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Promotive and Preventive Occupational Health Efforts for Farmers in Wonogiri

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ABSTRACT

Background: Farmers are informal-sector workers at high risk of health disorders and occupational accidents arising from physical, chemical, ergonomic, and environmental hazards. Promotive and preventive occupational health efforts are therefore needed to improve their health status. Community health centers, as primary healthcare facilities, play an important role in delivering occupational health services to working communities, including farmers. **Method:** A descriptive qualitative approach was used. Informants were selected by purposive sampling. Data were collected through in-depth interviews, observation, and documentation, and their validity was tested using source and method triangulation. Analysis followed the stages of data reduction, data display, and conclusion drawing. **Results:** Promotive efforts at the Eromoko 2 Community Health Center were delivered through health counseling, education on personal protective equipment (PPE), promotion of clean and healthy living behavior, and health guidance during Posbindu activities in each village. Preventive efforts comprised periodic health examinations, early detection of work-related disease, monitoring of farmers' health, and referral for those requiring further treatment. Health personnel understood occupational health services, but staff numbers were limited. No dedicated occupational health program for farmers was available, and farmers' awareness of PPE use remained low. **Conclusion:** Promotive and preventive occupational health efforts for farmers in the Eromoko 2 Community Health Center working area have been implemented, but not yet optimally. Program development and greater farmer awareness of occupational health are required.

1. Introduction

Indonesia is an agrarian country in which the agricultural sector remains one of the main pillars of the national economy. According to the latest data, more than 27.8 million Indonesians work in agriculture, and the majority are smallholders managing less than 0.5 hectares of land [1]. As a group of workers central to national food provision, farmers face a range of health and safety risks arising from the work environment, equipment, working methods, and the chemicals used in agricultural activities. These risks place agriculture among the most hazardous occupations.

Globally, agriculture is categorized among the occupations most at risk of accidents and occupational disease. The International Labour Organization reports that the agricultural sector accounts for approximately 170,000 deaths from workplace accidents each year worldwide [2]. The

World Health Organization and the United Nations Environment Programme have also recorded more than three million cases of pesticide poisoning annually, primarily in developing countries where occupational health protection systems remain limited. Farmers are therefore a group of workers requiring particular attention in occupational health protection.

The occupational health risks faced by farmers include musculoskeletal disorders from the repeated lifting and carrying of heavy loads, injuries from work tools, respiratory disorders from dust and agricultural chemicals, skin disease from contact with pesticides, metabolic disorders from exposure to certain chemicals, and heat fatigue from working long hours under direct sunlight. These risks can reduce productivity, increase healthcare costs, and affect the welfare of farmers and their families if preventive measures are not implemented optimally.

In Indonesia, occupational health remains a serious challenge. Reported cases of work-related illness rose from 210,789 in 2019 to 234,370 in 2021. Although these figures do not derive entirely from agriculture, they indicate that occupational health protection in Indonesia still requires strengthening, particularly for informal-sector workers such as farmers, who are generally not covered by the formal occupational health system in the way industrial workers are. Limited implementation of occupational safety and health (OSH), minimal use of personal protective equipment (PPE), and restricted occupational health services in the informal sector all compound the risks farmers face. Community health centers play an important role in delivering promotive and preventive occupational health efforts through counseling, regular health examinations, early detection of occupational disease, and monitoring of the working environment.

A preliminary study in the working area of the Eromoko 2 Community Health Center in Wonogiri Regency identified several problems in occupational health services for farmers, including the unavailability of an Occupational Health Post (Pos UKK), limited occupational health counseling, suboptimal health examinations in relation to occupational risk, and persistently low use of PPE. These conditions indicate a need to strengthen occupational health services through promotive and preventive approaches suited to the characteristics of farmers as informal-sector workers. As primary healthcare facilities, community health centers hold a strategic role in providing promotive and preventive services that increase knowledge, prevent occupational disease, detect health disorders early, and support safe and healthy work behavior among farmers.

This study therefore aimed to analyze promotive and preventive efforts in occupational health for farmers in the working area of the Eromoko 2 Community Health Center, Wonogiri Regency. Specifically, it aimed to (a) identify the forms of promotive occupational health effort implemented for farmers; (b) identify the forms of preventive occupational health effort implemented for farmers; and (c) develop strategic recommendations for strengthening promotive and preventive occupational health services for farmers in this working area.

2. Methods

2.1. Study design and setting

This qualitative study used a descriptive design to analyze the implementation of promotive and preventive occupational health efforts for farmers in the working area of the Eromoko 2 Community Health Center, Wonogiri Regency. The study was conducted from March to April 2026 in five villages within that working area: Ngandong, Pucung, Basuhan, Tempurharjo, and Pasekan.

2.2. Informants

Informants were selected by purposive sampling on the basis of their knowledge, experience, and direct involvement in the implementation of occupational health efforts. Key informants comprised the Head of the Eromoko 2 Community Health Center, occupational safety and health (OSH) officers, and health promotion officers; triangulation informants were farmers who were the targets of occupational health services. The number of informants was determined by the principle of data saturation, with data collection halted once no new relevant information emerged.

Key informants were required to be health workers directly involved in the planning, implementation, and supervision of occupational health programs. Triangulation informants were

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required to be farmers residing within the working area of the Eromoko 2 Community Health Center who had previously participated in health services such as Posbindu (Pos Pembinaan Terpadu, the integrated community health post) or health education sessions, were willing to serve as informants, and were able to communicate effectively during the interview process.

2.3. Instruments

The research instruments were a human instrument, a semi-structured interview guide, and an observation checklist. The researcher acted as the primary instrument in selecting informants, conducting interviews and observations, recording data, and interpreting the results. The interview guide was developed with reference to the indicators for implementing promotive and preventive occupational health efforts set out in Regulation of the Minister of Health Number 100 of 2015 concerning Integrated Occupational Health Posts (Pos UKK Terintegrasi) [3], covering the forms of promotive and preventive activity, the role of the community health center, farmer participation, program benefits, and the supporting and inhibiting factors in implementation. The observation checklist was used to verify the interview results by observing the implementation of occupational health activities, the counseling media used, the use of PPE, and the working conditions of farmers.

2.4. Data collection

Both primary and secondary data were collected. Primary data were obtained through in-depth interviews and field observation. Interviews were conducted face to face using the semi-structured guide in order to explore each informant's experience and perceptions of the implementation of promotive and preventive occupational health efforts. All interviews were recorded with the informants' consent and supplemented with field notes. Observations were made directly on the implementation of occupational health activities in the working area, including Posbindu activities, health education, the use of PPE by farmers, and working environment conditions. Secondary data were obtained through document review, including the profile of the Eromoko 2 Community Health Center, reports on occupational health service activities, farmer data, and relevant scientific literature.

2.5. Data analysis

Data were analyzed using the interactive model of Miles and Huberman, comprising data reduction, data display, and conclusion drawing and verification. Data reduction involved selecting, coding, and categorizing the interview and observation results according to the research themes: promotive efforts, preventive efforts, supporting factors, inhibiting factors, and farmers' perceptions of occupational health services. The data were then presented as thematic narratives to facilitate interpretation, and conclusions were drawn inductively through repeated verification of the interview, observation, and documentation results. To ensure credibility, the study applied source triangulation between health workers and farmers, and technique triangulation across interviews, observations, and documentation.

3. Results and Discussion

3.1. Results

Observation and interviews showed that promotive and preventive occupational health measures in the Eromoko 2 Community Health Center working area were not delivered through a stand-alone occupational health program, but were integrated into the Posbindu activities held routinely in the community. The center supports approximately eight Posbindu across its working area, each meeting once a month as a means of providing public health services and health education for the productive age group.

Posbindu activities target not only farmers but also other worker groups such as traders, laborers, self-employed individuals, and other informal-sector workers within the working area. The majority of participants are nevertheless farmers, consistent with the character of a working area dominated by agricultural work. The health materials delivered during Posbindu are therefore generally tailored to the needs and health problems of farmers.

Posbindu in the Eromoko 2 working area is divided into three target groups: toddlers, older people, and those of productive age. Farmers, as a group of workers, mostly participate in the productive-age sessions. Each session generally lasts approximately two to three hours, depending on the number of participants and the type of service provided, and consists of four main stages: participant registration, health examination, health consultation, and health counseling. The health examination stage usually includes measurement of blood pressure, weight, height, and waist circumference, together with other examinations as needed. Participants then receive health consultation services, and the session concludes with health counseling or education delivered by health workers.

These stages give health workers the opportunity to carry out a range of promotive and preventive activities relating to the occupational health of the working community. Promotive activities are generally delivered at the counseling stage, through education on clean and healthy living behavior (PHBS), the use of PPE, the dangers of pesticides, and other material relevant to participants' work. Preventive activities are carried out mainly at the examination and consultation stages, through monitoring of health conditions, early detection of health problems, identification of work-related complaints, and preventive advice tailored to each participant's condition.

3.1.1. Promotive efforts in occupational health

The observation results for the promotive indicators are presented in Table 1.

Table 1. Identification of promotive efforts in occupational health

No.	Observed indicator	Yes	No	Explanation
1	The community health center has an occupational health program or activity for farmers	✓		Conducted through Posbindu and health promotion activities
2	The community health center carries out occupational health education or counseling for farmers	✓		Carried out during Posbindu activities and public health counseling
3	The community health center provides information, education, and communication media related to occupational health	✓		Posters, leaflets, and presentation media are available
4	The community health center provides information on occupational health hazards and risk factors for farmers	✓		Material covers the use of PPE, the storage of pesticides, and clean and healthy living behavior
5	The community health center provides guidance on clean and healthy living behavior to farmers	✓		Implemented through counseling on clean and healthy living behavior and Germas
6	The community health center empowers farmer groups in occupational health activities		✓	No farmer group empowerment activities specific to occupational health were found
7	Occupational health promotion activities are well documented	✓		Documentation of counseling activities and Posbindu sessions is available

Of the seven indicators observed, six had been implemented by the Eromoko 2 Community Health Center. The one indicator not yet implemented was the empowerment of farmer groups specifically in occupational health activities.

The interviews indicated that occupational health promotion activities for farmers were conducted through counseling and education integrated with Posbindu. Counseling was provided after the health examination and involved both health officers and health promotion personnel.

"For health promotion activities, they are usually conducted during Posbindu. After the health check-up is completed, the officers provide counseling to the community." (Key Informant 1)

"Counseling is often provided during Posbindu activities. There was once training on the use of personal protective equipment, but it has not been conducted routinely." (Key Informant 2)

"The topics that are usually delivered include clean and healthy living habits, Germas, the use of personal protective equipment, the dangers of pesticides, and how to maintain health after working in the rice fields." (Key Informant 3)

This was reinforced by the triangulation informants.

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"We once received counseling on the use of masks and gloves for spraying in the rice fields." (Triangulation Informant 2)

Beyond counseling, observation showed that the community health center provided educational media such as posters, leaflets, and presentation materials for use during counseling activities. Promotive activities were also documented through reports and Posbindu records. The empowerment of farmer groups in occupational health had not, however, been carried out optimally: promotive activities remained focused on the health counseling and education delivered periodically through Posbindu and other community health activities.

The forms of occupational health promotion carried out by the Eromoko 2 Community Health Center therefore comprise occupational health counseling, education on the use of PPE, guidance on clean and healthy living behavior, education on the dangers of pesticides, and the provision of health information media. The empowerment of farmer groups and continuous occupational health training still need to be strengthened.

3.1.2. Preventive efforts in occupational health

The observation results for the preventive indicators are presented in Table 2.

Table 2. Identification of preventive efforts in occupational health

No.	Observed indicator	Yes	No	Explanation
1	The community health center identifies occupational health risk factors among farmers		✓	No formal risk identification activities have been carried out in the field
2	The community health center carries out early detection of health problems related to farmers' work	✓		Carried out through routine health examinations at Posbindu
3	The community health center carries out health examinations for farmers	✓		Blood pressure, blood glucose, cholesterol, and uric acid examinations are carried out routinely
4	The community health center monitors the health of farmers with occupational risk factors	✓		Carried out through Posbindu and health service visits
5	The community health center provides education on preventing occupational and work-related disease	✓		Delivered through health education and consultation
6	The community health center provides education on the use of PPE appropriate to occupational risk	✓		Counseling and training on the use of PPE have been carried out
7	The community health center conducts surveillance and monitoring of occupational health problems among farmers		✓	No structured occupational health surveillance is in place
8	The community health center carries out follow-up or referral for farmers with work-related health problems	✓		Patients are referred when further services are required

Of the eight indicators observed, six had been implemented. The two indicators not yet implemented were the identification of occupational health risk factors and structured occupational health surveillance. Preventive activities aimed to prevent health disorders caused by pesticide exposure and other occupational risks faced by farmers, but the interviews indicated that hazard identification and occupational health risk assessment had not been carried out systematically.

"Hazard identification and risk assessment have never been specifically conducted in the field." (Key Informant 2)

"There have been no specific activities to identify farmers' occupational health risks, because of limited personnel and programs." (Key Informant 2)

"No health personnel have ever come to the fields to directly observe the working conditions of farmers." (Triangulation Informant 1)

Observation likewise showed that structured occupational health surveillance and monitoring of the agricultural work environment were not yet in place. The preventive activities carried out remained focused on health examinations and occupational health education.

The forms of preventive occupational health effort implemented by the Eromoko 2 Community Health Center therefore comprise routine health examinations, early detection of health disorders, education on the prevention of occupational disease, education on the use of PPE, health monitoring, and case referral. The identification of occupational health risk factors, occupational health surveillance, and supervision of the agricultural work environment have not been implemented optimally.

3.1.3. Strategic recommendations identified by informants

Interviews and observation showed that promotive and preventive occupational health efforts for farmers in the Eromoko 2 working area were being delivered through health counseling, education on the use of PPE, routine health examinations, and early detection of health problems during Posbindu. Several obstacles nevertheless left implementation short of optimal: limited human resources, the absence of systematic hazard identification and occupational health risk assessment, the absence of occupational health surveillance, and the suboptimal empowerment of farmer groups.

Against these findings, informants identified six areas for strengthening: the capacity of health workers; a more structured and sustainable occupational health promotion program; the empowerment of farmer groups and occupational health cadres; the systematic identification and assessment of occupational hazards; the development of an occupational health recording and surveillance system; and cross-sectoral collaboration between the community health center, village governments, farmer groups, agricultural extension workers, and other relevant agencies. These six areas are examined in Section 3.2.3.

3.2. Discussion

3.2.1. Promotive efforts in occupational health for farmers

Promotive occupational health efforts in the Eromoko 2 Community Health Center working area were carried out through the Posbindu activities held routinely each month, in the form of health counseling, education on the use of PPE, information on the dangers of pesticides, guidance on clean and healthy living behavior, and the dissemination of health information through various educational media. These activities were not delivered through a stand-alone occupational health program but formed part of general public health services.

This indicates that occupational health services for farmers in the working area still follow an integrative approach. Such an approach is understandable given that farmers are informal-sector workers whose characteristics differ from those of formal-sector workers. Unlike formal workers, who have work units, organizational structures, and clear occupational health monitoring systems, farmers work independently at dispersed locations and are not tied to a specific institution. Occupational health services are therefore difficult to deliver through a workplace approach, and more feasible through a community approach.

Integrating occupational health activities into Posbindu demonstrates the community health center's adaptation of its programs to local conditions. Posbindu, essentially a community-based health service, is used as a means of reaching the farmer group that dominates the working area. The advantage of this strategy is that Posbindu is already well known in the community, is held routinely, and attracts a fairly high level of participation, which makes it a convenient medium for conveying occupational health messages.

This finding is in line with Tabibi et al. [4], who show that occupational health services for agricultural workers can be delivered through primary healthcare facilities with an emphasis on health promotion, occupational risk education, and occupational disease prevention. Primary healthcare plays a crucial role in reaching informal-sector workers, who generally lack an organized occupational health system.

This approach also accords with Regulation of the Minister of Health Number 100 of 2015 concerning Integrated Occupational Health Posts [3], which provides that occupational health services

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for informal-sector workers may be delivered through a community-based approach integrated with existing health programs. The use of Posbindu as a means of delivering occupational health information can therefore be seen as an adaptation of occupational health programs to the characteristics of farmers as informal-sector workers.

Integration into Posbindu nevertheless has limitations. Because Posbindu targets not only farmers but also traders, entrepreneurs, and other community groups, the material delivered tends to be general rather than fully specific to farmers' occupational health risk factors. Occupational health issues that should be a primary concern in the agricultural sector consequently receive inadequate attention.

The material most frequently delivered concerned the use of PPE, the dangers of pesticides, clean and healthy living behavior, and Germas. This illustrates that the primary focus of health promotion remains the modification of individual behavior. Theoretically, this aligns with the health promotion framework of Green and Kreuter, in which increased knowledge is a predisposing factor that can encourage healthy behavior: the better farmers' knowledge of the occupational risks they face, the greater the likelihood that safe and healthy work behavior will develop.

The findings align with Ekmekci and Yaman [5], who found that farmers' knowledge of occupational safety and health influences safer work behavior, and that education and counseling play a crucial role in raising awareness of occupational risk. Increased knowledge is not always accompanied by behavioral change, however. Interviews with farmers revealed that PPE use during work remained inconsistent: some farmers used PPE only partially, such as a hat or a mask, while gloves, boots, and protective clothing were often not used at all. Knowledge is therefore not the only factor influencing occupational health behavior; comfort, work habits, PPE availability, economic conditions, and risk perception also shape compliance.

This is consistent with Riswal et al. [6], who showed that farmers' occupational safety and health behavior is influenced not only by knowledge but also by work culture, habits, and perceptions of occupational risk. Some farmers regarded occupational risk as an integral part of their work, so that the use of PPE had not become a consistent practice. This can be explained by the Health Belief Model, under which individuals take preventive action if they perceive themselves to be vulnerable to a disease or health disorder. For farmers, exposure to pesticides and to the sun is often regarded as a normal part of the job, so the resulting health risks are not always perceived as serious threats. Even where counseling has been provided, behavioral change is therefore slow.

Another important finding is the absence of farmer group empowerment activities within the occupational health program; this was the only promotive indicator not met. Health promotion implementation thus remains at the stage of information dissemination and has not progressed toward community empowerment. This is inconsistent with Sudarmo et al. [7], who showed that establishing an occupational health forum within farmer groups can increase community participation in occupational health implementation. In that study, farmer groups were actively involved in delivering occupational health activities, so that program sustainability did not depend solely on health workers. In the Eromoko 2 working area, by contrast, no farmer groups concerned with occupational health, and no occupational health cadres acting as program drivers, were found.

From a contemporary health promotion perspective, community empowerment is a higher indicator of success than increased knowledge alone. Empowered communities not only receive health information but are also able to identify health problems, seek solutions, and act independently to protect their health. The absence of occupational health cadres or farmer groups concerned with occupational health indicates that the community's role in occupational health programs remains relatively passive.

This also indicates that implementation does not fully comply with Regulation of the Minister of Health Number 100 of 2015 [3], which emphasizes worker empowerment through the establishment of Occupational Health Posts (Pos UKK) and occupational health cadres, and through the active involvement of worker groups in identifying and resolving occupational health issues in their environment. Under the Pos UKK concept, workers are not only the target of counseling but also the primary actors in occupational health activities. This matters because the sustainability of occupational health programs depends heavily on community participation. If all activities rely solely on community health center staff, the program will be constrained by the availability of human resources, time, and

budget. If farmer groups are empowered, by contrast, occupational health messages can continue to be conveyed and acted upon even without formal counseling activities from the center.

3.2.2. Preventive efforts in occupational health for farmers

Preventive occupational health efforts in the Eromoko 2 working area comprised routine health examinations, early detection of health problems, health consultations, education on preventing occupational disease, monitoring of farmers' health conditions, and referral mechanisms, largely delivered through monthly Posbindu. The preventive approach was thus focused more on monitoring individual health conditions than on monitoring risk factors in the workplace. This is evident in the high volume of routine health examinations alongside the absence of systematic hazard identification and occupational health risk assessment.

Regular blood pressure, blood glucose, cholesterol, and uric acid examinations indicate that the center has implemented secondary prevention, enabling health workers to detect health problems early so that intervention can begin promptly. Routine examination is important because most farmers rarely examine themselves and tend to seek treatment only when their condition is already severe. This aligns with Tabibi et al. [4], who indicate that basic occupational health services for agricultural workers need to emphasize health screening, early disease detection, health status monitoring, and referral where health problems are detected.

From an occupational health perspective, however, these routine examinations remain general rather than targeted to the occupational risks of farmers. Farmers are at high risk of pesticide exposure, yet no examinations specific to pesticide exposure were carried out, so health disorders caused by chemical exposure may go undetected. Examinations remain focused on the common illnesses found in the general community, whereas occupational health practice requires examinations tailored to the risk factors inherent in specific work. Farmers face risks including exposure to pesticides, dust, and solar heat, high physical workloads, and non-ergonomic working postures, all of which require more specific health monitoring.

The most important finding of this study is the absence of hazard identification and occupational health risk assessment. Health workers had never conducted a direct assessment of farmers' working conditions in the fields, even though hazard identification is a foundation of the occupational health system. This differs from the model proposed by Susanto et al. [8] in their agricultural nursing-based occupational safety and health framework, which emphasizes the identification of occupational risk factors as a basis for developing health interventions for farmers. On that account, farmers' health problems cannot be separated from working environment conditions, so health workers need to assess directly the hazards and risk factors present in agricultural activity. The absence of hazard identification makes the occupational health services provided more curative than genuinely preventive: the center addresses health impacts that have already emerged rather than controlling the sources of hazard that cause them. Risk factors such as pesticide exposure, non-ergonomic work postures, exposure to extreme weather, and the use of agricultural equipment with the potential to cause injury have consequently not been clearly mapped.

This also falls short of Regulation of the Minister of Health Number 100 of 2015 [3], which emphasizes hazard identification, the recognition of occupational health risks, and work environment monitoring as part of preventive effort. The regulation provides that occupational health services should focus not only on worker health examinations but also on identifying the sources of hazard that can lead to health problems and workplace accidents.

The study also found an absence of structured occupational health surveillance, which means the center lacks data on disease patterns related to farmers' work. Occupational health program planning is consequently based on general health problems found in the community rather than on occupational risks in agriculture, and it is difficult to identify the relationship between work and the health problems farmers experience. Surveillance data are crucial for understanding occupational disease trends, dominant risk factors, and the farmer groups most vulnerable to health problems, and can serve as a basis for developing more targeted occupational health programs.

These findings also differ from the recommendations of Ekmekci and Yaman [5], who emphasize the continuous collection of data on risk factors and occupational health problems among farmers as a

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basis for developing occupational safety and health policy in the agricultural sector, and who show that the high occupational risks farmers face require a monitoring system capable of identifying potential hazards before they cause more serious health problems. Arifatunnahriyah et al. [9] further demonstrate that farmers are at risk of work fatigue and workplace accidents arising from environmental factors and workload. Together these findings reinforce the importance of occupational health surveillance and routine risk identification, so that factors with the potential to cause health problems and accidents can be identified and controlled early.

The implementation of preventive occupational health measures in the Eromoko 2 working area therefore remains at a basic stage of health examination and early disease detection, while more comprehensive components such as hazard identification, risk assessment, occupational health surveillance, and work environment monitoring have not been implemented optimally. Measured against Regulation of the Minister of Health Number 100 of 2015 [3], some preventive activities have been implemented through regular health examinations, health consultations, disease prevention education, and a referral system, but gaps remain in hazard identification, risk assessment, occupational health surveillance, and work environment monitoring, all of which are important components of occupational health services for informal-sector workers. Strengthening preventive activities oriented toward occupational risk factors is therefore necessary, so that occupational health services for farmers not only detect disease but also prevent disease and accidents at the source of the hazard.

3.2.3. Strategic recommendations for strengthening promotive and preventive services

Promotive and preventive occupational health efforts for farmers in the Eromoko 2 working area have been delivered through Posbindu, including health counseling, education on the use of PPE, routine health examinations, early detection of health problems, health consultations, and referral for farmers requiring further services. The center has thus sought to provide occupational health services for farmers within the resources and programs available. Implementation nevertheless faces obstacles that keep the program short of optimal: limited human resources, the absence of systematic hazard identification and risk assessment, the absence of occupational health surveillance, and the suboptimal empowerment of farmer groups. Six strategies follow from these findings.

a. Strengthening the capacity of human resources in occupational health. Capacity building is a fundamental requirement for developing occupational health services at the Eromoko 2 Community Health Center, and can be achieved through training, workshops, and technical guidance on occupational health in the informal sector, particularly agriculture. Such training would enable health workers to recognize the occupational health risk factors farmers face, conduct risk analyses, and develop interventions appropriate to field conditions. Improved competency would also support more comprehensive programs: with adequate knowledge and skills, health workers can serve not only as providers of healthcare services but also as facilitators of community-based occupational health programs. This matters because the agricultural sector has risk characteristics distinct from other sectors and requires an approach tailored to farmers' needs.

b. Strengthening a more structured and sustainable occupational health promotion program. Occupational health education needs to be developed not merely as an informational activity but as an effort to build awareness and change work behavior. Promotion material should be tailored to the characteristics of farmers' work and its risks: pesticide exposure, musculoskeletal disorders arising from non-ergonomic working positions, heat-related illness from prolonged sun exposure, and injury from agricultural equipment. Strengthening promotion is important because most occupational health problems among farmers are preventable through behavioral change. Increasing farmers' understanding of occupational risks and their control should raise awareness of PPE use, safe work practices, and health maintenance during work. Occupational health promotion therefore needs to be delivered sustainably and integrated more fully into public health services.

c. Empowerment of farmer groups in occupational health activities. Community empowerment increases people's capacity to identify, prevent, and address health problems independently. A viable strategy is therefore to establish and empower occupational health cadres

or farmer groups concerned with occupational health. Such groups can serve as extensions of the community health center in disseminating occupational health information, reinforcing the importance of PPE, and helping monitor farmers' health at community level. Establishing cadres would also improve program sustainability: limited health personnel mean the center cannot always provide intensive guidance to all farmers, whereas cadres allow health education and monitoring to continue in the community even without formal counseling activities. Cadres drawn from the farming community also generally understand local social and cultural conditions better, which makes health messages more readily accepted.

d. Implementation of hazard identification and occupational health risk assessment. The absence of hazard identification means that occupational health programs currently focus more on addressing health problems that have emerged than on preventing their causes, and the health risks present in the farming work environment remain unclear. Farmers are potentially exposed to physical, chemical, biological, ergonomic, and mechanical risk factors. Efforts are therefore needed to map potential occupational health hazards and risk factors in the agricultural sector, through field observation, interviews with farmers, and assessment of working environment conditions. The resulting risk map can then serve as a basis for developing more targeted promotive and preventive programs tailored to the needs of farmers in the Eromoko 2 working area.

e. Development of an occupational health surveillance system for farmers. Surveillance provides data for planning, implementing, and evaluating occupational health programs. Through effective surveillance, community health centers can identify trends in the health problems farmers experience, identify dominant risk factors, and set intervention priorities. A more structured occupational health recording and monitoring system is therefore needed. Such a system can be integrated with existing Posbindu activities, so that a separate program is not required. Data obtained from surveillance can then inform decision-making, program evaluation, and the development of occupational health policy better aligned with the needs of farming communities.

f. Strengthening cross-sectoral cooperation. Collaboration between community health centers, village governments, farmer groups, agricultural extension workers, and other relevant agencies can take the form of joint counseling, training on the proper use of PPE, mapping of agricultural occupational health risks, and community empowerment activities. Cross-sectoral collaboration can also extend the reach of occupational health programs, enabling more farmers to benefit from the promotive and preventive activities implemented.

4. Conclusion

a. Promotive occupational health efforts for farmers in the Eromoko 2 Community Health Center working area have been implemented routinely through Posbindu. These activities include health education, education on the use of PPE, education on pesticide hazards, guidance on clean and healthy living behavior, Germas, and the provision of communication, information, and education media. Promotive efforts have on the whole been implemented well, although the empowerment of farmer groups in occupational health management remains limited.

b. Preventive efforts have been carried out through routine health examinations, early detection of health problems, monitoring of farmers' health conditions, education on the prevention of occupational disease, education on the use of PPE, and referral services. These efforts have supported the early detection of health problems among farmers, but hazard identification, occupational health risk assessment, and occupational health surveillance have not been implemented optimally.

c. Strategies for strengthening promotive and preventive occupational health efforts should focus on improving the capacity of health workers, strengthening occupational health promotion programs tailored to agricultural risks, empowering farmer groups, implementing hazard identification and risk assessment in agricultural settings, developing an occupational health surveillance system for farmers, and enhancing cross-sectoral collaboration. These strategies are expected to improve the effectiveness of occupational health services for farmers.

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Declaration

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