

Agricultural Sanitation and Health Risks Among Hiyung Cayenne Pepper Farmers in Hiyung Village, Tapin Tengah District, Tapin Regency, South Kalimantan

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Agricultural activities involve direct interaction between farmers and the agricultural environment, including water, soil, equipment, pesticides, and other materials that may pose health risks. Hiyung Cayenne Pepper is a local agricultural commodity originating from Hiyung Village, Tapin Tengah District, Tapin Regency, and is cultivated as part of the local farming system. This study aimed to identify agricultural sanitation conditions and describe health risks among Hiyung Cayenne Pepper farmers in Hiyung Village. A descriptive observational study was conducted from April 1 to April 8, 2026, involving 10 Hiyung Cayenne Pepper farmers. Data were collected through interviews and direct observation of agricultural environments, including water conditions, toilet facilities, waste management, handwashing facilities, equipment cleanliness, pesticide use, personal protective equipment (PPE), and health complaints. The results showed that agricultural sanitation conditions were not optimal. The measured water pH was 5, toilet facilities were less permanent, waste management was poorly organized, handwashing facilities were unavailable, and agricultural equipment cleanliness was inadequate. All farmers used pesticides, masks, and long-sleeved clothing, but none used gloves. Five farmers (50%) reported experiencing dizziness when performing agricultural activities for prolonged periods. The study concludes that agricultural sanitation and occupational safety practices among Hiyung Cayenne Pepper farmers require improvement, particularly in handwashing facilities, waste management, equipment hygiene, toilet facilities, and more complete PPE use.

Keywords: Agricultural sanitation, Hiyung Cayenne Pepper, Farmers, Health risk, Pesticide, Personal protective equipment

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1. Introduction

Agriculture is an important sector for community livelihoods and local economic development. Farmers interact directly with their working environment, including soil, water, crops, fertilizers, pesticides, and agricultural equipment. These conditions make occupational health and safety an important concern, particularly because certain materials and work practices in agricultural activities may increase exposure and lead to health problems [1], [2].

One agricultural commodity that represents local wisdom and the agricultural identity of Tapin Regency is Hiyung Cayenne Pepper, which originates from Hiyung Village, Tapin Tengah District. Hiyung Cayenne Pepper is a local variety of cayenne pepper cultivated by the community and is characterized by its extremely spicy taste. This commodity is cultivated within the local farming system and is associated with the *lebak* swamp agroecosystem [3]. The sustainability of these agricultural activities needs to be accompanied by attention to farmers' health because farmers are directly involved in cultivation, maintenance, pesticide application, and harvesting activities.

In this study, agricultural sanitation encompasses the cleanliness of the working environment, availability and use of water, waste management, equipment cleanliness, personal hygiene, as well as the use of agricultural chemicals and personal protective equipment (PPE). Poor sanitation conditions and inadequate work practices may increase the potential for contact with hazardous substances, including pesticides. Previous studies among farmers in Indonesia have reported health complaints associated with pesticide exposure and emphasized the importance of PPE use and safe agricultural practices in reducing potential health risks [1], [4], [5]. Studies among horticultural farmers have also demonstrated associations between pesticide use, PPE practices, and health complaints [6], [7].

Based on these conditions, this study focuses on agricultural sanitation and health risks among Hiyung Cayenne Pepper farmers in Hiyung Village, Tapin Tengah District, Tapin Regency. This study aimed to identify agricultural sanitation conditions and describe potential health risks experienced by farmers during Hiyung Cayenne Pepper cultivation activities. The findings are expected to provide an initial basis for improving sanitation practices, personal hygiene, and occupational safety to support farmers' health and the sustainability of Hiyung Cayenne Pepper cultivation.

2. Literature Review and Problem Statement

Sanitation and occupational safety are important components of agricultural activities because farmers may be exposed to pesticides and various environmental conditions throughout the cultivation process. Joko *et al.* reported health problems among Indonesian farmers exposed to pesticides and indicated that the use of personal protective equipment (PPE) was associated with health conditions, including complaints of dizziness [1]. Nurcandra *et al.* reported that appropriate PPE use during pesticide preparation and spraying, following wind direction during spraying, and bathing after spraying could reduce the risk of neurological symptoms among farmers [2].

Suwimantra *et al.* also reported an association between PPE use and farmers' complaints related to pesticide use [5]. The study was conducted among farmers in Subak Sri Gumana, Rejasa Village, Tabanan Regency. Similar findings have also been reported among horticultural farmers in Bali, examining pesticide use and PPE practices in relation to health complaints [6]. These studies demonstrate that PPE use, personal hygiene, and safe work practices are important components of protecting farmers' health.

However, previous studies have primarily focused on pesticide exposure, PPE use, and health complaints. Meanwhile, agricultural sanitation as a broader concept, encompassing water conditions, toilet facilities, waste management, handwashing facilities, equipment cleanliness, and personal hygiene, has received limited attention when examined simultaneously in the context of Hiyung Cayenne Pepper cultivation.

Local research on Hiyung Cayenne Pepper has primarily examined farmers' perceptions and farming conditions rather than agricultural sanitation and occupational health aspects [3]. Research by Nor'ain, Mariani, and Santoso indicated that Hiyung Cayenne Pepper is a local cayenne pepper variety associated with the *lebak* swamp agroecosystem and is a commodity cultivated by farmers in Hiyung Village.

Therefore, a research gap remains regarding the description of agricultural sanitation conditions and potential health risks among Hiyung Cayenne Pepper farmers. Based on this research gap, the problem examined in this study is: What are the agricultural sanitation conditions and potential health risks among Hiyung Cayenne Pepper farmers in Hiyung Village, Tapin Tengah District, Tapin Regency?

3. Methods

This study employed a descriptive quantitative approach with an observational design to describe agricultural sanitation conditions and potential health risks among Hiyung Cayenne Pepper farmers. The

study was conducted from April 1 to April 8, 2026, in Hiyung Village, Tapin Tengah District, Tapin Regency. Data were collected through interviews and direct observation of the agricultural environment. This approach was selected to obtain an overview of sanitation conditions, agricultural practices, and health complaints reported by farmers.

The study respondents consisted of 10 Hiyung Cayenne Pepper farmers who were actively engaged in cultivation activities in Hiyung Village. Data were collected through interviews regarding agricultural activities, pesticide use, PPE practices, and health complaints. Direct observations were conducted to assess agricultural sanitation conditions, including water conditions, toilet facilities, waste management, availability of handwashing facilities, and agricultural equipment cleanliness.



Figure 1. Interview with Hiyung Cayenne Pepper Farmers

Source: Research documentation, 2026.

The interview results showed that all respondents used pesticides in their agricultural activities. All respondents used masks and long-sleeved clothing, whereas none used gloves. Health complaints were assessed based on symptoms self-reported by farmers during agricultural activities. The main complaint identified was dizziness when farmers performed agricultural activities for excessively long periods.

Because this study was descriptive and did not include medical examinations or biological measurements of pesticide exposure, dizziness was treated as a health complaint and an indicator of potential health risk, rather than confirmed pesticide poisoning. The data obtained from observations and interviews were analyzed descriptively using frequencies and percentages for categorical variables. The results were presented in tables to describe sanitation conditions, PPE practices, pesticide use, and health complaints among the respondents.

Table 1. Study Characteristics

Component	Description
Study design	Descriptive quantitative/observational
Study location	Hiyung Village, Tapin Tengah District, Tapin Regency
Study period	April 1–8, 2026
Respondents	10 Hiyung Cayenne Pepper farmers
Data collection	Interviews and direct observation
Pesticide use	Yes
Main health complaint	Dizziness during prolonged activities
Water condition	pH 5
Toilet facilities	Less permanent

Component	Description
Waste management	Poorly organized
Handwashing facilities	Not available
Agricultural equipment cleanliness	Poor

4. Results and Discussion

Agricultural Sanitation Conditions

The observation results showed that several aspects of agricultural sanitation in Hiyung Cayenne Pepper cultivation areas were not optimal. The measured water pH was 5. Toilet facilities were less permanent, waste management was poorly organized, and no dedicated handwashing facilities were available. In addition, the cleanliness of agricultural equipment was considered inadequate. These findings indicate that several basic sanitation facilities in the agricultural environment still require improvement.



Figure 2. Documentation of Observation of the Hiyung Cayenne Pepper Farm Environment
Source: Research documentation, 2026.

Table 2. Agricultural Sanitation Conditions Among Hiyung Cayenne Pepper Farmers

No.	Sanitation Aspect	Observation Result
1	Water condition	pH 5
2	Toilet facilities	Less permanent
3	Waste management	Poorly organized
4	Handwashing facilities	Not available
5	Agricultural equipment cleanliness	Inadequate
6	Pesticide use	Used in cultivation activities

The absence of handwashing facilities is one of the sanitation problems that requires attention because hand hygiene is an important component in preventing contact with various contaminants during agricultural activities. Farmers may come into contact with soil, crops, agricultural equipment, and agricultural chemicals while working. Research among farmers who use pesticides has emphasized the importance of personal hygiene, sanitation practices, and appropriate PPE use in reducing potential exposure and health risks [4]. Therefore, hygiene and sanitation practices need to be implemented alongside safe pesticide handling and occupational protection measures.

The cleanliness of agricultural equipment also requires attention. Equipment that is not adequately cleaned may increase the possibility of repeated contact with agricultural residues or contaminants. Although this study did not measure pesticide residues on agricultural equipment, inadequate equipment cleanliness represents a sanitation problem that should be addressed through routine cleaning and proper equipment storage.

Personal Protective Equipment Use and Health Complaints

Interviews with 10 Hiyung Cayenne Pepper farmers showed that all respondents used pesticides in their cultivation activities. Regarding PPE use, all respondents used masks and long-sleeved clothing, whereas none used gloves.

Table 3. PPE Use and Health Complaints Among Farmers

No.	Indicator	Result	Percentage
1	Farmers using pesticides	10 farmers	100%
2	Using masks	10 farmers	100%
3	Wearing long-sleeved clothing	10 farmers	100%
4	Using gloves	0 farmers	0%
5	Experiencing dizziness	5 farmers	50%
6	Not experiencing dizziness	5 farmers	50%

The results showed that PPE use among the respondents was still incomplete. Masks and long-sleeved clothing were used by all respondents, but none of the respondents used gloves. This condition indicates that protection against possible hand contact with agricultural chemicals remains limited.

Research among farmers in Indonesia has demonstrated the importance of appropriate PPE use in reducing potential health risks associated with pesticide exposure [1], [2]. Suwimantra *et al.* also reported an association between PPE use and farmers' complaints related to pesticide use [5].

Among the 10 respondents, 5 farmers (50%) reported experiencing dizziness when performing agricultural activities for excessively long periods, while the other 5 farmers (50%) did not report dizziness. Dizziness is a health complaint that should be considered, particularly in agricultural environments involving pesticide use and prolonged physical activity. However, these findings cannot establish that pesticide use was the direct cause of the reported dizziness.

This cautious interpretation is consistent with previous research. Joko *et al.* reported dizziness as one of the health complaints found among farmers exposed to pesticides [1]. Perwitasari *et al.* also reported that organophosphate exposure may be associated with several health complaints, although the reported symptoms did not specifically confirm pesticide poisoning [8].

Purba *et al.* reported subjective health complaints among pesticide-spraying farmers, including headaches and other symptoms [9]. These findings support the importance of monitoring farmers' health complaints but cannot be used to establish a causal relationship without appropriate health examinations or exposure measurements.

Discussion of Health Risks

The study findings indicate a combination of conditions that require attention, including pesticide use, the absence of handwashing facilities, inadequate equipment cleanliness, poorly organized waste management, less permanent toilet facilities, and incomplete PPE use. These conditions represent potential environmental health and occupational safety concerns for farmers.

A total of 50% of respondents reported experiencing dizziness, making it one of the important initial findings that should be considered. However, this study did not include medical examinations,

cholinesterase testing, biological monitoring, or quantitative measurements of pesticide exposure. Therefore, the dizziness reported by respondents cannot be interpreted as confirmed pesticide poisoning. Caution in interpreting self-reported symptoms is also important because health complaints among farmers may be influenced by various factors. Studies on pesticide use among Indonesian farmers have reported various health complaints and risk factors associated with pesticide-use practices [9], [10].

Previous studies have indicated that pesticide exposure may be associated with various health problems and that inadequate protection may increase the potential for exposure [11], [12]. Saftarina *et al.* demonstrated that inadequate PPE use was one of the dominant factors associated with pesticide poisoning among horticultural farmers.

Therefore, improvements in agricultural sanitation should be implemented alongside education on safe pesticide handling and more comprehensive PPE use. Providing easily accessible handwashing facilities, improving waste management, maintaining agricultural equipment, improving toilet facilities, and increasing PPE use, particularly hand protection, may strengthen occupational health and safety practices among Hiyung Cayenne Pepper farmers.

Overall, this study provides an initial description of agricultural sanitation conditions and potential health risks among Hiyung Cayenne Pepper farmers in Hiyung Village. The findings may serve as a basis for further research involving a larger number of respondents, more detailed exposure measurements, and objective health examinations.

5. Conclusion

This study showed that agricultural sanitation conditions among Hiyung Cayenne Pepper farmers in Hiyung Village still require improvement. Observations identified several sanitation problems, including a measured water pH of 5, less permanent toilet facilities, poorly organized waste management, the absence of handwashing facilities, and inadequate agricultural equipment cleanliness.

Regarding occupational safety, all 10 farmers used pesticides, masks, and long-sleeved clothing, whereas none used gloves. Five out of 10 farmers (50%) reported experiencing dizziness when performing agricultural activities for excessively long periods. These findings indicate potential health concerns that require attention. However, this study could not establish a causal relationship between pesticide exposure and dizziness because neither medical examinations nor biological exposure measurements were conducted.

Improving agricultural sanitation through the provision of handwashing facilities, better waste management, improved equipment cleanliness, better toilet facilities, and more comprehensive PPE use is necessary to support farmers' occupational health and safety. Future research is recommended to involve a larger number of respondents and to conduct health examinations or objective pesticide exposure measurements to obtain a more specific assessment of health risks among Hiyung Cayenne Pepper farmers.

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