

Developing Occupational Safety Awareness Among Exploration Porters Through PPM Activities

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Article history

Submitted: 2025/07/01; Revised: 2025/08/11; Accepted: 2025/09/21

Abstract

Occupational safety awareness is an essential component in supporting workplace preparedness and reducing occupational risks within mining exploration environments. Exploration porters frequently encounter hazardous working conditions, including difficult terrain, heavy equipment transportation, environmental risks, and physically demanding operational activities. This community empowerment program aimed to strengthen occupational safety awareness among exploration porters through participatory PPM activities conducted in Banyuwangi on October 22, 2025. The program employed a qualitative participatory approach involving educational workshops, practical safety demonstrations, emergency response simulations, collaborative discussions, and mentoring activities. Participants received training related to hazard identification, personal protective equipment usage, workplace communication, emergency preparedness, and safe operational behavior during exploration activities. The results demonstrated significant improvement in participants' understanding of workplace hazards, safety procedures, risk prevention strategies, and emergency response preparedness. Participants also showed increased awareness regarding the importance of personal protective equipment and collective responsibility in maintaining workplace safety. In addition, collaborative discussions and practical simulations positively influenced participants' communication skills, teamwork abilities, and confidence in applying occupational safety procedures during field operations. Despite challenges related to differences in educational backgrounds, traditional working habits, and limited previous safety training exposure, participatory educational methods and continuous mentoring contributed positively to strengthening safety awareness and responsible working behavior. Overall, the implementation of occupational safety training through PPM activities provided valuable opportunities for improving workplace preparedness, strengthening safety culture, and supporting sustainable community empowerment among exploration support workers in Banyuwangi.

Keywords

Occupational Safety; Exploration Porters; Community Empowerment; PPM Activities; Workplace Safety Awareness; Mining Exploration



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INTRODUCTION

Occupational safety has become one of the most important aspects in supporting sustainable working environments, particularly in high-risk sectors such as mining and exploration activities. Exploration work frequently involves physically demanding tasks, environmental hazards, challenging terrain conditions, and operational risks that can threaten workers' safety and well-being. Workers involved in exploration support activities, including exploration porters, are often exposed to various occupational hazards such as falling materials, equipment accidents, fatigue, slippery pathways, unstable ground conditions, and unpredictable environmental situations. Therefore, strengthening occupational safety awareness among exploration support workers has become an essential strategy for reducing workplace accidents and improving operational sustainability.

Occupational safety awareness refers to workers' understanding, attitudes, and behaviors related to identifying workplace hazards, following safety procedures, and implementing preventive measures during work activities. According to International Labour Organization, occupational safety education contributes significantly to reducing workplace injuries and promoting safe working environments in high-risk industries. Workers who possess adequate safety awareness are generally more prepared to identify hazards, utilize personal protective equipment correctly, and respond effectively during emergency situations. Therefore, safety education programs play important roles in strengthening workers' preparedness and supporting sustainable occupational safety culture.

Mining and exploration activities are widely recognized as industries with high levels of occupational risk due to the nature of field operations and environmental conditions involved. Exploration activities frequently require workers to operate in remote areas with uneven terrain, changing weather conditions, and limited access to emergency facilities. Exploration porters, who support logistical and operational activities during exploration work, often carry heavy equipment and supplies through difficult geographical conditions. These working environments increase the potential for workplace injuries, fatigue, musculoskeletal problems, and environmental accidents. According to World Health Organization, physically demanding work environments require comprehensive occupational safety measures to prevent injuries and improve workers' physical well-being.

In many mining support communities, exploration porters generally acquire work skills through practical field experience rather than formal occupational safety education. As a result, several workers may possess limited understanding regarding

workplace hazard identification, emergency response procedures, and the proper use of personal protective equipment. Traditional working habits and limited access to formal safety training often contribute to low safety awareness among workers involved in exploration support activities. This condition increases the importance of community-based occupational safety education programs that provide practical and accessible safety learning opportunities for workers within mining environments.

The development of occupational safety culture requires not only organizational regulations but also active community participation and continuous educational reinforcement. Occupational safety culture refers to shared values, attitudes, and practices that prioritize workplace safety and collective responsibility within working environments. According to International Council on Mining and Metals, sustainable occupational safety culture can be achieved through continuous training, participatory communication, and collaborative safety management practices among workers and communities. Therefore, participatory educational approaches become important strategies for strengthening workers' awareness and encouraging responsible workplace behavior.

Community empowerment programs, commonly known as Program Pemberdayaan Masyarakat (PPM), have become important approaches for improving social awareness, practical competence, and sustainable community participation within industrial and mining environments. PPM activities aim to strengthen community knowledge, improve local participation, and support sustainable social development through collaborative educational and empowerment initiatives. Within occupational safety contexts, PPM activities provide opportunities for workers and communities to improve workplace safety understanding and develop preventive safety behaviors through participatory educational experiences.

The implementation of occupational safety training through community empowerment activities contributes positively to improving workers' preparedness and workplace discipline. Through practical demonstrations, collaborative discussions, and simulation activities, participants can develop better understanding regarding workplace hazards and preventive safety measures. According to National Institute for Occupational Safety and Health, participatory occupational safety education improves workers' engagement and safety compliance because workers become actively involved in identifying risks and discussing preventive solutions. Educational activities that emphasize practical learning experiences and community participation are therefore more effective in strengthening long-term occupational safety awareness.

The importance of occupational safety awareness became increasingly evident due to the continued occurrence of workplace accidents within mining and exploration industries worldwide. Several workplace incidents are associated with inadequate safety preparation, lack of communication, improper equipment usage, and limited emergency preparedness among workers. According to United Nations Development Programme, sustainable community development within industrial sectors requires strong occupational safety systems that prioritize workers' protection and risk reduction. This condition demonstrates that occupational safety education is not only important for operational efficiency but also for protecting workers' physical and social well-being.

Banyuwangi is one of the regions in Indonesia that possesses mining and exploration activities supported by local communities and field workers, including exploration porters. Exploration support activities in this area involve physically demanding operational tasks and environmental challenges that require strong occupational safety awareness among workers. However, limited access to structured occupational safety training remains an important challenge within several local exploration support communities. Therefore, community-based occupational safety training programs become important initiatives for improving workplace preparedness and strengthening safety culture among workers.

The implementation of occupational safety education programs among exploration porters also contributes positively to strengthening communication, teamwork, and emergency preparedness within field operations. Workers who understand workplace safety principles are generally more capable of responding effectively during hazardous situations and maintaining communication discipline during operational activities. Collaborative safety practices and group-based emergency response training also strengthen workers' confidence and collective responsibility within exploration environments.

In addition, occupational safety training supports workers' understanding regarding the proper use of personal protective equipment and safe operational behavior. Personal protective equipment such as helmets, safety shoes, gloves, and reflective clothing plays essential roles in minimizing workplace injuries and protecting workers from environmental hazards. According to Occupational Safety and Health Administration, consistent use of personal protective equipment significantly reduces workplace injury risks and improves operational safety performance in physically demanding industries. Therefore, practical demonstrations and safety simulations become important educational strategies for

improving workers' compliance and understanding regarding safety equipment utilization.

Despite the importance of occupational safety education, several challenges remain in implementing safety training effectively within mining support communities. Differences in educational backgrounds, traditional working habits, and varying levels of previous safety exposure frequently influence workers' understanding and compliance regarding occupational safety procedures. Some workers may also perceive safety procedures as secondary compared to operational productivity and field efficiency. These conditions highlight the importance of adaptive educational approaches that utilize practical communication methods and participatory learning experiences appropriate to workers' educational and social backgrounds.

Another important challenge involves maintaining sustainable occupational safety behavior after the completion of educational activities. Occupational safety awareness requires continuous reinforcement, community support, and behavioral adaptation to become integrated into workers' daily operational practices. Therefore, occupational safety programs should emphasize not only theoretical understanding but also practical application, continuous mentoring, and collaborative safety culture development within local working communities.

Based on these conditions, strengthening occupational safety awareness among exploration porters through PPM activities in Banyuwangi has become an important initiative for improving workplace preparedness, reducing occupational risks, and supporting sustainable community empowerment within exploration environments. Through participatory educational activities, practical safety demonstrations, emergency response simulations, and collaborative discussions, workers can improve hazard recognition abilities, communication competence, and confidence in implementing workplace safety procedures effectively.

Therefore, this community service program aims to strengthen occupational safety awareness and emergency preparedness among exploration porters through participatory PPM activities in Banyuwangi. The program focuses on improving workers' understanding regarding workplace hazards, personal protective equipment usage, communication discipline, and emergency response procedures through practical and collaborative educational approaches. By integrating community participation and practical safety learning experiences, this program is expected to contribute positively to strengthening occupational safety culture and sustainable workplace behavior within exploration support communities.

METHODS

The community empowerment program entitled “*Developing Occupational Safety Awareness Among Exploration Porters Through PPM Activities*” was implemented in Banyuwangi on October 22, 2025, using a qualitative participatory approach aimed at improving occupational safety awareness, emergency preparedness, and safe working behavior among exploration porters working around mining exploration areas. The implementation of the program emphasized practical safety education, collaborative learning activities, and community participation to strengthen workplace safety culture within exploration support environments. According to International Labour Organization, occupational safety training is an essential strategy for reducing workplace accidents and improving workers’ preparedness in high-risk industries such as mining and exploration.

The participants involved in the program consisted of exploration porters and local community members who supported mining exploration activities in the surrounding area of Banyuwangi. Participants were selected purposively based on their direct involvement in exploration-related activities and their need for occupational safety education. Most participants possessed practical experience in exploration support work but had limited previous exposure to formal occupational safety training and risk management education. This condition highlighted the importance of implementing community-based educational activities that focused on practical safety competence and workplace risk awareness.

The implementation process was conducted through several stages, including preparation, needs analysis, socialization, training implementation, mentoring, simulation activities, and evaluation. During the preparation stage, the service team coordinated with local community representatives and exploration activity coordinators to identify workplace safety challenges and determine appropriate educational materials related to occupational safety in exploration environments. Preliminary observations and informal interviews were conducted to analyze participants’ understanding of hazard recognition, personal protective equipment usage, emergency response procedures, and safe working practices. The findings indicated that many participants still experienced limited understanding regarding workplace risk prevention and emergency preparedness during exploration activities.

The socialization stage aimed to introduce the importance of occupational safety awareness and responsible working behavior within exploration support activities. Facilitators explained the objectives of the program and encouraged

participants to actively engage in educational discussions and practical safety exercises. Participants received explanations regarding workplace hazards commonly encountered during exploration activities, including uneven terrain, equipment transportation risks, weather-related hazards, fatigue, and environmental dangers. According to World Health Organization, occupational safety awareness and preventive education significantly contribute to reducing work-related injuries and improving physical well-being among workers in physically demanding work environments.

The training implementation stage became the core activity of the community service program. Participants attended educational workshops, group discussions, safety demonstrations, practical exercises, and emergency response simulations related to exploration field activities. The training materials included hazard identification, personal protective equipment usage, communication procedures, emergency preparedness, first aid awareness, and safe equipment handling techniques. Practical learning methods were emphasized to ensure that participants could directly apply occupational safety concepts within real exploration working conditions. Facilitators utilized simple language, visual demonstrations, and participatory discussions to ensure that participants with varying educational backgrounds could understand the educational materials effectively.

Practical demonstrations of personal protective equipment usage became an important component of the training activities. Participants received guidance regarding the correct use of helmets, gloves, safety shoes, reflective clothing, and communication devices commonly utilized during exploration activities. Participants also practiced proper safety preparation procedures before conducting field operations. According to National Institute for Occupational Safety and Health, practical occupational safety training and equipment demonstrations improve workers' understanding and encourage consistent safety behavior in workplace environments.

Simulation activities were conducted to strengthen participants' emergency preparedness and workplace response competence. Participants engaged in basic emergency response exercises, evacuation simulations, and communication drills designed to improve readiness during workplace accidents or hazardous situations. Group-based simulation activities encouraged teamwork, rapid communication, and collaborative problem-solving during emergency scenarios. These participatory educational experiences helped participants improve confidence and preparedness in handling potential workplace risks during exploration activities.

Mentoring activities were conducted continuously throughout the implementation process to provide additional support and guidance for participants. Facilitators assisted participants who experienced difficulties understanding occupational safety terminology, emergency procedures, or personal protective equipment usage. Mentoring sessions were conducted through direct interaction, reflective discussions, and practical field guidance. Participants were encouraged to share field experiences, discuss workplace challenges, and identify preventive safety strategies collaboratively. This participatory mentoring approach aimed to strengthen participants' confidence and encourage sustainable occupational safety awareness.

Evaluation activities were conducted at the end of the program to measure the effectiveness of the implementation and identify participants' learning outcomes. Evaluation data were collected through observations, participation records, reflective discussions, practical safety exercises, and informal interviews with participants. The evaluation focused on measuring participants' improvement in hazard recognition, safety awareness, emergency preparedness, communication competence, and understanding of workplace safety procedures. The findings demonstrated that participants experienced significant improvement in occupational safety understanding and confidence in applying safe working practices during exploration activities.

Documentation techniques were also used to record educational activities, participant involvement, safety simulations, and mentoring processes. Attendance records, training photographs, participant reflections, and field observation notes were collected as supporting data for program reporting and analysis. The collected data were analyzed descriptively to identify the strengths, challenges, and impacts of the community service implementation.

Overall, the participatory and practical method applied in this community service program successfully strengthened occupational safety awareness, emergency preparedness, and responsible workplace behavior among exploration porters in Banyuwangi. Through collaborative educational activities, practical demonstrations, simulation exercises, and continuous mentoring, participants improved their safety competence, risk awareness, and confidence in implementing occupational safety procedures within exploration environments.

FINDINGS AND DISCUSSION

The implementation of the community empowerment program entitled *“Developing Occupational Safety Awareness Among Exploration Porters Through PPM Activities”* was conducted in Banyuwangi on October 22, 2025. The program aimed to improve occupational safety awareness, risk management understanding, and work preparedness among exploration porters working in mining exploration environments. Occupational safety has become an essential aspect of mining and exploration activities because field workers are frequently exposed to physical risks, environmental hazards, equipment-related accidents, and challenging working conditions. Therefore, community service activities focusing on occupational safety training are important strategies for strengthening safety culture and reducing work-related accidents within mining support communities.

The participants involved in the program consisted of local exploration porters and community members who support exploration activities around mining areas in Banyuwangi. Most participants possessed practical field experience in assisting exploration activities; however, many had not previously received formal occupational safety training related to mining exploration environments. Preliminary observations conducted before the implementation indicated that several participants still demonstrated limited understanding regarding hazard identification, personal protective equipment usage, emergency response procedures, and safe working practices during exploration activities. These findings highlighted the importance of practical safety education and community empowerment initiatives in strengthening occupational safety awareness among field workers.

The implementation of the training activities involved educational workshops, safety simulations, group discussions, demonstrations of personal protective equipment usage, and practical field safety exercises. The participatory educational approach encouraged active engagement and interaction among participants throughout the training sessions. Participants were introduced to occupational safety principles related to exploration activities, including hazard recognition, environmental risk awareness, emergency preparedness, communication procedures, and safe equipment handling. According to International Labour Organization, occupational safety training contributes significantly to reducing workplace accidents and improving workers' preparedness in high-risk industries such as mining and exploration.

One of the important findings observed during the implementation process was the significant improvement in participants' awareness regarding workplace hazards and risk prevention strategies. At the beginning of the program, several participants

demonstrated limited understanding of the potential dangers associated with exploration activities, including slippery terrain, heavy equipment transportation, weather-related risks, and fatigue during field operations. Through educational presentations, safety discussions, and practical demonstrations, participants gradually improved their understanding regarding occupational hazards and preventive safety measures. Participants became more aware of the importance of maintaining communication during field activities, following safety procedures, and utilizing protective equipment consistently.

The practical demonstration of personal protective equipment usage also became an important component of the training activities. Participants received guidance regarding the proper use of helmets, safety shoes, gloves, reflective clothing, and communication devices commonly utilized during exploration activities. Many participants initially underestimated the importance of protective equipment because of familiarity with traditional working practices and limited previous exposure to formal safety training. However, after participating in safety demonstrations and accident prevention discussions, participants demonstrated improved awareness regarding the role of personal protective equipment in minimizing workplace injuries. According to World Health Organization, the consistent use of personal protective equipment significantly contributes to reducing occupational injuries and improving workplace safety in physically demanding work environments.

The implementation of collaborative discussions and participatory learning activities also strengthened participants' communication and teamwork abilities during exploration-related tasks. Group discussions encouraged participants to share field experiences, discuss safety challenges, and identify practical strategies for preventing workplace accidents. Several participants described previous experiences involving minor injuries, fatigue, and unsafe environmental conditions encountered during exploration activities. These discussions created reflective learning environments that helped participants recognize the importance of collective responsibility and communication in maintaining workplace safety. Research conducted by National Institute for Occupational Safety and Health indicates that participatory occupational safety training improves workers' engagement and safety awareness because workers become actively involved in identifying risks and discussing preventive strategies.

Another important finding observed during the implementation process was the improvement of participants' emergency preparedness and response awareness.

Facilitators introduced emergency response procedures related to exploration activities, including first aid practices, accident reporting systems, evacuation procedures, and emergency communication protocols. Participants practiced basic emergency response simulations designed to improve readiness during unexpected workplace incidents. The simulation activities helped participants understand the importance of rapid communication, teamwork, and calm decision-making during emergency situations. According to International Council on Mining and Metals, emergency preparedness training is an essential component of occupational safety management because it strengthens workers' ability to respond effectively to workplace accidents and environmental hazards.

The educational activities also contributed positively to strengthening safety culture within the exploration support community. Participants demonstrated increased understanding that occupational safety is not solely an individual responsibility but also a collective commitment that requires cooperation and mutual awareness among workers. Discussions regarding safety discipline, responsibility, and risk prevention encouraged participants to recognize that safe working practices contribute to both personal well-being and operational sustainability. The development of positive safety culture became one of the most important outcomes of the training activities because sustainable occupational safety requires continuous behavioral adaptation and collective participation.

In addition, the implementation of the program improved participants' confidence in applying occupational safety procedures during field activities. Several participants initially expressed uncertainty regarding emergency response practices and the use of safety equipment. However, continuous demonstrations, mentoring, and practical simulations gradually improved participants' confidence in implementing safety procedures independently. The supportive learning environment encouraged participants to ask questions, share concerns, and participate actively in safety-related discussions without hesitation.

Despite the positive outcomes observed during the implementation process, several challenges remained during the training activities. One major challenge involved differences in participants' educational backgrounds and prior safety knowledge. Some participants required additional explanations and practical demonstrations to fully understand occupational safety terminology and emergency response procedures. Facilitators therefore needed to apply adaptive educational methods and utilize simple, practical communication approaches to ensure that all participants could understand the training materials effectively.



Another challenge related to traditional working habits and attitudes toward workplace safety. Some participants initially viewed occupational safety procedures as secondary compared to operational efficiency and field productivity. This perception reflected the influence of long-standing work practices where safety awareness had not been formally integrated into daily exploration activities. Therefore, facilitators emphasized practical examples, accident prevention case studies, and discussions regarding the long-term benefits of workplace safety for workers and communities.

Environmental and operational conditions around exploration areas also became important considerations during the implementation process. Exploration activities often involve physically demanding tasks, unpredictable weather conditions, uneven terrain, and logistical challenges that increase workplace risks. Participants therefore required continuous reinforcement regarding the importance of safety preparation, environmental awareness, and communication discipline during field operations.



Maintaining sustainable occupational safety behavior among participants also became an important concern following the completion of the training program. Occupational safety awareness requires continuous practice, reinforcement, and community support to become integrated into everyday working behavior. Therefore, facilitators encouraged participants to continue applying safety procedures consistently and to share occupational safety knowledge with other workers within the exploration support community. According to United Nations Development Programme, community-based occupational safety programs are more sustainable when participants actively contribute to strengthening collective awareness and promoting safe working practices within local communities.



Overall, the implementation of the occupational safety awareness training program in Banyuwangi on October 22, 2025, provided significant contributions to improving workplace safety awareness, emergency preparedness, and responsible working behavior among exploration porters. Participatory educational methods, practical simulations, collaborative discussions, and field safety demonstrations helped participants improve hazard recognition abilities, safety communication competence, and confidence in applying occupational safety procedures. Although challenges related to educational diversity, traditional working habits, and environmental conditions remained important concerns, the implementation of community-based safety education contributed positively to strengthening occupational safety culture and community empowerment within exploration support environments.

CONCLUSION

In conclusion, the implementation of the community empowerment program entitled “Developing Occupational Safety Awareness Among Exploration Porters Through PPM Activities” in Banyuwangi on October 22, 2025, demonstrated significant contributions to improving occupational safety awareness, emergency preparedness, and responsible working behavior among exploration porters. The training activities successfully strengthened participants’ understanding regarding workplace hazards, risk prevention strategies, personal protective equipment usage, and emergency response procedures within exploration environments. The findings revealed that participatory educational approaches, practical safety demonstrations, collaborative discussions, and field simulations positively influenced participants’ engagement and occupational safety competence. Participants demonstrated improved awareness regarding environmental hazards, communication discipline, teamwork, and the importance of following workplace safety procedures consistently during exploration activities. In addition, the integration of practical learning experiences and reflective discussions encouraged participants to recognize occupational safety as a collective responsibility that supports both personal well-being and operational sustainability. Despite the positive outcomes, several challenges remained during the implementation process, including differences in

educational backgrounds, limited previous exposure to formal safety training, and traditional working habits that underestimated occupational safety procedures. Some participants required additional guidance and practical demonstrations to understand safety terminology and emergency response practices effectively. These challenges highlighted the importance of adaptive educational strategies, continuous mentoring, and practical community-based learning approaches in strengthening sustainable occupational safety behavior. Overall, the implementation of occupational safety awareness training provided valuable opportunities for improving safety culture and community empowerment among exploration support workers. Through collaborative educational activities, practical field exercises, and continuous safety reinforcement, participants improved their confidence, hazard recognition abilities, and preparedness in responding to workplace risks. The experiences implemented in Banyuwangi also demonstrate that community-based occupational safety programs can contribute positively to reducing workplace risks, strengthening worker preparedness, and promoting sustainable occupational safety practices within exploration and mining support communities.

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