



SCHOOLCHILDREN'S
EXPOSURE
TO PESTICIDES
IN VIETNAM:
A STUDY IN
THREE DISTRICTS

Schoolchildren's Exposure to Pesticides in Vietnam:

A Study in Three Districts



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Community Pesticide Action Monitoring and reporting conducted by:

Research Centre For Gender, Family and Environment In Development (CGFED)

Sustainable Rural Development (SRD) and the Phu Luong District Agricultural Extension Station

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Summary

Children are more vulnerable to the harmful effects of pesticides than adults. Rural children, in particular, are at higher risk since they are living close to agricultural zones and fields where pesticides are widely used. This study—a combination of two studies conducted by PAN Asia Pacific (PANAP) partners—shows that in rural Vietnam, schoolchildren are often exposed to pesticides even inside their schools, which are often located within one kilometer away from agricultural lands where pesticides are being used.

Children are more vulnerable to the harmful effects of pesticides than adults. Rural children, in particular, are at higher risk since they are living close to agricultural zones and fields where pesticides are widely used. This study—a combination of two studies conducted by PAN Asia Pacific (PANAP) partners—shows that in rural Vietnam, schoolchildren are often exposed to pesticides even inside their schools, which are often located within one kilometer away from agricultural lands where pesticides are being used.

In 2018, the Research Centre For Gender, Family and Environment In Development (CGFED) conducted a Community Based Pesticide Action Monitoring (CPAM) study to document the health impacts of pesticides on schoolchildren in Hai Hau District and Nghia Hung District in Nam Dinh Province, North Vietnam. A total of 140 junior high school pupils from schools that are surrounded by rice fields were interviewed. Also in 2018, the Sustainable Rural Development (SRD), together with the Phu Luong District Agricultural Extension Station and school authorities initiated a CPAM study in Phu Luong District, Northeast Vietnam. A total of 80 school students and 20 teachers were interviewed from schools that are located within agricultural villages.

Previous studies cited in PANAP's Poisoning Our Future: Children and Pesticides show that

Highly Hazardous Pesticides (HHPs) cause neurobehavioral deficits, allergies, and reproductive problems in children. Girls are even more vulnerable to pesticides. Exposure to pesticides causes early puberty, menstrual irregularities, uterine fibroids, endometriosis, and infertility.

Findings from this study has documented that children have reported various health symptoms such as dizziness, headache, vomiting, and fatigue after being exposed to pesticides sprayed from nearby fields, which reach their schools and homes. Children help their parents purchase and spray pesticides. Children are also reported to mix and spray pesticides themselves. Due to lack of designated play areas, children also play in the fields where their parents work and pesticides are sprayed. Teachers reported that the HHPs such as glyphosate, paraquat, chlorpyrifos, thiamethoxam, cypermethrin, hexaconazole and fipronil are commonly used in these fields.

Based on these findings, there is a strong need for rural children to be protected from pesticides in their schools, homes and environment. We encourage the government to phase-out or ban Highly Hazardous Pesticides that are toxic to children, and to support the adoption of agroecological methods in farms surrounding the schools.

Key findings

a. Schoolchildren are exposed to Highly Hazardous Pesticides in their environment, homes, and schools.

In Hai Hau and Nghia Hung Districts

- An overwhelming majority or 98.6% of students reported that they were exposed to the pesticides in their homes and schools. They were exposed to pesticides through various ways, such as playing in the fields after pesticides were sprayed (66%), purchasing and selling pesticides when told by parents (48.6%), and washing pesticide spraying tanks or equipment (33%).
- Eighty percent of students reported inhaling pesticides drift and spray droplets.

In Phu Luong District

- Of the surveyed students, 93.7% reported that they detected the smell of pesticides after pesticides were sprayed, and 91.2% observed pesticides being sprayed near them.
- One-thirds or 32.5% of schoolchildren re-entered newly sprayed fields to assist their parents in various farming tasks, such as picking tea leaves and harvesting vegetables.
- There were 11.2% of children who reported mixing pesticides with their bare hands, while 12.5% helped their parents purchase pesticides.

b. Children reported health symptoms of poisoning after being exposed to pesticides.

In Hai Hau and Nghia Hung Districts

- Students reported experiencing fatigue (91.4%), dizziness (57.9%), vomiting or nausea (80.7%), headache (76.4%), and difficulty in breathing (57.1%) after being exposed to pesticides.
- Only 24.4% of students sought medical attention after experiencing symptoms.

In Phu Luong District

- An overwhelming majority or 97.5% of children reported that pesticides came into contact with their eyes and skin.
- One-thirds of students or 36.2% vomited after being exposed to pesticides, which they describe as smelling “terrible”.

c. Girls are more vulnerable to pesticides exposure due to involvement in activities based on traditional gender roles.

- In Hai Hau and Nghia Hung Districts, more girls (36.5%) are exposed to pesticides by washing pesticides spraying tanks or equipment compared to boys (28.8%).

d. School authorities are unable to prevent pesticides exposure to children due to pesticide drift from surrounding farms

- In all districts, there is no efficient system of pre-warning by farmers and school authorities prior to a scheduled pesticide spraying.
- School authorities are not able to close schools when pesticides are being sprayed during school hours because they would need to apply for special permission from the Education Department. It is also not practical to constantly close the schools every time pesticides are sprayed.

Policy Recommendations

There is an urgent need to protect rural schoolchildren from pesticides, especially Highly Hazardous Pesticides (HHPs). In this context, PANAP has the following recommendations:

- Enact a one kilometer or more pesticide-free buffer zone around schools as an initial risk reduction measure.
- Farms surrounding schools should provide written notification of any upcoming pesticide application to all students, parents, and school staff and authorities. If possible, disclose the type of pesticide and active ingredient used. Post notices around the perimeter of the application area and leave these notices in place for 48 hours after the application.
- Relevant stakeholders such farmers, school authorities and local authorities should discuss as an early warning system before pesticide are sprayed. For a start, pesticides should not be sprayed during school hours or when children and teachers are present.
- Assist farmers, particularly in these zones, in transitioning to agroecology, so that farmers can replace pesticides with non-chemical management method.
- Build community and individual awareness of routes of pesticides exposure and their effects on children, the community, and the environment.
- Apply the precautionary principle in the regulation of pesticides at the national level.
- Encourage the government to ban and phase-out Highly Hazardous Pesticides, especially the “Terrible Twenty” pesticides that are toxic to children¹.



Children’s Exposure to Pesticides In Hai Hau and Nghia Hung Districts, Nam Dinh Province

Research Center For Gender, Family and Environment In Development (CGFED)

Introduction

The Research Center for Gender, Family and Environment in Development (CGFED) is a non-governmental, non-profit organisation focused on action research and advocacy based in Hanoi, Vietnam. Since 2010, women in Hai Hau District in Nam Dinh Province have been part of CGFED and PAN Asia Pacific’s (PANAP) ongoing training and awareness-raising activities on pesticides risk reduction, agroecological methods of farming, and women’s leadership. In 2016, CGFED reported that 32.94% of farmers in Hai Hau District were exposed to several Highly Hazardous Pesticides once a week included in PAN International’s list.^{2,3} Due to concerns over this high incidence of pesticides

use, CGFED conducted further study on children’s exposure especially girls, who are more vulnerable to the harmful effects of pesticides.

Study Site and Population Sample

The study was conducted in four schools in Hai Hau and Nghia Hung Districts located in Nam Dinh Province, North Vietnam. Hai Hau is a rural district that covers 22,700 hectares with a population of 256,864 people. Nghia Hung District meanwhile covers 25,000 hectares with a population of 202,231 people. Rice is the main crop that is cultivated in both districts.

The respondents from the study were from four secondary schools. These are:

Figure 1
Map of Nam Dinh Province



Source: <https://www.canva.com/pro/>



Study sites in Nam Dinh Province, North Vietnam (Photo: CGFED)

- Nghia Hung District: Nghia Minh Secondary School, Hoang Nam Secondary School
- Hai Hau District: Hai Cuong Secondary school, Hai Long Secondary School

In total, there are 1,294 students from all four schools. At least three schools were less than one kilometer away from rice fields. One school was only about 15 meters away from the rice fields. Table 1 shows the summary and description of the surveyed schools.

Out of the 1,294 students from the total population of all four schools, 140 students were selected for the study based on availability. Among the surveyed students, 47.14% were male and 52.86% were female. The age of students surveyed ranged from 13 to 15 years old. (See Figure 2)

Methodology

The Community-Based Pesticide Action Monitoring (CPAM) research method was used for this study. Developed by PAN Asia Pacific, CPAM is a Participatory Action Research approach aimed

to document and create awareness of pesticide impacts on human health and the environment.

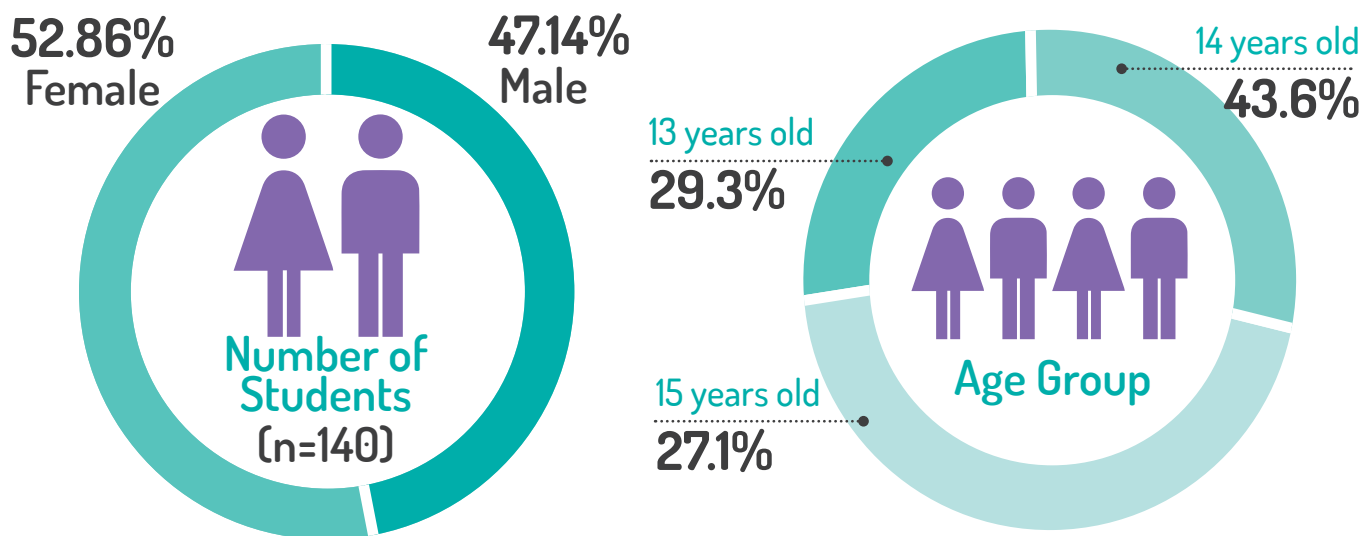
The CPAM tool used for the study was the Children's Exposure Questionnaire, which has two parts.

- Part A aims to collect information and data on students' demographics, as well as children and students' pesticide use and exposure from surrounding farms. This part is aimed at



Study sites are adjacent or less than one kilometer away from fields, where pesticides are being regularly sprayed. (Photo: CGFED)

Figure 2
Summary of Socio-demographic Characteristics



school management, or teachers and school administrators.

- Part B aims to collect information and data directly from children on their activities related to pesticide use and exposure, as well as health symptoms related to pesticide use.

Results from each questionnaire was tabulated, compiled and reported by the research team.

As a limitation, this study did not provide the list of pesticides that the students were exposed to.

Results

Children's Knowledge of Pesticides Exposure

Almost all children (98.6%) were aware that pesticides were being sprayed around their homes or school. Eighty percent of students reported inhaling pesticides drift and spray droplets. Around half or 50.7% of children observed farmers spraying pesticides, while 32.9% observed pesticides being mixed by others. Only 25% were pre-warned by adults before pesticides were sprayed, as shown in Figure 3.

Behavior of Children During Pesticides Use

While pesticides were being sprayed, 12.9% of children were indifferent and continued with their ongoing activities. There were 17.3% who stayed

indoors, while majority or 86.3% stayed away from the fields. (See Figure 4)

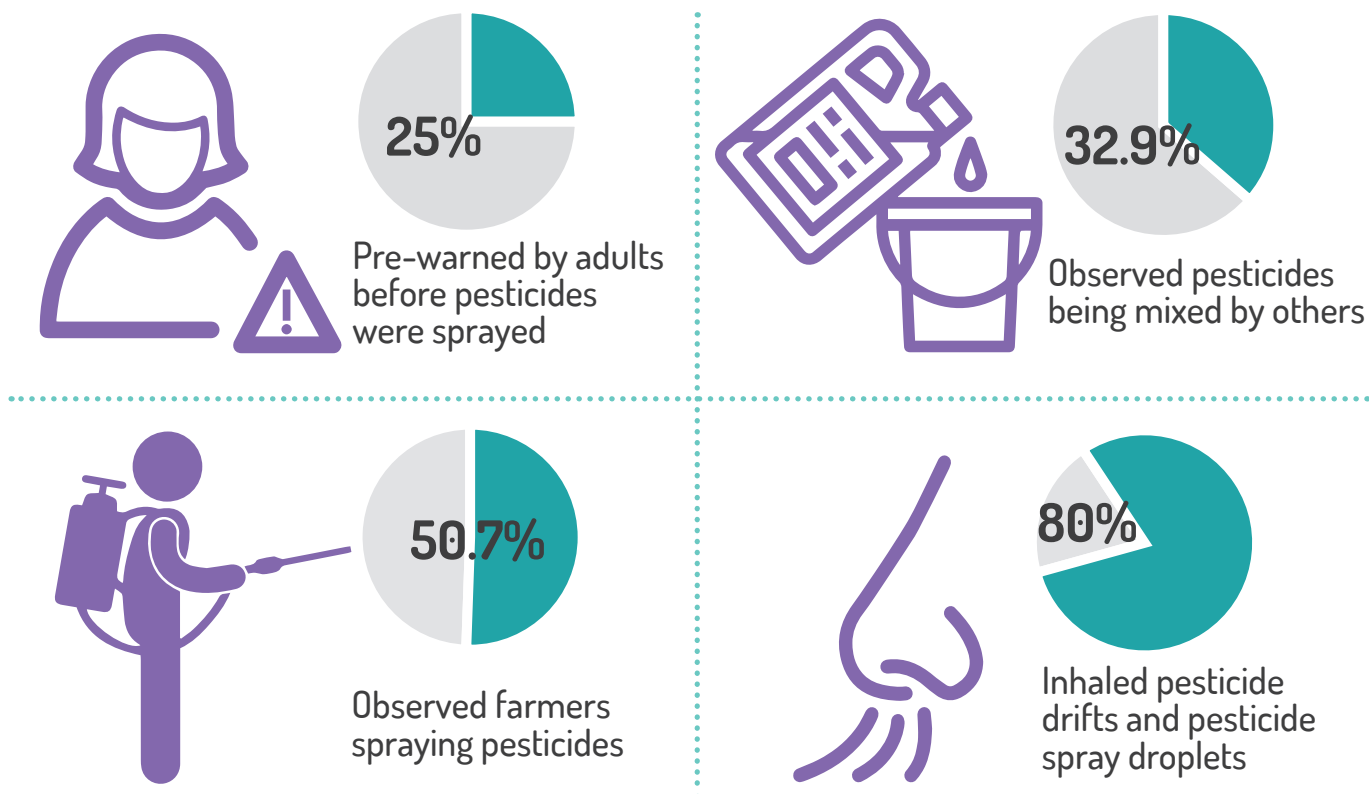
Exposure to Pesticides

Up to 79.1% of children reported that they were exposed to pesticides. Of those who reported that they were exposed, 77.3% were girls and 64.6% were boys.



Feeling fatigued is the most commonly experienced symptom reported by schoolchildren after pesticides exposure. (Photo: SRD)

Figure 3
Children's knowledge of pesticide exposure



The children were exposed to pesticides through multiple sources. Among the surveyed children, 66% played in the fields after pesticides were sprayed; 48.6% were told to buy or sell pesticides by their parents; and 33% helped their parents clean spraying equipment and containers. (See Figure 5)

Exposure of Children During School Hours

While in schools, children have limited options to avoid pesticide exposure.

According to the principal of Nghia Minh Secondary School, "We have to endure the smell of pesticides during scheduled spraying. We are forced to close classroom doors and we can smell the fumes for a time." Interviews reveal that the school administration can't grant permissions for students to stay at home and have a day-off when pesticides are being sprayed, as permissions for a day-off can only be



Children from various schools in Hai Hau and Nghia Hung Districts, Nam Dinh Province were answering the Community Pesticide Action Monitoring questionnaire. (Photo: CGFED)

Figure 4
Behavior of children during pesticide use

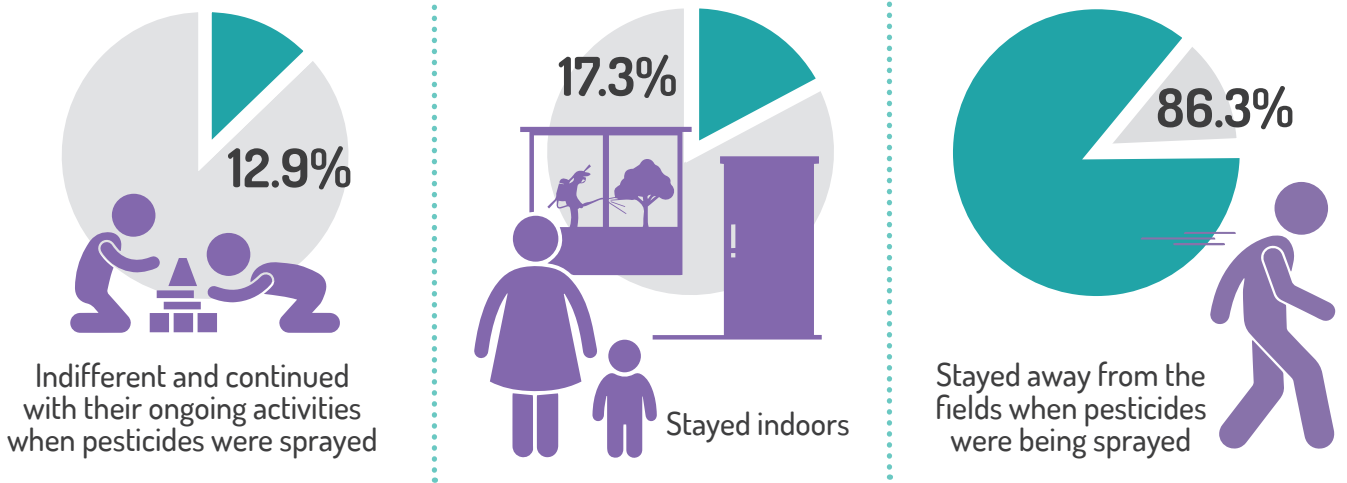
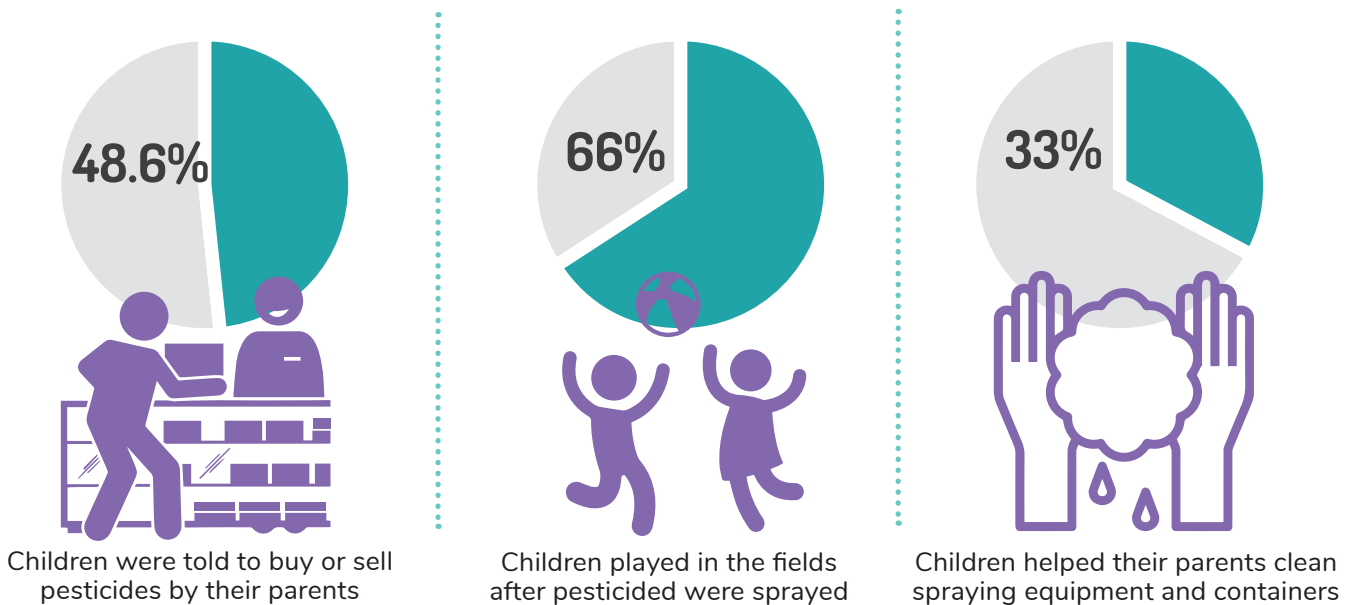


Figure 5
Sources of pesticide exposure in children



granted by the Education Department. “Farmers spray frequently, at different times for prolonged periods. If we allow our students to have a day off, we could not keep up with the educational program,” the principal said.

For Hai Long Secondary School, the school is not adjacent to the rice fields. However, the students are exposed when pesticides are sprayed from nearby gardens. “When the surrounding households spray

pesticides in their garden, we smell the pesticides,” the school principal said.

Meanwhile, the Hai Cuong Secondary School principal expressed concern about students being exposed to pesticides on their way home. “At school, there is no evident smell of pesticides or its effects on students. However, students might get exposed to pesticides on their way home, as rice fields are situated on the two sides of the road,” he said.



Pesticide drifts often reach children inside schools, where there are no efficient early warning systems in place. Nguyen Kim Thuy conducting Protect Our Children from Toxic Pesticides campaign. (Photo: CGFED)

Out of the four schools surveyed, only one school, the Hai Long Secondary School, reported to have conducted awareness-raising activities about the effects of pesticides via extra-curricular activities.

Gender Differences in Exposure

More than half of all the children (male: 66.7%, female: 63.5%) re-entered or played in fields after pesticides were sprayed. However, girls and boys were exposed to pesticides differently. While 36.5% of girls were exposed to pesticides while cleaning pesticide spraying tanks or spraying equipment, only 28.8% of boys were exposed through the same route. Table 2 shows the different routes of exposure to pesticides segregated by sex.

Impact of Pesticides on Students' Health

When asked about health symptoms experienced after pesticides exposure, a majority or 91.4% of students reported feeling fatigued (male: 90.9%, female: 89.2%). The other most common symptoms are headache (76.4%), vomiting or nausea (80.7%), difficulty in breathing (57.1%), and dizziness (57.9%).

Upon exposure to pesticides and displaying poisoning symptoms, only 24.4% of children (male: 20%, female: 28.6%) reported seeking medical attention. Summary of self-reported symptoms reported are presented in Table 4.

Feeling fatigued is the most commonly experienced symptom reported after pesticides exposure. When asked how frequently students felt fatigued, 25.8% reported feeling fatigued 'once or twice,' while 55.5% reported 'sometimes' and 8.3% reported feeling fatigued 'usually.' (See Table 1) Frequency range was not reported.

Table 1
Frequency of fatigue symptoms reported by students

Frequency	Percentage
Usually	8.3%
Sometimes	55.5%
One or two times	25.8%

Table 2
Routes of Exposure to Pesticides (segregated by sex)

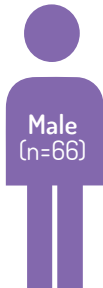
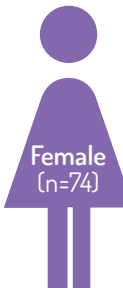

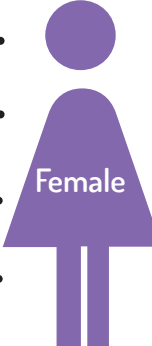
		Routes of Exposure						
		No.	%		%.	No.		
 Male (n=66)		44	66.7%	Re-entered or played in the fields after pesticides were sprayed	63.5%	47	 Female (n=74)	
		32	48.5%	Purchase or selling of pesticides	47.3%	35		
		19	28.8%	Cleaned pesticide spraying tanks or spraying equipment	36.5%	27		

Table 3
Self-reported Health Symptoms of Poisoning (segregated by sex)

		No	%		Total No	Total %	No	%
 Male		51	77.3%	Headache	107	76.4%	66	82.4%
		51	77.3%	Dizziness	81	57.9%	56	75.6%
		34	55.1%	Difficulty breathing	80	57.1%	45	60.8%
		36	55.4%	Vomiting or Nausea	113	80.7%	44	59.5%
		116	90.9%	Fatigue	128	91.4%	66	89.2%
							 Female	

Conclusion

The study shows that students are constantly exposed to pesticides in their environment during school hours, in their homes, and on the fields that they play on. Overall, students suffer from various symptoms of poisoning such as fatigue, dizziness, headaches, difficulty in breathing and vomiting after being exposed to pesticides. However, only a small number of them have sought medical attention.

There is no efficient system of prior warning to pesticides spraying in place. School authorities are also unable to grant day-offs to protect children and school staff during scheduled pesticides spraying, as permissions for day-offs can only be granted by the Education Department.

Girls are exceptionally vulnerable to pesticide exposure because girls often help their parents to wash pesticides spraying tanks and equipment. This is due to traditional gender roles and stereotypes in rural areas, which designates girls to housekeeping and cleaning. It should be noted that pesticide exposure could affect girls' reproductive systems such as early puberty, menstrual irregularities, uterine fibroids, endometriosis (a painful condition when the endometrium or the uterus-lining tissues grow outside the uterus), and infertility.³

Overall, students have reported various symptoms such as fatigue, dizziness, and vomiting after being exposed to pesticides drifts. However, only a small number of students seek medical attention after being exposed to pesticides. This can indicate rural

families' lack of awareness of the effects of pesticides on health, as well as the lack of a health system that can effectively address such effects.

A one kilometer pesticide-free buffer zone around schools should be implemented to reduce the exposure of children to pesticides during school hours. Children and school authorities should also be alerted before pesticides are being sprayed in order to implement precautionary measures. In addition, fields and plantations near schools should be

supported and encouraged to adopt agroecological methods that do not rely on pesticides.

Finally, the government should ensure that policies and practices on pesticides use—including pesticides registration—adopt the precautionary principle and the principle of minimum harm. To protect children from toxic pesticides, especially in the rural areas, it is recommended that the government implement alternatives assessment and substitution, while exploring various forms of agroecological practices.



Schoolchildren gather to demand pesticide-free buffer zones around schools, in a previous activities under the Protect Our Children from Toxic Pesticides campaign. (Photo: CGFED)

Children’s Exposure to Pesticides

In Phu Luong District, Thai Nguyen Province

Sustainable Rural Development (SRD) and the Phu Luong District Agricultural Extension Station

Study Objectives

The main objective of this study was to monitor the impacts of pesticide use on schoolchildren in selected schools in Phu Luong District in Thai Nguyen Province, North Vietnam. It aimed to document the distance of the schools from surrounding fields, ascertain the routes of children’s exposure to pesticides, monitor the health impacts of pesticides use, and document the children’s knowledge and awareness of pesticide use.

The study also aimed to take measure of the precautionary, preventative and health measures taken by school authorities, in order to further raise awareness on the impacts of pesticides on human health and provide recommendations to government officials, school authorities, students, teachers, farmers and community members.

Study Site and Population Sample

Phu Luong is a mountainous district of Thai Nguyen Province, located in Northeast Vietnam. The district’s natural area covers 35,071 hectares, with 13 communes, two district towns and 252 villages with a general population of 100,000 people.

Figure 2 shows the types of crops cultivated in the surveyed communes. In three communes (Phan Me, Hop Thanh and Dong Dat), farmers mostly cultivate rice, tea and maize. Vegetable crops are mainly cultivated in Dong Dat commune.

The study participants were from four secondary schools in four communes, namely Hop Thanh commune, Dong Dat commune, Phan Me commune and Du Town commune in Phu Luong District, Thai Nguyen Province. Three out of four selected communes are considered poor.

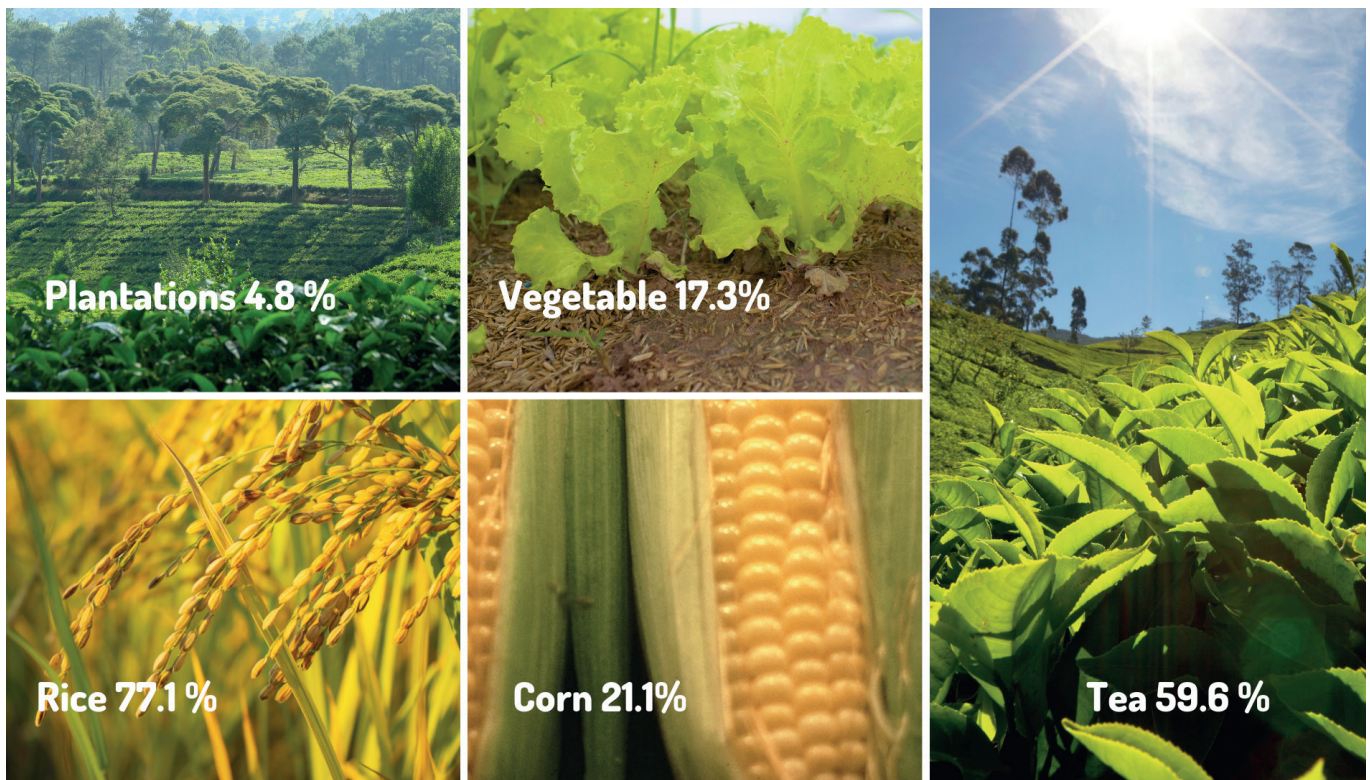
Figure 6
Map of Phu Luong District



Source: <https://www.canva.com/pro/>

Figure 7

Types of crops commonly grown in four surveyed communes



Description of schools and total population of students and teachers

In total, there are 1,366 students and 107 teachers from all four schools. Students study in schools in their communes or surrounding communes.

Summary and description of the surveyed schools:

- Hop Thanh Commune Secondary School has 418 students (231 male; 187 female) and 32 teachers. Students are mainly from Hop Thanh commune or neighboring communes such as On Luong and Phu Ly.
- Dong Dat Secondary School is located in Dong Dat commune. The school has 182 students (95 male; 87 female) and 14 teachers.
- Phan Me Secondary School is located in Phan Me commune. The school has 323 students (197 male; 126 female) and 28 teachers.

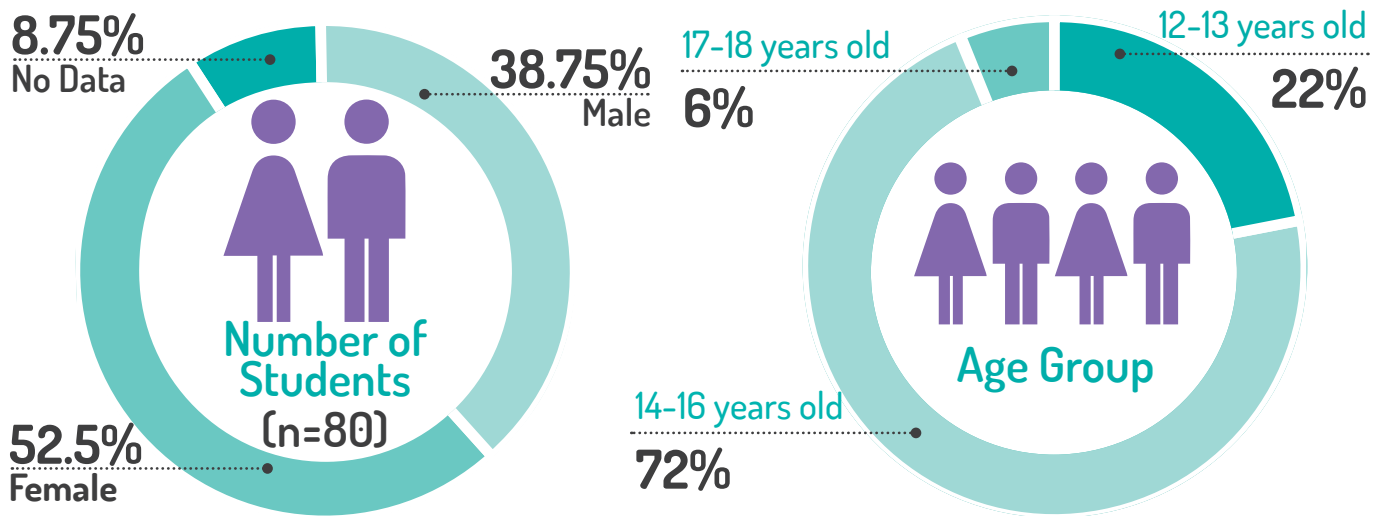
- Du Town Secondary School is located in Du Town commune. The school has 443 students (226 male; 217 female) and 33 teachers. The majority of the students are from Du Town and nearby communes such as Dong Dat, Phan Me, and Phu Ly.

Total Number of Participants (Selected Population)

Out of the 1,366 students and 107 teachers from the total population of all four schools, 80 schoolchildren and 24 teachers in selected for the study based on availability. Among the surveyed students, 38.75% are male (31 students), 52.5% are female (42 students) and there was no data for approximately 8.75% of the students (7 students). The age of students surveyed ranged from 12 to 18 years old, and most of the students were between 14 and 16 years old. Figure 8 provides a summary of socio-demographic characteristics.

FIGURE 8

Summary of Socio-demographic Characteristics



Research Team

A program officer from the Centre for Sustainable Rural Development (SRD) trained five officers from Phu Luong District Agricultural Extension Station at

Phu Luong District Extension Centre on Community based Pesticide Action Monitoring (CPAM). The researchers practiced using the CPAM mobile application before the study was conducted. The



Community Pesticide Action Monitoring (CPAM) application training for staff of the Extension Station of Phu Luong district, Thai Nguyen province (Photo: SRD)

research team includes SRD staff and officers from the Phu Luong District Agricultural Extension Station.

SRD is non-governmental organisation committed to working for the development of disadvantaged rural communities, supporting them to improve their lives and manage sustainable resources. It is based in Hanoi, Vietnam.

Methodology

The research team sent parental consent letters to the parents of the students before the study was conducted. The interview schedule was also sent to all school teachers, so that the interviews do not interfere with classes and relevant activities.

The study was conducted from 11th to 14th June 2018 and utilised a mixed methods research design. It used two methods for data collection: observational data from researchers and tools from the CPAM methodology. A total of 80 students and 24 teachers were interviewed and their responses were collected and tabulated in the CPAM app database and converted to an Excel sheet. Informal observations were undertaken and recorded in field notes.

Developed by PAN Asia Pacific, CPAM is a Participatory Action Research approach aimed to document and create awareness of pesticide impacts on human health and the environment. The CPAM tool used for the study was the Children's Exposure Questionnaire, which has two parts.

- Part A aims to collect information and data on students' demographics, as well as children and students' pesticide use and exposure from surrounding farms. This part is aimed at school management, or teachers and school administrators.
- Part B aims to collect information and data directly from children on their activities related to pesticide use and exposure, as well as health symptoms related to pesticide use.

The CPAM tools now available as Mobile Android Application was used in the study, as opposed to traditional paper and pencil method of data collection.

Results

The survey results are based on the data obtained from the CPAM application as well as the observations and notes made by researchers.

Routes of Exposure

Teachers' Reports

According to all 24 teachers, the schools are located near paddy fields, vegetable farms, tea plantations and poultry farms. More than half or 54.2 % of teachers stated that their schools are located less than 0.1 km away or are adjacent to agricultural fields where pesticides are used. Meanwhile, 54.2% of the teachers stated that schools are located less than 0.5 km away. Only 16.6 % of teachers stated that schools are one kilometer away from agricultural fields. (See Figure 9)

High school students' recreational activities are held or conducted close to rice fields, tea and vegetable farms. Children and students' do not have a designated play area away from pesticides application sites.

Pesticide Use and Exposure

Pesticide Applicators

Based on interviews of both teachers and students, 97% of the teachers and the students (101 people) stated that pesticides are directly sprayed by the farmers (83%), community members (12 %), hired pesticide applicators (3%) or the children themselves (2%). (See Figure 10)

Teachers' Report

Pesticide use and practices reported by the teachers are based on the teachers' own household use and practices in their surrounding areas. The teachers reported that pesticides are commonly used in the cultivation of rice, tea, corn, vegetables and fruit trees. Heavy use of pesticides is observed especially in Dong Dat and Phan Me communes, as large areas of land are allocated for tea and vegetable production.

Figure 9

Distance of the schools to the fields and farms in 4 communes

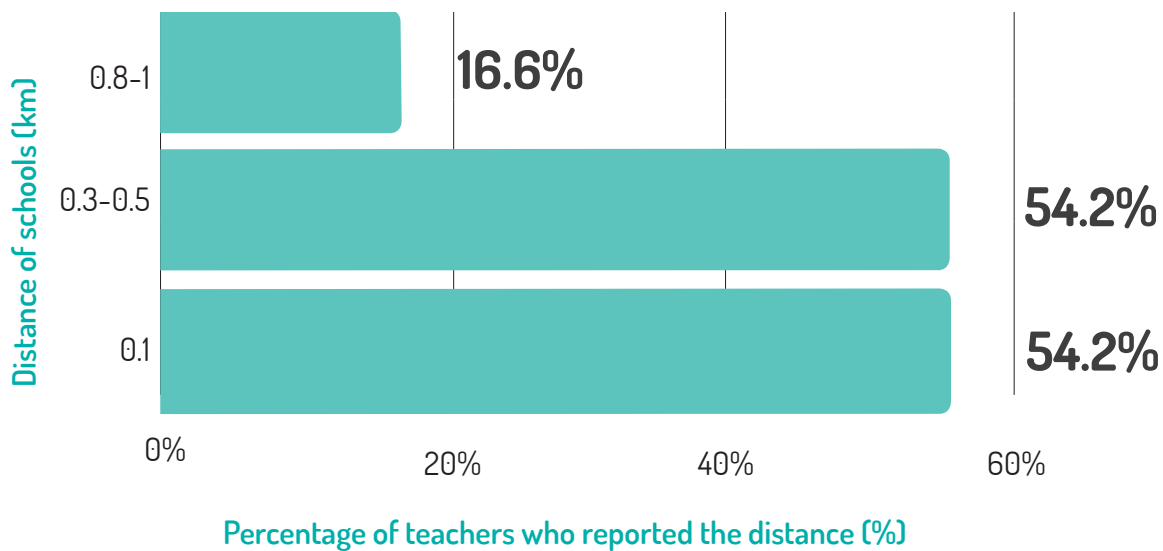
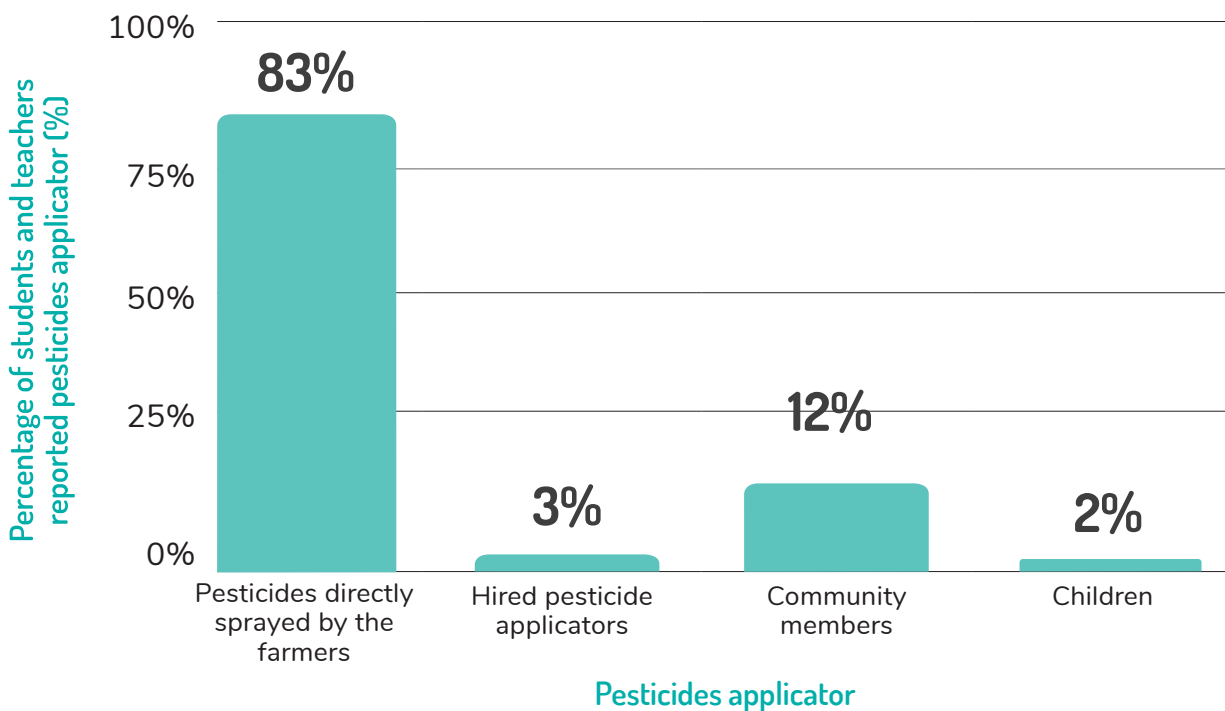


Figure 10

Percentage of pesticide applicators as reported by both students and teachers



Teachers observed that children are exposed to pesticides through various sources, as described in Figure 11. According to teachers, students are mostly exposed to pesticides from adjacent rice farms and tea plantations that are near their homes (79.16%), where children often play after pesticides are sprayed. They are also exposed through their family members and other members in their community who are handling pesticides (62.5%), and when

pesticides are mixed/handled in homes (29.16%). Children also exposed to pesticides by working in farms and plantations to help their parents pick tea leaves and vegetables. Two children were reported to have sprayed and applied pesticides themselves (8.33%). Lawn pesticides, pesticides used at home for vector control, and pesticides spraying with an extension rod are other sources of pesticides exposure.

Children's Knowledge of Pesticide Exposure

Students' Report

Most of the students (93.7%) reported that they knew they were being exposed to pesticides through the smell of pesticides after pesticides were sprayed. Meanwhile, 91.2% observed pesticides being sprayed near them. Only 8.7% were pre-warned by adults that spraying pesticides will occur. (See Figure 12)

Direct and Occupational Exposure to Pesticides

Students' Report

Children who assist their parents in farming are directly exposed to pesticides—11.2% of children reported mixing pesticides with their bare hands, while 12.5% of students have helped their parents purchase pesticides. Additionally, 32.5% of students re-entered the rice fields and tea plantations after pesticides were sprayed in order to help their parents with various tasks, such as picking tea leaves, cultivating tea fields, and harvesting vegetables.



Children being interviewed by researchers using CPAM tools (Photo: SRD)

Of these children who mixed pesticides, nine reported helping their parents spray pesticides—two of those children are aged 12, while the other seven are aged between 15 and 18. The children report that they

Figure 11

Sources of pesticide exposure as reported by teachers

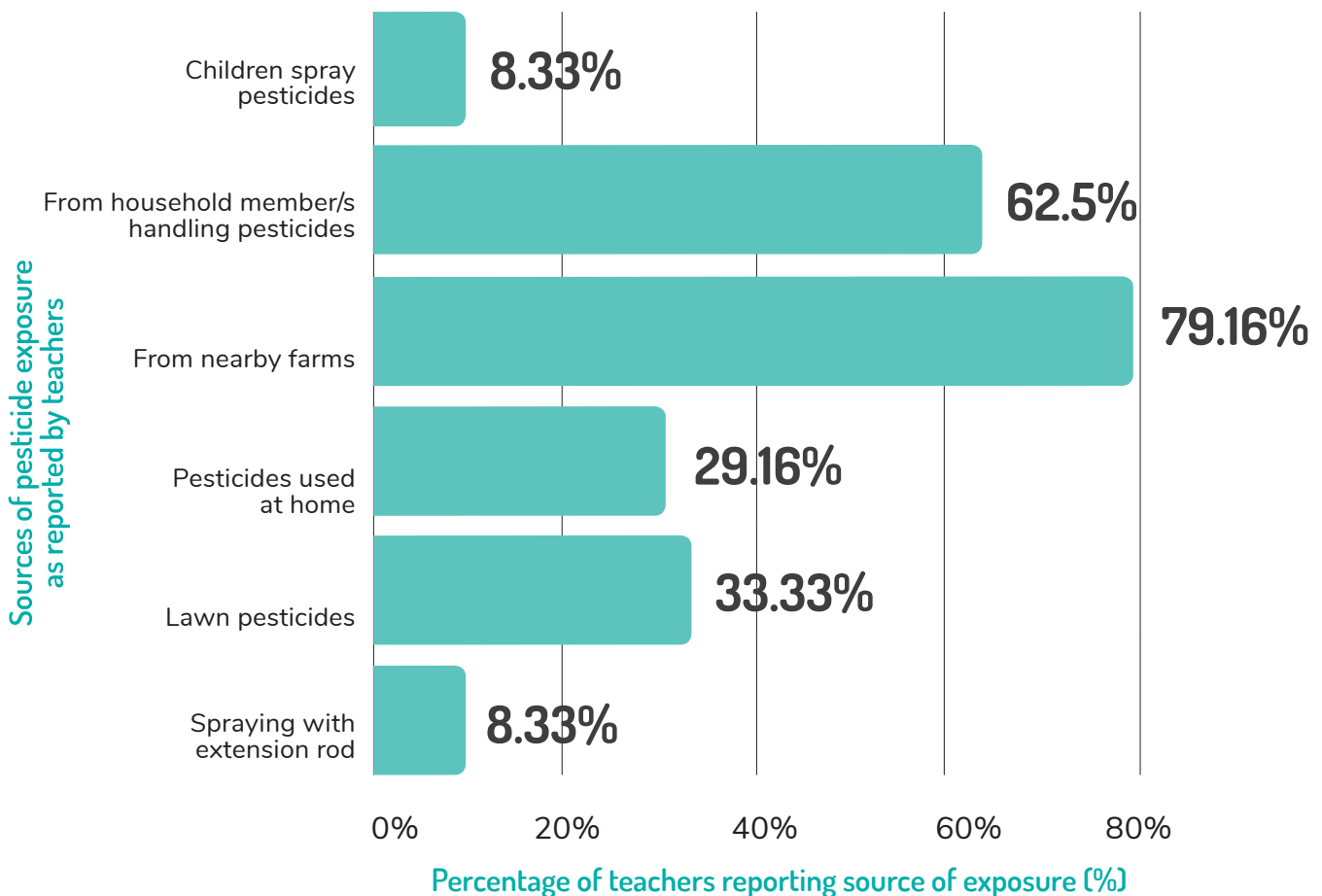
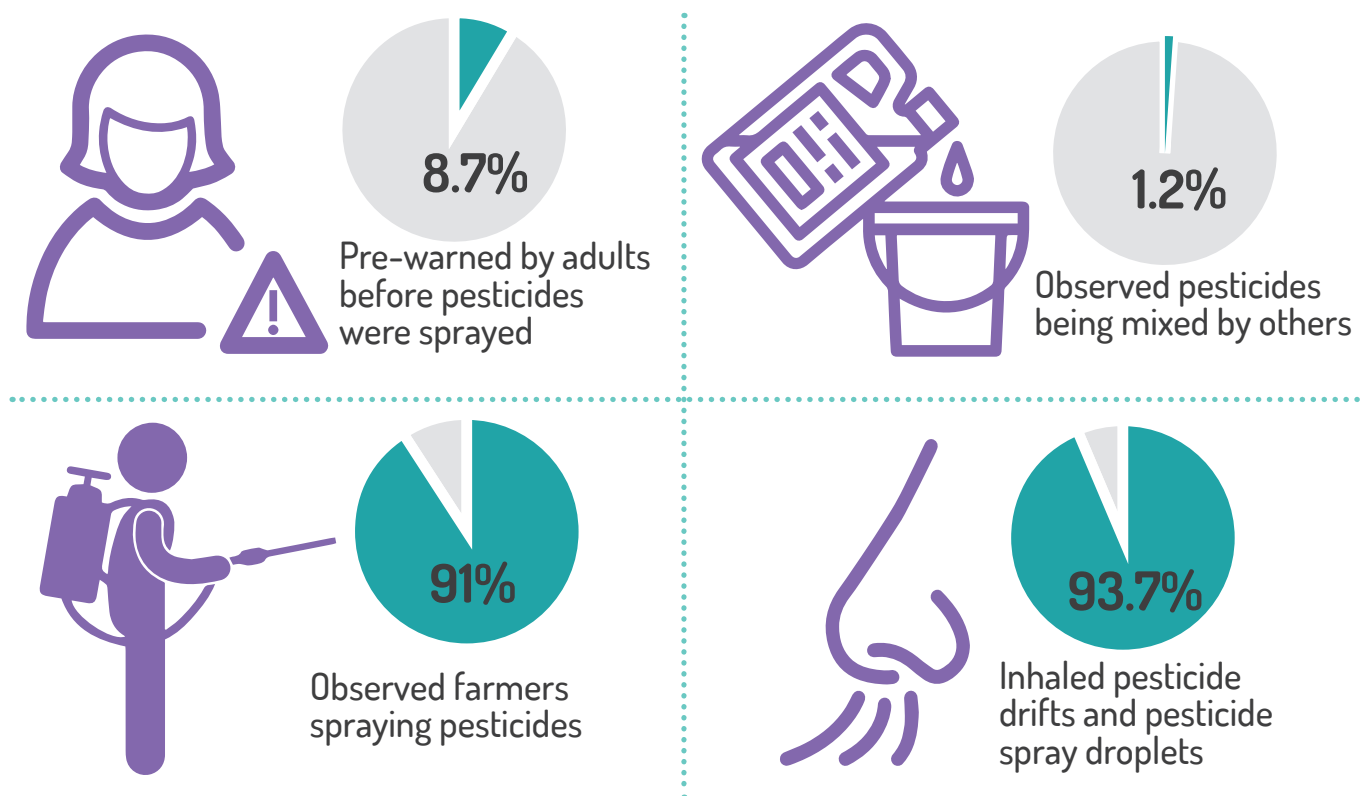


Figure 12
Children's knowledge of pesticide exposure



spray pesticides because there is a shortage of labor in their parent's farms. Farms are also close to children's homes, making it easier for them to be involved in pesticide spraying. The use of battery-operated spray equipment (as opposed to gasoline or diesel-powered sprayers) has also made spraying pesticides more convenient. Occasionally, children spray pesticides when their parents are unavailable to do so or are already tired.

Only 1% of the children reported helping their parents wash their clothes after spraying pesticides. (See Figure 13)

Avoiding Pesticides Exposure

Students' Report

Majority or 86.2% of the students stated that they would try to avoid areas where pesticides were sprayed, while 23.7% of the children said they remained indoors when pesticides were being sprayed. Only 1% of the children reported doing nothing to avoid pesticides spray or drift. (See Figure 14)

Advance Notice of Pesticide Spraying

Fifteen teachers or 62.5% stated that both students and teachers were given prior information before pesticides were sprayed. However, eight teachers or 33% stated that they were not notified, or did not know when pesticides would be sprayed in schools. Teachers stated that the main method of notification is via word of mouth and class announcements. Only six teachers said that there were advance notices from the school administration. Only four teachers stated that they saw warning signs about pesticide spraying and were given prior notice by nearby farm owners.

Teachers note that advance notice on the spraying schedule has helped them and the students be more cautious. They try to minimise exposure by wearing masks and long-sleeved clothes, not playing around the spraying area, and keeping the classroom doors closed during spraying.

Pesticide Equipment

Teachers reported that the most commonly used pesticide equipment are electrical mechanical

Figure 13

Direct pesticide exposure to students

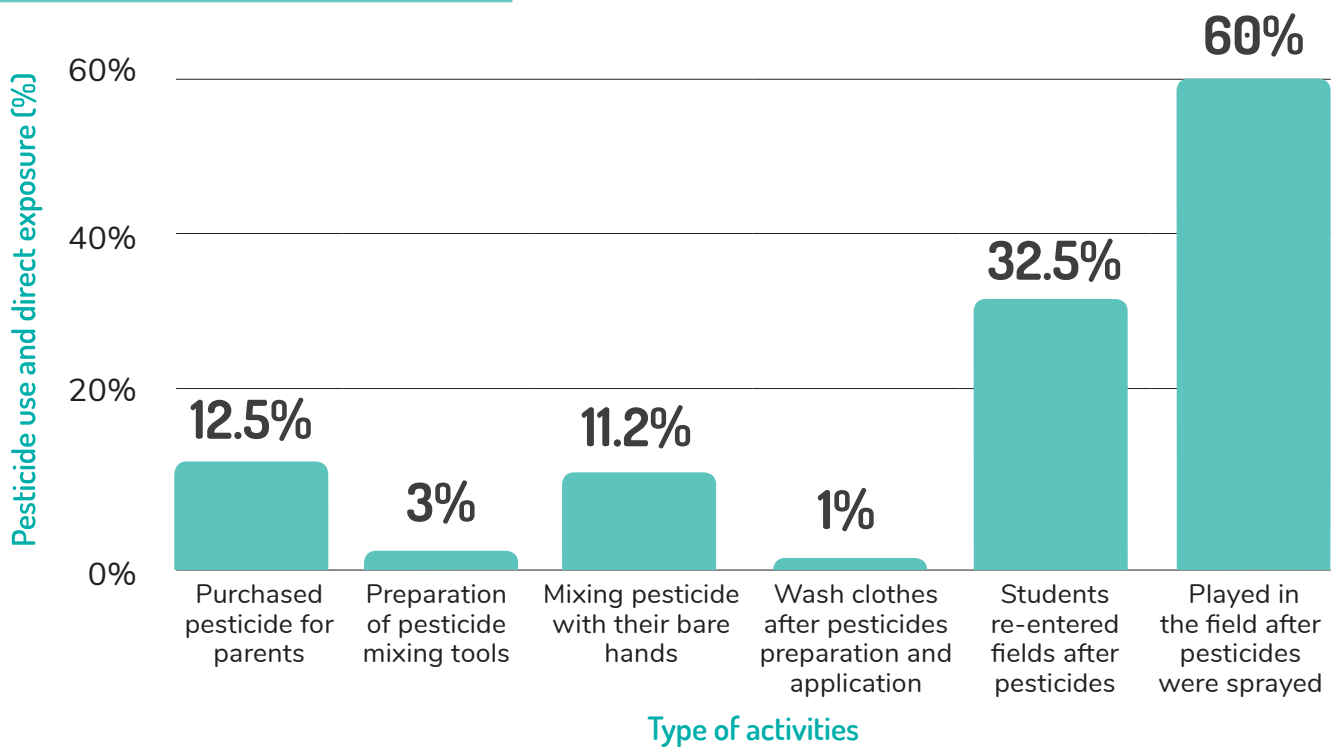
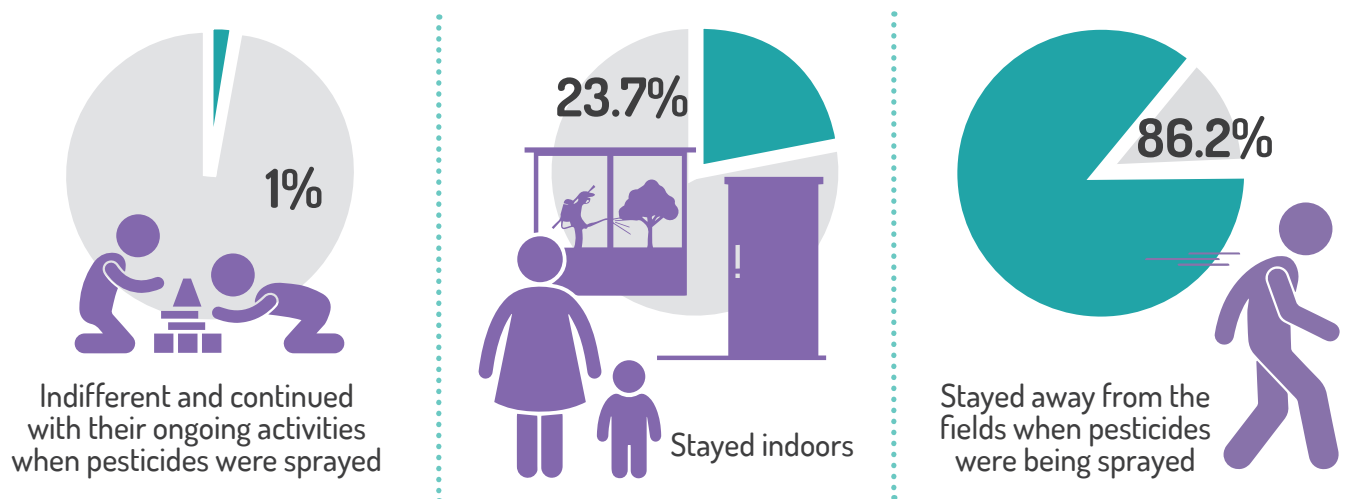


Figure 14

Ways to avoid pesticide exposure



sprayers. Only a handful were observed to use manual backpack spraying equipment.

Identified Pesticides

According to teachers surveyed, the commonly used pesticides are in PAN International's list of Highly Hazardous Pesticides. These include

glyphosate, paraquat, chlorpyrifos, thiamethoxam, cypermethrin, hexaconazole and fipronil.

Health Symptoms Reported

Observed Health Symptoms by Researchers

Researchers noted that 68.7% students they interviewed and observed were feeling tired after



The battery-powered pesticide sprayer, as opposed to the more traditional gasoline or diesel-powered sprayer, has made it more convenient for children to become involved in spraying pesticides. (Photo Source: <https://www.dietcontrungxanh.com/>)

being exposed to pesticides; while 12.8% of them were fatigued throughout the day after being exposed to pesticides.

Self-Reported Symptoms by Students

Majority or 97.5% of children reported pesticides coming into contact with their eyes and skin. They

also described the pesticides as smelling “terrible.” The children reported vomiting (36.2%), headaches (28.7%), dizziness (17.5%), fatigue (12.5%), and disturbed sleep (4%) whenever they were exposed to the smell of the pesticides. (See Figure 15)

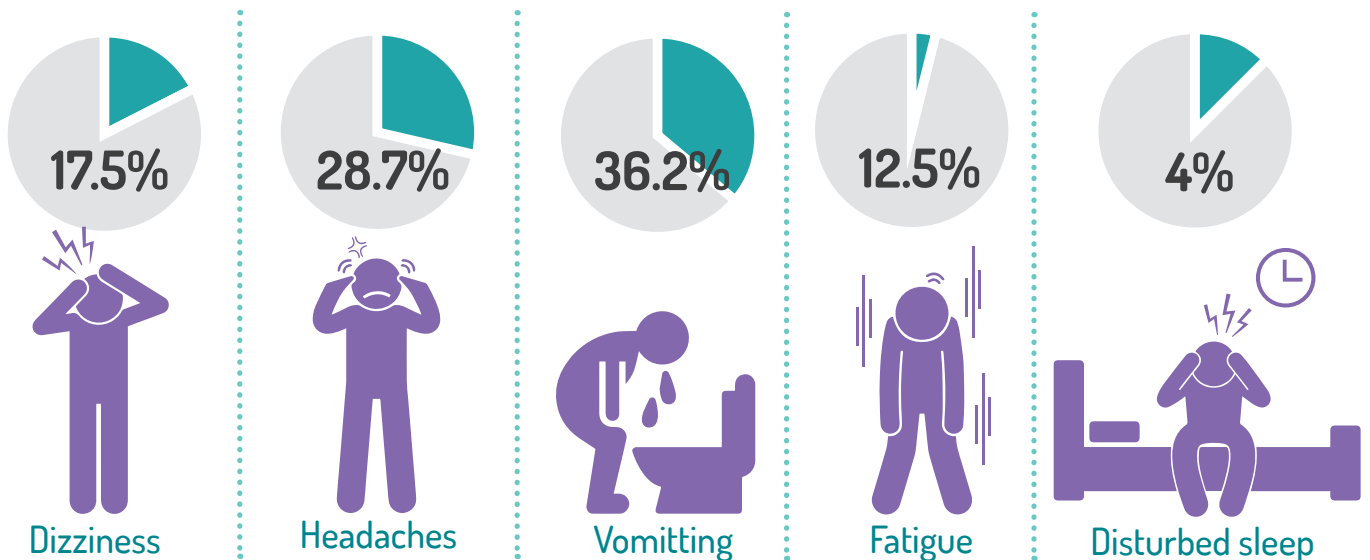
Only 20% of the students visited a pharmacy or dispensary after experiencing the symptoms described in Figure 10. However, the practice of keeping medical records, bills or prescriptions is not widespread.

Knowledge of Pesticide Hazards

Many students and teachers have heard about the impacts of pesticides from television, websites, mass media and awareness raising activities by mass organisations. From these sources, they have some knowledge on health impacts caused by pesticides, especially on women and children.

When asked about the potential problems caused by pesticides, students and teachers believed that pesticide exposure may lead to respiratory-related diseases (42.3%), skin diseases (50%) cancer (46.2%) and kidney/liver failure (6.7 %). One-tenths or 10.6 % of the respondents think that pesticides affect fetal development and cause low birthweight in babies. There were 15.3% of respondents who thought that pesticides can be fatal. Researchers

Figure 15
Self-reported health symptoms by students

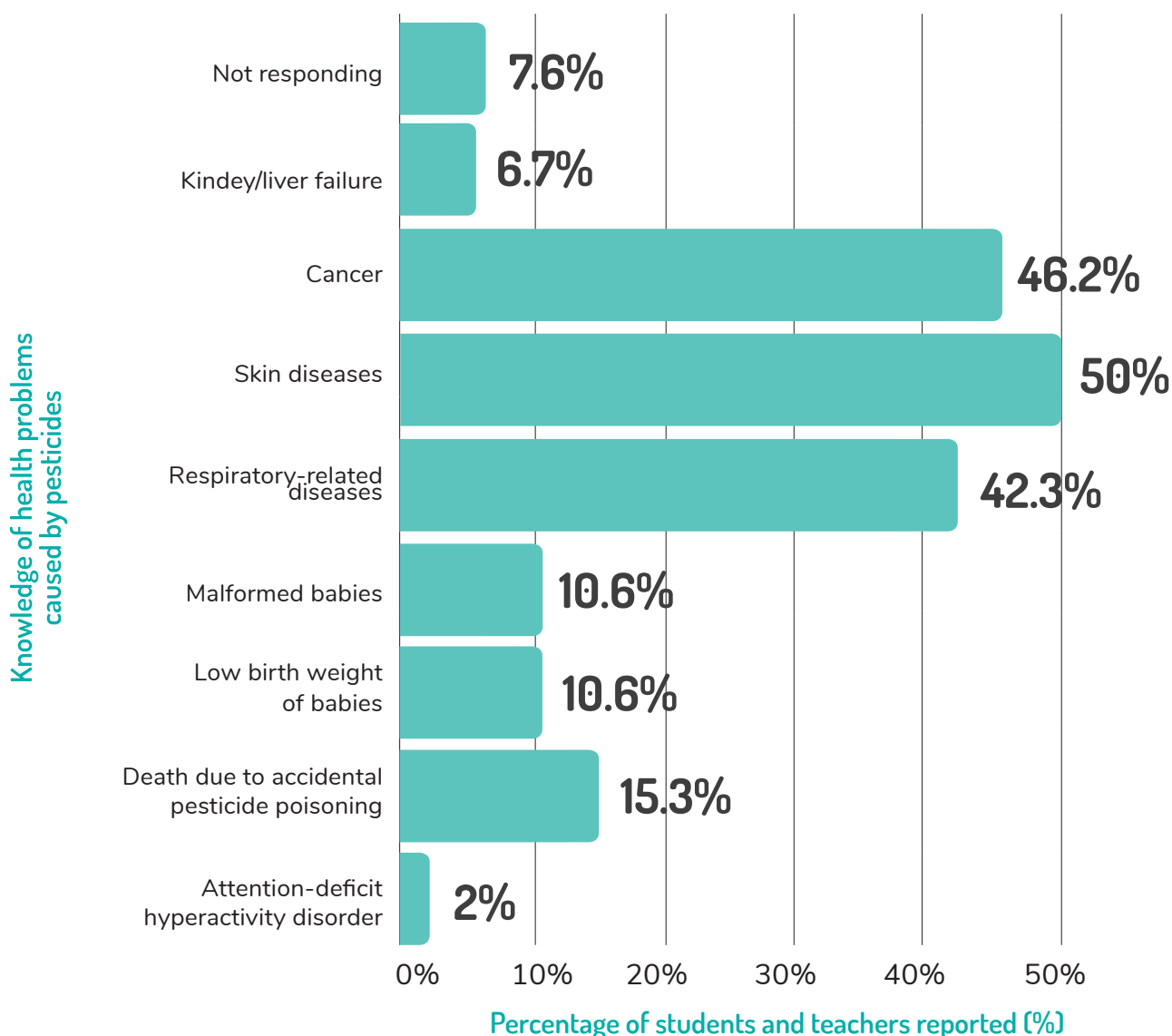


note there have been no pesticide-related deaths recorded in the study site for many years, yet respondents are aware of such acute hazards. (See Figure 16)

However, many students still do not have much knowledge about the particular pesticides that

they are exposed to. They are unaware of pesticide brands, their active ingredients, purpose, and target pests, as well as their hazards. A few students of Dong Dat and Phan Me Secondary School have knowledge about pesticides such as paraquat, glyphosate, and chlorpyrifos, mostly because they

Figure 16
Knowledge of health problems caused by pesticide exposure

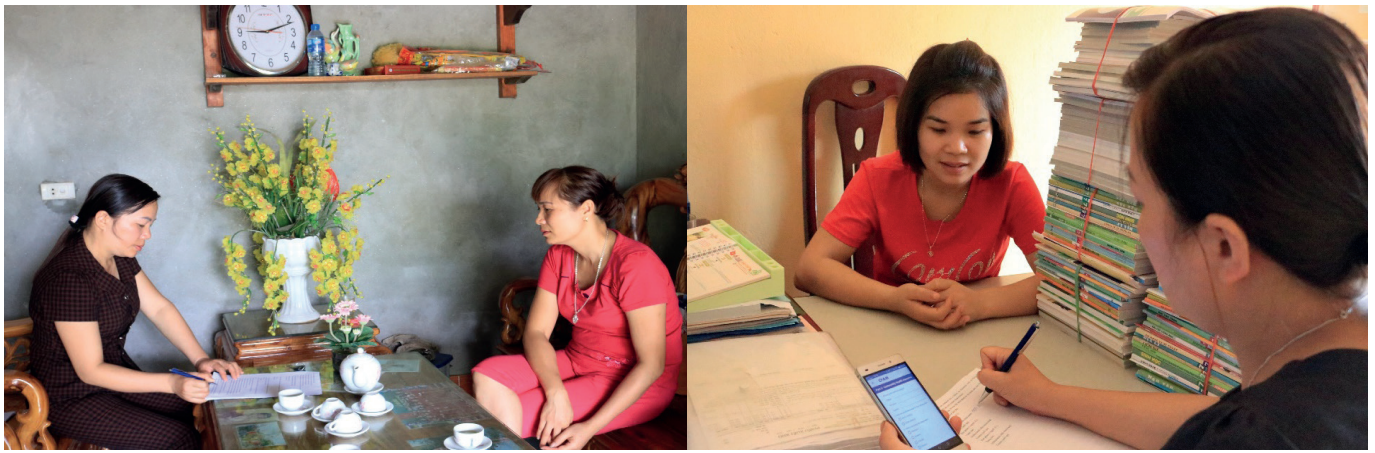


had previously participated in the Protect Our Children from Toxic Pesticides campaign organised by SRD and local authorities.

Conclusion

This study finds that schoolchildren in Phu Luong District are exposed to pesticides during school

hours, in their homes and their environment. Schools in three communes are located less than 500 meters away from fields where pesticides are sprayed, while one school is located less than one kilometer away. Since available land is limited, children often play in fields or near fields where pesticides are sprayed intensively. Children are



Teachers being interviewed by researchers using CPAM tools (Photo: SRD)

particularly exposed in vegetable or tea cultivation areas in the Dong Dat, Phan Me and Hop Thanh communes, where pesticides are sprayed once every two weeks.

Children are also exposed to pesticides while working in the fields where pesticides are sprayed, in order to assist their parents. Children help their families purchase and mix pesticides, and sometimes help in the spraying of pesticides as well. Alarming, some children mix pesticides with their bare hands—indicating a lack of awareness of safety precautions for pesticides use.

Children in the study have reported health symptoms of poisoning such as vomiting (36.2%), headaches (28.7%), dizziness (17.5%), fatigue (12.5%), and disturbed sleep (4%) after being exposed to pesticides. Few children have reported getting medical attention when experiencing symptoms related to pesticide exposure.

While some school authorities and teachers were orally notified or pre-warned before pesticides were sprayed, not all students and teachers were made aware of the spraying schedule. Teachers acknowledge that an early warning system for

spraying would help minimise children exposure to pesticides during school hours.

Highly Hazardous Pesticides such as glyphosate, paraquat, chlorpyrifos, thiamethoxam, cypermethrin, hexaconazole and fipronil are reported to be used in the study area. Long-term exposure to these HHPs is linked to various diseases in children, such as behavioural disorders, learning disabilities and cancers later in life.

In conclusion, with more awareness-raising activities facilitated by the CPAM process, teachers, students, and parents are now more aware of the health impacts of pesticides. Therefore, it is vital to intensify awareness-raising campaigns and efforts to protect children from toxic pesticides. Concerned government agencies should enhance relevant laws and regulations to ban and phase-out HHPs that are particularly toxic to children. A one kilometer pesticide-free buffer zone around schools should be implemented to reduce the exposure of children to pesticides during school hours. In addition, fields and plantations near schools should be supported and encouraged to adopt agroecological methods that do not rely on Highly Hazardous Pesticides.

Endnotes

- 1 PAN Asia Pacific. Terrible Twenty Pesticides that are Toxic to Children. <http://files.panap.net/resources/20-Terrible-Pesticides-poster.pdf>
- 2 PAN International (2019). List of Highly Hazardous Pesticides. http://pan-international.org/wp-content/uploads/PAN_HHP_List.pdf
- 3 PAN Asia Pacific. (2018). Of Rights and Poisons: Accountability of the Agrochemical Industry. <https://panap.net/resource/of-rights-and-poisons-accountability-of-the-agrochemical-industry/>
- 4 Watts, M. (2013). Poisoning Our Future: Children and Pesticides. PAN Asia Pacific. <https://panap.net/resource/poisoning-our-future-children-and-pesticides/?wpdmdl=2108&refresh=5fbf31aad880a1606365610>

About PANAP

PAN Asia Pacific (PANAP) is one of the five regional centres of Pesticide Action Network (PAN). PANAP works for the elimination of harm caused by pesticides on human health and the environment. PANAP also promotes agroecology, helps strengthen people's movements in their assertion of rights to land and livelihood, and advances food sovereignty and gender justice.

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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