media blitz, and through political influence, Syngenta was able to overturn the ban. Ironically, paraquat has been banned in Syngenta's home country of Switzerland since the 1980s. Switzerland, the UK (where paraquat is banned but still manufactured) and China (where liquid formulations are banned but still manufactured) all allow this double standard in trade to continue.

Further violations of labour rights such as the failure to provide sufficient wages and benefits directly impact workers' health and well-being, especially those of undocumented migrant workers as documented in Malaysia and casual workers who are less protected as documented in Indonesia.

The ILO's Convention 184 on occupational health and safety in agriculture requires governments to ensure that there are preventive and protective measures for the use of chemicals and handling of chemical waste at the level of the undertaking, covering:

- the preparation, handling, application, storage, and transportation of chemicals;
- agricultural activities leading to the dispersion of chemicals;
- the maintenance, repair, and cleaning of equipment and containers for chemicals; and
- the disposal of empty containers and the treatment and disposal of chemical waste and obsolete chemicals.

Regulatory measures in line with the ILO's Convention 184 rarely exist, or when they do exist, they are rarely implemented. Plantation companies and pesticide manufacturers who should be responsible throughout the life cycle of their products do not ensure these measures are implemented either.

Violations of children's rights

Article 32 of the UN Convention on the Rights of the Child (UNCRC) states that governments must "recognise the right of the child to be protected from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development."

In the national reports in India, Indonesia, Philippines, and Pakistan, children work in agriculture and are exposed to pesticides, thus violating their rights. Children as young as nine years old are working in the floriculture farms in India, while in the Philippines and Indonesia, children work in the plantations. In Pakistan, children work with their families in farms and live in communities where they are exposed to hazardous pesticides. Children are highly vulnerable to pesticides, as early-life exposure can damage their developing brains and endocrine, nervous, and immune systems. Some of the HHPs documented in the report, such as chlorpyrifos, which is extremely damaging to children's developing brains, are on PANAP's "Terrible Twenty" pesticides that are particularly toxic to children.

Children's right to education is also violated, as work in the fields and exposure to pesticides affect their schooling. Even children who are not working in the fields are also exposed since schools are near the sprayed fields. The pesticide industry so far has not been made accountable for their pesticides used in such conditions that greatly imperil children.

Violations of women's rights

Women are also vulnerable to pesticides. Women are more susceptible to the harmful effects of pesticides than are men for reasons that include having a higher proportion of body fat and of hormonally sensitive tissues. Women are exposed to HHPs in various ways — as workers in palm oil plantations, as rice farmers, as family members exposed to contamination through activities such as washing clothes and mixing the pesticides for their spouses. Due to gender discrimination, women's roles as farmers, workers and as wives and mothers are rarely understood and remain invisible, and so too their exposure to pesticides.

In addition, conditions of work of women in palm oil plantations violate Article 11 of the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) that guarantees the right of women "to protection of health and to safety in working conditions, including the safeguarding of the function of reproduction." Right to access health care services is also violated.

In relation to women and children's rights, intergenerational rights and equity are also violated, as even unborn children are exposed to pesticides through their mothers. Agrochemical TNCs have so

far failed to address the issue that their products have particular adverse effects on women and on the next generation.

Violations of indigenous people's rights

The UN Declaration on the Rights of Indigenous Peoples (UNDRIP) recognises that "control by indigenous peoples over developments affecting them and their lands, territories and resources will enable them to maintain and strengthen their institutions, cultures and traditions, and to promote their development in accordance with their aspirations and needs."

Indigenous peoples' rights are violated by palm oil companies that encroach on ancestral lands and forests as is the case in Malaysia and the Philippines. Agrochemical TNCs are complicit, as their products are being used to sustain the profitability and thus fuel the expansion of these plantations. The use of their hazardous products has also destroyed ecosystems which many of the indigenous cultural traditions are based on and has adversely impacted them, their children's health, and the communities' well-being.

4.2 RECOMMENDATIONS

Agrochemical transnational and national corporations involved in the manufacture, sale, export, and distribution of pesticides must be made accountable for violations of various human rights instruments and the International Code of Pesticide Management. They must be held liable for poisoning the people and the planet on a systematic and widespread scale, as revealed in the monitoring carried out by PANAP and its partners. In particular, they should:

- cease producing and trading pesticides that meet the criteria of HHPs and/or are known to have caused adverse human health or environmental damage or contamination;
- take full life cycle responsibility for their products and containers;
- indemnify the affected sectors of society, particularly the farmers, farm workers, women, children, and their families;
- clean up the environmental impacts of pesticides and ensure safe water, soil, air, and food; and together with plantation operators, shoulder all the costs related to such clean up;
- respect and heed the public's assertion of their rights to safe and healthy food and environment; and
- ensure full and transparent disclosure of all information related to the toxicity of their products.

These companies must also be prevented from dominating regulatory agencies and global conventions and agreements, in attempts to ensure the continued use of their harmful products.

National and local governments should:

- ban the trade, distribution, and use of HHPs;
- ratify, if they have not yet done so, the UN Conventions particularly CEDAW, Rights of Children, UNDRIP, as well as ILO Convention 184;
- support the proposal for a comprehensive new global treaty to phase out HHPs and institute other measures that will ensure full and transparent disclosure of all information relating to adverse effects of pesticides;
- require that companies take back and either recycle or dispose of, in an environmentally friendly manner, all used pesticide containers and left-over pesticides;
- legislate to prevent the double standard of exporting/importing pesticides that have been banned in their country of origin, and monitor to ensure compliance with this;
- disallow the sale and/or use of pesticides that require the use of PPE because it is unsuitable for hot humid conditions, not readily available, and/or too expensive for farmers and workers;
- closely monitor and ensure compliance of companies with labour and environmental laws, other related policies on hazardous pesticides (sufficient resources, including of competent personnel, must be allocated to implement this), and human rights;
- develop a medical and economic rehabilitation programme for farmers and others impacted by pesticides, with funds drawn from punitive actions and Corporate Social Responsibility;
- implement at least a one-kilometre pesticides-free buffer zone around schools as a measure to protect children from the harmful effects of pesticides;
- implement a systematic health surveillance and monitoring scheme to document the numbers of pesticide users poisoned, the pesticides involved, and other pesticide impacts on the health and the environment;
- ensure the liability of pesticide manufacturers and distributors for the harm caused by pesticides on human health and ecosystems, as people and governments should not be left bearing the costs;
- enact regulations on and ensure strict implementation of "right to information" and "right to know" to ensure that communities and agricultural workers are provided with full information on the pesticides that they are exposed to or spray;
- foster a supportive policy environment for agroecology, including supporting farmers to make the shift from pesticide dependency to agroecology. Relatedly, implement a genuine agrarian reform programme that will provide substantial state support to farming communities; and
- support the process of the UN Open-Ended Intergovernmental Working Group on Transnational Corporations and Other Business Enterprises with Respect to Human Rights and the Binding Treaty. This ongoing process to establish a legally binding instrument at the level of the UN aims to ensure that companies, including the agrochemical TNCs and plantation operators, are held responsible and accountable for their actions.

National and local plantations and agrochemical distributors and retailers should:

- adhere to environmental laws that respond to precautionary and polluter pays principles;
- respect workers' and farmers' rights in accordance with national laws and regulations and international conventions, including the International Code of Conduct on Pesticide Management, pertinent ILO conventions such as Convention 184, and other laws or conventions pertaining to the rights to live decently and with dignity;
- ensure that indigenous peoples' culture, tradition, and knowledge are respected, primarily by not encroaching into their ancestral lands;
- provide adequate training to plantation workers on pesticide hazards and proper handling;
- disallow the sale and/or use of pesticides that require the use of PPE because it is unsuitable for hot humid conditions, not readily available and/or too expensive for farmers and workers;
- discontinue the sale and use of all HHPs; and
- implement agroecological alternatives to HHPs and make them widely available.

The food industry should undertake initiatives to:

- implement higher standards throughout the supply chain, including agricultural production based on agroecology, to ensure that food and fibre is produced in a way that does not cause harm to farmers, agricultural workers, and indigenous peoples, and their overall communities and environment; and
- implement residue monitoring schemes to detect residues before food is placed on the market and withhold any food that contains residues.

Annex 4.1 END CORPORATE GREED! RIGHTS NOW! A Sign-On Statement to Stop the Poisoning Of the People and the Planet

On 3 December 1984, the horrendous Bhopal gas tragedy at the Union Carbide pesticide plant in India immediately killed 3,000 people and 15,000 more subsequently. Survivors, exposed to the deadly gas and their children, continue to suffer from the world's worst industrial disaster. Thousands of tons of hazardous wastes remain buried underground and the area remains contaminated. Meanwhile, Union Carbide, which became a subsidiary of Dow-Chemical Co. in 2001, has yet to fully account for the tragedy.

The infamous Bhopal tragedy serves as a harsh reminder of agrochemical corporations' transgressions of human rights and environmental integrity. They continue to poison our people and environment with impunity. Our food, health and environment are threatened now more than ever as these corporate giants continue to amass huge profits and expand their monopolies. Dow recently completed its USD 130 billion merger with DuPont to form the world's largest chemical company. As the UN Special Rapporteur on the right to food pointed out, these global corporations wield extraordinary power over regulatory agencies and policy makers, obstructing reforms and paralysing global pesticide restrictions.

Worrying new studies show certain pesticides are implicated in chronic effects including hormonal disruption, immune system dysfunction, cancers, and adverse effects on the growing foetus and children. Pesticides have been poisoning agricultural workers and farmers for over 60 years and yet there are still no accurate estimates of pesticide poisoning. In the 1990's, a report in a WHO journal estimated 25 million workers suffered at least one incident of poisoning every year. Recent estimates indicate that pesticides were responsible for an estimated 200,000 acute poisoning deaths each year.[186] The overwhelming number of fatalities, some 99%, occurred in developing countries where health, safety and environmental regulations were weaker[187].

PANAP and its partners have documented that Syngenta, Bayer, DuPont, and Monsanto and their local counterparts dominate the agro-chem industry in the South Asia and South East Asian region.

In South and South East Asia, HHPs produced by Syngenta, Bayer, DuPont and Monsanto such as atrazine, paraquat fipronil, carbofuran, chlorpyrifos, cypermethrin, glyphosate, lambda-cyhalothrin, imidacloprid, malathion, and monocrotophos – all known for poisoning people and/or the environment – are still used widely in farming. They are used on farms, cotton fields, rice paddies, mango, and oil palm plantations and in floriculture, violating the rights of plantation workers, farmers, rural women, and indigenous peoples to a safe and healthy working environment and the rights of communities to a healthy environment. Rights to information on the pesticides they use or to which they are exposed to are constantly violated. Specific cases of violations of women and children's rights, labour rights, and right to civil liberties have been documented.

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186 Report of the Special Rapporteur on the right to food. Human Rights Council, Thirty-fourth session, 27 February-24 March 2017. >https://documents-dds-ny.un.org/doc/UNDOC/GEN/G17/017/85/PDF/G1701785.pdf?OpenElement

187 Ibid.

In the meantime, because of the lack of corporate accountability for gross human rights violations and responding to the pressure from Civil Society Organisations (CSOs), the Human Rights Council has established an Open Ended Intergovernmental Working Group (OEIGWG) for the development of a legally binding treaty on transnational corporations (TNCs) and other business enterprises, with respect to human rights. We applaud the efforts OEIGWG and hope that the final document of the Treaty will achieve the goal of ensuring that companies are fully accountable for their human rights violations and environmental crimes.

Further to this, States must be responsible for the protection of human rights and put forward the interests and welfare of its people. It must defend and assert the rights of its people from corporate rights violations as enshrined in the Universal Declaration of Human Rights.

Dependence on pesticide use must be drastically reduced. Agroecology provides the best solution. It is economically, environmentally, and culturally sustainable. Agroecology is being practiced by thousands of farmers worldwide to ensure food security, safety and sovereignty, as well as environmental sustainability and farmer and community health and well-being.

Therefore, we the undersigned organisations and individuals demand:

That the Agrochemical TNCs, plantations, agribusinesses and complicit companies

- be held accountable for poisoning the people and the planet;
- heed the public's assertion of their rights to a safe and healthy food and environment;
- are prevented from dominating regulatory agencies and global conventions and agreements that attempt to restrict the worst pesticide problems;
- indemnify affected sectors of society such as farmers, children, and their families; and
- clean up the environmental impacts including ensuring safe water and food.

That the national and local governments

- ban the trade, distribution, and use of HHPs;
- support the call for a comprehensive new global treaty to regulate and phase out HHPs;
- closely monitor and ensure compliance of companies with labour and environmental laws and policies on hazardous pesticides;
- develop a medical and economic rehabilitation programme for farmers and others impacted by HHPs, with funds drawn from punitive actions and CSR;
- implement at least one kilometre pesticides-free buffer zones around schools as a measure to protect children;
- provide a supportive policy environment for agroecology, including supporting farmers to change from pesticides to agroecology;

- fully support the OEIGWG process and the Binding Treaty to help ensure that companies are responsible and accountable for their actions; and
- demand justice and accountability from corporations over gross human rights violations committed against its people.

That national and local agro-chemical companies and plantations

- adhere to environmental laws that respond to precautionary and polluter pays principles;
- fulfill workers' rights in accordance with national laws and regulations and international conventions, including the International Code of Conduct on Pesticide Management;
- fulfill workers' and farmer's rights to live decently and with dignity, and respect indigenous peoples' culture, tradition, and knowledge;
- do not allow the sale or use of pesticides that require the use of PPE, because it is unsuitable for hot humid conditions, not readily available and/or too expensive for farmers and workers, as is required by the Code;
- provide adequate training to their workers; and
- discontinue the sale and use of all HHPs.

Finally, we urge our fellow civil society organisations, social movements, and people's organisations to join our calls.

End Corporate Impunity, Accountability Now!
Oppose the Corporate Control Of Agriculture!
Support the global legally binding treaty for the life-cycle management of pesticides!
Promote Agroecology and Food Sovereignty! Fight For A Just And Pesticides Free Future!

Please sign-on at: https://www.change.org/p/governments-end-corporate-greed-rights-now

Annex 4.2 Urge the State Governments to Institute Pesticide-free Buffer Zones Around Schools

Dear Friends,

Can we still do more to protect children from toxic pesticides?

Yes we can! And you can definitely help by supporting our call for pesticide-free buffer zones around schools.

Schools are meant to be safe sanctuaries for children to learn and grow, but terrifyingly, children in Asia are consistently being poisoned in these supposedly safe learning environments. Children in schools are being exposed to pesticides via reckless aerial spraying and spray drifts that target their young developing bodies.

The world celebrates International Children's Day every 20th of November. For this year, PANAP and its partners demand state governments to set up a one kilometre or more buffer zones around their schools. You help bring about change by supporting them too!

Children must be protected from pesticide drifts. We do not want a repeat of the incidents in Mendocino and Ventura Counties (California, USA), Davao del Norte (Philippines), Nuwara Eliya District (Sri Lanka), and most recently in Po Ampil Primary School in Cambodia, where more than 30 children were poisoned by pesticides during schooling hours alone.

It is evident through numerous studies that pesticides negatively impact the life, health, and intelligence of children and thus violate the provisions of the Convention on the Rights of the Child. CRC recognises the child's "inherent right to life" and that the survival and development of the child should be ensured to the "maximum extent possible."

Available information show that pesticides drift hundreds of meters from the area of use at health-harming concentrations for days and even weeks after application, especially in rural areas in India, Laos, Vietnam, Cambodia, China, Philippines, Sri Lanka, and many other countries in Asia. 1.5 billion Children in Asia are estimated to live in rural areas.

Children's right to a healthy life should always be of utmost importance over any growing corporate interest. It is unacceptable that countries in Asia continue to be the toxic dump site of pesticides mainly peddled by developed countries. Inadequate laws and regulations in this region should be overhauled specifically for the best interest of our children.

Pesticides users and farms using pesticides in the vicinity of schools should be supported to move towards non-chemical alternatives and agroecology.

We, the PANAP and its partners, together with the global community, thus ask the governments to declare pesticide-free buffer zones around schools that would protect children from harmful exposure

to pesticides. As an initial risk reduction measure, the buffer zone must have at least a one kilometre in radius.

Making this landmark declaration on the occasion of the International Children's Day would be a meaningful gift to humanity.

Help us create awareness on pesticide-free buffer zones and realise that it can have the power to protect our future generations from toxic pesticides.

Hoping for your full support in this fight to protect our children.

Please sign on at: https://bit.ly/2GXWzU0

PANAP

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OF RIGHTS AND POISONS:

ACCOUNTABILITY OF THE AGROCHEMICAL INDUSTRY

About PANAP

PAN Asia Pacific (PANAP) is one of the five regional centres of Pesticide Action Network (PAN). PANAP works for the elimination of harm caused by pesticides on human health and the environment. PANAP also promotes agroecology, helps strengthen people's movements in their assertion of rights to land and livelihood, and advances food sovereignty and gender justice.

Our vision is a society that is truly democratic, equal, just, culturally diverse, and based on food sovereignty, gender justice and environmental sustainability.

PANAP concretises this vision through its role in:

- helping strengthen people's movements in their assertion of rights to land and livelihood and advancing food sovereignty
- promoting agroecology
- working to protect people and the environment from highly hazardous pesticides
- supporting rural women's leadership and empowerment
- contributing towards ensuring corporate accountability

PANAP anchors on the concept that community empowerment is at the core of social change. As such, it develops strong partnerships with peasants, agricultural workers, indigenous peoples, fisherfolk and other small food producers, and rural women's movements throughout the Asia-Pacific region. PANAP's credibility as a regional advocacy network is founded and continues to be built by the guidance and close working relations with these grassroots organisations.

As a network, PANAP is currently comprised of more than 100 partner organisations from the Asia-Pacific region and has links with about 400 other regional and global civil society and grassroots organisations.

PAN Asia Pacific (PANAP)
P.O. Box 1170, Penang, 10850 Malaysia
Tel: +604-657 0271 / 656 0381 Fax: +604-6583960
E-mail: info@panap.net Web: www.panap.net
Facebook: www.facebook.com/panasiapacific
Twitter: @PANAsiaPacific

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