FIELD SURVEY:

Use and impacts of pesticides in four countries in Asia

PAN ASIA PACIFIC
For a just and pesticide-free future

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CONTENTS

1. INTRODUCTION 5

2. METHODOLOGY 7
   - 2.1 Objectives 7
   - 2.2 Participating organisations 7
   - 2.3 Selection of respondents 8
   - 2.4 Data gathering 8
   - 2.5 Description of districts involved in study 10

3. CONSOLIDATED ANALYSIS 15
   - 3.1 Gender analysis of pesticide activities 15
   - 3.2 Pesticides use 18
   - 3.3 Exposure routes 20
   - 3.4 Illness after pesticide exposure 28

4. COUNTRY REPORTS 29
   - 4.1 Bangladesh 29
     - 4.1.1 Manikganj District 29
     - 4.1.2 Cumilla District 40
   - 4.2 India 48
     - 4.2.1 Yavatmal District 48
     - 4.2.2 Wayanad District 55
   - 4.3 Laos PDR 64
     - 4.3.1 Kham District 64
   - 4.4 Vietnam 73
     - 4.4.1 Hai Hau District 73
     - 4.4.2 Thuan Chau District 82

5. CONCLUSION 92

Appendices A 95
   - i. Bangladesh 95
   - ii. India 103
   - iii. Laos 113
   - iv. Vietnam 118

Appendices B 129

SYNTHESIS OF DATA

- 350 of 367 respondents (95.37%) in the four countries (Bangladesh, India, Laos, and Vietnam) used pesticides on their farms.
- Overall, 80.37% (131) of women farmers sprayed pesticides and 95.14% (176) of men farmers.
- In Bangladesh and Laos, more than 70% of women mixed and loaded pesticides.
- 34.57% of women (121) were washing pesticide-contaminated clothes and equipment and 23.43% (82) were purchasing and transporting pesticides.
- Of the 36 pesticides found in the 4 countries, 27 (75%) are Highly Hazardous Pesticides (HHPs);[1] and many are widely banned in other countries: HHPs were 100% of the pesticides being used in Laos, 92.31% in Bangladesh and India, and 60% in Vietnam.
- Farmers in all four countries reported not using PPE during pesticide application, with Bangladesh reporting the highest proportion of non-use (98 farmers = 99%).
- 27.71% (97) of respondents entered the field the same day pesticides were sprayed, with Bangladesh contributing the highest number (68.04%, 66) of respondents.
- 20.86% of respondents stated that they decant pesticides, with this figure rising to 78.13% (50) in Laos.
- The majority of the farmers (258, 73.71%) from all of the countries were not trained on pesticide use, with the problem worse for women (83.95 %).

1 According to the criteria established by PAN International, which are based on the FAO/WHO JMPM criteria for HHPs but with additional criteria for inhalation toxicity, endocrine disruption and several environmental impacts. For more detail, see Appendix B and https://pan-international.org/wp-content/uploads/PAN_HHP_List.pdf

- 87 respondents (20.57%) stored pesticides in their homes – this problem is greatest in Bangladesh – with 11 (2.60%) storing them in the kitchen, and this situation is worse in Vietnam.
- 36.8% (46) of women farmers and 37.28% (63) of men farmers using pesticides in Bangladesh, India and Vietnam showed symptoms of illness after pesticide exposure (Laos participants did not respond to questions on symptoms of illness).

RECOMMENDATIONS

- That immediate action be taken by governments of countries with hot climates and small-scale users to comply with Article 3.6 of the International Code of Conduct on Pesticide Management and ban pesticides that require PPE.
- That immediate action be taken by the pesticide industry to cease the import and sales of pesticides that require PPE in countries where small-scale farmers have access to them.
- That countries cease the export and import of pesticides that have been banned in their country of origin for health and/or environmental reasons ('double standards trade').
- That governments assist their small farmers to move away from the use of hazardous pesticides by assisting them to implement agroecology.
- That FAO, UNEP and WHO works with countries to develop and implement a legally binding treaty on the global management of pesticides based on human rights principles, including the phase-out of HHPs by 2030, the prevention of 'double standards trade', legal liability of the pesticide industry for adverse impacts of the pesticides they sell, and the reduction of pesticide use and increased food security through the implementation of agroecology.

1. INTRODUCTION

For more than six decades, farmers have been constantly exposed to toxic pesticides, resulting in high levels of acute poisoning and serious chronic impacts that leave a legacy of ill health and suffering, including in successive generations.

In 2020, a systematic review of published literature estimated that 385 million farmers and workers are being poisoned by pesticides every year, including around 11,000 fatalities.[2] That's about 44% of farmers and farmworkers poisoned each year, with that figure rising to 51% in Southeast Asia and 65% in South Asia. This figure does not include the chronic effects of pesticides such as cancers, immune system malfunction, birth defects, damage to the brains of small children, reduced intellectual capacity, neurological conditions, infertility, and metabolic and endocrine disorders including obesity and diabetes.

These poisoning statistics are a massive increase on the estimates provided by WHO in 1990[3] and reflect both the 81% increase in global pesticide use since 1990,[4] and the failure of both countries and UN agencies to implement adequate measures to prevent harm from

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[2] Boedeker, W., Watts, M., Clausing, P. et al. The global distribution of acute unintentional pesticide poisoning: estimations based on a systematic review. BMC Public Health 20, 1875 (2020). https://doi.org/10.1186/s12889-020-09939-0

[3] WHO, UNEP. Public health impact of pesticides used in agriculture. Geneva: World Health Organization; 1990. p. 128. https://apps.who.int/iris/handle/10665/39772

[4] Boedeker et al.

pesticides. Globally, around 160 million children are involved in child labour, with more than 70% of them engaged in agriculture.[5] Many of them are exposed to toxic pesticides when they work in the fields during or following the spraying.

Pesticides continue to cause massive environmental disruption – especially, devastating losses of biodiversity including bee and bird populations. Agroecological systems are severely affected by the loss of beneficial insects that could control pest and disease populations, leaving crops vulnerable and damaged and communities lacking food security. Pesticides do not respect borders and contaminate land, water and air globally. Runoff, spray drift and volatilisation from treated crops pollute the surrounding ecosystem and beyond, with predictable and unpredictable ecological consequences that further undermine the stability and productivity of terrestrial and aquatic ecosystems. Pesticide production and use also contribute to climate change emissions, and failure to implement agroecological practices in their place diminishes the potential of agriculture for climate change mitigation.

Conditions of use of pesticides in low- and middle-income countries (LMICs) are widely reported to be dangerous. Many farmers use pesticides without any personal protective equipment (PPE) and just cover their mouth and nose with handkerchiefs or any clothes that are available. Farmers use their hands to mix the pesticides and spray them against the wind, resulting in a drift back onto their bodies. The pesticide containers are stored in their homes, in the bedroom and kitchen and many people reuse them as water containers or food storage. Often, 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 and farmers and workers may still be exposed.

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[5] FAO. 2022. International Congress for Occupational Health: Supporting a breakthrough against child labour in agriculture. Food and Agriculture Organization of the United Nations. Rome. https://www.fao.org/childlabouragriculture/news-detail/international-congress-for-occupational-health-supporting-a-breakthrough-against-child-labour-in-agriculture/en

This study by PANAP and partners on the use of pesticides in four Asian countries aims to provide updated information on what pesticides are being used and the current conditions of use.

2. METHODOLOGY

2.1 Objectives

The objectives of this study are to document the pesticides that are being used and the current conditions of pesticide use in different communities, across gender, in Bangladesh, India, Laos and Vietnam. This report will also provide data on the health impacts experienced by communities due to pesticide use.

2.2 Participating organisations

The organisations that participated in conducting the study are listed in Table 1.

Table 1. Participating organisations by country

Country	District	Organisation
Bangladesh	Manikganj	BARCIK (Bangladesh Resource Center for Indigenous Knowledge)
	Cumilla	SHISUK (Shikkha Shastha Unnayan Karzakram)
India	Yavatmal	PAN India (Pesticides Action Network India)
	Wayanad	Thanal Trust
Laos	Kham	SAEDA (Sustainable Agriculture & Environment Development Association)
Vietnam	Hai Hau	CGFED (Research Centre for Gender, Family and Environment in Development)
	Thuan Chau	SRD (Centre for Sustainable Rural Development)

2.3 Selection of respondents

The area in four countries was selected using purposive sampling and participants were selected randomly in this quantitative study. Partners were informed that the community selected were doing agriculture and using pesticides by local villagers/commune or local agricultural department. The sampling was used because it is hard to reach the agricultural area with additional COVID-19 travel restrictions. Then, participants were selected randomly through simple random sampling to be interviewed. This mixed-method approach supports triangulation and improves the rationality and reliability of the results[6].

2.4 Data gathering

Data gathering was done using the Community-based Pesticide Action Monitoring (CPAM) methodology developed by PANAP. CPAM is a participatory action research approach to documenting and creating awareness of the hazards of pesticides and their impacts on human health and the environment. It involves community members undertaking the research and encourages organising and action.

Adjusting to the restrictions during the COVID-19 pandemic, data gathering involved the combination of personal visits or face-to-face interviews and online interviews. Prior to the interviews, PANAP conducted online training and orientation with the partner organisations in the four countries. Subsequently, the partner organisations trained community leaders and farmers to administer the survey since they could not go to the field themselves due to the pandemic lockdown. Hard copies of the CPAM questionnaire were translated into the local language and were provided for the interviewees, while the

[6] Rao V, Woolcock, M. Integrating qualitative and quantitative approaches in program evaluation, pp 165– 190. In Bourguignon, Francois ; Pereira da Silva, Luiz A. . 2003. The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools. Washington, DC: World Bank and Oxford University Press.

research team used Google Form to record the data. Consent forms translated into the local language, including for the children involved in the research, were also provided. The information gathered from the interviews was submitted by the partner organisations online through the Google Form designed exclusively for the survey.

In Bangladesh, personal visits and face-to-face interviews were primarily used by the four researchers and interviewers in conducting the survey. The respondents were from unions in Singair sub-district in Manikganj district and Daudkandi, Cumilla. Survey in Mankiganj was done from July to August 2021 and August 2021 for Cumilla district.

In India, PAN India conducted its interview in Yavatmal, an eastern district in the Vidarbha region of the western state of Maharashtra. Despite the pandemic threat, a survey in the three villages of Dattapur, Yerad, and Borgaone Pungi was conducted by directly interviewing the respondents. In another area in Wayanad district, 70% of the data collected was through audio conferences and the rest was through direct field visits by four interviewers from Thanal. Interview in Yavatmal and Wayanad was carried out from July to October 2021.

In Lao PDR, the interviews were conducted by eight staff members from various local organisations: three SAEDA staff, one staff each from the Provincial of Natural Resource and Environment (PonRE), Provincial Agriculture and Forestry Office (PAFO), and District of Natural Resource and Environment (DoNRE), and two staff from District Agriculture and Forestry Office (DAFO). Two chiefs from the target villages accompanied the interviewers. The survey was conducted with members of the community from Longpiew and Koimor villages, Kham district, Xieng Khouang province, Laos. It was conducted from September to October 2021.

In Vietnam, the study was conducted in two districts, Hai Hau and Thuan Chau. In Hai Hau, CGFED provided online training for three officers of the Women's Union of Hai Hau on the survey questionnaires and on how to interview farmers. After the training, they coached these

three officers online through an online demonstration interview session with two farmers. The farmers were interviewed and the questionnaire's answers were then sent to CGFED by the Women's Union of Hai Hau for data entry on Google Form. The study was done in July and August 2021. In Thuan Chau, ten researchers and interviewers for SRD surveyed 51 farmers in the Muoi Noi and Bon Phang commune. They are from the local partner of SRD (staff of the Sub-Department of Crop Production and Plant Protection of Son La province). The researchers were trained to conduct face-to-face interviews with the community using the questionnaire. The data collection was through face-to-face interviews with the community in August 2021.

2.5 Description of districts involved in study

BANGLADESH

i. Manikganj District

Singair is a sub-district in Manikganj district, an area 30 kilometres from the capital city of Dhaka. The community is a rural area where paddy rice, vegetables, and other crops are grown. The literacy rate in the area is 46.20%. Both boys and girls usually study at primary schools. However, from the secondary school level, the percentage of boys continuing their education exceeds the number of girls. This is related to some religious barriers and families' interest in sending their boys to school.

ii. Cumilla District

Eliotgonj (South) union/village is part of the Daudkandi upazila[7] in the district of Comilla, Bangladesh. According to SHISUK, the upazila occupies an area of 3,49,910 km^2 with 83,245 households. Eliotgonj (South) union is 14.70 square kilometres with a population of 30,288

[7] Upazilas are the second lowest tier of regional administration in Bangladesh, below Divisions and Districts

based on 2011 national population census, and has 17 villages (Bashora, Kutubpur, Bakinagor, Malikhil, Daulatpur, Kolakopa, Khilalpar, Lakshimpur, Elliotgonj Bazar, Mobarokpur, Viktala, Noakandi, Bitman).

INDIA

i. Yavatmal District

Yavatmal, an eastern district in the Vidarbha region of the Western State of Maharashtra in India has a total population of 2,772,348 where 51.22% (1,419,965) are males and 48.78% (1,352,383) are females[8]. The entire region practises cotton monocropping, and a number of approved and non-approved pesticides are applied on the farms as a routine calendar practice.

This district has been in the local and national media since 2017 due to numerous deaths and hospitalisation resulting from occupational exposure to pesticides in the cotton fields. Official reports pointed to more than 800 pesticide poisonings and 23 deaths from Yavatmal in 2017. The farmers used different Bt cotton hybrids, that include Bollgard III – also known as Roundup Ready Flex – a herbicide-tolerant hybrid that is not yet approved and has made its entry into the country illegally. The Yavatmal farmers blamed the unusual height of the Bt cotton plants for their poisoning as the pesticide released from the sprayer is at the approximate height of the sprayer's face. Farmers, without PPE, would be thoroughly wet with pesticides, their clothes completely soaked in spray mist. Yavatmal victims reported the use of brand names that contain the highly hazardous pesticides diafenthiuron, profenofos, cypermethrin, monocrotophos, imidacloprid, fipronil, and acephate. Furthermore, the farmers had not been provided with training on the hazards of pesticides, their application and usage, precautionary measures, or the use of personal protective equipment (PPE).

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[8] Census of India, (2011). *District Census Handbook, Yavatmal*. Retrieved from https://censusindia.gov.in/2011census/dchb/DCHB_A/27/2714_PART_A_DCHB_YAVATMAL.pdf

PAN India initiated the documentation of the pesticide poisonings in Yavatmal and published their findings on the massive pesticide poisonings faced by farmers and workers. As a result of their efforts, the Maharashtra Association of Pesticide Poisoned Persons (MAPPPs), a local grassroots community organisation was launched in 2018 to further organise the farmers and workers to secure justice for victims of pesticide poisoning and ensure accountability of the agrochemical companies.

In contrast to the highly-developed area of Maharashtra, the selected villages in the study are located in Yavatmal – Dattapur, Yerad, and Borgaon Pungi (major crops are cotton and soybean) – are rural with poor infrastructure. Dattapur also produces pigeon peas (which they intercrop with cotton), black gram, chickpea, wheat, turmeric, ginger and some vegetables. Yerad produces sorghum, and pigeon peas as minor crops. Wheat, chickpea, ground nut, brinjal, onion, chilli, okra, palak, among others are also planted, while in Borgaon minor crops are pigeon pea (mostly intercropped with cotton), chickpea, ground nut, wheat, turmeric, brinjal, palak, bitter gourd, potato, and onion.

ii. Wayanad District

Wayanad District is located in the northern part of Kerala State. Kerala, a south Indian state, often captures attention on the national and international level for its high Human Development Indices. It is home to the largest concentration of tribal communities or indigenous peoples (33.47%) in the State and holds a prominent share of the State's green cover.[9] Agriculture is the main economic activity in the district, with more than half of the population engaged in agriculture as their means of livelihood. The main crops produced are coffee, tea, cocoa, pepper, plantain, vanilla, rice, coconut, cardamom, tea, and ginger.

Wayanad District is classified as an "industrially backward district" since it has a few small-scale industries and farms but no major industries

[9] KSTDD (Kerala Scheduled Tribes Development Department). *Scheduled Tribes of Kerala: Report on the Socio- Economic Status.* (Government of Kerala, 2013)

yet. Since one of the major sources of the district is cattle raising, there is one dairy company, the Wayanad Dairy of Milma of the Kerala Cooperative Milk Marketing Federation, which is located in Kalpetta. There are 72 industrial cooperatives registered in the district but only 19 of them are functional.

According to Thanal, paddy was once a major crop in the district, covering almost the entirety of agricultural areas. Currently, paddies now cover just 204 hectares with only a single crop harvested per year. Much of the paddy fields in the district are being converted to banana and ginger cultivation.

LAOS

i. Kham District – the villages of Longpiew and Koimor

Lao People's Democratic Republic or Lao PDR/Laos is a Southeast Asian country with a total land area of 236,800 sq. km, and currently has a population of 6.7 million. According to the Food and Agriculture Organization of the United Nations (FAO), Laos has rice-based agriculture, having reached rice self-sufficiency in 2000. At present, 72% of their agricultural land is dedicated to rice production. Moreover, their rich agricultural production contributes to 66% of their GDP and accounts for at least 60% of the household income in rural villages.[10]

VIETNAM

i. Hai Hau District

Hai Hau is a coastal district of Nam Dinh province, a coastal delta province located in the south of the Red River Delta with an area of 226 square kilometres. Agricultural land accounts for more than 56% of the total natural land area of the province. The current population of the

[10] Food and Agriculture Organization, 2021

province is 294,216 distributed in 32 communes and three towns. The average population density is 1,301 people per square kilometre.

Farmers harvest rice manually with sickles or use reaping machines. After threshing, fresh rice is sun-dried naturally without the use of mechanical driers. The produce is then milled using privately owned mills. Produce mostly serves the demand of local people, but some are also supplied to the market outside of the district. Slaughtering of cattle and poultry is more of individual activity to meet the demands of local people. Farmers, mostly women, use the capital to invest in production in their local area, mostly in crops, livestock and small businesses. Women mostly work as farmers or workers in local companies or run small businesses.

During the pandemic crisis, Hai Hau was not heavily affected since the agricultural and industrial activities continued as normal so there was no need for alternative jobs. Women who used to work away from home and were affected by the pandemic went back to the area and continued their farm work.

ii. Thuan Chau District

The survey was conducted in Muoi Noi and Bon Phang commune, Thuan Chau district, Son La province. Its distance from the capital is 380 kilometres; it is a remote rural area, surrounded by rice paddies.

For more information on the demographic profile for each district in each country, please refer to Appendix A.

3. CONSOLIDATED ANALYSIS

3.1 Gender analysis of pesticide activities

Three hundred and fifty out of 367 respondents (95.37%) in the four countries used pesticides in their farms. Of these, 163 were women farmers (46.57%) and 185 men (52.86%); two farmers (0.57%) did not state their gender. Of the 350 farmers who use pesticides, 294 farmers (84.00%) have been using them for five years and more. The majority of farmers (312, 89.14%), both men and women, handle pesticides when they are spraying. The most common way farmers were getting exposed to pesticides was when they were conducting ground spraying (256, 73.14%) using backpack sprayers. The majority of the farmers (242, 69.14%) live one kilometre or less from where pesticides are being sprayed.

In all the countries surveyed, women are involved in pesticide activities that include pesticide spraying, mixing and loading, washing clothes used when handling pesticides, washing equipment used, and purchasing and transporting pesticides. In Laos, all 38 (100%) women respondents sprayed pesticides and mixed and loaded them. In Vietnam, 51 (98.07%) of the 52 women respondents said that they sprayed pesticides. In Bangladesh, 24 (48%) of the 50 women respondents said that they sprayed pesticides and 43 (86%) mixed and loaded the pesticides. In India, 18 (78.26%) of the 23 women respondents said that they were spraying pesticides and 8 (34.78%) also mixed and loaded the pesticides. Overall, 80% of women farmers sprayed pesticides; and in Bangladesh and India, an average of 70% mixed and loaded them.

Washing clothes or equipment, is often seen as women's work, and this is reflected in the data gathered: 37 out of 38 (97.37%) of women respondents in Laos, around 28 out of 52 (53.85%) in Vietnam and 47 out of 50 (94.00%) in Bangladesh. In India, 6 of 23 (26.09%) of the women respondents were washing clothes and equipment. In all the countries involved, women were purchasing pesticides and transporting them:

37 (97.37%) in Laos, 22 (62.75%) in Vietnam and 18 (36%) in Bangladesh and 6 (18.18%) in India. Overall, 121 (74.23%) of women were washing pesticide-contaminated clothes and equipment and 82 (50.31%) of women were purchasing and transporting pesticides.

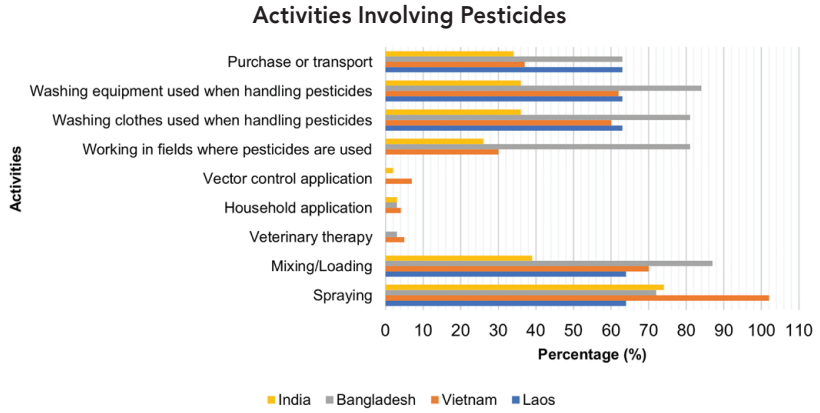

Figure 1. Activities involving pesticides by the respondents in each country
*Multiple responses were allowed; thus, the totals do not correspond to the number of respondents (N=350)

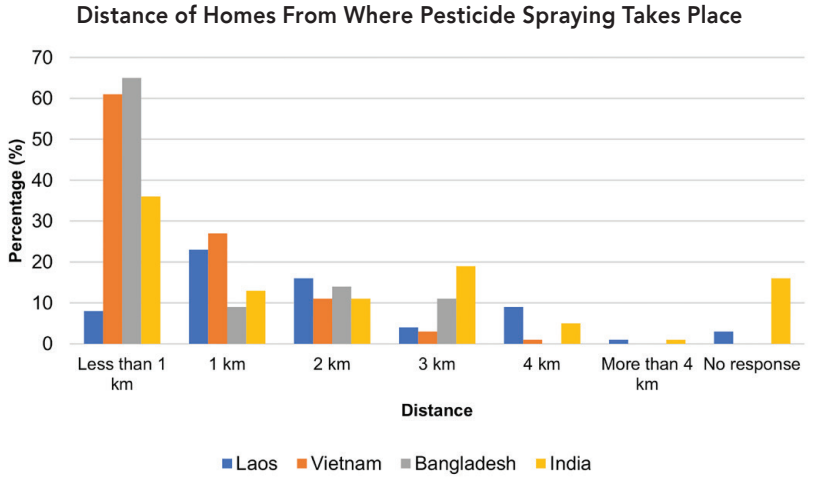

Figure 2. Distance from respondents' homes to pesticide spraying

Table 2. Breakdown of activities involving pesticides in each country by gender

Activities	Laos		Vietnam			Bangladesh		India	
	Women	Men	Women	Men	Un-known	Women	Men	Women	Men
Total respondents	**38**	**26**	**52**	**49**	**2**	**50**	**49**	**23**	**61**
Spraying	38	26	51	49	2	24	45	18	56
Mixing/loading	38	26	34	34	2	43	44	8	31
Veterinary therapy	0	0	1	4	0	2	1	0	0
Household application	0	0	7	7	0	1	2	1	2
Vector control application	0	0	6	1	0	0	0	0	2
Working in fields where pesticides are used	0	0	19	16	0	47	34	3	23
Washing clothes used when handling pesticides	37	26	28	32	0	47	34	6	30
Washing equipment used when handling pesticides	37	26	31	30	0	47	37	6	30
Purchase/transport	37	26	21	15	0	18	45	6	28

*Multiple responses were allowed; thus, the totals do not correspond to the number of respondents (N = 350)

Table 3. Respondents' pesticides exposure in each country by gender

Activities	Laos		Vietnam			Bangladesh		India	
	Women	Men	Women	Men	Un-known	Women	Men	Women	Men
Total respondents	**38**	**26**	**52**	**49**	**2**	**50**	**49**	**33**	**68**
Ground spraying	37	25	51	46	1	24	35	13	24
Aerial spraying	0	0	2	0	0	0	1	2	11
Water contamination	0	2	4	7	0	38	22	0	11
Eating contaminated food	0	0	4	3	0	24	22	1	13
Eating food after spraying without washing hands	0	3	3	0	0	2	0	0	11
Neighbours' use of pesticides	0	0	20	23	1	42	45	2	2

*Multiple responses were allowed; thus, the totals do not correspond to the number of respondents (N = 350)

3.2 Pesticides use

The surveys revealed that 27 HHPs were used in the four countries. Some of the pesticides are also listed under PANAP's Terrible Twenty (T20), a list of pesticides that are extremely hazardous to children. It was also noteworthy that farmers from Cumilla district, Bangladesh use bish, which is a combination of pesticides and the respondents did not specify the exact pesticides present in this mixture. Therefore, the HHPs presented for Bangladesh are from the farmers in the Manikganj district. Cypermethrin was found to be used by farmers in all four countries. Of the 36 pesticides found, only difenoconazole, isoprothiolane and metsulfuron-methyl are not either an HHP or widely banned in other countries.

Table 4. Number of pesticides in use in each country

	Laos	Vietnam	Bangladesh	India
Total number of pesticides	3	25	13	13
Number of HHPs	3	15	12	12
Number of T20	2	7	5	4
% of HHPs	100.00	60.00	92.31	92.31

Table 5. List of pesticides found in the four countries

Pesticides	Bangladesh	India	Laos	Vietnam	HHP	No. of countries banned[11]
Abamectin	✓		✓		X	not known to be banned
Acephate		✓			X	38
Atrazine				✓		44
Carbofuran	✓				X	87
Carbosulfan	✓				X	48
Chlorantraniliprole	✓				X	not known to be banned
Chlorfluazuron				✓	X	29
Chlorophenoxy acetic acid	✓					29
Chlorpyrifos	✓	✓		✓	X	39
Cypermethrin (not specified whether alpha or beta)	✓	✓	✓	✓	X	30 (if beta)
Cypermethrin, alpha				✓	X	29
Deltamethrin				✓	X	not known to be banned
Diafenthiuron		✓			X	32
Difenoconazole				✓		1

Pesticides	Bangladesh	India	Laos	Vietnam	HHP	No. of countries banned[11]
Dimethoate		✓		✓	X	33
Diquat dibromide				✓	X	31
Emamectin benzoate				✓	X	not known to be banned
Fenobucarb				✓		30
Fipronil	✓	✓		✓	X	38
Glyphosate			✓	✓	X	4
Hexaconazole				✓		35
Imidacloprid	✓	✓		✓	X	29
Indoxacarb				✓	X	not known to be banned
Isoprocarb				✓		29
Isoprothiolane				✓		not known to be banned
Lambda-cyhalothrin	✓			✓	X	not known to be banned
Mancozeb	✓	✓			X	31
Metsulfuron-methyl		✓		✓		1
Monocrotophos		✓			X	129
Nitenpyram				✓	X	28†
Paraquat	✓				X	58
Pendimethalin	✓				X	1
Propiconazole				✓	X	29
Quinalphos		✓			X	32
Thiamethoxam		✓			X	28
Tricyclazole				✓		29

† Not banned in any country but has had approval removed in the European Union.

Table 6. HHP's that were found in the four countries

Pesticides	Type	HHP – reason for listing
Abamectin	Insecticide	WHO Ib; H330; Highly toxic to bees
Acephate	Insecticide	Highly toxic to bees
Carbofuran	Insecticide	WHO Ib; H330; Highly toxic to bees; PIC
Carbosulfan	Insecticide	H330; Highly toxic to bees; PIC
Chlorantraniliprole	Insecticide	Very pers water, soil or sediment; Very toxic to aq. organism
Chlorfluazuron	Insecticide	Very bio acc; Very toxic to aq. organism
Chlorpyrifos	Insecticide	GHS+ muta (1A, 1B); Highly toxic to bees; meets the Stockholm Convention's screening criteria for a POP but not yet listed
Cypermethrin	Insecticide	Highly toxic to bees

[11] PAN International. 2022. Consolidated List of Banned Pesticides https://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/

Pesticides	Type	HHP – reason for listing
Cypermethrin alpha	Insecticide	Highly toxic to bees
Deltamethrin	Insecticide	GHS+ C2 & R2; Highly toxic to bees
Diafenthiuron	Insecticide	Highly toxic to bees
Diquat dibromide	Herbicide	H330
Dimethoate	Insecticide	Highly toxic to bees
Emamectin benzoate	Insecticide	Very pers water, soil or sediment; Very toxic to aq. organism; Highly toxic to bees
Fipronil	Insecticide	Highly toxic to bees
Glyphosate	Herbicide	IARC prob carc
Imidacloprid	Insecticide	Highly toxic to bees
Indoxacarb	Insecticide	Highly toxic to bees
Lambda-cyhalothrin	Insecticide	H330; Highly toxic to bees
Mancozeb	Fungicide	EPA prob/likel carc; GHS+ repro (1A, 1B); EU EDC; GHS+ C2 & R2
Monocrotophos	Insecticide	WHO Ib; H330; Highly toxic to bees; PIC
Nitenpyram	Insecticide	Highly toxic to bees
Paraquat	Herbicide	H330; PIC
Pendimethalin	Herbicide	Very bio acc; Very pers water, soil or sediment
Propiconazole	Fungicide	GHS+ repro (1A, 1B)
Quinalphos	Insecticide	GHS+ C2 & R2; Highly toxic to bees
Thiamethoxam	Insecticide	Highly toxic to bees

Please refer to Appendix B for Explanatory notes regarding the table of HHPs; also https://pan-international.org/wp-content/uploads/PAN_HHP_List.pdf

3.3 Exposure routes

i) Wind direction

Spraying against the wind causes the spray to blow back onto the sprayer; spraying in the direction of wind travel reduces the extent of exposure.

Although there were 220 (62.86%) farmers spraying pesticides along the wind direction, there were still 119 (33.71%) farmers who are jeopardising their health and their lives by unnecessary exposure resulting from spraying against the wind direction, or by not taking wind direction into account (random). Vietnam showed the greatest adherence to the correct direction of spraying and Bangladesh the least.

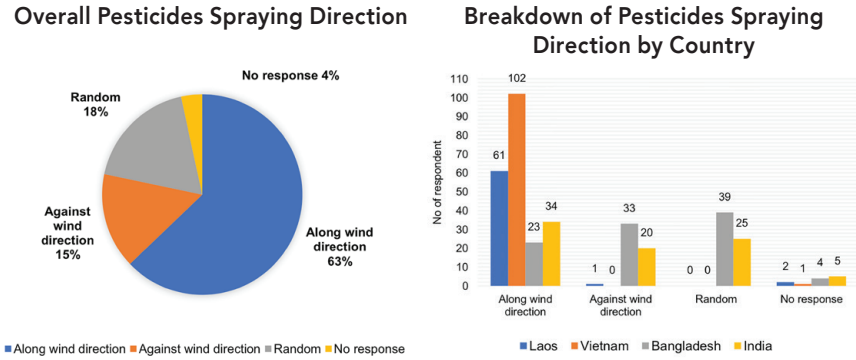

Figure 3. Farmers' pesticides spraying during windy day

ii) Spillages

Two hundred sixty-five (75.71%) respondents stated that they did not experience pesticide spillage, while 79 (22.57%) respondents reported having experienced spillages during spraying, mainly due to faulty equipment. Spillages were greatest in Vietnam and Bangladesh.

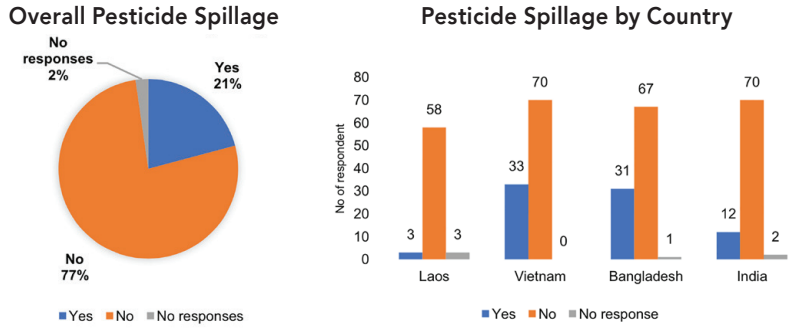

Figure 4. Pesticide spillage experienced by respondents (N = 350 = 100%)

iii) PPE use

Farmers in all four countries reported not using PPE during pesticide application, with Bangladesh reporting the highest proportion of non-use (98 farmers = 99%). Even where PPE use was reported, most of

the farmers were wearing a mixture of gloves, rubber boots, glasses, face masks, raincoats or long sleeves shirts, and long pants that still do not meet standard PPE requirements, while others only wore light PPE that did not prevent pesticide exposure. The main reasons given for not wearing correct PPE were that it is unaffordable, uncomfortable or unavailable. Most of the PPE that was worn was purchased by the farmers, rather than provided by the retailer or pesticide company.

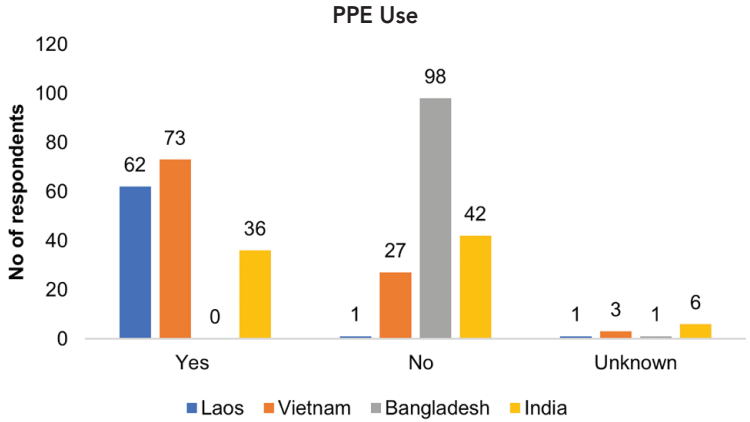

Figure 5. Responses on PPE use from respondents in four countries

iv) Re-entry to the field after pesticide spraying

It was reported that 97 respondents (27.71%) entered the field the same day pesticides were sprayed; 49 (14.00%) entered 1 day after spraying; 42 (12.00%) entered 2 days after spraying; 70 (20.00%) entered 3 days after spraying; 79 (22.57%) entered 5 days or more after spraying; 6 (1.71%) did not respond. One hundred forty-six (41.71%) respondents stated that the labels do specify re-entry intervals; 64 (18.29%) stated that the labels did not state the re-entry interval; 115 (32.86%) were not aware of the re-entry interval label and 25 (7.14%) did not respond. Bangladesh shows the highest number of respondents (66 or 18.86%) re-entering the field on the same day after pesticide spraying.

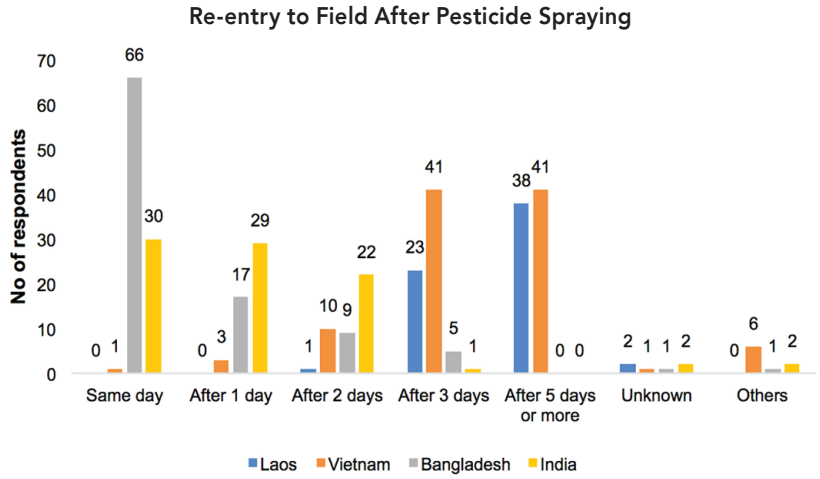

Figure 6. Respondents' re-entry to the field after pesticide spraying

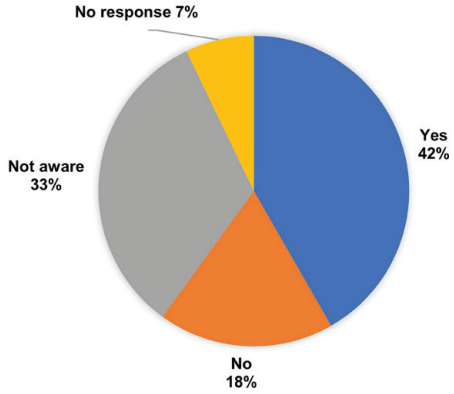

Figure 7. Pesticide label specification on re-entry interval

v) Decanting of pesticides

Of the 350 respondents, 269 (76.86%) stated that they do not decant pesticides, while 73 (20.86%) respondents stated that they do, and there were no responses from 8 (2.28%) respondents. Laos has the highest (78.13% or 50) decanting rate of pesticides.

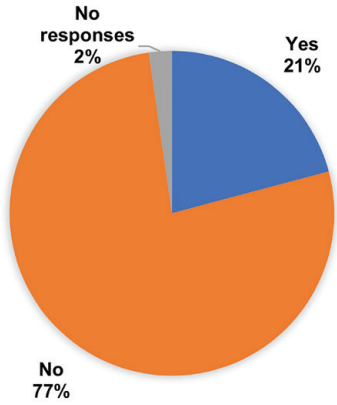

Figure 8. Decanting of pesticides

vi) Training on pesticide use and handling

The majority of the farmers (258, 73.71%) from all of the countries were not trained on pesticide use. India (6 farmers, 1.71%) and Laos (4 farmers, 1.14%) reported the least training received by their farmers. The training was provided mostly by governments and NGOs.

Overall, in India, Bangladesh and Laos, a smaller number of women were involved in training on pesticide use and handling:

- in Laos, none of the women interviewed attended training, but 4 (6.25%) men did
- in Vietnam, 21 (20.39%) women and 20 (19.42%) men attended training
- in India, 3 (4.48%) women and 3 (4.48%) men out of 67 respondents received some level of training
- in Bangladesh, 2 (2.02%) women and 9 (9.09%) men participated in the training.

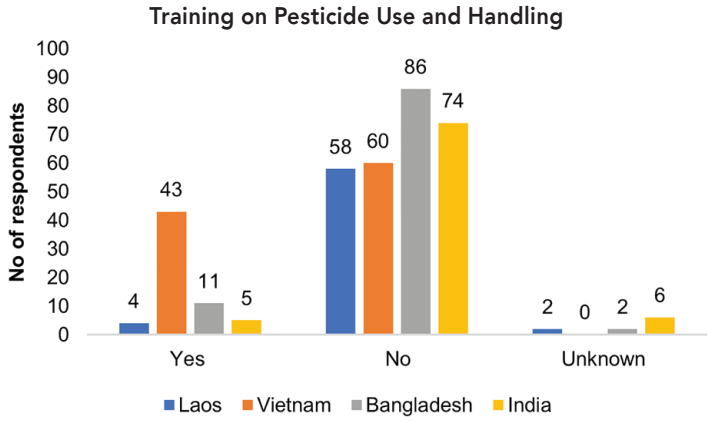

Figure 9. Responses on training on pesticide use and handling

*Multiple responses were allowed in this item, thus the total numbers do not correspond to N = 350.

Table 7. Training on pesticide use and handling by gender for each country

Country	Laos				Vietnam						Bangladesh				India			
Response	Women	%	Men	%	Women	%	Men	%	Unknown	%	Women	%	Men	%	Women	%	Men	%
Yes	0	0.00	4	15.38	21	40.38	20	40.82	2	100.00	2	4.00	9	18.37	3	9.09	3	4.41
No	37	97.37	21	80.77	31	59.62	29	59.18	0	0.00	48	96.00	38	77.55	20	60.61	53	77.94
Unknown	1	2.63	1	3.85	0	0.00	0	0.00	0	0.00	0	0.00	2	4.08	10	30.30	12	17.65
Total	38	60.32	26	40.63	52	50.49	49	49.52	2	1.94	50	50.5	49	49.49	33	32.67	68	67.33

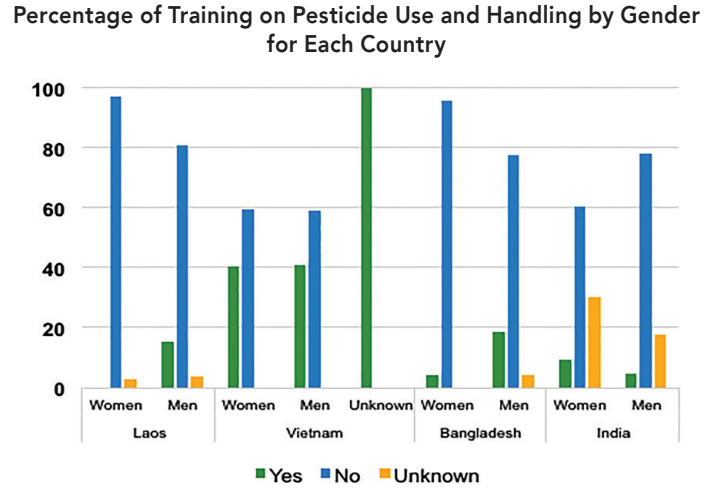

Figure 10. Percentage of training received by gender

Table 8. Stakeholders identified for training on pesticide use and handling			
Countries	Government	NGO	Pesticide company
Laos	4	0	0
Vietnam	13	15	0
Bangladesh	2	1	0
India	2	0	4

vii) Storage of pesticides

The storage of pesticides differed between countries. Respondents in most of the countries stored the pesticides in sheds (120, 28.37%). However, a large number store them in the home (87, 20.57%), increasing the risk of exposure of the whole family to the pesticides, but in particular increasing the risk of accidental poisoning of children.

Table 9. Storage location by country					
Storage location	Laos	Vietnam	Bangladesh	India	Total
Garden and field	29	0	0	0	29
Field	26	0	53	0	79
Home	4	19	44	20	87
Kitchen	3	8	0	0	11
Shed	0	52	31	37	120
Shed and field	0	0	0	21	21
Shed and home	0	0	0	4	4
Garden	0	13	0	0	13
Others	0	9	0	0	9
Below the house	0	22	3	0	25
Used until finish	0	11	0	0	11
Separate tank in the field	0	1	0	0	1
Unknown	2	0	0	11	13

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

viii) Container disposal/reuse

None of the four countries has a proper disposal system and most of the farmers burned, buried or threw the containers in the field. However, CGFED and SRD from Vietnam reported that there is a plastic waste management facility: the local Plant Protection Department had built a field garbage tank for the empty pesticide containers.

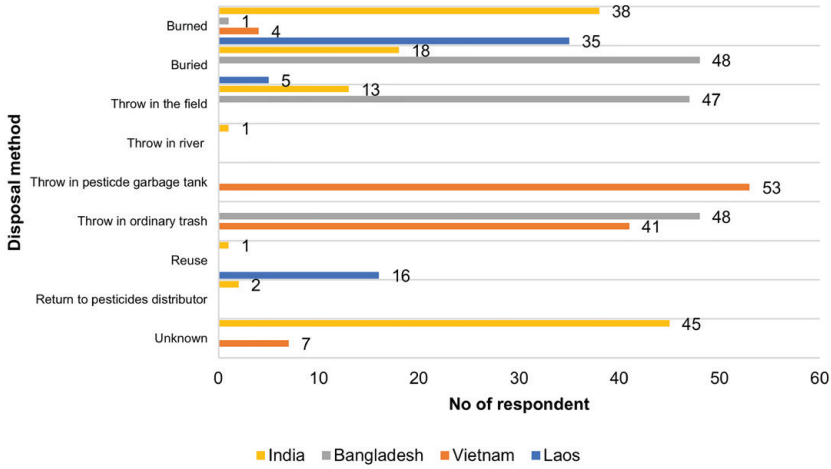

Figure 11. Disposal method for four different countries

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

ix) Washing facilities

Watercourses and irrigation drains were observed as the most common washing facilities reported by Laos, Vietnam and Bangladesh. For Bangladesh, ponds were also frequently used to wash hands, body and PPE after pesticide use. India commonly used wells as water sources for washing facilities.

Table 10. Washing facilities by country

Washing facilities	Laos	Vietnam	Bangladesh	India
Water course/irrigation drain	51	50	51	3
Tap water	40	23	40	18
River	30	31	30	28
Wells	1	10	1	44
Ponds	56	0	56	2
Stream	0	13	0	0
Water container	19	12	19	2
Unknown	3	3	6	10

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

3.4 Illness after pesticide exposure

Forty-six of the 125 women farmers (36.80%) and 63 of 169 men farmers (37.28%) showed symptoms of illness after pesticide exposure (excluding respondents that did not use pesticides and excluding Laos participants who did not respond to questions on symptoms of illness).

The most commonly reported symptoms were dizziness (33.03%), followed by headache (27.52%), excessive sweating (9.17%), vomiting (8.72%), blurred vision (6.88%) and skin rashes (5.96%).

Table 11. Illness symptoms reported by respondents after pesticide exposure

	Bangladesh				India				Vietnam					Total	
	Total	%	Men	Women	Total	%	Men	Women	Total	%	Men	Women	N/A		%
Headache	2	3.33	1	1	26	43.33	17	9	32	53.33	17	15	0	60	27.52
Dizziness	19	26.39	16	3	25	34.72	18	7	28	38.89	12	16	0	72	33.03
Excessive sweating	6	30.00	6	0	8	40.00	6	2	6	30.00	2	4	0	20	9.17
Blurred vision	2	13.33	2	0	5	33.33	1	4	8	53.33	7	1	1	15	6.88
Skin rashes	0	0.00	0	0	5	38.46	2	3	8	61.54	3	5	0	13	5.96
Hand tremor	2	20.00	1	1	3	30.00	1	2	5	50.00	0	5	0	10	4.59
Vomiting	9	47.37	6	3	3	15.79	1	2	7	36.84	3	4	0	19	8.72
Insomnia	0	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0	0	0.00
Diarrhoea	0	0.00	0	0	2	50.00	0	2	2	50.00	0	2	0	4	1.83
Irregular heartbeat	0	0.00	0	0	1	33.33	1	0	2	66.67	1	1	0	3	1.38
Throat pain	0	0.00	0	0	2	100.00	1	1	0	0.00	0	0	0	2	0.92
Total by Gender	40		32	8	80		48	32	98		44	53	1	218	

*Multiple responses were allowed; thus, the total does not correspond to the number of respondents.

Table 12. Illness reported by country and gender

Countries	Women	No. of women using pesticides	Men	No. of men using pesticides
Vietnam	32	52	23	49
Bangladesh	4	50	17	49
India	10	23	23	71
Total no. that experienced illness	46	125	63	169
Percentage	36.80%		37.28%	

4. COUNTRY REPORTS

4.1 BANGLADESH

4.1.1 Manikganj District

A. Pesticide use

Of the respondents who have been handling pesticides, 25 (50.00%) were women and 25 (50.00%) were men. Two farmers (4.00%) have been handling pesticides for 3 to 4 years, and 13 farmers (26.00%) have been handling pesticides for the past 5 to 9 years. Seventeen farmers (34.00%) have been using pesticides for 10 to 20 years while 18 farmers (36.00%) have been handling pesticides for 21 to 45 years. In terms of the whole family, five families (10.00%) have been using pesticides for 5 to 7 years, 15 family members (30.00%) have been using pesticides for 10 to 20 years and 24 families (48.00%) have been using pesticides for 21 to 40 years. Six of the respondents' families (12.00%) stated that they have been using pesticides for 45 to 50 years.

Table 13. List of pesticides used by respondents in Manikganj district, Bangladesh

Pesticides used	Crops treated	Number of farmers	Percentages
Abamectin	Vegetable	3	6.00%
Carbofuran	Maize, potato, paddy, vegetables	7	14.00%
Carbosulfan	Paddy	3	6.00%
Chlorantraniliprole	Maize, paddy	12	24.00%
Chlorpyrifos	Paddy, vegetable	21	42.00%
Chlorophenoxy acetic acid	Brinjal, maize, paddy, onion	10	20.00%
Cypermethrin	Vegetables, eggplant	24	48.00%
Fipronil	Paddy	2	4.00%
Imidacloprid	Paddy, jute	2	4.00%
Lambda-cyhalothrin	Paddy, vegetables	3	6.00%
Mancozeb	Cauliflower	3	6.00%
Paraquat	Paddy, jute, vegetable	3	6.00%

Figure 12. Mancozeb (Indofil M-45) and carbofuran (Furadan) used by the farmers

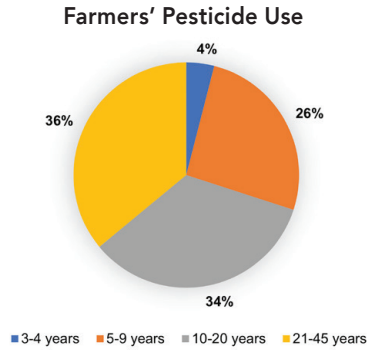

Figure 13. Duration of farmers' pesticides usage

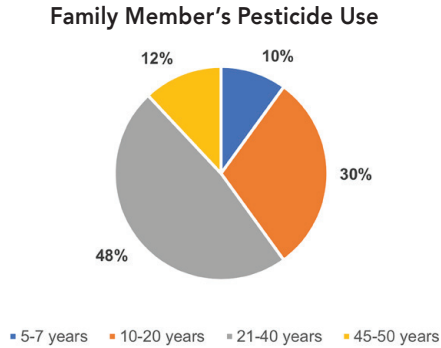

Figure 14. Duration of family members' pesticides usage

Twenty-five farmers (50.00%) chose and purchased the pesticides themselves. The rest was purchased by their husband (17, 34.00%), son (6, 12.00%) or other family members (2, 4.00%).

B. Pesticide exposure

None of the women was involved in spraying pesticides; however, all of them (25,100.00%) were involved in mixing and loading pesticides. All farmer respondents stated that they are exposed to pesticides through water contamination and 11 (22.00%) of them are exposed through spraying. The majority of the farmers (82.00%) spray their farms monthly.

Table 14. Breakdown of activities involving pesticides by gender in Manikganj, Bangladesh

Activities	Women	%	Men	%	Total	%
Total respondents	**25**	**50.00**	**25**	**50.00**	**50**	**100.00**
Spraying	0	0.00	22	88.00	**22**	**44.00**
Mixing/loading	25	100.00	22	88.00	**47**	**94.00**
Veterinary therapy	0	0.00	0	0.00	**0**	**0.00**
Household application	1	4.00	2	8.00	**3**	**6.00**
Vector control application	0	0.00	0	0.00	**0**	**0.00**
Working in fields where pesticides are used	24	96.00	24	96.00	**48**	**96.00**
Washing clothes used when handling pesticides	23	92.00	23	92.00	**46**	**92.00**
Washing equipment used when handling pesticides	22	88.00	23	92.00	**45**	**90.00**
Purchase/transport	4	16.00	25	100.00	**29**	**58.00**

All of the farmers (100.00%) are living less than 1km from where pesticide spraying takes place.

My seven ducks died in May 2022 due to poisoning from pesticides applied in rice fields adjacent to my house. The ducks went to eat snails and earthworms in the paddy field. I came to know from neighbour that granular insecticide was applied on that land the previous day. My demand is to stop the use of pesticides on agricultural land around settlements.

Namita
Manikganj, Bangladesh

Wind direction

Twenty-four farmers (48.00%) sprayed in a random direction, 19 farmers (38.00%) sprayed along the direction and 7 farmers (14.00%) sprayed against the direction during windy weather.

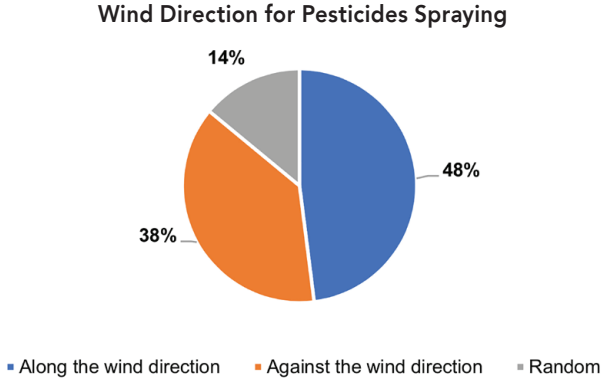

Figure 15. Farmers' pesticide spraying during windy days

Spillages

Thirty-one farmers reported incidents of spillage (62.00%) while spraying, mixing, and loading pesticides on their hands, feet, upper back and front bodies. Frequent pesticide exposure was observed during the mixing of the pesticides. Twenty-five out of 31 farmers (80.65%) sstated that the spillage was due to the loading while mixing the pesticides.

Other incidents were caused by falling while spraying (10, 32.26%), faulty equipment (5, 16.13%), change in wind direction (3, 9.68%) and unknown causes (2, 6.45%). It was noted that 13 men farmers (52.00%) had more spillage incidents during decanting of pesticides than the 12 women farmers (48.00%). After the incidents, they clean the spillages by washing their affected areas (28, 90.32%) or taking a bath (3 farmers, 9.68%). The spillage incidents occurred from March until August 2021.

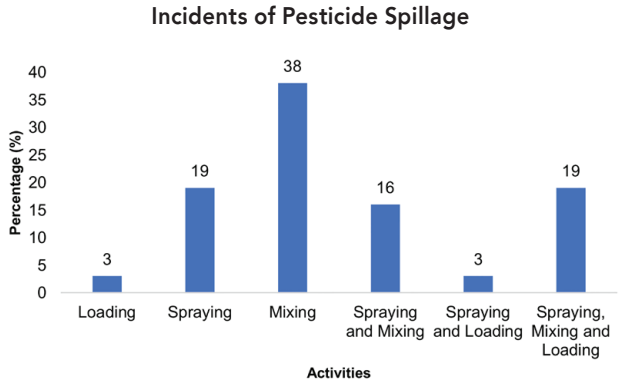

Figure 16. Activities during incidents of pesticide spillage

Figure 17. Pesticide commercial name Double (Imidacloprid, chlorpyrifos) spilt from their original container produced by a local company in Bangladesh

PPE use

All the respondent farmers (50, 100.00%) stated they did not wear any PPE during pesticide application: 24 (48.00%) of them did not wear the PPE because it was not available, and 26 farmers (52.00%) stated that the PPE is too expensive.

Table 15. PPE use by gender in Manikganj, Bangladesh				
Responses	**Women**	**%**	**Men**	**%**
Yes	0	0.00	0	0.00
No	25	50.00	25	50.00
Unknown	0	0.00	0	0.00
Total	**25**	**50.00**	**25**	**50.00**

Figure 18. Long sleeve cloth and long trousers were used as protective cloths by farmers

Re-entry to field after pesticide spraying

The majority of respondents (36, 72.00%) were exposed to pesticides when they entered the newly sprayed field the same day after the application of the pesticides. Thirteen farmers (26.00%) re-entered one to three days after pesticide application and one farmer (2.00%) did not specify the time.

Six (12.00%) of the farmers were not aware of the re-entry interval on the pesticides label. 48 respondents (96.00%) did not wear any protective clothing during the purchase of pesticides. The rest of the respondents (2 farmers, 4.00%) did not answer the question.

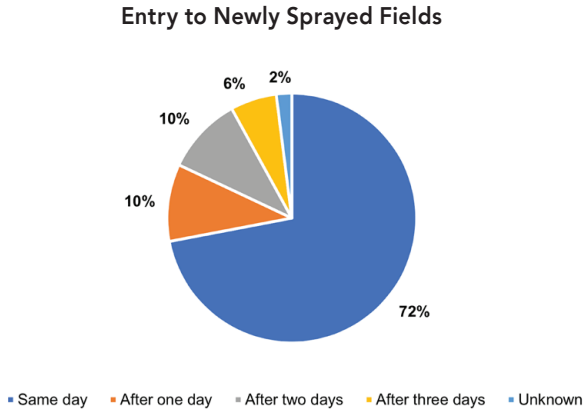

Figure 19. Period of re-entry to newly sprayed fields with pesticides

Decanting activities and access to labels

None of the respondents reported on decanting activities and access to labels.

Washing facilities

All respondents stated that there were washing facilities for their hands, body and PPE. They used tap water (38, 76.00%), river (30, 60.00%), water container (18, 36.00%), and watercourse or irrigation (12, 24.00%).

Training on pesticide use and handling

Forty-one (82.00%) of the farmers lack training on pesticide use. The remaining 9 farmers (18.00%) were trained only through courses, with no field demonstration. Four farmers (50.00%) were trained over several hours and 4 farmers over days (50.00%). The duration of the training was not reported.

Storage of pesticides

Thirty-seven farmers kept the pesticides in the house (74.00%), followed by the shed (14 farmers, 28.00%), field (4 farmers, 8.00%) and below the house (3 farmers, 6.00%). Some of the respondents kept the pesticides in multiple locations at the same time.

Figure 20. Highpower (Cypermethrin, India products) and Nitro (Chlorpyrifos, cypermethrin) were stored near the farmer's house

In May 2022, my 9-year-old physically and mentally challenged son Noyon Mondal swallowed pesticide from an open packet kept in a neighbour's living room, while playing with other children. After a while, unusual saliva came out of his mouth. He was taken to a local health centre. Although my baby survived, his disability worsened after the incident. My call is to put more protective measures in place for the handling of pesticides.

Jharna
Manikganj, Bangladesh

Container disposal/reuse

All respondents (100.00%) disposed of the container by throwing it on the open field, burying and burning it. Some containers were thrown in the river (7, 14.00%). No disposal tank was reported by the respondents, indicating the unavailability of a proper disposal system.

Figure 21. A fungicide named Trooper (Tricyclazole) found in an open field

Illness after pesticide exposure

Thirty-four per cent of the farmers (17) reported multiple symptoms of pesticide poisoning such as dizziness, excessive sweating, sleeplessness/insomnia, and vomiting after the application of the pesticides. Three of the 25 women farmers (12.00%) and 14 of the 25 men (56.00%) farmers reported symptoms of illness after pesticide exposure.

I went to pick some uncultivated naturally grown vegetables in the crop field near my house. At that time, a farmer was spraying pesticides in his cauliflower field. There was a bad smell. Soon after returning back home, I suddenly got a headache, dizziness and unusual vomiting. I demand that specific rules and precautions should be followed strictly in the use of pesticides.

Shilpi
Manikganj, Bangladesh

C. Social history

Most of the 50 respondents were chewing tobacco (44.00%) and/or betel nut (44.00%), and some were smoking cigarettes (22.00%). Only one said that they were consuming alcohol, and none were taking other drugs or narcotics.

Table 16. Consumption of cigarettes, alcohol, etc. in Manikganj, Bangladesh

		Smoking	Alcohol consumption	Tobacco	Betel nut	Others, narcotics
YES	Number	11	1	22	22	0
	%	22.00%	2.00%	44.00%	44.00%	0.00%
NO	Number	39	49	28	28	49
	%	78.00%	98.00%	56.00%	56.00%	98.00%
No answer	Number	0	0	0	0	1
	%	0.00%	0.00%	0.00%	0.00%	2.00%

Access to clean water

Almost all got drinking water from a tube well. However, only half (50.00%) of the respondents reported that they accessed it from their tube well.

Burning rubbish

The majority (39 or 78.00%) of the respondents do not burn rubbish.

Summary

In the Manikganj district of Bangladesh, the majority of the farmers had been using pesticides for 21-45 years. Twelve pesticides were identified in this district, 11 of them hazardous and cypermethrin was the most frequently used pesticide.

Exposure to pesticides was high, as the majority of the farmers experienced spillage on their bodies while spraying, mixing, and loading pesticides; the majority also entered the field on the same day after pesticide application. They were also not aware of the pesticide label with re-entry intervals. Almost all the farmers lacked training in the use and handling of pesticides.

High numbers of the respondents also stored their pesticides in their houses, exposing themselves and their families to pesticides. All respondents disposed of the container by throwing it on the open field, burying or burning it. Farmers reported multiple symptoms of pesticide poisoning such as dizziness, excessive sweating, sleeplessness/ insomnia, and vomiting after the application of the pesticides.

Only a small number of women farmers reported symptoms of illness after pesticide exposure while more than half of men farmers experienced the symptoms. The women farmers were not involved directly in pesticide spraying.

4.1.2 Cumilla District

A. Pesticide use

Of the 49 respondent farmers using pesticides, 25 (51.02%) were women and 24 (48.98%) were men. Forty-one farmers (83.67%) had been spraying and mixing/loading. Two farmers (4.08%) had been using pesticides for less than 5 years, two farmers (4.08%) for 5 to 9 years, 30 farmers (61.22%) for the past 10 to 20 years, 14 (28.57%) farmers had been using pesticides for 21 to 40 years, and one farmer (2.04%) did not respond to this question.

Three (6.12%) of the respondents' families had been using pesticides for less than 9 years, while 29 families (59.18%) had been using pesticides for the past 10 to 20 years, and 17 families of farmers (34.69%) for 21 to 40 years.

Figure 22. Cypermethrin 10 EC (identified from label translation with partners help) that was found during the survey

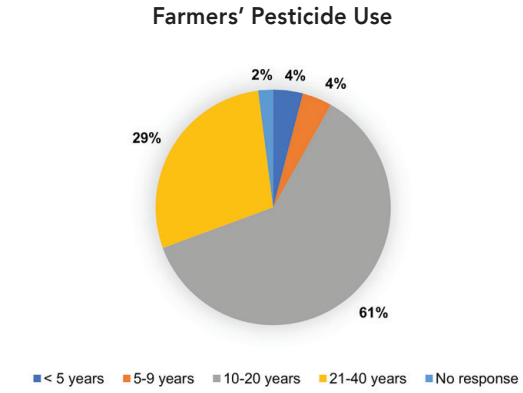

Figure 23. Duration of farmers' pesticides usage

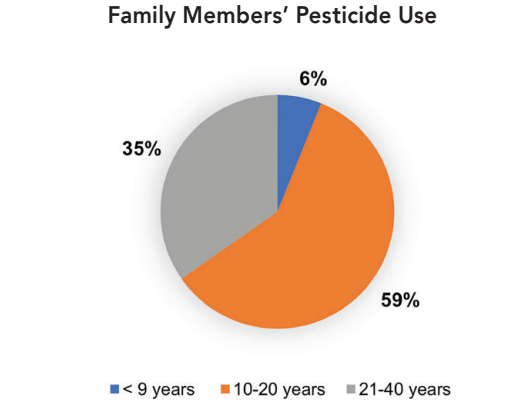

Figure 24. Duration of family members' pesticides usage

Table 17. Breakdown of activities involving pesticides by gender in Cumilla, Bangladesh

	Women	% of total respondents	Men	% of total respondents	Total	%
Total respondents	**25**	**51.02**	**24**	**48.98**	**49**	**100.00**
Activities		**% w/in Women**		**% w/in Men**		
Spraying	24	96.00	23	95.83	**47**	**95.92**
Mixing/loading	18	72.00	22	91.67	**40**	**81.63**
Veterinary therapy	2	8.00	1	4.17	**3**	**6.12**
Household application	0	0.00	0	0.00	**0**	**0.00**
Vector control application	0	0.00	0	0.00	**0**	**0.00**
Working in fields where pesticides are used	23	92.00	10	41.67	**33**	**67.35**
Washing clothes used when handling pesticides	24	96.00	11	45.83	**35**	**71.43**
Washing equipment used when handling pesticides	25	100.00	14	58.33	**39**	**79.59**
Purchase/transport	14	56.00	20	83.33	**34**	**69.39**

Thirty-two respondents (65.31%) were exposed to pesticides during the purchase. However, among the 24 women respondents, 12 women farmers (50.00%) said their husbands were in charge of pesticide buying.

All the farmers in the Cumilla district that were surveyed were using bish, which is a mixture of several pesticides. The contents of the pesticides in the bish were not specified in the survey.

B. Pesticide exposure

Of the 49 farmers who stated that they were exposed to pesticides, 20 (40.82%) were exposed to pesticides monthly; five farmers (10.20%) were exposed every 15 days; 18 (36.73%) were exposed to pesticides weekly; two (4.08%) were exposed twice a week and two (4.08%) were exposed to pesticides daily.

Twenty-four (48.98%) of the total 49 farmer respondents were reported to be living 1 km or less from where the pesticides were being sprayed, while the remaining 25 farmers (51.02%) lived within 2 to 3 km.

Wind direction

Twenty-six farmers (53.06%) sprayed against the wind direction, 15 farmers (30.61%) at random, four farmers (8.16%) sprayed along the wind direction and four farmers (8.16%) did not respond.

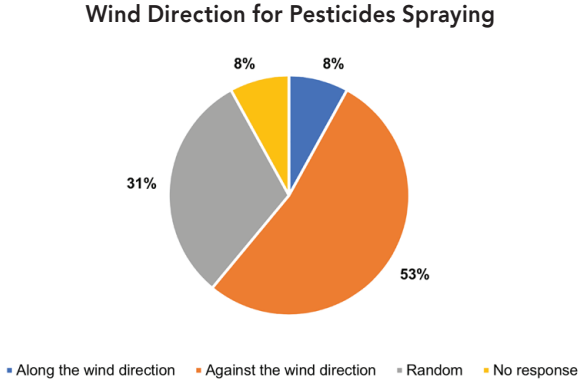

Figure 25. Farmers' pesticides spraying during windy days

Spillages

None of the respondents reported on spillages.

PPE use

Forty-eight farmers (97.96%) did not wear any protective clothing during pesticide application. Forty-two farmers (85.71%) did not think PPE was necessary, five farmers (10.20%) felt uncomfortable wearing the PPE and one farmer (2.04%) did not respond.

Table 18. PPE used by gender in Cumilla, Bangladesh

Responses	Women	%	Men	%
Yes	0	0.00	0	0.00
No	24	48.98	24	48.98
Unknown	1	2.04	0	0.00
Total	**25**	**51.02**	**24**	**48.98**

Re-entry to field after pesticides spraying

The majority of the farmers (30, 61.22%) entered the field on the same day of spraying, followed by one, two-, and three days post-spraying (18, 36.73%) and one farmer (2.04%) did not respond. Thirty-seven (75.51%) of farmers were not aware that the product label specified the re-entry interval, 4 farmers (8.16%) stated the product did not have the re-entry interval on the label and eight farmers (16.33%) did not respond.

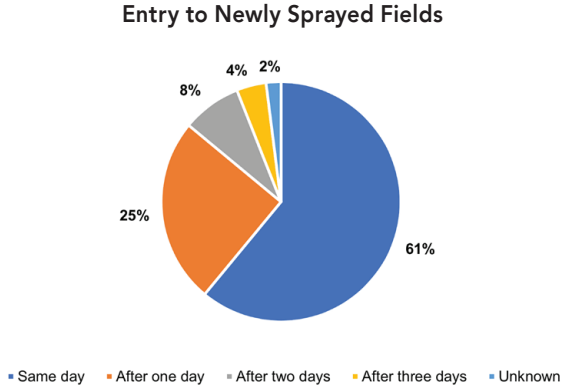

Figure 26. Period of re-entry to newly sprayed fields

Decanting activities

None of the respondents reported decanting activities.

Access to label

Forty-four farmers (89.80%) did not have access to the information on the labels because the labels were too small to read and not in the local language. Thirty-nine of the respondents (79.59%) did not read pesticide labels. Within the 39, multiple choices showed that 30 (61.22%) did not feel that reading the label was necessary, 12 were illiterate (30.77%), and 2 did not have the time to read (4.08%).

Washing facilities

Washing facilities were available for 48 (97.96%) of the total 49 respondents. The forty-one with access used ponds (83.67%), water irrigation or course (39, 79.59%), tap water (2, 4.7%) and wells (1, 2.08%) as water sources to wash their hands, body and PPE.

Training on pesticide use and handling

Two out of the total respondents (4.08%) reported training on pesticide use and the rest (45, 91.84%) were not trained; 2 farmers (4.08%) did not provide any answer.

Storage of pesticide

All of the 49 respondents (100%) stored their pesticides in the field; 17 of them also stored them in the shed (34.69%) and 7 (14.29%) in their homes. Some of the respondents kept the pesticides in multiple locations.

Container disposal/reuse

All respondents (100.00%) dispose of the pesticide containers by burying them, throwing them in the ordinary rubbish bin or burning them.

Illness after pesticide exposure

Four respondents (8.16%) experienced various illness symptoms after pesticide exposure. They experienced headaches, dizziness, excessive sweating, hand tremor and blurred vision.

C. Social history

Of the 49 total respondents, consumption mostly included betel nut (46.94%), tobacco (32.65%), and cigarettes (18.37%). No one reported consuming alcohol, and one (2.04%) reported taking other drugs or narcotics.

Table 19. Consumption of cigarettes, alcohol, etc. in Cumilla, Bangladesh (N = 49 = 100%)

		Smoking	Alcohol consumption	Tobacco	Betel nut	Others, narcotics
YES	Number	9	0	16	23	1
	% within response	18.37%	0.00%	32.65%	46.94%	2.04%
NO	Number	38	49	29	21	37
	% within response	77.55%	100.00%	59.18%	42.86%	75.51%
No answer	Number	2	0	4	5	11
	% within response	4.08%	0.00%	8.16%	10.20%	22.45%

Access to clean water

Almost all were getting drinking water from tube wells. There was no information, however, on whether the tube well was owned or shared with other households.

Burning rubbish

The majority (32 or 65.31%) of the respondents do not burn rubbish.

Kidney diseases are increasing in my area due to pesticide use.

Joynal
Cumilla District, Bangladesh

Summary

In Cumilla district, there was no specific pesticide mentioned. Only mixtures of pesticides or general terms were used by the farmers to identify pesticides such as *bish* (in the Bangladeshi language means poisons). Almost all farmers did not wear PPE during pesticide application. The majority of the farmers entered the field one day after pesticide application and they were also not aware of the re-entry interval on the label of pesticide products. They did not have access to information on the labels because the writing was too small and not in the local language.

Almost all farmers in Cumilla district did not receive any training on the use and handling of pesticides. All farmers disposed of the containers by burning, burying and throwing them in an open field. The farmers here lacked knowledge of hazardous use of pesticides and highly hazardous pesticides.

4.2 INDIA

4.2.1 Yavatmal District

A. Pesticide use

All 66 farmer respondents in Yavatmal were using pesticides on their farms, for various purposes. Of these, 16 (24.24%) were women farmers and 50 (75.76%) were men farmers. Six (9.09%) farmers had been using pesticides for less than 5 years, 23 (34.84%) farmers for 5 to 9 years, 23 farmers (34.84%) for 10 to 20 years, ten farmers (15.15%) for 21 to 40 years, and 4 farmers (6.06%) did not respond.

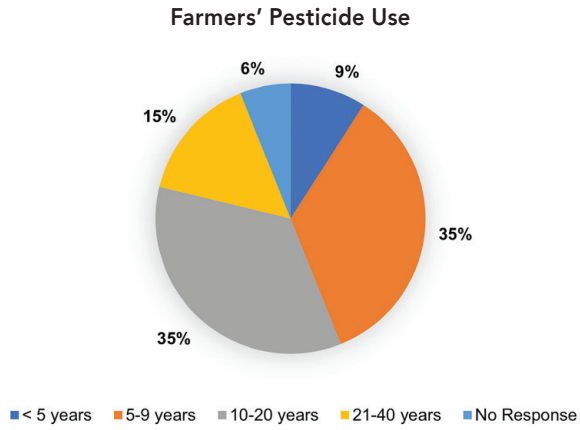

Figure 27. Duration of farmers pesticide usage

Meanwhile, 7 families (10.61%) had been using pesticides for less than 5 years, 22 families (33.33%) for 5 to 9 years, 13 families (19.70%) for 10 to 20 years, 15 families (22.72%) for 21 to 40 years, and 4 families (6.06%) did not respond. Five (7.58%) families of farmers that were interviewed had been using pesticides for 50 years. The list of pesticides used by the farmers is in the table below.

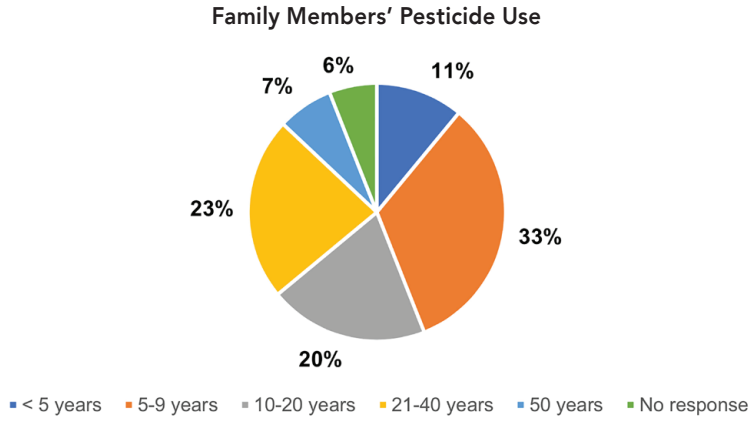

Figure 28. Duration of family members pesticide usage

Table 20. List of pesticides used by respondents in Wayanad, India

Pesticides used	Crops treated	Number of farmers	Percentage
Acephate	Cotton	10	15.15%
Diafenthiuron	Cotton, soybean, toor dal	8	12.12%
Imidacloprid	Cotton, soybean, toor dal	8	12.12%
Monocrotophos	Cotton, soybean, toor dal	49	74.24%
Thiamethoxam	Cotton	1	1.52%

Sixty-three (95.45%) of the interviewed farmers reported that they buy the pesticides themselves while one farmer (1.52%) reported that the worker buys the pesticides; one female farmer (1.52%) reported that her husband buys the pesticides; one farmer (1.52%) did not respond.

B. Pesticide exposure

The majority of the farmers had been spraying pesticides on their farms (58, 87.88%). For the period during which spraying takes place, twenty-one (31.82%) sprayed pesticides monthly and 20 farmers (30.30%) sprayed weekly. Twenty-five farmers (37.88%) reported that they spray pesticides on their farms weekly and/or monthly.

Table 21. Breakdown of activities involving pesticides by gender in Yavatmal, India

Activities	Women	%	Men	%	Total	%
Total respondents	**16**	**24.24**	**50**	**75.76**	**66**	**100.00**
Spraying	11	68.75	47	94.00	**58**	**87.88**
Mixing/loading	3	18.75	25	50.00	**28**	**42.42**
Veterinary therapy	0	0.00	0	0.00	**0**	**0.00**
Household application	0	0.00	0	0.00	**0**	**0.00**
Vector control application	0	0.00	2	4.00	**2**	**3.03**
Working in fields where pesticides are used	2	12.50	20	40.00	**22**	**33.33**
Washing clothes used when handling pesticides	5	31.25	26	52.00	**31**	**46.97**
Washing equipment used when handling pesticides	5	31.25	26	52.00	**31**	**46.97**
Purchase/transport	4	25.00	24	48.00	**28**	**42.42**

Thirty-two farmers (48.48%) live 1 km or less from where the spraying of the pesticide takes place.

Wind direction

Twenty-three farmers (34.84%) sprayed in random directions during windy weather, while the rest sprayed along the wind direction (33.33%), against the direction (28.78%) and 2 farmers (3.03%) did not specify their spraying direction.

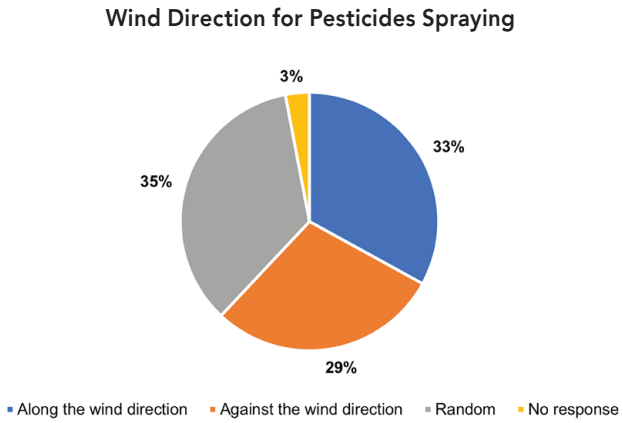

Figure 29. Farmers' pesticide spraying during windy days

Spillages

Only two male (3.03%) farmers out of 66 respondents reported having experienced spillages while handling pesticides. One of the two male farmers experienced spillages when spraying and loading, while the other experienced getting it on his hands when spraying. The remaining respondents (64, 96.97%) did not experience pesticide spillages.

PPE use

Twenty-nine (43.94%) farmers did not use PPE when they were spraying pesticides. Regarding access to protective equipment, 22 farmers (75.86%) responded that the PPE was not available to them. Three farmers (10.34%) with access to PPE said that it is not comfortable. Additionally, two farmers (6.90%) said that other workers sprayed for them and two farmers did not respond (6.90%). However, 12 (38.71%) farmers of the 31 (46.97%) that said yes to the usage of PPE only had masks and goggles. Six farmers (9.10%) did not respond to the use of PPE.

Of the total respondents, sixty-two farmers (93.94%) did not wear PPE when purchasing pesticides.

Table 22. PPE used by gender in Yavatmal, India

Responses	Women	%	Men	%
Yes	5	7.58	26	39.39
No	8	12.12	21	31.82
Unknown	3	4.55	3	4.55
Total	**16**	**24.24**	**50**	**75.76**

Re-entry to field after pesticides spraying

Sixty-five farmers (98.48%) in Yavatmal were vulnerable to exposure to pesticides, as they entered the newly sprayed fields on the same day or only one to three days after spraying, while one farmer (1.52%) did not respond.

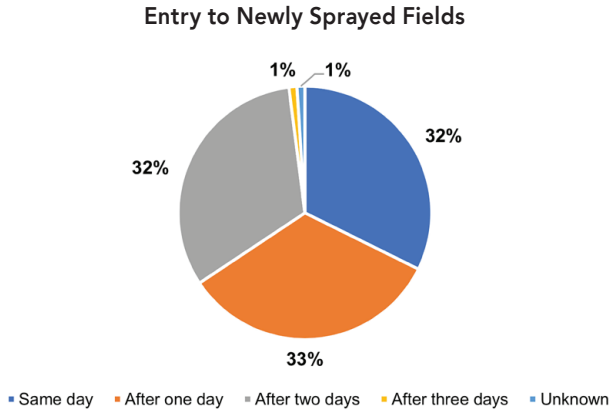

Figure 30. Period of re-entry to the newly sprayed field with pesticides

Decanting activities

Fifty-one farmers (77.27%) stated that they do not decant pesticides; 14 (21.21%) reported decanting their pesticides and one farmer (1.52%) did not respond.

Access to label

Forty-three farmers (65.15%) did not get access to the information on the pesticide labels: 19 (44.19%) stated that the labels were only sometimes in local languages, while 13 (30.23%) stated that the labels were not in the local language; however, 11 (25.58%) farmers did say that the labels were in the local language.

Twenty-one farmers (31.82%) also reported that the writing on the labels was not big enough to read, while nine (13.64%) reported that the writing was sometimes big enough to read. Twenty-nine (43.94%) farmers did not read labels while 25 (37.88%) only read the labels sometimes. Sixteen farmers (55.17%) also stated that the reason that they can't read the leaflets is that they are illiterate, while six farmers (20.69%) found that the texts of the leaflets are too small to read; five

farmers (17.24%) have no time to read the labels and two (6.90%) stated that they are not in the local language. Multiple responses were given by the participants.

Washing facilities

Fifty-five farmers (83.33%) stated that there are washing facilities to wash their hands, bodies and PPE. Thirty-seven farmers (67.27%) were using wells as washing facilities; 26 farmers (47.27%) were using the river as a washing facility and six farmers (10.91%) were using tap water for washing.

Training on pesticide use and handling

Sixty (90.91%) of the farmers in Yavatmal that were interviewed had not received training on pesticide use and handling. Only three farmers (4.55%) received training from the pesticides company via seminars while the remaining three farmers (4.55%) who received training did not specify who provided it.

Storage of pesticides

Twenty-three (34.85%) farmers stored pesticides in sheds; 16 farmers (24.24%) were storing pesticides in their homes; 21 (31.82%) stored pesticides in the shed and/or field; four (6.06%) stored pesticides in the shed and/or home and two farmers (3.03%) did not respond.

Container disposal/reuse

Burning seems to be the go-to option for 26 farmers (39.39%) when it comes to the disposal of pesticide containers, while eight farmers (12.12%) bury the pesticide containers; 22 farmers (33.33%) either bury or burn their pesticide containers and four (6.06%) still throw them into the open field. The rest did not indicate how they dispose of containers.

Illness after pesticide exposure

Twenty-six farmers (39.39%) were reported to have experienced illness after pesticide exposure. Of the 26, nine were women (34.62%) and 17 were men (65.38%). Of the nine affected women farmers, all (100.00%) experienced headaches and dizziness; two farmers (22.22%) experienced excessive sweating; one (11.11%) experienced skin rashes. Of the 17 affected men, 16 (94.12%) reported dizziness; 14 (82.35%) reported headaches; five (29.41%) experienced excessive sweating; two (11.76%) reported excessive salivation; two (11.76%) reported skin rashes: and one farmer (5.88%) experienced hand tremors.

*The percentages do not add up to 100% because of multiple answers from some of the respondents

C. Social history

Of the 66 Yavatmal respondents, 92.42% (61) did not smoke or drink alcohol; 68.18% (45) did not chew tobacco while 50.00% (33) did not chew betel nut. A significant number (51.52%, 34) did not provide an answer on whether they took illegal drugs or narcotics.

Table 23. Consumption of cigarettes, alcohol, etc in Yavatmal, India (N = 66 = 100%)

		Smoking	Alcohol consumption	Tobacco	Betel nut	Others, narcotics
YES	Number	2	2	17	27	3
	% within response	3.03%	3.03%	25.76%	40.91%	4.54%
NO	Number	61	61	45	33	29
	% within response	92.42%	92.42%	68.18%	50.00%	43.94%
No answer	Number	3	3	4	6	34
	% within response	4.55%	4.55%	6.06%	9.09%	51.52%

Access to clean water

The respondents said that they got their water from a tap, a well, and a hand pump. Only one male respondent mentioned using filtered water.

Burning rubbish

All 66 respondents admitted to burning rubbish, which was mostly garbage and home waste that included plastics, rubbers, and cloth.

Summary

All 66 farmers in the Yavatmal district were using pesticides, with the majority of them have used them for five years or more. Five families had been using pesticides for 50 years. Nearly half of the farmers that were interviewed were living within one km or less from where pesticide spraying is done. In Yavatmal, farmers had been using highly hazardous pesticides like acephate, diafenthiuron, imidacloprid, monocrotophos and thiamethoxam. Most of the farmers were exposing themselves to pesticides when they sprayed pesticides against the wind direction. Almost half of the farmers in the Yavatmal district did not use PPE when they were spraying pesticides and almost all of them re-entered the field on the same day or up to three days after pesticide spraying. The majority of the farmers were using wells as a water source to clean their bodies and PPE after pesticide spraying. Most farmers stored their pesticides in a shed, and they buried or burned containers. Nine women and 17 men experienced signs of illness like dizziness, headaches, excessive sweating, and skin rashes, after pesticide exposure.

4.2.2 Wayanad District

A. Pesticide use

Of the 35 farmers interviewed in Wayanad, 17 (48.57%) were women and 18 (51.43%) were men. Seventeen farmers (48.57%) stated they did not use pesticides while 18 respondents (51.43%) were using them. Five (27.78%) farmers and their families reported they had been using pesticides for less than five years; eight farmers (44.44%) and their families had been using pesticides for 10 to 20 years and one farmer (5.56%) has been using them for 40 years. The remaining four farmers

(22.22%) did not give any response on the duration that they used pesticides. Of the 18 (48.57%) farmers who use pesticides, 7 (38.89%) of them are women and 11 (61.11%) of them are men.

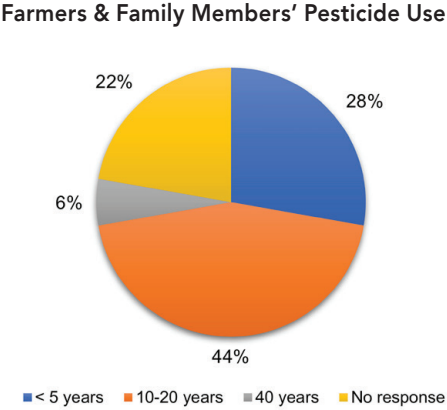

Figure 31. Duration of farmers and family members' pesticide usage

Table 24. List of pesticides used by respondents in Wayanad, India

Pesticides used	Crops treated	Number of farmers	Percentages
Chlorpyrifos	Cow pea, banana	2	11.11%
Cypermethrin	Paddy	4	22.22%
Dimethoate	Paddy	2	11.11%
Fipronil	Areca nut	1	5.56%
Imidacloprid	Guava	1	5.56%
Mancozeb	Vegetables	1	5.56%
Metsulfuron methyl	Paddy	2	11.11%
Quinalphos	Banana, paddy, cow pea, ginger, vegetables	7	38.89%

Seventeen of the 18 farmers using pesticides (94.44%) mostly bought their pesticides through their own experience and sometimes suggestions from the seller. One (5.56%) farmer did not specify how they bought their pesticides.

Figure 32. Chlorpyrifos (Hildan), metsulfuron (Tag Mix) and quinalphos (Ekalux) were observed during the survey

B. Pesticide exposure

The majority of the farmers were involved in spraying (16 out of 18, 88.89%) and mixing or loading (11, 61.61%). During the spraying period, six farmers (33.33%) spray pesticides in their fields monthly, while seven (38.89%) reported spraying yearly, and three (16.67%) reported spraying only occasionally. The remaining farmers that were interviewed did not specify the frequency of their pesticide spraying.

Table 25. Breakdown of activities involving pesticides by gender in Wayanad, India

Activities	Women	%	Men	%	Total	%
Total respondents	7	**38.89**	11	**61.11**	**18**	**100.00**
Spraying	7	100.00	9	81.82	**16**	**88.89**
Mixing/loading	5	71.43	6	54.55	**11**	**61.61**
Veterinary therapy	0	0.00	0	0.00	**0**	**0.00**
Household application	1	14.29	2	18.18	**3**	**16.67**
Vector control application	0	0.00	0	0.00	**0**	**0.00**
Working in fields where pesticides are used	1	14.29	3	27.27	**4**	**22.22**
Washing clothes used when handling pesticides	1	14.29	4	36.36	**5**	**27.78**
Washing equipment used when handling pesticides	1	14.29	4	36.36	**5**	**27.78**
Purchase/transport	2	28.57	4	36.36	**6**	**33.33**

Seventeen of the 35 respondent farmers (48.57%) live only 1 km or less from where pesticide spraying takes place. Only one farmer (2.86%) lives 12 km from where pesticides are being sprayed and one farmer (2.86%) reported staying 4km away. The remaining 16 farmers (45.71%) did not specify their distance from the spraying.

Wind direction

Thirteen of the 18 farmers using pesticides (72.22%) sprayed along the wind direction; two farmers (11.11%) sprayed in a random direction, and one farmer (5.55%) sprayed against the wind direction and two farmers (11.11%) did not respond.

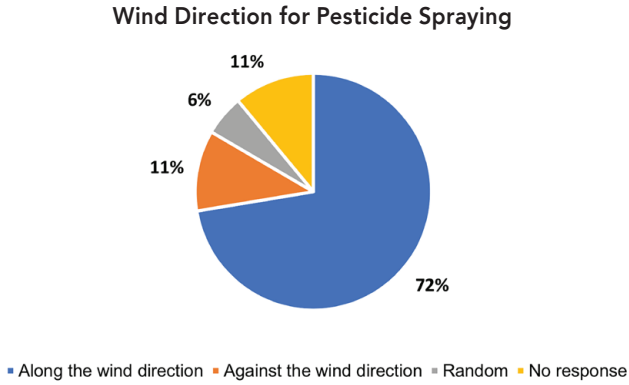

Figure 33. Farmers' pesticide spraying during windy days

Spillages

Eleven of the 18 farmers using pesticides (61.11%) reported spillage incidents while spraying; nine of these (81.82%) were men and two (18.18%) were women. Four out of 11 farmers involved in mixing and loading (36.36%) stated that the spillage happened during mixing, loading and spraying pesticides (36.36%). The exposure occurred mostly on their hands and sometimes other parts of the body; and mostly because they fell while spraying. The farmers usually would take a bath after the spillages.

PPE use

Thirteen respondents (37.14%) did not wear PPE: eight (61.54%) because they could not afford it; one (7.69%) said that the PPE was not available;

one farmer (7.69%) said that he is not aware of it; two farmers (15.38%) were not concerned about PPE, and one farmer (7.69%) stated that it is uncomfortable. Farmers who wear (5, 14.29%) the PPE bought it themselves. The PPE worn was gloves, eyeglasses, face masks, boots or shoes, long sleeve shirts, and long pants. Two farmers (11.76%) did not respond to the use of PPE during pesticide application.

Table 26. PPE use by gender in Wayanad, India

Responses	Women	%	Men	%
Yes	2	5.71	3	8.57
No	5	14.29	8	22.86
Unknown	10	28.57	7	20.00
Total	**17**	**48.57**	**18**	**51.43**

Re-entry to field after pesticides spraying

Seven farmers (38.89%) said that they enter fields the same day after spraying. Another seven farmers (38.89%) enter after one day and 2 farmers (11.11%) enter after 12 hours of pesticide application. Two farmers did not respond (11.11%).

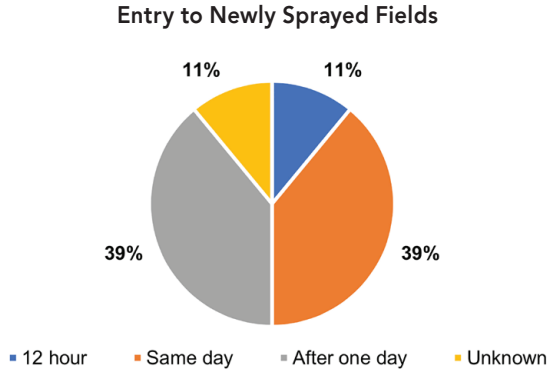

Figure 34. Entry to newly sprayed fields

Decanting activities

Twelve farmers (66.67%) reported not decanting their pesticides while three (16.67%) did decant their pesticides; the remaining three farmers (16.67%) did not respond.

Access to label

Of the eighteen respondents using pesticides, four farmers (22.22%) reported not having access to labels when they were purchasing pesticides. Five farmers (27.78%) reported that the labels were not in local languages, while 5 farmers (27.78%) stated that the labels were in local languages sometimes. Five farmers (27.78%) also stated that the information on labels is not big enough to read while four farmers (22.22%) said that the information is only sometimes big enough to read. Six farmers (33.33%) stated that they do not read the labels as four of them (66.67%) have no time and two of them (33.33%) stated that the labels are not in the local language.

Washing facilities

Sixteen farmers (88.89%) stated there were facilities for them to wash their hands and body, and the remaining two farmers (12.50%) did not respond. Of those who responded, 12 (75.00%) used taps, eight (50.00%) used wells, two (12.50%)used rivers, two (12.50% used watercourse/irrigation drains, and one (6.25%) used water containers. Multiple responses were given for the washing facilities.

Training on pesticide use and handling

Thirteen respondents (72.22%) did not receive any training on pesticide use. One farmer (5.56%) received training from the agricultural department and one farmer (5.56%) from the pesticides company. Three farmers (16.67%) answers were 'unknown'.

Storage of pesticide

Out of 18 respondents using pesticides, 14 (77.78%) stored the pesticides in their shed and four (22.22%) stored them in their homes.

Container disposal/reuse

Eight farmers (44.44%) burned their pesticide containers; six farmers (33.33%) buried them; six farmers (33.33%) threw them into the open field, two farmers (11.11%) returned them to the pesticide distributor, and one farmer (5.56%) reused the containers. Three farmers' (16.67%) answers were unknown. The farmers responded with multiple answers.

Figure 35. Pesticides (an insecticide and sulphur fungicide) containers found in the field

Illness after pesticide exposure

Seven of 18 respondents (38.89%) experienced multiple symptoms of illness when exposed to pesticides. One out of 7 women farmers (14.29%) experienced throat pain. Of the six men farmers (85.71%) who felt symptoms, four (66.67%) experienced headaches, three (50.00%) experienced dizziness, one (16.67%) experienced irregular heartbeat, one (16.67%) experienced excessive sweating, one (16.67%) experienced throat pain, and one (16.67%) experienced vomiting.

*The percentage did not add up to 100% because of multiple answers from some of the respondents

C. Social history

82.86% (29) of the respondents did not smoke, 27 (77.14%) did not drink alcohol, 33 (94.28%) did not chew tobacco, 31 (88.57%) did not chew betel nut, and 34 (97.14%) did not take any illegal drugs or narcotics.

Table 27. Consumption of cigarettes, alcohol, etc in Wayanad, India

		Smoking	Alcohol consumption	Tobacco	Betel nut	Others, narcotics
YES	Number	6	8	1	4	1
	% within response	17.14%	22.86%	2.86%	11.43%	2.86%
NO	Number	29	27	33	31	34
	% within response	82.86%	77.14%	94.28%	88.57%	97.14%
No answer	Number	0	0	1	0	0
	% within response	0.00%	0.00%	2.86%	0.00%	0.00%

Access to clean water

The respondents said that they got their water from the well. One mentioned getting the water from the well of a neighbour, while another mentioned getting forest water.

Burning rubbish

Almost half of the respondents (15; 42.86%) admitted burning rubbish, which included plastic, paper, and dried leaves.

We are highly dependent on the other states for fruits and vegetables. These pesticide-laden foods are creating a lot of health problems for us. I think the right solution is to start organic kitchen gardening in every home and school. Eating fresh, pesticide-free vegetables from our own garden has its own nutritional and health benefits.

Amala, a young farmer in a school
Edavaka National ALP School,
Moolithodu, Wayanad, India

Summary

In Wayanad, of the 35 farmers that were interviewed, only 18 were using pesticides. Of these, nine had been using them for more than five years. The farmers in Wayanad are using six highly hazardous pesticides. Almost half of the farmers interviewed lived one km or less from where pesticide spraying takes place; one farmer was living 12 km away. The majority of the farmers in Wayanad that used pesticides sprayed along the wind direction. The majority of them do not wear PPE as they could not afford it.

Most of the farmers re-enter their fields on the same day or a day after pesticide spraying takes place. The farmers had facilities to wash their bodies and PPE after pesticide use; a lot of them use taps. Many farmers interviewed stored pesticides in a shed, and they burn or bury the pesticide containers after use. One woman and six men experienced signs of illness including throat pain, headaches and dizziness.

4.3 LAOS PDR

4.3.1 Kham District

A. Pesticide use

All respondent farmers (women: 38, 59.38%; men: 26,40.63%) reported using pesticides and chemical fertilisers. Twenty-five farmers (39.06%) and their families had been using pesticides on their farms for less than 5 years, 19 farmers (29.69%) and their families for five to nine years and 19 farmers (29.36%) and their families had been using them for 10-20 years. There were no separation data for farmers and their family members as both of them were using pesticides on the same farm. However, one farmer (1.56%) stated that he has been using pesticides on his farm for 10 years while his family has been using pesticides for 5 years.

Forty-three (67.19%) of the respondents were using pesticides only once a year, while 15 (23.44%) respondents were using pesticides monthly; six farmers did not respond.

Table 28. List of pesticides used by respondents in Laos

Pesticides used	Crops treated	Number of farmers	Percentages
Abamectin	Paddy, vegetables, corn	16	25.00%
Cypermethrin	Paddy, corn	14	21.88%
Glyphosate	Paddy, weed	11	17.19%
Chemical Fertilisers	Paddy	23	35.94%

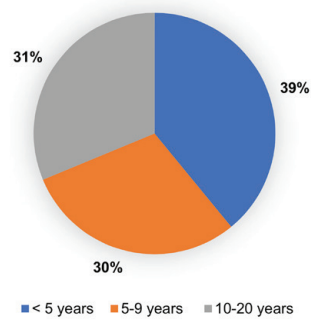

Figure 36. Duration of their family members' pesticide usage

*Cumulative data as both farmers and family members used pesticides on the same farm

Figure 37. Pesticides (Abamectin, glyphosate, cypermethrin, metaldehyde) used by farmers in Kham district

Fifty-nine respondents (92.19%) purchased the pesticides themselves according to their own experience and, for three of them (4.69%), they were bought by family members. The pesticide purchases were done without PPE. Four (4.69%) of the respondents purchased the pesticides according to the sellers' recommendation or from others and one did not respond to this question.

B. Pesticide exposure

All the respondents were exposed to pesticides through activities such as spraying the pesticides in the field, mixing the pesticides, washing the clothes and equipment used in spraying and when they are purchasing or transporting pesticides.

Sixty-two (96.88%) farmers were exposed to pesticides through ground spraying, mainly using backpack sprayers; two farmers (3.13%) did not respond.

We don't consume foods laden with toxic pesticides for better health.

Seephan
Xiengkhuang Province, Laos PDR

Table 29. Breakdown of activities involving pesticides by gender

Activities	Women	%	Men	%	Total	%
		% w/in Women		% w/in Men		
Total respondents	38	**59.38**	**26**	**40.63**	**64**	**100.00**
Spraying	38	100.00	26	100.00	**64**	**100.00**
Mixing/loading	38	100.00	26	100.00	**64**	**100.00**
Veterinary therapy	0	0.00	0	0.00	**0**	**0.00**
Household application	0	0.00	0	0.00	**0**	**0.00**
Vector control application	0	0.00	0	0.00	**0**	**0.00**
Working in fields where pesticides are used	0	0.00	0	0.00	**0**	**0.00**
Washing clothes used when handling pesticides	37	97.37	26	100.00	**63**	**98.44**
Washing equipment used when handling pesticides	37	97.37	26	100.00	**63**	**98.44**
Purchase/transport	37	97.37	26	100.00	**63**	**98.44**

It was also noteworthy that 31 (48.44%) farmers' homes were reported to be one km or less from where pesticide spraying takes place.

Wind direction

Sixty-one respondents (95.31%) sprayed the pesticides along the wind direction, one (1.56%) sprayed against the wind direction and two respondents (3.13%) did not state the spraying direction.

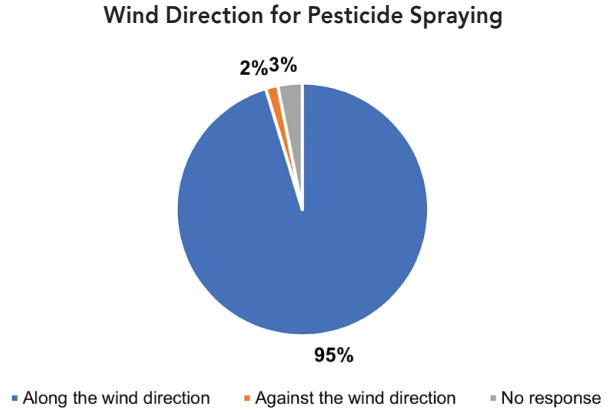

Figure 38. Farmers' pesticides spraying during windy days

Spillages

Only 4 respondents (6.25%) stated that they have experienced pesticide spills on their hands, upper and lower body while spraying, mixing and loading pesticides.

PPE use

While almost all the farmers, 62 (96.88%) wore some PPE during spraying, only 4 farmers (6.25%) wore the standard PPE, and the rest (58, 90.63%) wore non-standard PPE. Only one store owner and supplier provided PPE. Noted: The farmers wearing non-standard PPE such as raincoats as body cover, full-sleeved shirts, and full-length trousers and shoes.

Table 30. PPE used by gender

Responses	Women	%	Men	%
Yes	38	60.32	24	37.50
No	0	0.00	1	1.59
Unknown	0	0.00	1	1.59
Total	**38**	**60.32**	**26**	**41.28**

The majority of the farmers know how to use PPE through their research (57, 89.06%). Only two farmers (3.13%) learn the use of PPE through the leaflets provided to them.

Re-entry to field after pesticides spraying

Farmers were also exposed when re-entering fields after pesticide spraying; 24 farmers (37.50%) re-enter the field after two to three days, 38 farmers (59.38%) re-enter after one week and two farmers (3.13%) did not respond to this question. Fifty-seven farmers (89.06%) reported that the product label specified re-entry intervals. Three farmers (4.69%) stated that the product label that they use did not specify re-entry intervals and four farmers (6.25%) did not answer.

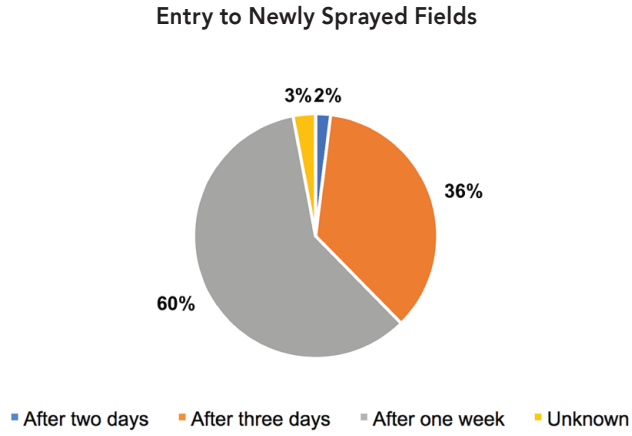

Figure 39. Period of re-entry to newly sprayed fields

Decanting activities and disposal of left-overs

Fifty farmers (78.13%) said that they decanted pesticides into smaller containers as they only required small quantities of pesticides for their crops at their house. Thirty-six farmers (56.25%) burned the leftover or unwanted pesticides, 20 farmers (31.25%) used them until it's finished, 3 farmers (4.69%) throw them in the field, and one farmer (1.56%) kept them in the home, one farmer (1.56%) buried them, one farmer (1.56%) disposed at the landfill prepared by the government and two farmers (3.13%) did not respond. Multiple responses were answered by farmers.

Washing facilities

Almost all of the respondents were using watercourses (59, 92.19%), tap water (2, 3.13%), river (1, 1.56%), ponds (1, 1.56%), and wells (1, 1.56%) to wash their hands, body and PPE. For the remaining 3 respondents (4.69%), washing facilities were unknown.

Almost all the farmers (62, 96.88%) reported having washing facilities for their hands, body and PPE.

Training on pesticide use and handling

Fifty-eight (90.63%) respondents did not receive any training on pesticide use and handling. Of the four respondents (6.25%) who did receive training, two of them (50.00%) said that it was in the form of courses, while the rest (50.00%) said that it was through a field demonstration. None of the respondents was trained by the companies that supply the pesticides. The training was conducted by the Department of Agriculture and Forestry. The remaining 2 respondents (3.13%) did not respond to the survey.

Storage of pesticides

Twenty-nine farmers (45.31%) stored their pesticides in the garden and field, while 26 farmers (40.63%) stored in the field only. Four farmers (6.25%) kept their pesticides in their homes and 3 farmers (4.69%) stored them in their kitchens. The remaining two farmers (3.13%) storage were unknown.

Container disposal/reuse

Thirty-five out of 64 respondents (54.69%) disposed of their containers by burning them. Thirty-five respondents (54.69%) that reported burning leftover and unwanted pesticides also reported burning their containers. Sixteen (25%) farmers reused the pesticide containers as household items and for water and food storage. Five farmers (7.81%) buried their pesticide containers.

Illness after pesticide exposure

None of the respondents answered about the signs of illness after pesticide exposure.

C. Social history

Consumption of harmful substances

A small number of respondents were consuming alcohol (15.62%), and some were smoking cigarettes (3.13%). On the other hand, no one said that they were consuming tobacco, betel nut, and none were taking other drugs or narcotics.

Table 31. Consumption of cigarettes, alcohol, etc. in Longpiew and Koimor, Laos

		Smoking	Alcohol consumption	Tobacco	Betel nut	Others, narcotics
YES	Number	2	10	0	0	0
	% within response	3.13%	15.62%	0.00%	0.00%	0.00%
NO	Number	59	50	56	52	58
	% within response	92.19%	78.13%	87.50%	81.25%	90.63%
No answer	Number	3	4	8	12	6
	% within response	4.69%	6.25%	12.50%	18.75%	9.36%

Access to clean water

Half of the respondents stated that their source of drinking water was from a drinking water company. Also, most households used all wood, charcoal, and electric stoves for cooking.

Table 32. Access to drinking water in Longpiew and Koimor, Laos

Source	Number	Percent
Company drinking water	32	50%
No answer	32	50%

Burning rubbish

The majority of the respondents stated that they burned rubbish, including plastic.

Table 33. Burning of rubbish in Longpiew and Koimor, Laos		
Kind of rubbish	Yes	Percent
Rubbish	59	92.22%
Plastic rubbish	59	92.22%

When I used pesticides, my health was affected. So, I turned to organic farming to keep myself healthy.

Phonexay
Xiengkhuang Province, Laos PDR

Summary

All the farmers that were interviewed were using chemical fertilisers and pesticides. The majority of the farmers had been using pesticides for more than five years. Almost all the farmers were taking precautions to limit exposure to pesticides, like spraying along the wind direction and wearing PPE when spraying. The majority of the farmers were entering the farms one week after pesticides were sprayed there. Almost all the farmers used watercourses to wash their bodies and PPE after spraying and they stored their pesticides in the field and garden.

None of the farmers reported any symptoms of illness after pesticide exposure, which may be a result of a lack of awareness of the harm caused by pesticides as a result of their lack of training. Or it may be a result of the nature of the pesticides being used: all were HHPs, but only abamectin is classified as such based on acute toxicity.

4.4 VIETNAM

4.4.1 Hai Hau District

A. Pesticide use

Of the 52 farmer respondents who were using pesticides in Hai Hau, 27 (51.92%) were women and 25 (48.08%) were men. One farmer and her family (1.92%) had been using pesticides for less than 5 years, 11 farmers and their families (21.15%) had been using pesticides for the past 10 to 20 years, while 36 farmers and their families (69.23%) had been using pesticides for 21 to 40 years. One farmer and her family (1.92%) have been handling pesticides for more than 40 years while two farmers (3.85%) and their families have been handling pesticides for more than 50 years. One farmer (1.92%) did not respond to this question. There were no separation data for farmers and their family members as both of them were using pesticides on the same farm.

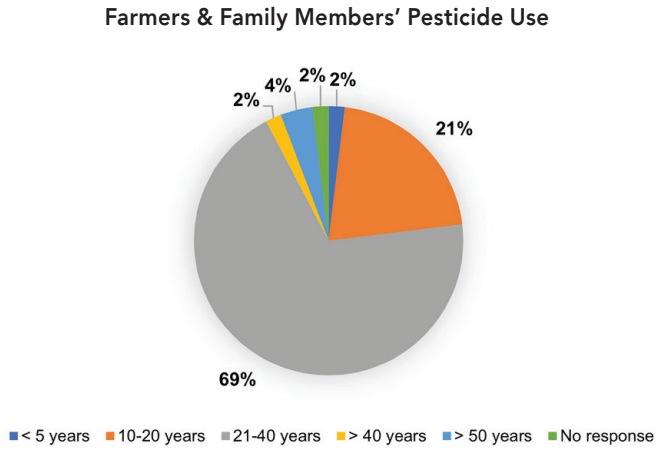

Figure 40. Duration of farmers' and family members' pesticides usage

Table 34. List of pesticides used by respondents in Hai Hau, Vietnam

Pesticides used	Crops treated	Number of farmers	Percentages
Chlorfluazuron	Rice	11	21.15%
Chlorpyrifos ethyl	Rice	24	4.62%
Cypermethrin	Rice	17	32.69%
Deltamethrin	Rice, corn, guava, custard apple, vegetables	36	69.23%
Difenoconazole	Rice, guava, custard apple	24	46.15%
Emamectin benzoate	Rice, rice seeds corn, vegetable, guava, custard apple	43	82.69%
Fipronil	Rice, rice seeds	11	21.15%
Fenobucarb	Rice, guava, custard apple, fruits	10	19.23%
Hexaconazole	Rice, fruits, corn	34	65.38%
Indoxacarb	Rice	37	71.15%
Isoprothiolane	Rice, corn, vegetables	37	71.15%
Isoprocarb	Rice	10	19.23%
Nitenpyram	Rice	26	50.00%
Propiconazole	Rice, guava, custard apple	13	25.00%
Tricyclazole	Rice	14	26.92%

Figure 41. Hexaconazole (A.V.T VIL 5SC), isoprothiolane (Babalu 40WP), chlorpyrifos (Victory), and emamectin benzoate (Angun 5WG) used by farmers in Hai Hau district

Fifty respondents (96.15%) purchased the pesticides themselves, while two farmers (3.85%) stated that their wives purchased the pesticides. Of the 52 participants using pesticides, 32 farmers (61.54%) purchased pesticides without wearing any protective clothing. Thirty-two (61.54%) farmers bought according to the suggestions of the pesticide sellers and 15 (30.00%) bought from their own experience.

B. Pesticide exposure

All 52 (100.00%) farmers were spraying pesticides in the field and 51 of them (98.08%) often got exposed to them through ground spraying using backpack sprayers. For twenty-five farmers (48.08%), the frequency of spraying depended on the crop season, while 12 (23.00%) farmers sprayed pesticides monthly. Three farmers (5.77%) sprayed pesticides under directions from the local agriculture department. All 52 (100.00%) farmers were reported to be living 2 km or less from where the pesticide spraying takes place.

Table 35. Breakdown of activities involving pesticides by gender in Hai Hau, Vietnam

Activities	Women	% of Total respondents	Men	% of Total respondents	Total	%
Total respondents	**27**	**51.92**	**25**	**48.08**	**52**	**100.00**
Activities		**% w/in Women**		**% w/in Men**		**%**
Spraying	**27**	100.00	25	100.00	**52**	**100.00**
Mixing/loading	**14**	51.85	11	44.00	**25**	**48.08**
Veterinary therapy	**0**	0.00	1	4.00	**1**	**1.92**
Household application	**4**	14.81	5	20.00	**9**	**17.31**
Vector control application	**5**	18.52	1	4.00	**6**	**11.54**
Working in fields where pesticides are used	**8**	29.63	8	32.00	**16**	**30.77**
Washing clothes used when handling pesticides	**12**	44.44	17	68.00	**29**	**55.77**
Washing equipment used when handling pesticides	**15**	55.56	15	60.00	**30**	**57.69**
Purchase/transport	**13**	48.15	9	36.00	**22**	**42.08**

Figure 42. Farmer with backpack sprayer in Hai Hau district

Wind direction

All farmers (52, 100%) sprayed the pesticide along the wind direction during windy weather.

Spillages

Pesticide spills, while spraying was reported by only eight farmers (15.38%) and the rest of the farmers (44 farmers, 84.62%), did not experience spillages. The eight farmers spilt the pesticides on their hands and back of their bodies because of faulty spraying equipment. Of these 8, five of the respondents (62.50%) washed the affected area, while 3 respondents (37.50%) took a bath after the exposure.

PPE use

Thirty-one farmers (59.62%) wore PPE during pesticide application. None of the respondents received the PPE from the pesticide manufacturer; they had to buy it themselves. Twenty out of fifty-two farmers (38.46%) that wore PPE did not receive any instructions on how to use it. Only three of the farmers (9.38%) wore raincoats or long sleeves shirts, cloth gloves and long pants that still do not meet the standard PPE requirements because the cloth materials used can absorb the pesticide[12]. One farmer (3.13%) only wore long sleeve shirts and no other PPE.

[12] Code of Practice: Safety and Health in Agriculture. (2011). International Labour Organization (ILO). Pg 119. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/normativeinstrument/wcms_161135.pdf

Table 36. PPE used by gender in Hai Hau, Vietnam				
Responses	**Women**	**%**	**Men**	**%**
Yes	18	34.62	13	25.00
No	9	17.31	12	23.08
Unknown	0	0.00	0	0.00
Total	**27**	**51.92**	**25**	**48.08**

Figure 43. Long sleeves, long trousers, boots, gloves, and masks were used as PPE by farmers

Re-entry to field after pesticides spraying

Some of the farmers were also exposed when re-entering fields after pesticide spraying: two farmers (3.85%) re-entered after only one day, two (3.85%) after two days, 18 (35.29%) after three days, five (9.62%) after five days, 20 (38.46%) after seven days, and two (3.85%) after ten days. Three respondents (5.77%) said that their re-entry depended on the type of pesticides used and according to instructions from the local department of agriculture. Fourteen of the farmers (26.92%) were not aware of the re-entry intervals on pesticide labels.

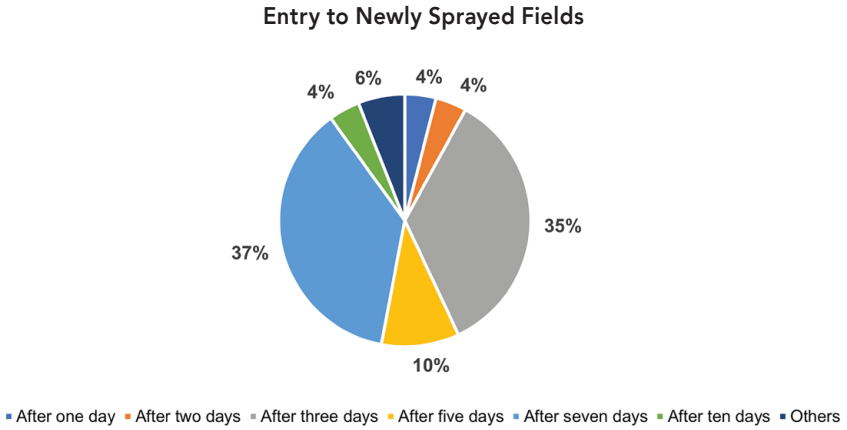

Figure 44. Period of re-entry to newly sprayed fields

Decanting activities

None of the respondents reported decanting pesticides.

Access to labels

Fifty-one respondents (98.08%) had access to the label; only one respondent (1.92%) did not. However, four farmers (7.69%) said only sometimes was the label in the local language, and seven farmers (13.46%) did not read the labels because they had no time.

Washing facilities

Fifty-one respondents (98.08%) reported having washing facilities for their hands, body and PP; one farmer (1.92%) did not have such facilities. Forty-three farmers (84.31%) used watercourses or irrigation, 22 farmers (43.14%) used rivers, 7 farmers (13.73%) used wells and 2 farmers (3.92%) used tap water.

Training on pesticide use and handling

Thirty-four of the fifty-two farmers (65.38%) had not received any training on pesticide use. Of the 18 who did receive training, 13 (72.22%) received it from a Farmers Union;[13] only five farmers (27.78%) received training from pesticide manufacturers.

Storage of pesticides

Pesticides used in the fields were usually stored in a shed (31, 59.62%), kitchen (7, 13.46%), garden (2, 3.85%), or separate tank in the field (1, 1.92%), or used until finished (11, 21.15%).

Container disposal/reuse

Multiple responses were reported by the farmers. Pesticide containers were placed in the ordinary rubbish bin by 37 farmers (71.15%) and 17 farmers threw them in the pesticide garbage tank (32.69%). None returned containers to the warehouse or retailers. The pesticide garbage tank was built by Vietnam's Plant Protection Department for the disposal of pesticide containers. Pesticide garbage tanks, for container disposal, are more abundant in this province than in Son La (SRD) province.

[13] http://vietnamfarmerunion.vn/sitepages/news/1082/55837/about-us

Figure 45. Pesticide garbage tank built by Vietnam's Plant Protection Department

Illness after pesticide exposure

Fourteen of the fifty-two farmers (26.92%) reported symptoms of illness after pesticide spraying. Nine of the 14 farmers were women (64.29%) and five were men (35.71%). One woman reported multiple symptoms of dizziness, blurred vision, hand tremor, headache, excessive sweating, sleeplessness or insomnia, and skin rashes. She had 30 years' experience in pesticide spraying and used deltamethrin, emamectin benzoate, hexaconazole, nitenpyram and isoprothiolane on her farm.

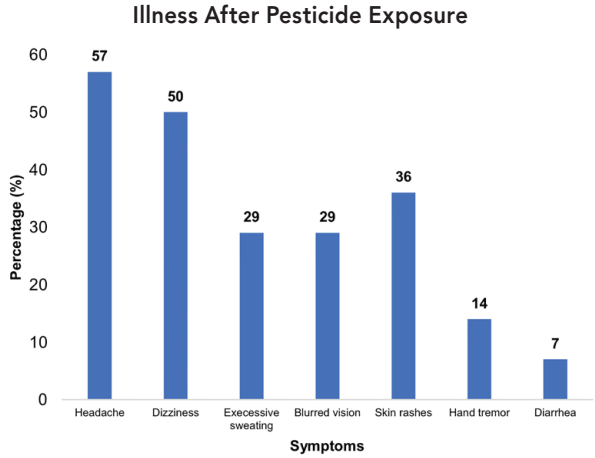

Figure 46. Symptoms reported by farmers after spraying pesticides

C. Social history

Access to clean water

The main source of water in this area is rain water (42.31%, 22) followed by filtered bore-well (21.15%, 11), drill well (17.31%, 9), machine water (11.54%, 6) and filtered tap water (1.92%, 1). Another 3 (6.77%) respondents did not answer.

Burning rubbish

Thirty-seven out of 52 respondents (71.15%) did not burn their rubbish while 15 respondents (28.85%) burn their rubbish in Hai Hau.

Summary

In the Hai Hau district, nine highly hazardous pesticides were used. All farmers were spraying pesticides in the field and were often exposed to them through ground spraying using backpack sprayers. More than half of the farmers were wearing PPE during pesticide application. However, none of the respondents received the PPE from the pesticide manufacturer, so they had to buy it themselves. In contrast to the Thuan Chau district, farmers in Hai Hau enter seven days after pesticide applications and some of them enter according to instructions of the local department of agriculture. More than half of the farmers did not receive training on pesticide use and handling.

The majority of the farmers store their pesticides in a shed. Fourteen farmers reported symptoms of illness after pesticide exposure. Headache and dizziness were observed as the frequent symptoms in this district. Women exhibited more symptoms than men farmers. One farmer who used 3 highly hazardous pesticides for more than 30 years experienced blurred vision, insomnia and skin rashes.

4.4.2 Thuan Chau District

A. Pesticide use

All 51 farmers interviewed in the Thuan Chau district were using pesticides in their farms (25, 49.02% women; 24,47.06% men; two (3.92%) gender not specified). Six farmers (11.76%) had been using pesticides for less than 5 years; 14 farmers (27.45%) for 5 to 9 years; 21 (41.18%) farmers for 10 to 20 years; nine (17.65%) farmers for 21 to 38 years; and one farmer (1.96%) did not respond. Meanwhile, eight families of the farmers (15.69%) had been using pesticides for 5 to 9 years; 25 families (49.02%) for 10 to 20 years; 16 families (31.37%) for 21 to 40 years; and two families (3.92%) did not respond.

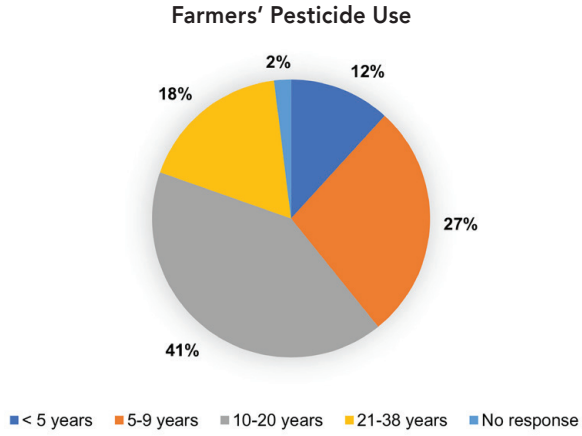

Figure 47. Duration of farmers' pesticides usage

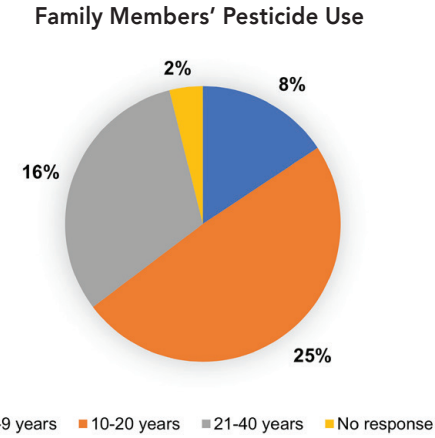

Figure 48. Duration of family members' pesticides usage

Table 37. List of pesticides used by respondents in Thuan Chau, Vietnam

Pesticides used	Crops treated	Number of farmers	Percentage
Alpha-cypermethrin	Rice, coffee	5	10.20%
Atrazine	Corn, coffee	8	16.33%
Chlorpyrifos	Rice, Coffee	4	8.16%
Cypermethrin	Rice, Coffee	8	16.33%
Diquat dibromide	Coffee	4	8.16%
Dimethoate	Coffee	4	8.16%
Emamectin benzoate	Rice	5	10.20%
Glyphosate	Rice, corn, yam, coffee	10	20.41%
Imidacloprid	Rice	13	26.53%
Lambda-cyhalothrin	Rice	2	4.08%
Metsulfuron-methyl	Rice	14	28.57%

B. Pesticide exposure

Almost all the farmers were handling pesticides, either spraying in the field (50, 98.04%) and/or mixing or loading (45, 88.24%). Four farmers (7.84%) stated that they handle pesticides through veterinary therapy. Thirty-one (60.78%) farmers were exposed to pesticides when they were washing clothes and equipment. It was reported that 35 (68.63%) of the farmers only spray pesticides when there are pests or diseases on their farms. However, all 51 respondents reported having been exposed to pesticides through ground spraying or neighbours' use of pesticides.

Nineteen of the respondents (37.25%) were also exposed to pesticides when the equipment was washed at home.

Table 38. Breakdown of activities involving pesticides by gender in Thuan Chau district, Vietnam

Activities	Women	%	Men	%	Unknown	%	Total	%
Total respondents	**25**	**49.02**	**24**	**47.06**	**2**	**3.92**	**51**	**100.00**
Spraying	24	96.00	24	100.00	2	100.00	**50**	**98.04**
Mixing/loading	20	80.00	23	95.83	2	100.00	**45**	**88.24**
Veterinary therapy	1	4.00	3	12.50	0	0.00	**4**	**7.84**
Household application	3	12.00	2	83.33	0	0.00	**5**	**9.80**
Vector control application	1	4.00	0	0.00	0	0.00	**1**	**3.70**
Working in fields where pesticides are used	11	44.00	8	33.33	0	0.00	**19**	**37.25**
Washing clothes used when handling pesticides	16	64.00	15	62.50	0	0.00	**31**	**60.78**
Washing equipment used when handling pesticides	16	64.00	15	62.50	0	0.00	**31**	**60.78**
Purchase/transport	8	32.00	6	25.00	0	0.00	**14**	**27.45**

Forty-four (86.27%) farmers from the Thuan Chau district in this survey stated that they live 1 km or less from where the spraying of pesticides takes place. Seven farmers (13.73%) live 2 km to 4 km from the pesticide spraying area.

Wind direction

Fifty farmers sprayed the pesticide along the wind direction (98.04%) and one farmer sprayed randomly (1.96%).

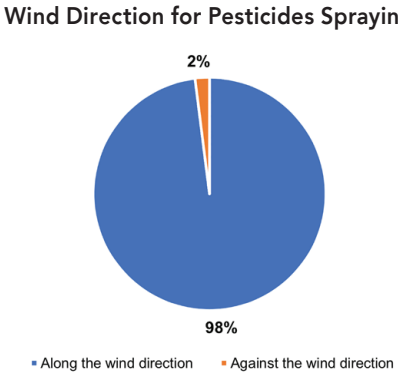

Figure 49. Farmers' pesticide spraying during windy days

Spillages

Twenty-five farmers (49.02%) had experienced pesticide spillages while loading (15,) spraying (11), and mixing (5) their pesticides.

(Note that some of the farmers experience spillages while both loading and spraying)

Spillage of pesticides mostly occurred through faulty equipment (20, 80.00%). Only two farmers (8.00%) were exposed to the pesticides while mixing. The spillages occurred on their upper body, front of the body, face, hands, feet, and back of the body. After the pesticide spills, 20 respondents (80.00%) washed their hands or the area affected, took a bath, and washed the clothes where the pesticide spills happened.

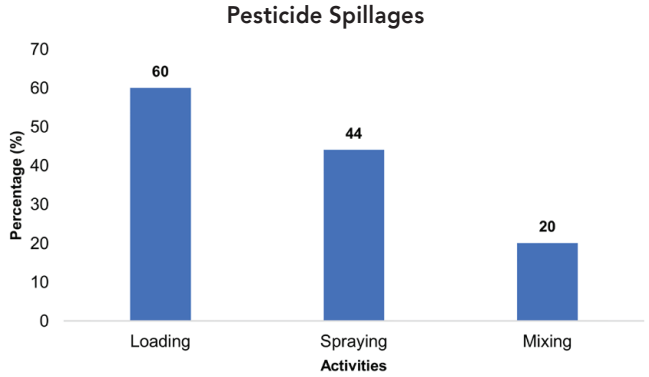

Figure 50. Percentage of pesticides spillages reported by farmers

PPE use

Forty-four farmers (86.28%) wear PPE during the application of pesticides. However, 41 farmers (80.39%) bought the PPE themselves; only two farmers (3.92%) wore PPE that was supplied free by the store owner. Six respondents (11.54%) did not receive any instruction on the use of the PPE. The farmers mainly used a raincoat and long sleeved-shirt for the body; gloves, face masks; boots and shoes for feet protection. None of them met standard PPE requirements. It was reported that some of the farmers only used raincoats as the PPE.

Table 39. List of pesticides used by respondents in Thuan Chau, Vietnam						
Responses	**Women**	**%**	**Men**	**%**	**Unknown**	**%**
Yes	21	41.18	21	41.18	2	3.92
No	3	5.88	3	5.88	0	0.00
Unknown	1	1.96	0	0.00	0	0.00
Total	**25**	**49.02**	**24**	**47.06**	**2**	**3.92**

Re-entry to field after pesticides spraying

Farmers were also exposed when re-entering fields after pesticide spraying: 33 farmers (64.71%) entered their farm the same day to three days after spraying and 14 farmers (27.45%) entered between five to seven days after spraying. Three farmers (5.88%) re-entered depending on the pests and diseases and one farmer (1.96%) did not answer. Lack of information on labels for re-entry intervals was reported by 40 (78.43%) farmers. Nine respondents (17.65%) said there were product labels that specify the re-entry intervals and one respondent (1.96%) was not aware of it. One (1.96%) farmer did not answer.

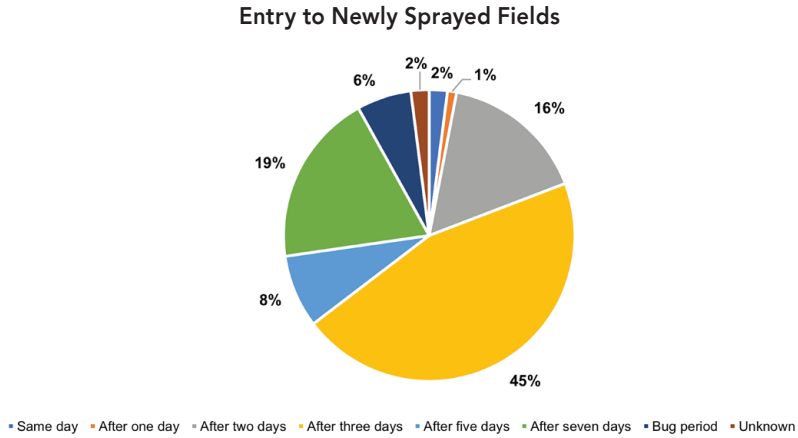

Figure 51. Period of re-entry to newly sprayed fields

Decanting activities

Forty-seven (92.16%) farmers stated that they do not decant pesticides while four farmers (7.84%) were reported to decant their pesticides.

Access to label

Forty-six farmers (90.20%) have access to the pesticide label. Although access was available, 20 farmers (43.48%) said that the pesticide labels are not in the local language. Five farmers (9.80%) did not have access to the pesticide's label.

Washing facilities

Forty-nine (96.08%) respondents were reported to use improper washing facilities like rivers, wells and streams to wash their clothes and equipment.

Figure 52. The river is used as a washing facility by farmers

Training on pesticide use and handling

Twenty-six of the respondents (50.98%) did not receive any training on pesticide use. Of the remaining 25 farmers who received training, 16 (64%) received training from an NGO and 12 (48%) from the government. Some of the respondents received training from multiple stakeholders at the same time. It was noted that no training was carried out by the

pesticide company. Eleven (68.75%) of the 16 farmers trained by an NGO received only a field demonstration. Other training methods included courses and seminars by NGOs and the government.

Storage of pesticides

Twenty-two (43.14%) of the 51 respondents stored their pesticides below the house, followed by the shed (20%), home (18%) and garden (11%). Others stored their pesticide by hanging in the chicken coop, inside the cow house or in animal houses. It was noted that one farmer (1.96%) stored pesticides in the kitchen.

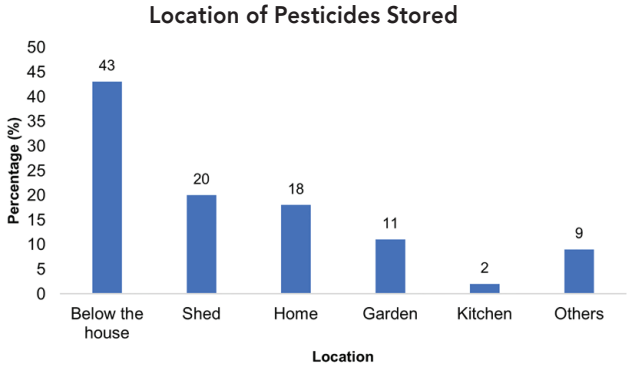

Figure 53. Location of pesticides stored reported by farmers

*The percentage does not add up to 100% because of multiple answers from some of the respondents

Figure 54. Pesticides were stored by hanging near their animal houses and home

Container disposal/reuse

Disposal of the pesticide containers was mainly done by throwing them into a tank built by their Plant Protection Department in their commune (36 farmers, 70.59%). Four farmers (7.84%) throw the container in the ordinary trash, another four (7.84%) burn the container and the rest of the respondents' (11 farmers, 21.57%) disposal method is unknown. Multiple responses were recorded from some farmers. There is no information on improper disposal of leftover and unwanted pesticides because 24 of the farmers (47.06%) used the pesticides until it was finished, and the rest did not respond (27 farmers, 52.94%).

Illness after pesticide exposure

Twenty-three women farmers (92.00%) reported signs and symptoms of pesticide poisoning compared to 17 out of 24 men farmers who use pesticides (70.83%) – a total of 40 farmers (78%). The main symptoms were dizziness (24 farmers, 47.06%) and headache (21, 41.18%), followed by blurred vision (13, 25.49%), vomiting (7, 13.73%), narrow pupil or miosis (3, 5.88%), and hand tremor (3, 5.88%). Other symptoms (3, 5.88%) experienced included excessive sweating, irregular heartbeat and difficulty breathing.

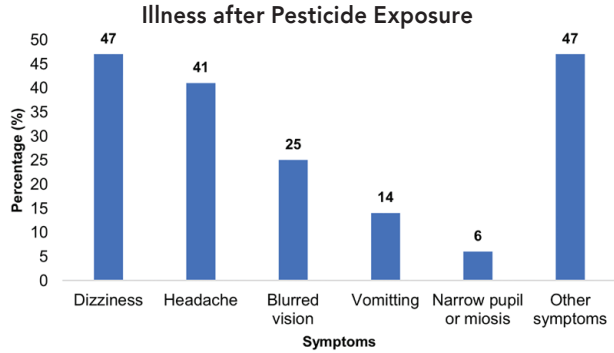

Figure 55. Symptoms reported by farmers who sprayed pesticide

*Total number of respondents is 51, 25 women, 24 men, 2 unknowns
*The percentage did not add up to 100% because of multiple answers from some of the respondents

C. Social history

Consumption of harmful substances

The majority of the 51 respondents (31, 60.78%) said that they were consuming alcohol; only ten respondents reported smoking cigarettes, and none said that they consumed tobacco, betel nut, and other narcotics.

Table 40. Consumption of cigarettes, alcohol, etc. in Thuan Chau District, Vietnam

		Smoking	Alcohol consumption	Tobacco	Betel nut	Others, narcotics
YES	Number	10	31	0	0	0
	% within response	19.61%	60.78%	0.00%	0.00%	0.00%
NO	Number	37	17	48	44	48
	% within response	72.55%	33.33%	94.12%	86.27%	94.12%
No answer	Number	4	3	3	7	3
	% within response	7.84%	5.88%	5.88%	13.73%	5.88%

Ecological agriculture has helped me to produce quality rice, improve the field ecosystem and be safe for everyone's health. I hope more households will apply ecological agriculture, towards an environmentally friendly agriculture.

Quyen
Muoi Noi commune, Vietnam

Summary

In the Thuan Chau district, all the farmers interviewed used pesticides. Of the 11 pesticides reported to be used, eight (73%) were highly hazardous pesticides. The majority of the farmers experienced pesticide spillage while loading the pesticides. Most of them wore some form of PPE and bought the PPE themselves.

The majority of farmers were also exposed to pesticides when they re-entered the field on the same day after spraying and used products that did not specify the re-entry interval. More than half the farmers in this district did not receive any training on pesticide use and handling. High numbers of farmers stored their pesticides below the house. Dizziness and headache were observed as the most prominent symptoms experienced by almost all the farmers in that district. All women farmers, and more than half of the men, experienced symptoms of pesticide poisoning.

5. CONCLUSION

In this report, on the conditions of the use of pesticides in 4 Asian countries, PANAP and partners from Bangladesh, India, Laos and Vietnam record that 95.37% of the 367 farmers and workers interviewed, including women and children, are exposed to pesticides including highly hazardous pesticides (HHPs). Almost all the pesticides being used are HHPs, and/or are widely banned in other countries.

Exposure of farmers was found to be widespread, beginning with the purchase and transport of pesticides, and then through decanting, mixing, application techniques, re-entry into sprayed fields, with additional risks generated by the washing of pesticide-contaminated clothes and equipment, and the storage of pesticides in the home and especially the kitchen. Drift into nearby homes is another exposure route, especially for children and other family members not involved in the actual spraying. None of the respondents was wearing the correct PPE, for the usual reasons that it is not available, too expensive and/or too uncomfortable to wear.

Consequentially, 36.8% out of 46.57% of women farmers and 37.28% out of 52.86% of male respondents reported symptoms of pesticide poisoning following spraying.

Many of the pesticides being used are linked to several chronic health impacts, including cancers, immune system malfunction, birth defects, damage to the brains of small children, reduced intellectual capacity, neurological conditions, infertility, and metabolic and endocrine disorders including obesity and diabetes. Pesticides like atrazine, chlorpyrifos, cypermethrin, deltamethrin, lambda-cyhalothrin, malathion, mancozeb, monocrotophos and others are known to be carcinogenic and cause disruption in the endocrine system, especially in children and acute health effects due to pesticides exposure could

range from skin disorder, respiratory issues, circulatory issue, respiratory problems and even death[14]. As these conditions are extremely difficult to link to particular spray events, this survey was unable to capture the incidence of chronic health impacts among the communities involved.

In analysing the impacts of pesticide use in these four countries, it can be concluded 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, and workers' rights.

The provision of, and requirement to use, pesticides under the conditions described in this report is also a breach of the International Code of Pesticide Management (the Code):

> **Article 3.6** 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.

The problem of allowing pesticide use without adequate protection, which is the normal condition of use in many low- and middle-income countries (LMICs), is compounded by the national and international failure to prevent 'double standards trade' in pesticides – in which countries that have banned pesticides for health and/or environmental reasons continue to allow their export to LMICs and other countries continue to import them. Global pesticide governance, which is largely voluntary, has failed to stem the flood of poisonings, chronic health impacts and environmental destruction experienced in these four Asian – and many other – countries.

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[14] Watts, M. (2010). Pesticides: Sowing Poison, Growing Hunger, Reaping Sorrow. Retrieved from https://www.panna.org/sites/default/files/sowingpoisongrowinghunger_2ndedition.pdf

6. RECOMMENDATIONS

PANAP makes the following recommendations on the basis of the findings of its survey of 4 Asian Countries:

- That immediate action be taken by governments to comply with Article 3.6 of the Code and ban pesticides that require PPE
- That immediate action be taken by the pesticide industry to cease the import and sales of pesticides that require PPE into countries where small-scale farmers have access to them
- That countries cease the export and import of pesticides that have been banned in their country of origin for health and/or environmental reasons ('double standards trade')
- That governments assist their small farmers to move away from the use of hazardous pesticides by assisting them to implement agroecology
- That FAO, UNEP and WHO works with countries to develop and implement a legally binding treaty on the global management of pesticides based on human rights principles, including the phase-out of HHPs by 2030, the prevention of 'double standards trade', legal liability of the pesticide industry for adverse impacts of the pesticides they sell, and the reduction of pesticide use and increased food security through the implementation of agroecology.

Appendices A

DEMOGRAPHIC PROFILE

I. BANGLADESH

a. Manikganj District

Age

The majority of the respondents were aged 36 to 59 (37, 74.00%).

Respondents by Age Group in Manikganj, Bangladesh		
Age Group	**Number**	**Percent**
18 to 35 years old	4	8.00%
36 to 59 years old	37	74.00%
60 years old and above	9	18.00%
Total	**50**	**100.00%**

Marital status

All respondents (100.00%) were married.

Respondents by Marital status in Manikganj, Bangladesh		
Marital status	**Number**	**Percent**
Married	50	100.00%
Total	**50**	**100.00%**

Gender identity

There were 50 respondents from Manikganj, 25 men and 25 women.

Respondents by Gender in Manikganj, Bangladesh		
Gender	**Number**	**Percent**
Women	25	50.00%
Men	25	50.00%
Total	**50**	**100.00%**

Pregnancy and breastfeeding

None of the women respondents were pregnant nor breastfeeding.

Pregnancy and breastfeeding in Manikganj, Bangladesh		
Response	**Are you pregnant?**	**Are you breastfeeding?**
Yes	0	0.00%
No	25 (100.00%)	25 (100.00%)

Educational attainment

Thirty (60.00%) respondents had a low level of education (none, know signature, pre-school), while only 18 or 36.00% were able to reach high school. There was not much difference between men and women on the level of education attained.

Level of education by gender in Manikganj, Bangladesh							
Gender and level of education		**None**	**Know signature**	**Pre-school**	**High school**	**College**	**Total**
Women	Count	4	1	9	10	1	25
	% within gender	16.00%	4.00%	36.00%	40.00%	4.00%	100.00%
Men	Count	5	1	10	8	1	25
	% within gender	20.00%	4.00%	40.00%	32.00%	4.00%	100.00%
Total	**Count**	**9**	**2**	**19**	**18**	**2**	**50**
	% within gender	**18.00%**	**4.00%**	**38.00%**	**36.00%**	**4.00%**	**100.00%**

Household relations

Households with children

Twenty-three (46%) respondents had two children in their households. Only one (2%) had the largest number of children – 10 – in the household.

Number of children in households in Manikganj, Bangladesh		
Number of children	**Frequency**	**Percent**
1	7	14.00%
2	23	46.00%
3	12	24.00%
4	6	12.00%
5	1	2.00%
10	1	2.00%
Total	**50**	**100.00%**

Eighteen (18) or 36.00% of the households had children 5 years old and below, and 31 (62.00%) households had children aged 6 to 12 years.

Households with children under 17 in Manikganj, Bangladesh		
Number of children	**Number of HH**	**Percent within total number of HHs**
Under 5	18	36.00%
6 to 12	31	62.00%
13 to 17	21	42.00%

*Multiple responses were allowed; thus, the totals do not correspond to the number of respondents.

Households with elderly members

There were 16 households with elderly members aged 65 and above. This comprised 32.00% of the total households surveyed.

Households with elderly members in Manikganj, Bangladesh		
With elderly members	**Number of HH**	**Percent within total number of HHs**
Elderly members	16	32.00%

Number of household members

Most of them were living in households with 4 to 5 members (54.00%), while the smallest household size was three (3) and the biggest household size was 18.

Total number of household (HH) members in Manikganj, Bangladesh		
HH members	**Number**	**Percent**
3	3	6.00%
4	14	28.00%
5	13	26.00%
6	9	18.00%
7	4	8.00%
8	4	8.00%
9	2	4.00%
18	1	2.00%
Total	**50**	**100.00%**

Income and Employment

Nature of employment

All respondents were self-employed in agriculture.

What is your means of living in Manikganj, Bangladesh		
Means of living	**Number**	**Percent**
Employed	0	0.00%
Self-employed	50	100.00%

Family income

Most respondents reported their income from cropping: male respondents earned an average of 1509.74 compared to 920.13USD average earning for female respondents. There was a 48.53% gap between the income of male and female respondents.

Average Income by Gender in USD in Manikganj, Bangladesh					
Period earning received	**Male**		**Female**		**% Difference**
	Number of respondents	**Average Income**	**Number of respondents**	**Average Income**	
per month	3	115.74	1	19.84	141.46%
per cropping	22	1509.74	24	920.13	48.53%

Thirty-seven (37) or 74.00% of the total 50 respondents reported that there were other household members who were also earning income for the household. Among these, all women respondents (100%) reported that their husbands or sons were also earning income for the household.

On the other hand, 12 out of the total men respondents or 48.00% said that their sons helped earn for their household. The other half of the men respondents (52.00%) indicated that there were no other household members earning income aside from them.

Other household members earning income by gender in Manikganj, Bangladesh				
Other household members earning income		Yes	No	Total
Women	Count	25	0	25
	% within gender	100.00%	0.00%	100.00%
Men	Count	12	13	25
	% within gender	48.00%	52.00%	100.00%
Total	**Count**	37	13	50
	% within gender	**74.00%**	**26.00%**	**100.00%**

Qualitative perception of income

Almost half (23 or 46.00%) of the respondents perceived that they earned more income compared to three years ago, while 10 (20.00%) said that they earned the same, and 16 (32.00%) said that they had less income. Among women, 48% said that they had more income while 32% had the same income.

Perception of income by gender in Manikganj, Bangladesh						
Perception of income		More income	Same income	Less income	No answer	Total
Women	Count	12	8	5	0	25
	% within gender	48.00%	32.00%	20.00%	0.00%	100.00%
Men	Count	11	2	11	1	25
	% within gender	44.000%	8.00%	44.00%	4.00%	100.00%
Total	**Count**	**23**	**10**	**16**	**1**	**50**
	% within gender	**46.00%**	**20.00%**	**32.00%**	**2.00%**	**100.0%**

b. Cumilla District

Age

Majority of the respondents were aged 36 to 59 (57.14%). Eleven (11) or 22.45% were aged 18 to 35.

Respondents by Age Group in Cumilla, Bangladesh		
	Number	Percentage
18 to 35 years old	11	22.45%
36 to 59 years old	28	57.14%
60 years old and above	9	18.37%
No answer	1	2.04%
Total	**49**	**100.00%**

Marital status

Majority of the respondents (89.80%) were married.

Respondents by Marital status in Cumilla, Bangladesh		
Marital status	**Number**	**Percentage**
Single (never married)	2	4.08%
Married	44	89.80%
Widowed and not remarried	3	6.12%
Total	**49**	**100.00%**

Gender identity

There were 49 respondents from Cumilla, 24 (48.98%) men and 25 (51.02%) women.

Respondents by Gender in Cumilla, Bangladesh		
Gender	**Number**	**Percent**
Women	25	51.02%
Men	24	48.98%
Total	**49**	**100.00%**

Pregnancy and breastfeeding

None of the respondents reported pregnancy while only one was breastfeeding.

Pregnancy and breastfeeding in Cumilla, Bangladesh		
Response	**Are you pregnant?**	**Are you breastfeeding?**
Yes	0 (0.00%)	1 (4.00%)
No	25 (100.00%)	0 (0.00%)

Educational attainment

Forty percent (40.82%) of the respondents did not have any formal education, while only 17 or 34.69% were able to attend elementary. There were also more women who had a low level of education compared to men. There were 10 men (41.67%) who were able to reach high school, and one (1, 4.17%) who was able to reach college, while none for women.

Level of education by gender in Cumilla, Bangladesh							
Gender and level of education		None	Pre-school	Elementary	High school	College	Total
Women	Count	13	1	11	0	0	25
	% within gender	52.00%	4.00%	44.00%	0.00%	0.00%	100.00%
Men	Count	7	0	6	10	1	24
	% within gender	29.17%	0.00%	25.00%	41.67%	4.17%	100.00%
Total	**Count**	**20**	**1**	**17**	**10**	**1**	**49**
	% within gender	**40.82%**	**2.04%**	**34.69%**	**20.41%**	**2.04%**	**100.00%**

Household relations

Number of household members

Most of them were living in households with 4 to 6 members (63.27%). Twelve (12) or 24.49% of the households had children 5 years old and below, and 17 (34.69%) of the households had children aged 6 to 12 years, 26 households or 53.06% had children aged 13 to 17.

Total number of household (HH) members in Cumilla, Bangladesh		
Household members	Frequency	Percent
2	1	2.04%
3	5	10.20%
4	9	18.37%
5	10	20.41%
6	12	24.49%
7	6	12.24%
8	3	6.12%
9	3	6.12%
Total	**49**	**100.0**

Households with children under 17 in Cumilla, Bangladesh		
Number of children	Number of HH	Percent within total number of HHs
Under 5	12	24.49%
6 to 12	17	34.69%
13 to 17	26	53.06%

Income and Employment

Nature of employment

Almost all respondents (97.96%) were self-employed and one respondent (2.04%) did not answer.

Income

Most of the respondents reported their income by cropping where male respondents reported an average of 1710.25USD income compared to 781.60USD average income per cropping of female respondents. This showed a 74.53% difference in the wage gap between males and females, in favour of the former.

Average Income by Gender in Cumilla, Bangladesh					
	Male		Female		
	Number of respondents	Average Income	Number of respondents	Average Income	Differences
per day	0	NA	1	2.00	NA
per cropping	24	1710.25	20	781.60	74.53%
No answer/ incomplete answers	0	NA	2	NA	NA

** One female respondent indicated 24,990 per cropping and another female respondent indicated 100,000 per cropping. These two responses were excluded from the computation.*

Twenty-five of the 49 respondents (51.02%) reported that there were other household members who were earning income. Of these, 68.00% (17) of women respondents reported that someone else was also earning income for the household but did not identify whose household member. Eight male (33.33%) respondents said that someone else was also earning in their household. The majority of the men respondents (66.67%) indicated that there were no other household members earning income aside from them.

Is someone else earning income in the household? In Cumilla, Bangladesh					
		Yes	No	No answer	Total
Women	Count	17	6	2	25
	% within gender	68.00%	24.00%	8.00%	100.00%
Men	Count	8	16	0	24
	% within gender	33.33%	66.67%	0.00%	100.00%
Total	**Count**	**25**	**22**	**2**	**49**
	% within gender	**51.02%**	**44.90%**	**4.08%**	**100.00%**

Qualitative perception of income

Seven (7) out of 10 of the respondents perceived that they earned less income compared to three years ago, while 26.53% said that it was the same. Women are reporting a perception of less income (18 out of 25) compared to 15 out of 24 among men.

Perception of income in Cumilla, Bangladesh					
		Same income	Less income	No answer	Total
Women	Count	3	18	2	25
	% within gender	12.00%	72.00%	8.00%	100.00%
Men	Count	8	15	1	24
	% within gender	33.33%	62.50%	4.17%	100.00%
Total	**Count**	**13**	**33**	**3**	**49**
	% within gender	**26.53%**	**67.35%**	**6.12%**	**100.00%**

II. INDIA

a. Yavatmal District

Respondents by Age Group in Yavatmal, India		
Age Group	Number	Percentage
18 to 35 years old	17	25.76%
36 to 59 years old	41	62.12%
60 years old and above	8	12.12%
Total	**66**	**100.00%**

Marital status

Most of the respondents were married. Among the female respondents, all of them were married and two were widows. Only a few (6, 9.09%) among the male respondents were single who were mostly in the younger age bracket.

Respondents by Marital status in Yavatmal, India		
Marital status	**Number**	**Percentage**
Single (never married)	6	9.09%
Married	53	80.30%
Married but separated	1	1.52%
Widowed and not remarried	5	7.58%
No answer	1	1.52%
Total	**66**	**100.00%**

Gender identity

A substantial number of respondents were male (50 or 75.76%) compared to 16 females (24.24%).

Respondents by Gender in Yavatmal, India		
Gender	**Number**	**Percent**
Women	16	24.24%
Men	50	75.76%
Total	**66**	**100.00%**

Ethnic groups or Tribes

All of the respondents from Yavatmal District or 66 of them came from various ethnic groups and Adivasis (India's indigenous peoples). Many of them belong to the ethnic group (Banjara), 23 or 34.85% VJ-A, and 6 or 9.84% of VJ/NT group. Adivasis is Kolam (16 or 24.24%).

They are categorised in the various lists of Vimukta Jati and Nomadic Tribes (VJ/NT), Scheduled Tribes (ST) or Other Backward Classes (OBC). The list is important among the communities since it indicates affirmative action and access to all other services including education, jobs, scholarships, and political representation.

Ethnic Groups/ Tribes by Gender in Yavatmal, India						
ETHNIC GROUPS/ TRIBES	Female		Male		Total	
	Number	% within Gender	Number	% within Gender	Number	% within Gender
Banjara - VJ-A	7	43.75%	16	32.00%	23	34.85%
Banjara – VJ/NT	1	6.25%	5	10.00%	6	9.09%
Kolam (Scheduled Tribe/ ST)	4	25.00%	12	24.00%	16	24.24%
Other Backward Classes (OBC)	0	0.00%	4	8.00%	4	6.06%
Gond Adivashi	0	0.00%	1	2.00%	1	1.52%
Mana Samaj (Scheduled Tribe/ ST)	0	0.00%	3	6.00%	3	4.55%
Vimukta Jati – A	1	6.25%		0.00%	1	1.52%
VJNT – Vimukta Jati and Nomadic Tribes (VJ/NT)	3	18.75%	9	18.00%	12	18.18%
TOTAL	**16**	**100.00%**	**50**	**100.00%**	**66**	**100.00%**

Pregnancy and breastfeeding

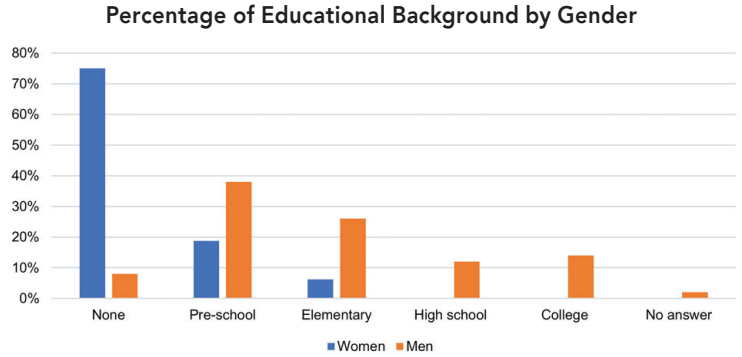
None of the women respondents were pregnant nor breastfeeding.

Pregnancy and breastfeeding in Yavatmal, India		
Response	Are you pregnant?	Are you breastfeeding?
Yes	0 (0.00%)	0 (0.00%)
No	16 (100.00%)	16 (100.00%)

Educational attainment

The male respondents reached the basic level of education (pre-school and elementary). The data showed a large discrepancy among male and female respondents, where the males were able to reach college level (7, 14.00%) while most of the females (12, 75.00%) did not reach any level of education, while four of them reached just the basic level (pre-school and elementary).

Level of education by gender in Yavatmal, India								
Gender and level of education		None	Pre-school	Elementary	High school	College	No answer	Total
Women	Count	12	3	1	0	0	0	16
	% within gender	75.00%	18.75%	6.25%	0.00%	0.00%	0.00%	100.00%
Men	Count	4	19	13	6	7	1	50
	% within gender	8.00%	38.00%	26.00%	12.00%	14.00%	2.00%	100.00%
Total	**Count**	**16**	**22**	**14**	**6**	**7**	**1**	**66**
	% within gender	**24.24%**	**33.33%**	**21.21%**	**9.09%**	**10.61%**	**1.52%**	**100.00%**



Educational background, by gender, by level

Household relations

Households with children

A large number (23, 34.85%) had four children living in the household, while 10 (15.15%) had no children living in the household.

Number of children in households in Yavatmal, India		
Number of children	Frequency	Percent
0	10	15.15%
1	4	6.06%
2	9	13.64%
3	9	13.64%
4	23	34.85%
5	7	10.61%
6	4	6.06%
Total	**66**	**100.00%**

Thirty-seven (48.48%) of the households had children under 17 years old. There were 8 households with children under 5 years old; 14 households with children 6 to 12 years old; and 15 households with children 13 to 17 years old.

Households with children under 17 in Yavatmal, India		
Number of children	Number of HH	Percent within total number of HHs
Under 5	8	12.12%
6 to 12	14	21.21%
13 to 17	15	15.15%
Total	**37**	**48.48%**

Households with elderly members

There were nine (9) or 13.64% of the total households with elderly members aged 65 and above.

Households with elderly members in Yavatmal, India		
With elderly members	Number of HH	Percent within total number of HHs
Elderly members	9	13.64%

Number of household members

Most of them were living in households with 5 members (29 or 43.94%). The smallest household size was 2 and the biggest household size was 7.

Total number of household (HH) members in Yavatmal, India		
Household members	Number	Percent
2	5	7.58%
3	11	16.67%
4	10	15.15%
5	29	43.94%
6	5	7.58%
7	5	7.58%
No answer	1	1.52%
Total	**66**	**100.00%**

Income and Employment

Nature of employment

All respondents were self-employed in agriculture.

What is your means of living in Yavatmal, India?		
Means of living	**Number**	**Percent**
Employed	0	0.00%
Self-employed	66	100.00%

Family income

In their actual earnings per day, there was a wage gap of 25.42% between female and male respondents who received USD 2.3 and USD 2.97 daily wage respectively. However, with their per week and per cropping earnings, the female respondents' earnings were higher than their male counterparts, with 40.87% difference and 22.48% difference respectively. After discussions with the community, the researchers from PAN India mentioned that even though the women workers were receiving less wages per day, they were working longer hours and more days per week and during the cropping season, thus were having more income.

Average Income by Gender in USD in Yavatmal, India					
Period of earning received	**Male**		**Female**		**% Difference**
	Number of respondents	**Average Income**	**Number of respondents**	**Average Income[15]**	
per day	24	3.10	3	2.47	22.62%
per week	5	10.26	3	11.25	9.20%
per cropping	17	1752.94	8	2088.00	17.45%
No answer/ incomplete answers	4		2		

per day and per week converted from INR to USD
** Average exchange rate in 2021: 0.0135 USD*
** https://www.exchangerates.org.uk/INR-USD-spot-exchange-rates-history-2021.html*
Note: per kharif cropping season of rice, coffee, soybeans, cotton is from June to October

[15] In getting the wage gap, the percentage difference formula was used, dividing the absolute value of change by the average of the values and then multiplying it with 100. Thus: (%D) = n1-n2/(n1+n2)/2 x 100, where n1 and n2 are the two different values.

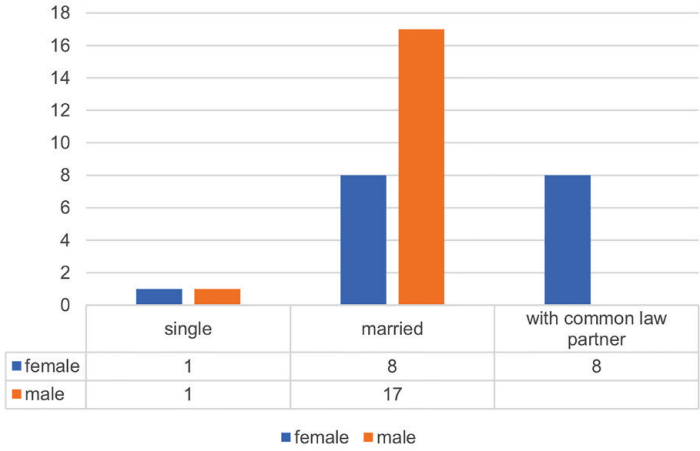
b. Wayanad District

The respondents

A survey among 35 farmers was undertaken in Wayanad district of Kerala. There were 17 female and 18 male respondents. Majority of the respondents or 74.28% were under the 36-59 age group.

Number of Wayanad respondents, by gender, by age in Wayanad, India				
Respondents	18-35 age	36-59 age	60-up age	TOTAL
	No/ %	No./ %	No./ %	No./ %
Female	1 (2.86%)	14 (40%)	2 (5.71%)	17 (48.57%)
Male	2 (5.71%)	12 (34.28%)	3 (8.57%)	18 (51.43%)
Total	**3 (8.57%)**	**26 (74.28%)**	**5 (14.28%)**	**35 (100%)**

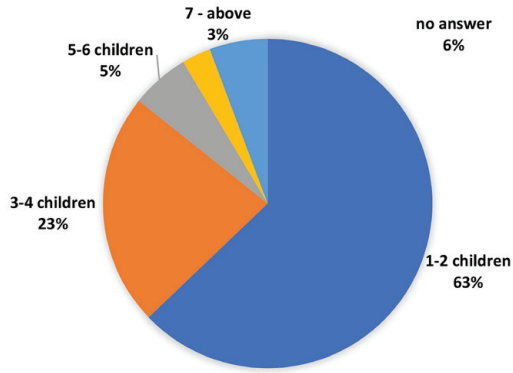
Almost all (33, 94.28%) of the respondents were married or were living with a common-law partner. Only two (5.72%) among the respondents were single. All of the 17 female respondents were neither pregnant nor breastfeeding.



Number of respondents, by status

Majority (63%) of the respondents had 1-2 children, followed by 23% who had three to four children, while 3% had more than seven children.

No one among the female respondents was pregnant or was breastfeeding.



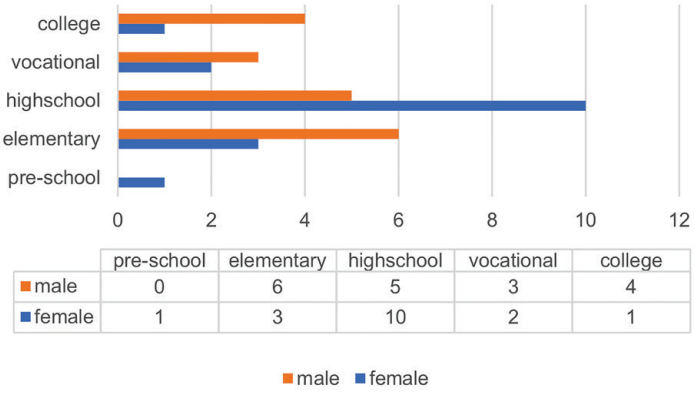
Number of children of Wayanad respondents

In taking care of their children or household members among the younger group of 0-17 years old, five of the 17 female respondents acknowledged their spouses/partners as the primary responsible persons. Among the 18-64 household members, eight of the 17 female respondents recognised the role of their spouses in taking care of the household and family members. Significantly, no respondents articulated a shared responsibility of the household and childcare.

On the Responsibility of Childcare and Household (multiple answers) in Wayanad, India

Person Responsible	Female			Male		
	0-17 y.o. children	18-64 y.o. adults	elderly	0-17 y.o. children	18-64 y.o. adults	elderly
sole	3 (8.57%)	8 (22.85%)	2 (5.71%)	7 (20%)	13 (37.14%)	4 (11.43%)
spouse	5 (14.28%)	8 (22.85%)	4 (11.43%)	0	0	0
both	0	0	0	0	0	0
our elders	0	0	0	1 (2.86%)	1 (2.86%)	1 (2.86%)
No one	0	0	0	0	0	0
No Answer (NA)	9 (25.71%)	1 (2.86%)	11 (31.42%)	10 (28.57%)	4 (11.43%)	13 (37.14%)
TOTAL	**17 (48.56%)**	**17 (48.56%)**	**17 (48.56%)**	**18 (51.43%)**	**18 (51.43%)**	**18 (51.43%)**

All the Wayanad respondents were literate. Notably, male respondents obtained a higher level of education, reaching college level (4 male respondents) compared to their female counterparts (one female respondent). Most of the 10 female respondents reached the high school level compared to their male counterparts (five male respondents).



	pre-school	elementary	highschool	vocational	college
male	0	6	5	3	4
female	1	3	10	2	1

Educational background by gender, by level

Economic Status

All of the respondents were working. Of the total 35 respondents, 12 (34.28%) of the female respondents and 11 (31.43%) male respondents were self-employed. On the other hand, 11 (31.43%) of the respondents were employed.

Frequency of Employment, by Gender in Wayanad, India			
employment	female	male	TOTAL
self-employed	12 (34.28%)	11 (31.43%)	23 (65.71%)
employed	4 (11.43%)	7 (20.00%)	11 (31.43%)
refused to answer	0	0	0
no answer	1 (2.86%)	0	1 (2.86%)
TOTAL	**17 (48.57%)**	**18 (51.43%)**	**35 (100.00%)**

Based on the data gathering of Thanal in Kerala, the average monthly per capita income was around 168 US dollars (Rs.12,463.58) but for the surveyed population in Wayanad, the average income was around 141 US dollars (Rs. 10472.42). The existing condition can be the micro-level example of the 2011 Socio-Economic and Caste Census (SECC), which highlighted the residents of Wayanad as the lowest earning district in Kerala (State Planning Board 2020).

Particularly on the interviewed respondents, the wage gap between female and male respondents was 47.56% (per day), 37.18% (per cropping), and bigger in the monthly income with 61.14%, all in favour of the male wage earners.

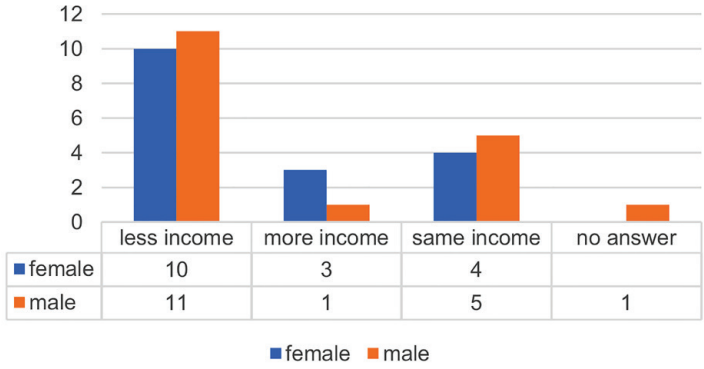
Average Income by Gender in Wayanad, India

Period of earning received	Male		Female		% Difference
	Number of respondents	Average Income	Number of respondents	Average Income	
per day	3	6.35	1	3.91	47.56%
per week	0	0.00	1	6.67	-
per month	6	265.68	12	141.27	61.14%
per cropping	4	798.43	2	548.12	37.18%
No answer/ incomplete answers	5	-	1	-	-

Note: per kharif cropping season of rice, coffee, soybeans, cotton is from June to October

Three female respondents mentioned that their husbands helped in their family income while one female respondent said her son helped in earning for the family. Meanwhile, four male respondents said that their wives helped in the family income and two male respondents stated that their sons augmented their family budget.

Majority (21, 60%) of the 35 respondents perceived that they had less income compared to three years ago and only four and nine respondents viewed that they obtained more income and the same income, respectively.



Perception on income, by gender

III. LAOS

Age

Majority of the respondents were aged 36 to 59 years old (39, 60.94%).

Respondents by Age Group in Longpiew and Koimor, Laos		
Age Group	**Number**	**Percent**
18 to 35 years old	19	29.69
36 to 59 years old	39	60.94
60 years old and above	6	9.37
Total	**64**	**100.00**

Marital status

The majority of the respondents, 57 (89.06%) were married.

Respondents by Marital status in Longpiew and Koimor, Laos		
Marital status	**Number**	**Percent**
Married	57	89.06
Single (Never Married)	4	6.25
Widowed and not remarried	2	3.13
Married but separated	1	1.56
Total	**64**	**100.00**

Gender identity

There were 64 respondents from Longpiew and Koimor, where the majority (38, 59.37%) were women and 26 (40.63%) were men.

Respondents by Gender in Longpiew and Koimor, Laos		
Gender	**Number**	**Percent**
Women	38	59.37
Men	26	40.63
Total	**64**	**100.00**

Pregnancy and breastfeeding

One woman was pregnant and another was breastfeeding.

Pregnancy and breastfeeding in Longpiew and Koimor, Laos		
Response	**Are you pregnant?**	**Are you breastfeeding?**
Yes	1 (2.63%)	1 (2.63%)
No	37 (97.47%)	37 (97.47%)

Educational attainment

A large number of both male (16, 61.54%) and female (18, 47.37%) respondents finished high school.

Only a small percentage of the respondents had low educational attainment (No education in Preschool). Seven (10.94%) of the respondents went to college. There was not much difference between men and women on the level of education attained.

Level of education by gender in Longpiew and Koimor, Laos									
		No Answer	**None**	**Pre-school**	**Elementary**	**High school**	**Vocational**	**College**	**Total**
Women	Count	1	1	2	12	18	0	4	38
	% within gender	2.63	2.63	5.36	31.58	47.37	0.00	10.53	100.00%
Men	Count	0	0	1	4	16	2	3	26
	% within gender	0.00	0.00	3.85	15.38	61.54	7.69	11.54	100.00%
Total	**Count**	**1**	**1**	**3**	**16**	**34**	**2**	**7**	**64**
	% within gender	**1.56**	**1.56**	**4.68**	**25.00**	**53.12**	**3.13**	**10.94**	**100.00%**

Household relations

Households with children

Most households (22) had two children. There were also 13 households without any children and one household with seven children.

Number of children in households in Longpiew and Koimor, Laos	
	Frequency
0	13
1	10
2	22
3	8
4	6
5	1
6	3
7	1
Total	**64**

Households with elderly members

There were only four households with elderly members aged 65 and above. This comprised 6.25% of the total households surveyed.

Households with elderly members in Longpiew and Koimor, Laos		
	Number of HH	Percent within total number of HHs
Elderly members	4	6.25%

Number of household members

Most of them were living in households with four members (23.44%), while the smallest household size was three (2) and the biggest household size was 18.

Total number of household (HH) members in Longpiew and Koimor, Laos		
	Number	Percent
2	1	1.56
3	4	6.25
4	15	23.44
5	11	17.19
6	12	18.75
7	9	14.06
8	6	9.38
9	4	6.25
11	1	1.56
18	1	1.56
Total	**64**	**100.00**

Income and Employment

Nature of employment

Majority (53, 82.81%) of the respondents were self-employed in agriculture. Eleven (17.19%) of the respondents were employed.

What is your means of living in Longpiew and Koimor, Laos?		
	Number	Percent
Employed	11	17.19
Self-employed	53	82.81

Family income

According to the data, the average monthly income of the respondents was 113 USD per month, and about 1115 USD a year. Usually, one to two members of the household shared household expenses by working in the field and seeking other jobs available such as retail stores and sewing or weaving. Also, according to secondary data, household income was about 200-300 USD in a month.

Based on the survey, the wage gap was evident among the male and female respondents, in favour of the male. The gap was so wide, in the monthly income (41.31%) and in the yearly income (96.85%).

Average Income by Gender in Longpiew and Koimor, Laos					
	Male		Female		% Difference
	Number of respondents	Average Income	Number of respondents	Average Income	
per month	17	158.13	28	95.39	41.31%
per cropping	NA	NA	1	50	NA
per year	9	1562.33	7	542.86	96.86%
No answer /incomplete answers	0	0	2	0	0

Qualitative perception of income

Fifty-five (85.94%) of the respondents, both men and women, said that on a qualitative perspective, their income stayed the same compared to three years ago. Seven answered that they had more income while two said they had less income.

Perception of income by gender in Longpiew and Koimor, Laos						
		More income	Same income	Less income	No answer	Total
Women	Count	2	36	0	0	38
	% within gender	5.26	94.73	0.00	0.00	100.00%
Men	Count	5	19	2	0	26
	% within gender	19.23	73.07	7.69	0.00	100.00%
Total	**Count**	**7**	**55**	**2**	**0**	**64**
	% within gender	**10.94**	**85.94**	**3.13**	**0.00**	**100.0%**

The survey was conducted with members of the community from Longpiew and Koimor villages, Kham district, Xieng Khouang province, Laos. These villages are about 450 Km from Vientiane capital. These villages are in the middle of rice paddies with good irrigation, and are at least 10 kilometres away from the nearest town.

There is also microfinancing in the villages, where representatives from the Women's Union are involved in the management committee. Fund is used for loans for agriculture and women's sewing, aiming to reduce poverty among villagers. Middlemen and traders also exist, but some farmers opt to take some of their products to the market themselves. According to SAEDA, the literacy rate is 60% for men and 40% for women, which may be attributed to economic growth.

IV. VIETNAM

a. Hai Hau District

The majority (27, 51.92%) of the respondents were senior or elderly, followed by the middle-aged group (22, 42. 31%).

Age

Respondents by Age Group in Hai Cuong and Hai Phuong communes, Vietnam		
Age Group	**Number**	**Percent**
18 to 35 years old	1	1.92%
36 to 59 years old	22	42.31%
60 years old and above	27	51.92%
No answer	2	3.85%
Total	**52**	**100.00%**

Marital status

A large majority (42, 80.77%) of the respondents were married and only two (3.85%) were single.

Respondents by Marital status in Hai Cuong and Hai Phuong communes, Vietnam		
	Number	**Percent**
Married	42	80.77
Single (Never Married)	2	3.85
Living with a partner (cohabiting)	5	9.61
No answer	3	5.77
Total	**52**	**100.00**

Gender identity

There were 52 respondents from Hai Cuong and Hai Phuong communes, 27 women and 25 men. None were pregnant or breastfeeding.

Respondents by Gender in Hai Cuong and Hai Phuong communes, Vietnam		
	Number	Percent
Women	27	51.92
Men	25	48.08
Total	**52**	**100.00**

Educational attainment

Half (34, 65.38%) of the respondents finished High School. Only a small percentage of the respondents had low educational attainment (No education in Preschool). There was not much difference between men and women on the level of education attained.

Level of education by gender in Hai Cuong and Hai Phuong communes, Vietnam						
		No Answer	Elementary	High school	College	Total
Women	Count	0	2	25	0	27
	% within gender	0	7.41	92.59	0	100.00%
Men	Count	1	1	22	1	25
	% within gender	4.00	4.00	88.00	4.00	100.00%
Total	**Count**	**1**	**16**	**34**	**1**	**52**
	% within gender	**1.92**	**30.77**	**65.38**	**1.92**	**100.00%**

Household relations

Households with children

Most of the respondents (37, 71.15%) did not provide an answer on the number of children in their households. Among those who did, the households did not have more than three children in the households.

Number of children in households in Hai Cuong and Hai Phuong communes, Vietnam		
	Frequency	Percent
No answer	37	71.15
1	7	13.46
2	4	7.69
3	4	7.69
Total	**52**	**100.00%**

Households with elderly members

Like any Asian household, Vietnamese respondents had reflected the caring for the elderly in the family. Twenty (38.62%) said that they had one elderly in their household, while 10 (19.23%) had two elderly members in their household. A significant number (18, 34.62%) did not provide any answer.

Number of elderly members in households in Hai Cuong and Hai Phuong communes, Vietnam		
	Frequency	Percent
No answer	18	34.62
1	20	38.46
2	10	19.23
3	2	3.85
4	2	3.85
Total	**52**	**100.00%**

Number of household members

Sixteen (30.77%) of the households were living with just one member, while 10 (19.23%) had two household members. The largest household is composed of six members.

Total number of household (HH) members in Hai Cuong and Hai Phuong communes, Vietnam		
	Number	Percent
1	16	30.77
2	10	19.23
3	8	15.38
4	7	13.46
5	5	9.62
6	3	5.77
No answer	3	5.77
Total	**52**	**100.00**

Income and Employment

Nature of employment

All the respondents stated that they were self-employed, and that all 52 respondents worked on land.

What is your means of living in Hai Cuong and Hai Phuong communes, Vietnam?		
	Number	Percent
Employed	0	0.00
Self-employed	52	100.00

Family income

According to CGFED, the average per capita income in the Hai Hau district was approximately 70 million VND/ year. The average income was measured by dividing the total income by the total population.

From the interviews, a relatively wide range of income in US Dollars was reported. Income per cropping ranged from 431 USD to 3000 USD. In addition, more than one-third of the respondents said that they had the same income in the last three years. Seventeen of 52 said that they got more income, while the remaining 15 said that they had less income compared to three years ago.

Based on the survey results, women received higher monthly income than men, with a 43.77% difference. The opposite could be seen in the per cropping income where there was a 27.93% difference in favour of the men.

Average Income by Gender in USD in Hai Cuong and Hai Phuong communes, Vietnam					
	Male		Female		% Difference
	Number of respondents	Average Income	Number of respondents	Average Income	
per month	19	351.83	25	549.00	43.77%
per cropping	6	1438.05	2	1085.61	27.93%

Qualitative perception of income

Nineteen (36.54%) perceived that they received the same income for three years, while 17 (32.69%) considered themselves getting more income compared to three years ago.

Perception of income by gender in Hai Cuong and Hai Phuong communes, Vietnam						
		More income	Same income	Less income	No answer	Total
Women	Count	11	9	7	0	27
	% within gender	40.74	33.33	25.93	0	100.00%
Men	Count	6	10	8	1	25
	% within gender	24.00	40.00	32.00	4.00	100.00%
Total	**Count**	**17**	**19**	**15**	**1**	**52**
	% within gender	**32.69**	**36.54**	**28.85**	**1.92**	**100.00%**

b. Thuan Chau District

Age

There were 51 respondents interviewed in the two districts. Half of them (25 respondents) were 36-59 years old, while 23 respondents belonged to the younger age group (18-35 years old). Only three interviewees were elderly.

Respondents by Age Group in Thuan Chau District, Vietnam		
Age Group	**Number**	**Percent**
18 to 35 years old	23	45.1
36 to 59 years old	25	49.02
60 years old and above	3	5.88
Total	**51**	**100**

Marital status

The majority (48, 94.12%) of the respondents were married, and only two were widowed and had not remarried.

Respondents by Marital status in Thuan Chau District, Vietnam		
	Number	**Percent**
Married	48	94.12
Widowed and not remarried	2	3.922
NA	1	1.96
Total	**51**	**100.00**

Gender identity

As agreed, upon in the research methodology, half of the respondents were female and half were male. However, two survey respondents failed to mention their gender identity.

Respondents by Gender in Thuan Chau District, Vietnam		
	Number	**Percent**
Female	25	49.02
Male	24	47.06
NA	2	3.92
Total	**51**	**100**

Pregnancy and breastfeeding

None of the respondents were pregnant, while two respondents were breastfeeding.

Educational attainment

A significant number of female respondents (10, 40%) registered a higher level of education (High school) than their male counterparts (5, 20.83%). The biggest number of male respondents (9, 37.5%) obtained the elementary level, however, two (8.88%) had reached college/ vocational level.

Level of education by gender in Thuan Chau District, Vietnam (N=49= 100%) *

		None	Preschool	Elementary	High school	College/ Vocational	Total
Women	Count	6	3	6	10	0	25
	% within gender	24%	12%	24%	40%	0	100%
Men	Count	1	7	9	5	2	24
	% within gender	4.17%	29.17%	37.5%	20.83%	8.88%	100%

* - 2 respondents without gender identity information excluded

Household relations

A typical household had an average of four to five members. Only three mentioned that they were the sole breadwinner of the household, while the majority said that their husbands and other family members also worked. Men and women shared responsibility in caring for the young children, the sick, and the elderly.

Households with children

Most households (23, 45.10%) had two children.

Number of children in households in Thuan Chau District, Vietnam		
No children	**Frequency**	**Percentage**
1	5	9.80%
2	23	45.10%
3	13	25.49%
4	4	7.84%
5	3	5.88%
6	1	1.96
7	1	1.96
8	1	1.96

Households with elderly members

There were only seven households with elderly members aged 65 and above. This comprised 13.73% of the total households surveyed.

Households with elderly members in Thuan Chau District, Vietnam		
	Number of HH	**Percent within total number of HHs**
Elderly members	7	13.73%

Number of household members

Most of the respondents were living in households with four to five members, while the smallest household size was two (1) and the biggest household size was 11.

Total number of household (HH) members in Thuan Chau District, Vietnam		
# HH members	Number	Percentage
2	1	1.96%
3	5	9.80%
4	13	25.49%
5	13	25.49%
6	5	9.80%
7	5	9.80%
8	3	5.88%
9	1	1.96%
11	1	1.96%
No answer	4	7.84%
Total	**51**	**100%**

Income and Employment

Nature of employment

All the respondents who answered (47 out of 51, 92.16%) worked on land, and considered themselves self-employed.

Is someone else earning in the household in Thuan Chau District, Vietnam?		
	Number	Percent
Yes	47	92.16%
No	3	5.88%
No answer	1	1.96%

How many are working in the house in Thuan Chau District, Vietnam?		
	Number	Percent
Employed	0	0.00%
Self-employed	48	94.12%
No answer	3	5.88%

Family income

There was a need to counter check the accuracy of income as there was a huge range of income reported. Farmers shared that they received 500 USD to 6521 USD per cropping.

Average Income by Gender in USD in Thuan Chau District, Vietnam					
	Male		Female		% Difference
	Number of respondents	Average Income	Number of respondents	Average Income	
per day	2	222.00	3	57.00	118.28%
per cropping	21	1323.29	20	2314.90	54.51%

In qualitative perception of income, half (26 out of 51) mentioned that they received more income at present compared to three years ago. There is no significant difference between responses of male and female respondents.

Respondents by perception of income in Thuan Chau District, Vietnam				
Perception of income	Male	Female	Did not say	Total
More income	11	13	2	26
Less income	10	7	0	17
Same income	2	5	0	7
No answer	1	0	0	1
Grand Total	**24**	**25**	**2**	**51**

Situation of the district

The two communities were largely agricultural areas. Their major crops were rice, coffee, and plum. In terms of area in hectares covered, SRD provided the data below:

Annual crop yield (in tons) in Thuan Chau District, Vietnam			
Area (ha)	Rice	Coffee	Plum
Muoi Noi	54.0	344.6	221.7
Bon Phang	104.9	389.9	187.8

In addition, according to the respondents, they yielded the following amount of produce in a year.

Annual crop yield in Thuan Chau District, Vietnam	
Crops	**Yield (in a year)**
Rice	500kg- 10,000kg
Coffee	500kg- 20,000kg
Plum	0.5 - 2.5 tons

Their main livestock and number of animals per year were as follows:

Main livestock (in heads per year) in Thuan Chau District, Vietnam						
Animal	**Buffalo**	**Cow**	**Goat**	**Pig**	**Chicken**	**Duck**
Muoi Noi	49	843	903	897	17801	11720
Bon Phang	247	1296	485	1982	13520	1220

Appendices B

Explanatory notes regarding the table of HHPs

The table below is taken from the PAN International List of Highly Hazardous Pesticides, March 2021, and includes both the original JMPM criteria[16] and the additional PAN criteria Pesticides.[17]

WHO Ia:	Extremely hazardous (Class 1a) according to World Health Organisation
WHO Ib:	Highly hazardous (Class 1b) according to World Health Organisation
H330	'Fatal if inhaled', hazard classification according to the EU or Japan Globally Harmonised System (GHS)
EPA carc	Human carcinogen according to EPA
IARC carc	Human carcinogen according to IARC
GHS+ carc (1A, 1B)	Known or presumed human carcinogens (1A or 1B) according to EU or Japan GHS
EPA prob/likel carc	Probable/ likely carcinogen (including "Likely to be Carcinogenic to Humans: At High Doses" according to EPA
IARC prob carc	Probable carcinogen according to IARC
GHS+ muta (1A, 1B)	Substances known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans. Substances known to induce heritable mutations in the germ cells of humans' (Category 1A or 1B) according to EU or Japan GHS.
GHS+ repro (1A, 1B)	Known or presumed human reproductive toxicant according to EU or Japan GHS
GHS+ C2 & R2	Pesticides classified GHS Carcinogen Category 2 AND Reproductive Category 2 following EU or Japan GHS
EU EDC	Known as an endocrine disrupter according to EU assessment following Commission Regulation (EU) 2018/605
Very bio acc	Very bioaccumulative (BCF >5000) or Kow logP >5 (BCF values supersede Kow logP data)
Very pers water, soil or sediment	Very persistent in water (half-life > 60 days), soils or sediments (half-life > 180 days)
Very toxic to aq. organism	Very toxic to aquatic organisms (Acute LC/EC50 <0,1 mg/l for Daphnia species)
Highly toxic to bees	Hazard to ecosystem services – Highly toxic to bees (<2 µg/bee) according to U.S. EPA as listed by FOOTPRINT data
Montr Prot	Ozone depleting chemical according to the Montreal Protocol
PIC	Listed in Annex III of the Rotterdam Convention or meeting the criteria for being listed
POP	Listed in Annex III of the Stockholm Convention or meeting the criteria for being listed

[16] https://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/hhp/en/
[17] https://pan-international.org/wp-content/uploads/PAN_HHP_List.pdf

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.

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.

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