

# COMMUNITY PESTICIDE ACTION MONITORING

IN MINDANAO, PHILIPPINES



**Title of Report:** Community Pesticide Action Monitoring in Mindanao, Philippines

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Citizens Alliance Unified for Sectoral Empowerment Davao del Sur (CAUSE-DS)

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## SUMMARY

The report presents the findings of a field study conducted to document the use of pesticides in Mindanao and its health impacts using the Community-based Pesticide Action Monitoring (CPAM) process. A total of 57 plantation workers from banana and oil palm plantations and residents from surrounding villages were interviewed for the study from 2015 to 2016.

The island of Mindanao in the Philippines has vast banana, oil palm, sugar cane plantations, cacao and various cash crops and is also rich with abundant natural resources. Since the 1920's Mindanao has served as host to plantations that produce export crops which are controlled by various local, transnational and multinational corporations. More than 500,000 hectares of land in the five regions of the island have now been converted to cash crops for export, which equals to 12 percent of Mindanao's agricultural land.

Often, these cash crops are produced with the use of highly hazardous pesticides (HHPs). The use of HHPs causes serious health impacts on workers and the environment surrounding them. With growing concerns of local community organizers and residents, a study was undertaken to fully understand the situation of pesticide use and its impacts.

In oil palm plantations and banana plantations, workers are often not aware of the hazards of pesticides and are exposed to pesticides in their working conditions. It's even more appalling to find out that workers are expected to buy their own personal protective equipment (PPE). One worker had to use his bare hands as he could not afford to buy gloves for his safety, while others used bra cups as face masks. Water resources are not always accessible that workers could not immediately wash even if pesticides spill on them. Many have reported various health symptoms.

In banana plantations, workers and their young children are aeri ally sprayed with pesticides. Pesticides are extremely toxic to young children and spray drifts linger in the environment long after pesticides have been sprayed. Thirty respondents from Davao were all exposed to pesticide drift, and there were cases when they were aeri ally sprayed while eating or during their way to the river to do laundry. Residents also enter newly sprayed areas without adequate protection.

For this study, names of the plantation companies are withheld and pseudonyms are used to protect the workers. Conditions found in the study violate the Universal Declaration of Human Rights, the UN "Protect, Respect and Remedy" Framework for Business and Human Rights, International Labour Standards and provisions mentioned in the International Code of Conduct on Pesticide Management.

# KEY FINDINGS

## 1. Plantations have not given adequate training to workers

- There was absence or inadequacy of training given to most of the pesticide handlers. Very few were aware not to spray against wind direction.
- Part time workers were not given training and relied on their colleagues to give them information.
- This is made worse by the fact that there were respondents handling paraquat, a highly hazardous pesticide that has been banned in many countries, and which US EPA classifies as highly toxic by inhalation (Class 1). Not knowing the dangers, handlers were not mindful of restricting contact with the pesticides, with one even de-clogging the pesticide applicator nozzle using his mouth.

## 2. Lack of proper washing spaces and personal protective equipment have caused various illnesses

- Violation of plantation workers' right to safe and healthy working environment is also evident. Making the washing facilities off-limits to plantation workers, not providing accessible comfort rooms, and limiting the provision for masks, gloves, coveralls/aprons and boots to the workers have increased the risk of pesticide-induced illnesses.
- Due to the lack of safety procedures for washing pesticide equipments and their bodies, pesticide residues get into the workers' skin, if not private parts, that lead to dermal and other diseases.
- Some workers had to resort to the use of bra cups as masks or "respirators" since their employers did not provide them replacements once their masks wore out. The use of inappropriate respirator could have increased the respiratory illnesses among the workers. Practically all the illnesses reported by the respondents can be reasonably attributed to pesticide exposure.
- Respondent workers in the oil palm plantation in Agusan del Sur said that PPE was provided only when the Labour Union asked for it. PPE was given once a year by the plantation company.

## 3. Women and children are exposed to pesticides in the plantations

- For many, the cause for concern is the presence of people, especially children, inside and within the 10-meter radius of the banana and oil palm plantations.
- Respondents from a banana plantation community in Davao del Sur were all exposed to aerial spraying of pesticides and there were cases when they were sprayed while eating or while on their way to the river to do laundry.
- One respondent said a three-year old child was exposed to the pesticide drift while playing, making her lose consciousness and ending up mentally handicapped.



Women and children often bathe and wash their clothes in rivers nearby. Pesticides equipment are also washed in these rivers and pesticide residues can find its way to these water systems. Photo: PAN Philippines

#### 4. Plantations expose workers to highly hazardous pesticides

- The five most commonly reported pesticides were Syngenta's paraquat, deltamethrin, Monsanto's glyphosate, chlorothalonil and malathion. All these pesticides are highly hazardous based on the PAN International's classification, the use of which should be banned or severely restricted, and demands highly trained personnel and a superior degree of safety measures. Ethoprop and paraquat, in particular, should be immediately banned, especially in developing countries where conditions of use will inevitably result in exposure and severe harm to workers and community residents.



A plantation worker demonstrating the usual pesticide spraying technique in the plantation. Workers often lack access to personal protective equipment. Photo: PAN Philippines

## 5. Lack of access to professional health care services

- There were 11 cases of accidental exposure to pesticides and several health symptoms. Among the most commonly experienced include headache, blurring of vision, nausea, coughing, eye pain and skin itchiness.
- Workers often lack access to trained medical professionals that recognize the health symptoms of pesticides poisoning and medical facilities are often far and not easily accessible.

## 6. Children are taken in as plantation workers

- A respondent and her husband was taken in as workers in the oil palm plantation when they were 12 years old.
- Respondents from the banana plantation reported that they have children co-workers.



South Cotabato resident with eye disorder has been exposed to aerial spraying by banana plantation. Photo: PAN Philippines



## POLICY RECOMMENDATIONS

- Concerned government institutions and agencies (e.g. House of Representatives, Department of Health, Dept. of Agriculture, Dept. of Agrarian Reform, etc.) should conduct a thorough investigation of the reported health and environmental impacts of pesticides used in banana and oil palm plantations, particularly the use of paraquat and other highly hazardous pesticides.
- The banana and oil palm plantations should be made accountable for violations of national and international regulations on Occupational Health and Safety, including cancellation of their business permits, if warranted.
- The corporations should be made accountable for both human and environmental damage and be made to indemnify workers and residents of communities who have been adversely affected by their harmful practices.
- Concerned government agencies should ensure, through appropriate implementation of relevant laws and regulations, and through additional legislation and policies, that workers and communities, especially children, are adequately protected from potentially harmful practices of banana and oil palm plantations, especially the use of highly hazardous pesticides.
- Highly hazardous pesticides, particularly, paraquat and glyphosate, should be immediately banned for use in the Philippines.
- Corporations producing and marketing these pesticides particularly paraquat (Syngenta) and glyphosate (Monsanto) should withdraw these pesticides under conditions of use in the Philippines (see International Code of Conduct on Pesticide Management – Articles: 3.5.6, 3.6, and 7.5)

# STUDY SITE AND METHODOLOGY

Mindanao is the second largest island of the Philippines.<sup>1</sup> More than 500,000 hectares of land in the five regions of the island have now been converted to cash crops for export. The banana and oil palm plantations comprise 12% of Mindanao's agricultural land. These plantations are controlled by various local, transnational and multinational corporations.<sup>2</sup>

Areas in Mindanao with banana and oil palm plantations were chosen as study sites. Names of the plantation companies are withheld to protect the workers. Individual interviews and focused group discussions (FGDs) were done by Barangay Health Workers or community organizers from participating organizations in two cycles, from May to September 2015, and from June to July 2016, in communities in Davao del Sur and South Cotabato where banana plantations were located and in Agusan del Sur and Bukidnon where oil palm plantations were located. Purposive sampling<sup>3</sup> was utilized with plantation workers and communities near or within the plantations as the target respondents.

Community-based pesticide action monitoring (CPAM)<sup>4</sup> is a participatory action research process to document and create awareness of pesticide impacts on human health and the environment. It involves community members who undertake the research, and encourages organising and action. Through CPAM, the community learns to record the impacts of pesticide use and becomes aware of the pesticides' harmful effects. CPAM aims to empower communities to address their situation themselves and get actively involved in solving their problems. This approach drives the changes required to reduce the use of agrochemicals, adopt more ecological and sustainable agricultural practices, and pressure governments for the implementation of better pesticide regulations and international conventions on pesticides.



*Banana plantation in Mindanao. Photo: PAN Philippines*

Additional data were gathered during the International Fact Finding Mission on the use of paraquat in oil palm plantations in Mindanao carried out in June 8-12, 2016.

## RESULTS AND DISCUSSION

### ***Distribution of respondents per province***

There were 57 study participants, mostly from banana plantation communities in Davao del Sur and South Cotabato, and a few in oil palm plantation communities in Agusan del Sur and Bukidnon (Table 1). Some participants live inside the plantation while many of them reside within the 10 m radius (Table 2).

*Table 1. Residence of the study participants*

FREQUENCY	PROVINCES
30	Davao del Sur (DDS)
18	South Cotabato (SC)
4	Bukidnon (B)
5	Agusan del Sur (ADS)
57	Total

*Table 2. Participants' house distance from the plantation and from the road*

MAX	MIN	MODE	SD	SE	MEAN	N	HOUSE DISTANCE
1200	0	10	251.69	38.84	132.48	42	From the plantation (m)
500	1	10	107.05	16.93	48.05	40	From the road (m)

### ***Demographic profile of study participants***

Thirty-five males and 22 females participated in the study (Tables 3a&b). None of the female respondents were breastfeeding or pregnant at the time of the interview. The mean age is 49. All of them are literate with most of them having finished high school education.

Twenty were connected with the plantation either as a general worker (N=19) or as an aerial crew (N=1) at the time of the interview. Another twenty of the respondents used to do odd jobs in the plantation as a harvester, sprayer, feed processor or guard. Three of them have worked in the plantation for 25 to 26 years. The rest are residents of the area.

The mean length of residency in the place is 31 years, the oldest of them having lived in the area for 93 years. The household size is generally small with three members as the mode.

Table 3a. Demographic profile of study participants

N	FREQ.	CHARACTERISTICS
57	35	Sex Male
	22	Female
57	41	Marital status Married
	11	Single
	4	Widow/er
	1	Separated
53	0	Age group 18 – 19
	11	20 – 29
	12	30 – 39
	7	40 – 49
	13	50 – 59
	6	60 – 69
	2	70 – 79
2	80 & above	
55	26	Level of education Grade school
	23	High school
	2	Vocational
	4	College
54	19	Occupation Plantation worker
	5	Farmer
	14	Housekeeper
	2	Driver
	1	Laborer
	1	Thatch shingle sewer (TSS)
	1	Shellfish gleaner & TSS
	1	Aerial crew
	2	Health worker
	2	Pensioner
	6	None
45	26	Household size 1 – 3
	16	4 – 6
	2	7 – 9
	1	10 – 11

Table 3b. Demographic profile of study participants

MAX	MIN	MODE	SD	SE	MEAN	N	CHARACTERISTICS
93	24	25	16.00	2.38	48.87	45	Age
93	1	5	27.32	4.27	30.98	41	Length of Residency
11	1	3	2.23	0.33	3.69	45	Household Size

### **Pesticides reported**

For the purposes of the monitoring, the researchers defined highly hazardous pesticides (HHPs) as those that have high potential to cause illness, injury or death to humans and animals or damage to the environment. These include pesticides that are acutely toxic or for which there is evidence of carcinogenicity, mutagenicity, reproductive toxicity, immunotoxicity, endocrine disruption, neurological or developmental toxicity based on the PAN International's HHP criteria.<sup>5</sup>

Respondents reported four types of pesticides (Tables 4a-c). The herbicide paraquat was used mainly in the oil palm plantations in Bukidnon and Agusan del Sur, and according to two respondents, its use was discontinued in the plantation they were working with sometime in 2012. Among the insecticides, Decis (deltamethrin) was the most common. Daconil (chlorothalonil) was the most commonly reported fungicide. There are a total of 19 pesticides used in the plantations, one of which – cypermethrin – is included in the list of pesticides that are highly hazardous to children (see Annex).

For the plantation workers, pesticides are provided by the companies. Most of the workers did not know what pesticides they were handling, and thus, could not specify the trade names or active ingredient.

In the oil palm plantation in ADS, Green Mustard was applied directly to the roots. Garlon (Triclopyr) was also applied to kill vines.

Table 4a. Pesticide types

FREQUENCY	TYPE
13	Insecticide
11	Herbicide
9	Fungicide
3	Nematicide

Table 4b. Number of pesticide types used by respondents

FREQUENCY	NUMBER OF TYPES
3	1
2	2
7	3
3	4
15	N

Table 4c. Pesticides used in the banana and oil palm plantations in Mindanao

TOTAL	ADS	B	SC	DDS	BRAND NAME/ACTIVE INGREDIENT
<b>Herbicides</b>					
4	0	4	0	0	Clear-Out (Glyphosate)
5	3	2	0	0	Round-Up (Glyphosate)
10	4	6	0	0	Gramoxone (Paraquat)
4	0	4	0	0	Shadow (dimethenamid-p ++)
4	4	0	0	0	2,4-D
2	2	0	0	0	GarlonTM (Triclopyr)
<b>Insecticides</b>					
10	4	0	4	2	Decis (Deltamethrin)
5	2	0	3	0	Malathion
1	0	1	0	0	Karate (Lambda-cyhalothrin)
2	2	0	0	0	Cymbush (Cypermethrin)
1	0	0	0	1	Lorsban (Chlorpyrifos)
<b>Nematicide</b>					
3	3	0	0	0	Furadan (Carbofuran)
1	0	0	0	1	Mocap (Ethoprop)
<b>Fungicide</b>					
7	2	0	4	1	Daconil (Chlorothalonil)
2	0	0	1	1	Antracol (Propineb)
1	0	0	0	1	Banguard (Thiram)
1	0	0	0	1	Benlate (Benomyl)
					Alternative Pesticides
1	0	1	0	0	Jackpot ( <i>Bacillus thuringiensis</i> )
2	2	0	0	0	Green Mustard



Blindness due to paraquat exposure. Photo: PAN Philippines from previous fact finding mission

## Herbicides

### Paraquat

The World Health Organisation classified paraquat as Class 2 or “moderately hazardous”<sup>6</sup> but PAN classified it as Class I or “highly hazardous”.<sup>7</sup> Current knowledge shows that paraquat falls within the WHO criteria of acute toxicity (LD<sub>50</sub> below 50mg/kg in animals and 35mg/kg in humans) for Class I classification. There is sufficient evidence from independent studies and clinical experiences that paraquat, in fact, is highly hazardous because of its severe acute toxicity and delayed effects.<sup>8-14</sup>



*Nail erosion due to paraquat exposure. Photo: PAN Philippines*

Paraquat is among the most widely used pesticide for weed control. It has no known antidote for cure. Less than one teaspoon, if ingested, is fatal. The European Commission has described the acute hazard of paraquat as very toxic by inhalation; toxic in contact with skin and if swallowed; irritant to the eyes, respiratory system and skin; and danger of serious damage to health by prolonged exposure.<sup>15</sup> It can cause severe acute and long term health problems such as severe dermatitis, kidney failure, respiratory failure, rapid heart rate, second degree burns, skin cancer and Parkinson’s disease.<sup>8,10,16,17</sup>

Common exposure symptoms include burns to the mouth, acute respiratory distress, loss of appetite, abdominal pain, thirst, nausea, vomiting, diarrhoea, giddiness, headache, fever, muscle pain, lethargy, shortness of breath and rapid heartbeat. There can be nose bleeds, skin fissures, peeling, burns and blistering, eye injuries, and nail damage including discoloration and temporary nail loss. <sup>8,10</sup>

Paraquat’s harmful effects on the foetus, pregnant women and children are well-documented. It can cause acute poisoning including death of the foetus or chronic effects that can persist for the lifetime. It is a neurotoxicant, and a likely endocrine disruptor. <sup>8,10,17</sup>

Syngenta sells the pesticide globally under the brand name Gramoxone. It is extensively used on bananas, cocoa, coffee, cotton, palm oil, pineapple, rubber, and sugar cane – in plantations

and small-scale farms. All industrialised countries that allow its use recommend highly stringent precautions which cannot be guaranteed in developing countries.

In December 2011, Syngenta along with other agrochemical transnational corporations that sell paraquat, were found guilty of gross human rights violations by the Permanent People's Tribunal Session on Agrochemical Transnational Corporations.<sup>18</sup>

### **Glyphosate**

Glyphosate, has been declared as a probable carcinogen by the International Agency for Research on Cancer (IARC) of the WHO. It is listed as an endocrine disruptor and there is also strong scientific evidence that it causes severe kidney disease, birth defects, infertility in males, Alzheimer's disease and diabetes among others.<sup>19-26</sup>

## **Insecticides and Fungicides**

### **Deltamethrin, cypermethrin and lambda-cyhalothrin**

Deltamethrin, cypermethrin and lambda-cyhalothrin are pyrethroids. These are carcinogenic, teratogenic, genotoxic, neurologic toxicants and endocrine disruptors. They cause sensation of prickling, tingling or creeping on skin, numbness and in severe cases fluid in the lungs and muscle twitching.<sup>27,28</sup>

### **Chlorothalonil**

Chlorothalonil is an organochlorine. It is a likely human carcinogen, increasing the risks of multiple myeloma, non-Hodgkin's lymphoma, kidney and stomach cancer. It is also a reproductive toxin, causing adverse effects on behavioural and physical development. It is a skin sensitizer and can cause severe eye irritation. There is also evidence that it is immunotoxic and an endocrine disruptor.<sup>29</sup>

### **Malathion, chlorpyrifos and ethoprop**

Malathion, chlorpyrifos and ethoprop are organophosphates, and thus, are cholinesterase inhibitors. Ethoprop belongs to the most acutely toxic group of pesticides, classified by the WHO as extremely toxic or Class Ia. Symptoms of poisoning from organophosphates include abdominal pain, diarrhea, excessive salivation, sweating, rhinorrhea and tearing. Severe cases would manifest seizures, incontinence, respiratory depression, and loss of consciousness. Convulsions, paralysis and death can result with sufficient exposure. Chlorpyrifos and malathion are extremely toxic to children's developing brains and are on PAN's Terrible Twenty pesticides that are toxic to children.<sup>30-32</sup>

### **Carbofuran**

Carbofuran is a carbamate and is essentially a cholinesterase inhibitor. Its effects are similar to organophosphates and include malaise, muscle weakness/twitching, incoordination and slurred speech. Hypertension, cardiorespiratory depression, dyspnea, bronchospasms and bronchorrhea with eventual pulmonary edema occur in severe cases of exposure.<sup>33</sup>

## Benomyl

The fungicide benomyl, although classified by the WHO as not likely to be acutely toxic, is a likely carcinogen and a reproductive toxin, causing testicular dysfunction, birth and developmental defects. It is also neurotoxic, can cause kidney and liver damage and is an endocrine disruptor.<sup>34-37</sup>

## Pesticide use and exposure

Out of the 57, 40 are connected or have worked in the plantation, and from this 40, 35 were directly exposed to pesticide as sprayers, mixers, injector, loaders, field applicator and baggers (Tables 5a-c).

*Table 5a. Use of pesticide at work*

FREQ.	USAGE
21	No
35	Yes
1	Unknown
57	N

*Table 5b. Activity with pesticide*

FREQ.	ACTIVITIES
26	Spraying
17	Mixing
1	Injecting
19	Loading
1	Applying in the field
2	Bagging sprayed products
6	Others

*Table 5c. Entry to a newly sprayed field*

FREQ.	ENTRY
4	No
38	Yes
1	Not sure
43	N

Exposure to pesticides (Tables 6a-f) was for a mean duration of nine years while the frequency of pesticide use and exposure was mostly 4-8 hrs/day and ranged from 10 min/day to 3-4 months/year.

Eighteen of the respondents were backpack sprayers. There were 11 cases of accidental exposure.

*Table 6a. Exposure duration in years*

SD	MEAN	MAX	MIN	N
7.43	8.83	26.00	0.48	26

*Table 6b. Frequency of exposure to pesticides*

FREQ.	EXPOSURE
2	10 minutes/day
11	4-8hours/day
3	6 days/week
2	Weekly
4	1-2 months/year
5	3-4 months/year
27	N

Table 6c. Form of pesticide exposure

FREQUENCY	FORM
6	Liquid
1	Gaseous/Vapor
14	Liquid & Gas
4	Can't describe form
25	N

Table 6d. Pesticide applicator

FREQUENCY	TYPE
18	Backpack sprayer
1	Squirt sprayer
1	Medicine dropper
1	Airplane
21	N

All respondents from Davao del Sur said that they were regularly exposed to aerial spraying because of the banana plantation. A respondent who was passing through the plantation to do laundry in the river was aerially sprayed. Another was aerially sprayed while he was eating within the plantation premises.

Only one respondent was cautious of not entering a newly-sprayed field. Respondents do not eat or drink while spraying. They usually take a break after the task.

Table 6e. Frequency of pesticide use

FREQ.	PESTICIDE USE
10	Daily
6	Once a week
2	Once a month
1	Every other day
1	Twice a week
2	1-2 months/year
3	3-4 months/year
4	Others
29	N

Table 6f. Pesticide application time

FREQ.	DURATION
3	1 hour
4	2-3 hours
9	4-5 hours
1	6-7 hours
3	8 hours
20	N

Table 6g. Loading time

FREQ.	DURATION
5	≤10 min
2	15 min
5	30 min
12	N

## Conditions of use

### Personal protective equipment (PPE)

The FAO and WHO International Code of Conduct on Pesticide Management (ICCPM) recommends users to wear PPE, defined as "any clothes, materials or devices that provide protection from pesticide exposure during handling or application... it includes both specifically designed protective equipment and clothing reserved for pesticide application and handling".<sup>38</sup>

For manual spraying, the most essential items are boots or covered shoes, a long-sleeved upper garment and garment that covers the legs, and a hat (if spraying high crops). Also, gloves and eye protection must be worn when pouring, mixing or loading pesticides, and there may be additional items required in certain circumstances.<sup>38</sup>



PPE used are boots, caps and facemasks. Workers in Agusan del Sur said that PPE was provided only when the union asked for it. Photo: ECCHR

In this study, of the 35 respondents that answered the query on PPE use, 31 wore PPE (Tables 7a&b). They normally had personal caps, long sleeves, long pants, boots and face cloth towel at work. The towel served a dual purpose of a respirator and face shield/mask. Coveralls/apron, gauntlet gloves and respirators were provided to some. Only six had goggles to protect their eyes.

Table 7a. Use of PPE

FREQ.	USE
4	No
31	Yes
35	N

Table 7b. Items worn by the respondents and frequency of use

RARELY	OCCASIONALLY	50% OF THE TIME	100% OF THE TIME	NONE	ITEMS
0	0	0	10	15	Coveralls
0	0	0	6	19	Goggles
0	0	1	6	17	Face shield
5	4	4	8	4	Face mask
0	0	2	6	18	"Respirator"
0	0	4	4	16	Apron
5	0	3	13	7	Gauntlet gloves
0	2	1	25	0	Boots
0	0	30	4	0	Face cloth towel

Focused group discussion (FGD) participants said that the masks and gloves lasted barely one month, while the aprons for about five months. The apron was of the same material as a raincoat.

Respondent workers in the oil palm plantation in Agusan del Sur said that PPE was provided only when the union asked for it. PPE was given once a year. Torn PPE was not replaced as the company emphasized that it is the workers' responsibility to ensure that the PPE does not break. Thus, several of them resorted to the use of bra cups as substitutes to masks.



Focused group discussion (FGD) participants said that the masks and gloves lasted barely one month, while the aprons for about five months. Photo: ECCHR

## Washing facilities

Most respondents said that washing facilities were provided in the workplace but were not always accessible. Thirty-three of the workers wash their hands after handling pesticides and 17 bathe immediately after. The three who said they do not wash reasoned that they were too tired to wash and were scared of *pasma*, a local belief of becoming ill if they wash or bathe immediately after work. There were times, too, that workers could not wash when the stored water runs out. On these occasions, they washed in rivers, brooks or creeks, or at home. Such practice contaminates ecosystems and increases “take home” exposure to pesticides.

Brian, an FGD participant from the oil palm plantation in Bukidnon, said that the washing area of the company was restricted and off-limits to him and his co-workers. Thus, they used the creek to wash themselves and the equipment. They did not regularly wash at home since water is limited. His co-worker,

Brendan, afraid that the pesticide seeps into his hands never washed after mixing pesticides. Another co-worker, Manuel, added that they did not bathe to avoid *pasma*.

## Spillages

Most of the respondents experienced spillage while backspraying (N=9), circle spraying (N=22), loading (N=6) and mixing (N=10). The body parts affected ranged from dermal to oral (Fig. 1).

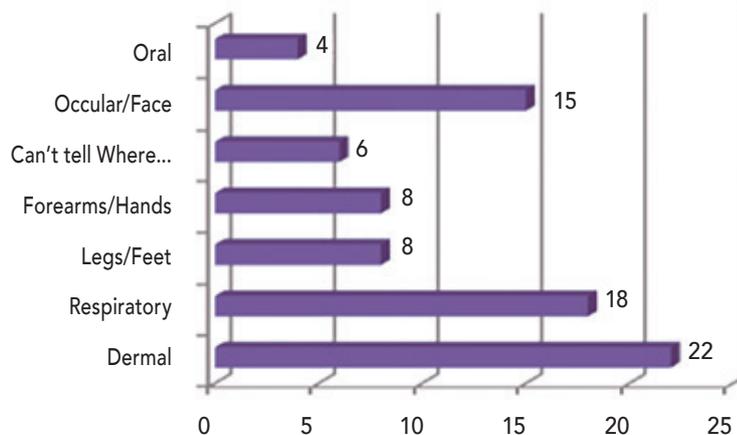


Fig. 1. Body parts affected during spillage and frequency

In the oil palm plantations in Bukidnon and Agusan del Sur, knapsacks were used for spraying. Sometimes, parts of the knapsack break, e.g. the spring or the pump. The workers usually try to fix it on their own whenever it was not possible to return to the company. Leaks were sealed with plastic and clogged nozzles were fixed.

Adriana did not realize that her backsprayer was leaking until she felt pain in her buttocks. The pesticide burned her skin and left a scar at her buttocks.

Brendan reported that he wraps the nozzle with tissue and unclogs it with his mouth.

Oil palm plantation worker Brian used sardine cans to measure pesticides, and thus, the pesticide normally gets in contact with his hands. Maria shared that during spraying, the pesticide would flow from her knees towards her feet. This caused discoloration/blackening of her nails and toes.

### Wind direction

Of the 33 pesticide applicators, nine sprayed against the wind direction while 10 were not conscious of the wind movement when spraying. Only 14 made sure that they spray along the wind direction.

## Pesticide storage, disposal and cleaning practice

### Disposal

Industry has product stewardship responsibilities under the ICCPM or Code of Conduct in relation to the disposal for pesticides and used containers. Government and industry should also cooperate to establish services to collect and safely dispose of used containers.<sup>38</sup>

Through observations and discussions, monitoring teams found that pesticide containers were disposed of using various methods. Pesticide containers were usually buried or destroyed and placed in the ordinary rubbish bin (Table 8). There were times, too, when these were returned to suppliers, burned or thrown in the field. Some would not know the method of disposal since containers were returned to the warehouse.

Table 8. Pesticide container disposal method

FREQUENCY	DISPOSAL METHOD
6	Bury
2	Burn
5	Destroy & put in rubbish bin
4	Return to supplier
1	Thrown in the field
3	Return to warehouse
1	Don't know

Pesticides were usually finished or, if ever there were leftovers, they were stored. No one mentioned recycling pesticide containers.

### Cleaning and rinsing of containers and equipment

Most respondents (N=23) wash their equipment at their workplace, in a brook, creek, field, at a faucet or using the stored water in drums. Three wash their equipment at home, while one leaves the equipment unwashed.

The respondents or their spouses normally wash the PPE (Tables 9a&b), and washing was usually done at home.

Table 9a. Place where PPE is washed

FREQ.	LOCATION
6	Brook
5	Creek
3	Workplace: Faucet
11	Workplace: Stored water
14	Home: Faucet
3	Do not wash PPE

Table 9b. Person who washes the PPE

FREQ.	PERSON RESPONSIBLE
10	Respondent
13	Spouse
1	Respondent & Spouse
1	Spouse & child
2	Laundrywoman
27	N

### Storage

Pesticides used in the fields were usually stored in the company warehouse (N=6), in a shed (N=3), or in the fringes of the field (N=2). Some respondents bring it home and put it beside their houses (N=4). Two workers bury the pesticides while four of them said they simply put it in a proper place without specifying where.

Pesticides for home use were stored in a shed (N=3), placed beside the house (N=1), or buried (N=1). One respondent replied that he never store pesticides.

## Training, access to information, and awareness of hazards

### Training

Of the 34 plantation workers who responded to the query, only 17 had training on pesticide use and handling.

Adriana said that she received instruction on the modes of pesticide application, and how to measure. A contractual laborer, she did not get any training on health and safety. A co-worker informed her of the hazards of pesticides which made her conscientious in wearing PPE and in washing.

In a similar situation, Brendan learned how to properly open, measure and mix pesticides but was not advised on what to do after spraying. Brendan uses a sardine container to measure pesticides, and thus, it gets in contact with his hands whenever he pours it into the spray can. He learned of the hazards of pesticides from the lead man who told him to use PPE. However,

the gloves were easily torn and were not replaced. Financially incapable to buy gloves, he had been handling pesticides with bare hands.

Brian, just like Adriana and Brendan, had no safety training. He was only briefed on how to use the knapsack and to avoid spraying against the wind direction. The sudden changes in wind direction get him in direct contact with pesticides. Brian realized the hazards of pesticide when he experienced symptoms. He attributed his fellow sprayer’s paralysis to pesticide exposure.

The rest of the FGD participants from the oil palm plantation in Agusan del Sur received safety training. Maria and Amelia had safety training once, while Arturo twice. Pablo said that the training is given once a year.

### Access to label/Safety data sheets

Maria said that the pesticides come in gallons with labels bearing the name of the pesticide and other chemical information but without pictograms. Brendan, on the other hand, said that the pesticide he was using was in a container bearing the pesticide name and a picture of weeds on which it is applied.

## Illnesses

### Illnesses of household members

Each household had in general one diseased member and two types of illnesses (Table 10). The most common illnesses were hypertension, allergy and asthma (Fig. 2).

Table 10. Household illnesses

MAX	MIN	MODE	SD	SE	MEAN	N	
3	0	1	0.69	0.11	1.33	40	Number of Household Members with Illness
6	0	2	1.35	0.21	2.49	43	Number of Household Illnesses

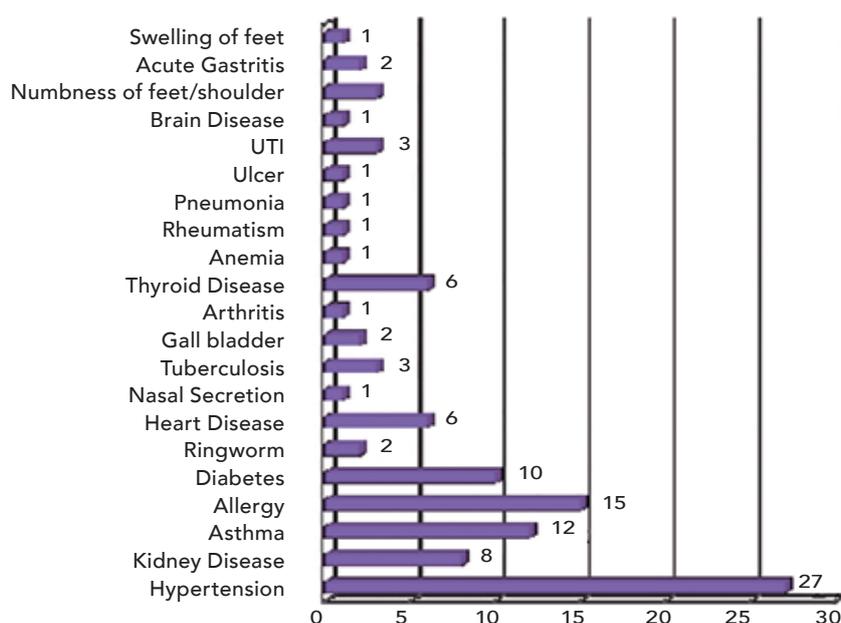


Fig. 2. Types and frequency of illnesses per household

### Illnesses of respondents

Fourteen of the respondents (Fig. 3) have been ill at least three times in the last 12 months. Yet, most of them could not afford to see a medical doctor (Fig. 4)

Headache, blurring of vision, nausea, coughing, eye pain and skin itchiness were the most common ailment among the respondents (Fig. 5).

Maria started working at the oil palm plantation in 1980. In 2004, she started coughing and her eyes became blurred. She had bouts of losing consciousness. Her skin became very dry and her fingers would feel numb. The medical doctor did not give prescription when she had herself checked. She began having headaches in 2008.

Adriana had the same complaints. Other than these, she has breast cysts and myoma, and finds it painful to urinate. Her vagina itches as well. She attributed her symptoms to pesticides since she used to urinate on newly sprayed ground. Unlike Maria, she did not see a doctor after quitting her job in 2014 for she could not afford the transportation fare to the clinic.

Maria and Adriana's recounts would strengthen earlier findings that women are more susceptible to the harmful effects of pesticides compared to men since they have higher proportion of body fat and of hormonally sensitive tissues. There is strong scientific evidence that pesticides increase the risk of breast cancer.<sup>39-42</sup>

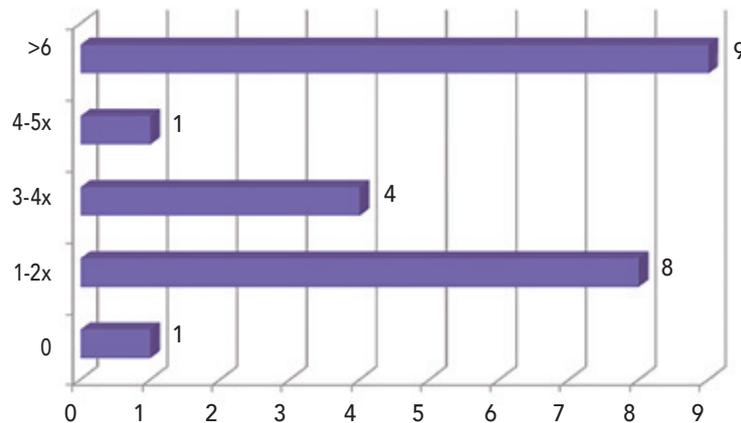


Fig. 3. Frequency of the number of times the respondent was sick in the last 12 months

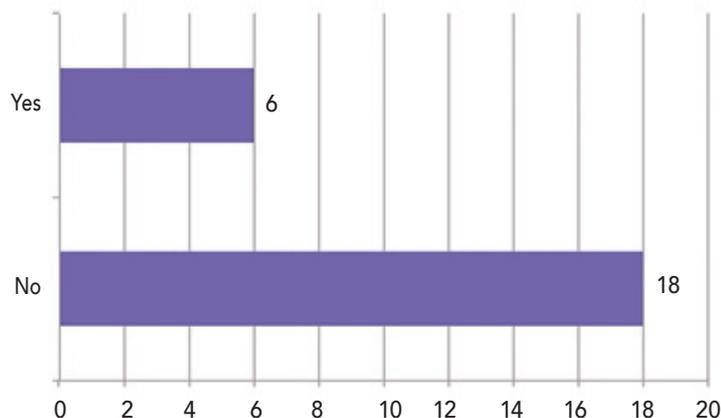


Fig. 4. Number of respondents with health symptoms that were given medical attention

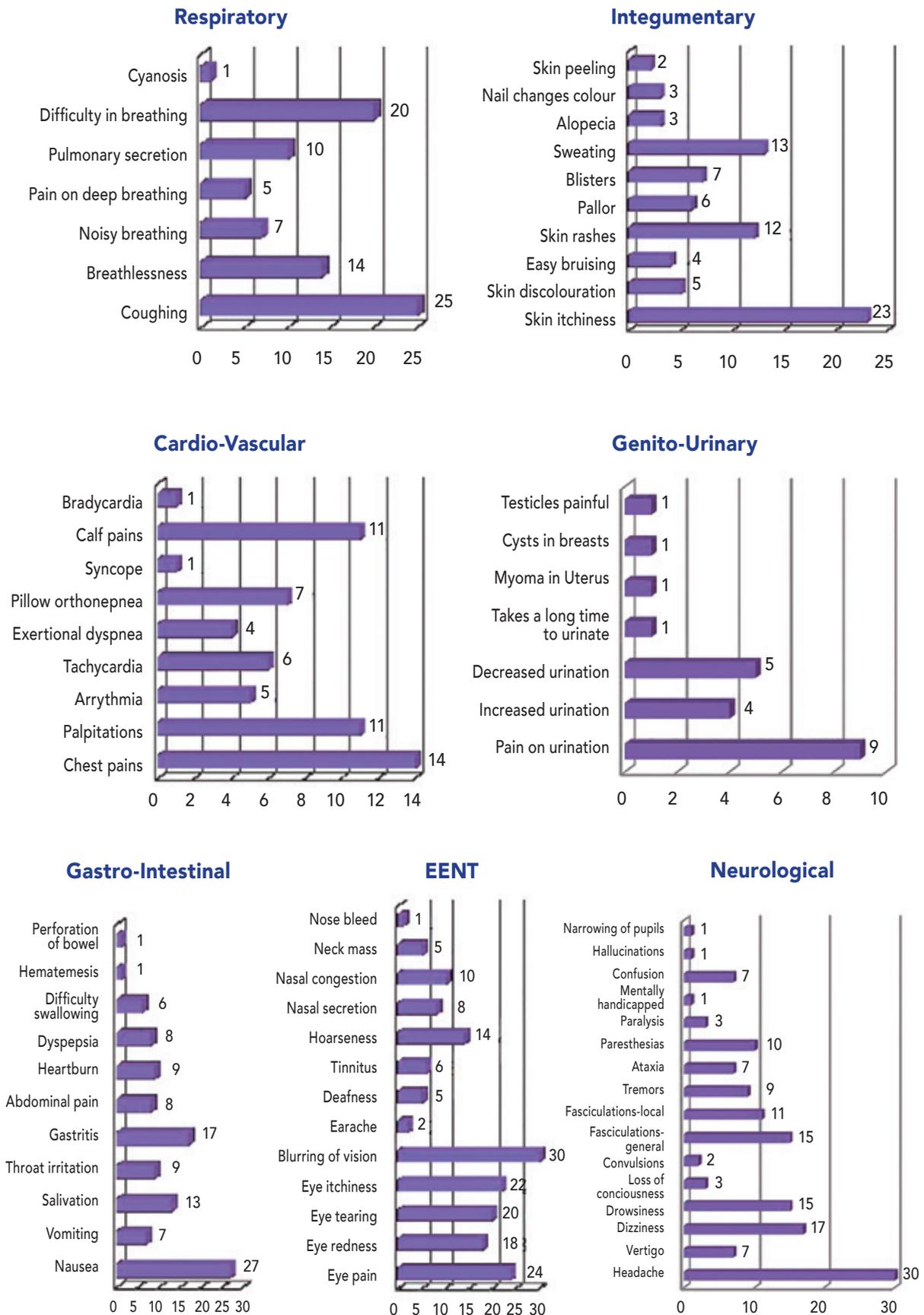


Fig. 5. Specific illnesses reported by the respondents



Chronic dermatitis due to repeated immersion in plantation canals. Photo: PAN Philippines



Effect of paraquat on skin and nails. Photo: PAN Philippines



Skin discoloration due to paraquat spillage. Photo: PAN Philippines

## Children

There were 80 children below 18 years old in the 48 households interviewed (Tables 11a&b). At least 10 children were at the vulnerable ages of 6 years old and below. One interviewee had a normal and healthy child who became mentally handicapped at the age of three after exposure to aerial spray.

Children are more vulnerable to pesticides since they breathe more air, eat more food and drink more water per unit of body weight. Early-life exposure can damage their developing brain and body systems.<sup>43</sup> This is the reason why a pesticide drift that may not harm adults may cause mental retardation to exposed children.

Table 11a. Age range of the children

FREQ.	AGE RANGE
1	<1 year old
9	1-6 years old
16	7-12 years old
18	13-17 years old
36	Unspecified
80	Total

Table 11b. Children below 18 years old

TOTAL	FREQ.	CHILDREN/HOUSEHOLD
0	15	0
14	14	1
12	6	2
21	7	3
8	2	4
5	1	5
6	1	6
14	2	7
80	Total No. Children	



Child with acute respiratory disease in a banana plantation, South Cotabato. Photo: PAN Philippines

Pesticides are now considered a *silent pandemic* by public health experts.<sup>43</sup> Children must not be allowed to work in pesticide-ridden environment and even more so to handle pesticides. It is thus disturbing to learn that Adriana and her husband, and other workers were taken in by the oil palm plantation when they were only 12 years old as cleaners and fruit pickers. Children are also hired in the banana plantation. The revised Code of Conduct<sup>38</sup> pays specific attention to the health and wellbeing of children and encourage governments and industries to take special actions to reduce children's risk of exposure.

## Women

The wives of some of the male respondents also answered portions of the survey. This is the reason why the sample size changed from the initial 22 female respondents to 27.

Thirteen of the respondents (Tables 12a-h) were sexually active. Most of them with a regular menstrual period, lasting for 3-5 days, and with a 28-day cycle. Half experienced dysmenorrhea and two had increased/decreased menstrual flow. They had their menarche from 11 to 17 years of age, with the mode at 16 years old. Twenty-five of them had children. Two had miscarriages while three had a stillborn child or a child that died shortly after birth.

Table 12a. Sexual activity

FREQ.	ACTIVE
13	Yes
14	No
27	N

Table 12b. Menstrual Period

FREQ.	REGULARITY
25	Regular
2	Irregular
27	N

Table 12c. Period Duration

FREQ.	DURATION
25	3-5 Days
2	6-7 Days
27	N

Table 12d. Menstrual Cycle

FREQ.	ACTIVE
15	28 Days
12	30 Days
27	N

Table 12e. Dysmenorrhea

FREQ.	REGULARITY
13	With
14	Without
27	N

Table 12f. Menstrual Flow

FREQ.	DURATION
25	Normal
2	Abnormal
27	N



Woman worker with burned skin due to paraquat spill.  
Photo: PAN Philippines

Table 12g. Age of first menstruation

SD	SE	MEAN	MODE	MAX	MIN	N
1.78	0.34	14.22	16	17	11	27

Table 12h. Number of children

SD	SE	MEAN	MODE	MAX	MIN	N
2.00	0.40	4.00	3	8	1	25

Next to children, women are most vulnerable to pesticides.<sup>42</sup> A recent study showed that exposure to pesticides during pregnancy may increase the likelihood of stillbirth.<sup>44</sup>



## CONCLUSIONS

This report finds that not only the plantation workers but the community within and near the plantations – especially the elderly, women and children – are adversely affected by the use of HHPs in the plantations. Two women have reported miscarriages and painful menstruation. A child who was exposed to pesticides due to aerial spraying, have after falling unconscious became mentally challenged.

Children as young as 12 years old are taken in as plantation workers.

The corporations that run the banana and palm oil plantations do not comply with national and international regulations pertaining to the use of agrochemicals and do not abide by their corporate responsibility of ensuring the safety of their workers and the nearby communities. The safety precautions taken by the plantation management are inadequate. The PPEs are neither sufficient nor durable. More appallingly, workers are expected to buy their own PPEs, that due to lack of money, workers handle pesticides with bare hands and use bra cups as face masks.

Water resources are not always accessible at the most crucial times. Some workers use nearby water systems, e.g. rivers, brooks, and creeks, to bathe, wash and rinse their equipment. This practice contaminates the environment and increases the health risk on the many others who come in contact with the water. Respondents that do not directly handle pesticides have illnesses that can be linked to pesticide exposure.

Conditions that were reported in the study clearly violate the Universal Declaration of Human Rights, the UN “Protect, Respect and Remedy” Framework for Business and Human Rights, International Labour Standards and provisions mentioned in the International Code of Conduct on Pesticide Management. Such conditions specially trample children’s rights. Articles 6 and 24 of the Convention on the Rights of the Child state that “*every child has the inherent right to life,*” that the survival and development of the child must be ensured to the “maximum extent possible,” and that “*the right of the child to the enjoyment of the highest attainable standard of health*” must be safeguarded and upheld.

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**Annex: List of reported pesticides in the banana and oil palm plantations  
in Mindanao, Philippines 2015-2016**

Pesticide	No. of brands with pesticide	WHO Ia Ib	EU R26	Cancer rating	Muta (EU 1,2)	Repro (EU 1,2)	EU EDC	ChE Inh	vB	vP	High bee tox	POP	PIC	HHP	T20	Banned in Philippines	Total Bans (number of countries)
2,4-D	1			Possible			Yes				Slightly			Yes			2
Lambda-cyhalothrin	1		Yes				Yes				Yes			Yes	Yes		28 †
Carbofuran	1	Yes		Possible							Yes						46
Cypermethrin, alpha	1						Yes				Yes			Yes	Yes*		
Glyphosate	2																1
Paraquat	2		Yes											Yes	Yes		35
Deltamethrin	1						Yes				Yes						
Malathion	1			Possible			Yes				Yes				Yes		1
Chlorpyrifos	1	Yes									Yes						1
Chlorothalonil	1		Yes	Probable											Yes		2
Propineb	1																
Dimethenamid-p	1																
Metazachlor	1				Yes									Yes			1
Quinmerac	1													Yes			
Triclopyr	1																
O-Ethyl S, S-dipropyl phosphorodithiorate	1																
Tetramethylthiuram disulphide	1																
Methyl-1[butyl-carbomoyl]-2-benzimidazole carbamate	1																
Bacillus thuringiensis	1																

\* Parent of active substance (cypermethrin) is listed on 20 Terrible Pesticides list

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





**PAN Asia Pacific (PANAP)**, one of five regional centres of the Pesticide Action Network, is dedicated to the elimination of harm upon humans and the environment by pesticide use and the promotion of sustainable biodiversity-based agriculture. In addition, PANAP helps strengthen people's movements in their assertion of rights to land and livelihood; advancing food sovereignty and gender justice.

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