

Economic Pressures and Occupational Health and Safety: A Qualitative Study of Workers' Experiences in the Shipbuilding and Ship Scrapping Industry in Kendari

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ABSTRACT

The shipbuilding and ship scrapping industries play a significant role in maritime economic development, especially in coastal areas such as Kendari. Within the framework of industrial economics theory, this sector reveals the complex relationship between cost-efficiency, market structure, and its influence on occupational health and safety (OHS) standards. This research endeavor aims to investigate the correlation between economic constraints in the shipbuilding and ship dismantling sectors and the prevalence of significant occupational hazards, as well as their impact on the accessibility of occupational health services in Kendari. A descriptive qualitative approach was employed, utilizing an intrinsic case study design. Data were gathered through comprehensive interviews with a cohort of 12 pivotal informants, comprising both laborers and proprietors of ship workshops, as well as direct observational analysis conducted at the workplace. The findings reveal that cost-efficiency pressures drive the neglect of occupational health and safety (OHS) practices. The majority of workers do not use personal protective equipment (PPE), have never participated in OHS training, and work in unsafe environmental conditions. Common health complaints include respiratory issues, skin irritation, fatigue, and hearing impairment. Access to occupational health services is also highly limited, with most workers lacking social security and relying on self-medication. This study concludes that the economic structure of the industry directly contributes to the lack of adequate workplace safety measures. Therefore, an inclusive, participatory, and community-based policy approach is essential for improving OHS protections in the informal sector.



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INTRODUCTION

The shipbuilding and ship scrapping industries play a significant role in maritime economic development, especially in coastal areas such as Kendari. Within the framework of industrial economics theory, this sector reveals the complex relationship between cost-efficiency, market structure, and its influence on occupational health and safety (OHS) standards. The competitive structure of the industry pressures businesses to minimize operational costs, which, in turn, affects the implementation of safety standards. In many cases, economic pressures lead companies to overlook or minimize the enforcement of OHS procedures, even though this sector is known to be one of the highest risk industries for workplace accidents and work-related diseases. According to (Kanrak et al., 2023), while economic pressures may exacerbate work demands, it can also increase compliance with safety procedures when workers' perceive a strong commitment to safety from management. Thus, the economic dynamics in shipbuilding and ship scrapping industries not only affect business performance but also significantly determine how workers' face daily occupational risks.

In Kendari, the shipbuilding and ship scrapping sectors serve as critical economic engines for local livelihoods and regional trade. These industries not only absorb a significant portion of the coastal labor force but also support ancillary sectors such as welding, metal recycling, and

marine logistics. The availability of used ships from regional trade routes has created a thriving ship dismantling economy, largely dominated by small and medium-scale enterprises. These businesses operate with limited capital but provide income for hundreds of informal workers', making the industry economically indispensable to many coastal communities. Despite this, the sector remains underregulated and underresearched, especially in terms of its dual identity as both an economic lifeline and a high-risk workplace environment. By highlighting this dual role, this study seeks to understand how economic imperatives intersect with health and safety practices in a setting where survival and risk co-exist daily.

Furthermore, the link between economic pressures and the implementation of safety measures becomes even more complex when associated with the workplace safety culture. (Ludwick et al., 2023) found that management decisions to adopt safety protocols are often driven by cost and operational efficiency considerations, especially in large construction projects. In the shipbuilding industry, where physical and chemical hazards are prevalent, such considerations become more critical. (Aghaei et al., 2020) found that a strong safety climate is directly correlated with safe behavior among workers'. This indicates that investment in safety education and training will only be effective if conducted within a safety culture that supports it. Conversely, when economic pressures reduce investment in OHS measures, the likelihood of workplace accidents increases significantly. A study by (Dehaghi et al., 2022) further supports this, showing that a positive perception of a safe work environment can reduce accident rates. Therefore, the economics of the industry must be understood not only as an external factor influencing OHS but as an internal variable that shapes managerial decisions and worker behavior.

In the context of the shipbuilding and ship scrapping industries, the risks associated with occupational health and safety are extremely high. Exposure to heavy metals, extreme noise, and physical labor represent the main challenges faced by workers'. (Saragih et al., 2022) noted that ship cutting and welding processes produce hazardous metal fumes, such as lead and cadmium, contributing to lung diseases and neurological disorders. Meanwhile, (Fitriadi et al., 2025) emphasized that the noise levels from heavy machinery in shipyards can cause permanent hearing impairment if proper PPE is not used. However, compliance with Personal Protective Equipment (PPE) usage remains a significant issue, as (Wati et al., 2025) found that workers' low knowledge and attitudes contribute to the low usage of PPE. This is further exacerbated by high work fatigue, especially during ship dismantling and repair processes, which, according to (Hariyanto et al., 2023), contributes to concentration loss and increases the risk of accidents.

These conditions are worsened by the low implementation of OHS management systems in small-scale and informal shipbuilding and ship scrapping industries. (Nainggolan et al., 2023) stated that many small shipyards in Indonesia have not fully complied with OHS management systems mandated by the government, primarily due to limited resources and lack of training. (Winarni et al., 2024) identified that workers' awareness of safety procedures remains low, making unsafe actions commonplace. In this context, risks not only arise from the physical working environment but also from the underlying social and economic conditions. (Pengetahuan et al., 2025) emphasized that exposure to chemicals, such as paint dust and heavy metals, without adequate protection, has led to chronic work-related diseases. (Aditya Andre Wicaksono et al., 2023) also observed that poor sanitation at work sites worsens workers' health conditions. This highlights the close relationship between the economic structure of the informal industry and the health risks borne by workers'.

Access to occupational health services is also a serious challenge, particularly in maritime areas like Kendari. (Kamiluddin Saptaputra et al., 2024) reported that geographic isolation and limited healthcare infrastructure make it difficult for workers' to receive adequate medical care. Even when healthcare facilities are available, social and economic barriers prevent workers' from accessing these services. (Ramdani & Tiarapuspa, 2023) noted the stigma surrounding health issues, including mental and substance-related disorders, which worsens workers' health conditions. Meanwhile, (Nugraha et al., 2023) indicated that most informal workers' lack social security or health insurance, which makes them reluctant to seek medical treatment when injured or experiencing work-related illness. Without strong policy support, as highlighted by (Hanani, 2020), informal workers' remain vulnerable and unprotected. This situation became even more

pressing in the post-pandemic era, where health protocols are hard to enforce due to economic limitations, as stated by (Pattisinai et al., 2020).

From a policy perspective, Indonesia has a legal framework regulating OHS, particularly through Government Regulation No. 50 of 2012 on OHS Management Systems. (Candra et al., 2023) explained that this regulation requires all companies to identify and control safety risks. However, its implementation in areas such as Southeast Sulawesi is far from satisfactory. Although (Muzaki & Yustiarini, 2021) demonstrated that the application of the WARA (Workplace Assessment and Risk Analysis) method can reduce accident rates in shipbuilding projects, its implementation remains very limited. (Winarni et al., 2024) also noted that although policies are in place, awareness and training on OHS are still minimal. (Anthony et al., 2024) added that consistent monitoring and evaluation are essential to ensure the sustainability of policy implementation. Without strong oversight, OHS implementation remains a formality rather than an effective measure for worker safety.

From the discussion above, it is evident that there is a research gap between the available regulations and their practical implementation, especially in regions like Kendari, where small and medium-scale shipbuilding and ship scrapping industries operate. Existing studies predominantly focus on the formal sector and large shipyards in industrial cities like Batam or Surabaya. Meanwhile, OHS conditions in the informal shipbuilding sector in Eastern Indonesia remain underexplored in the academic literature. This opens up an opportunity for this research to contribute original insights by highlighting the experiences of workers' on the ground, showing how the local economic structure influences OHS practices, and uncovering the dynamics of access to occupational health services that have not been thoroughly studied.

Given the informal and underregulated nature of the shipbuilding and scrapping industry in Kendari, the use of a qualitative exploratory approach is essential. Much of the occupational safety and health data in this sector is either incomplete or absent, particularly for small and medium-scale enterprises that operate outside formal oversight. Furthermore, the lived experiences of workers', their perceptions of risk, coping strategies, and barriers to healthcare access are rarely captured in quantitative reports. These underreported experiences represent critical gaps in existing literature. By employing qualitative methods, this study seeks to uncover these nuanced realities and provide a deeper contextual understanding of how economic structures influence occupational risk and access to health services. Such insights are crucial for developing inclusive, grounded, and context-specific OHS policies.

This study aims to analyze the relationship between economic pressures in the shipbuilding and ship scrapping industries and the emergence of high occupational risks, as well as its impact on access to occupational health services in Kendari. This approach not only seeks to document the factual conditions on the ground but also aims to show that strengthening OHS in the informal sector cannot be separated from a structural and policy approach that is sensitive to local economic conditions. The central research question addressed in this study is: "How do economic pressures in the shipbuilding and ship scrapping industry in Kendari affect workplace safety risks and workers' access to occupational health services?" The findings of this study are expected to provide theoretical and practical contributions to formulating more inclusive and reality-based OHS policies in the informal maritime sector.

METHOD

This study uses a descriptive qualitative approach with an intrinsic case study design, aiming to gain an in-depth understanding of the relationship between economic pressures in the shipbuilding and ship scrapping industry and the increased occupational risks, as well as access to occupational health services in Kendari. This approach was chosen as it is suitable for exploring the socio-economic context and workers' perceptions in informal work environments, where the data produced are narrative and interpretive in nature. The focus of the study is on identifying economic factors that influence the implementation of occupational health and safety (OHS)

standards, as well as the structural barriers workers' face in accessing occupational health services.

The subjects of the study consisted of workers' in the shipbuilding and ship scrapping industry in Kendari, specifically those operating around the Bungkutoko and Kendari Caddi ports. The informants were selected using purposive sampling, where participants were intentionally chosen based on their direct experience in ship repair, scrapping, and construction activities. The main criteria for selecting informants included: (1) having worked in the shipbuilding or ship scrapping industry for at least one year, (2) having direct experience with workplace accidents or health issues caused by work, and (3) being willing to provide in-depth information. A total of 12 primary informants were interviewed, including welders, steel cutters, paint technicians, and two small ship workshop owners.

The research instrument used was a semi-structured interview guide developed based on themes relevant to previous literature, such as operational cost pressures, the use of personal protective equipment (PPE), perceptions of occupational risks, access to occupational health services, and knowledge of OHS regulations. The interview guide also included open-ended questions, allowing informants to describe their working conditions, personal experiences with safety, and their perceptions of the attention given to OHS by companies or workshops. In addition to interviews, participatory observation was conducted at the worksite for three weeks to directly observe work activities, safety procedures in place, and the availability of first aid facilities or healthcare services at the workplace.

Data collection was conducted in three stages: (1) initial engagement and ethical clearance, which involved communication with workshop owners and workers' and explaining the study's objectives; (2) in-depth interviews, conducted individually with a duration of 45-60 minutes per session, recorded with the consent of informants; and (3) field observations, carried out during working hours to directly observe workers' interactions with potential occupational risks. Additional data were collected through informal documents such as attendance records, informal medical records from nearby health posts, and documentation of PPE use.

The collected data were analyzed using thematic analysis, which aimed to identify key patterns and themes from the narratives provided by the informants. The analysis process began with verbatim transcription of the interview recordings, followed by manual coding, where codes were assigned based on themes such as economic pressure, risk perceptions, access to healthcare, and structural barriers. These codes were then grouped and analyzed to identify relationships between themes. Data validity was strengthened through method triangulation, which involved comparing interview results with field observations and supporting documents, as well as member checking, where a summary of findings was reconfirmed with some informants to ensure the accuracy of the researcher's interpretation.

This methodology allowed the researcher to explore the subjective meanings of workers' experiences in the shipbuilding and ship scrapping industries in Kendari, as well as provide a contextual explanation of how economic pressures contribute to high occupational risks and limitations in access to occupational health services. This approach also helped identify structural and cultural factors often overlooked in formal evaluations of OHS policies. Therefore, the findings of this study are expected to provide a more holistic understanding of the economic dynamics and workplace safety in the informal shipbuilding sector in Eastern Indonesia.

This study adhered to ethical research principles to ensure the protection and dignity of all participants. Prior to data collection, informed consent was obtained from each informant after explaining the study's purpose, procedures, and their rights as participants—including the right to withdraw at any time without consequences. All interviews were conducted voluntarily, and participation was entirely based on the informant's willingness. The researcher ensured confidentiality by using pseudonyms instead of real names, and no personal identifiers were recorded in any transcript or report. Audio recordings, notes, and documentation were securely stored and only accessible to the research team. Since the study involved informal workers in a high-risk industry, special attention was given to avoid any psychological or social harm. This research did not require formal approval from an institutional ethics board but followed widely

accepted qualitative research ethics, including transparency, non-coercion, and respect for participants' autonomy and well-being.

RESULTS

The findings of this study indicate that economic factors have a significant impact on work dynamics in the shipbuilding and shipbreaking industry in Kendari. Interviews with 12 key informants revealed that economic pressures influence almost all aspects of work activities, including occupational health and safety. Below are the interview results and findings obtained:

1. Economic Pressure and Safety Neglect in Work Decisions

The majority of workers' in this industry acknowledged that they work in conditions far from the safety standards that should be implemented. Below are excerpts from interviews with several informants regarding their decisions to forgo using personal protective equipment (PPE).

Table 1. Statement on PPE usage

Informant	Statement on PPE usage
IF-02	"We often choose not to use PPE because the work gets done faster. If we use them, the work becomes slower, and we lose time."
IF-04	"Even when we know it's dangerous, we keep working without protection because we're afraid that if the work is delayed, we won't get paid."

2. Inadequate Working Conditions

During field observations, it was found that the working environment in the shipyards in Kendari is minimal in terms of safety. Below are some interview excerpts related to working conditions.

Table 2. Statement on working conditions

Informant	Statement on working conditions
IF-07	"There are no fences or evacuation routes here, so if an accident happens, we don't know where to go. Sometimes, it's so dark at night, we work under torchlight."
IF-08	"Sometimes we work in open spaces with no protection from the weather. There are no clear safety standards."

3. Health Issues in the Workplace

In addition to safety, workers' health has also become a significant issue in this industry. Many workers' experience chronic health problems due to exposure to hazardous substances in the workplace. Below are findings related to health problems experienced by workers'.

Table 3. Statement on work-related health issues

Informant	Statement on work-related health issues
IF-03	"I've been coughing non-stop, but there's no treatment. Welding fumes are dangerous, but we have to keep working."
IF-06	"My skin itches and turns red from being exposed to ship paint, but no medication is provided."
IF-09	"The sound from welding and machines is very loud, but I've never received ear protection, and now my ears often ring."

4. Limited Access to Healthcare Services

The limited access workers' have to healthcare services is a major issue in this industry. Only a few informants have health insurance. Below are excerpts related to access to healthcare services.

Table 4. Statement on healthcare access

Informant	Statement on Healthcare Access
IF-08	"When I'm sick or injured, I can only buy medicine at a local store. There's no medical facility here."
IF-12	"If I get injured or feel sick, I can only go to a local store to buy medicine. There's no place offering medical treatment here."

5. Lack of Knowledge and Safety Training

The majority of workers' in the Kendari shipbuilding industry have not received training on Occupational Health and Safety (OHS). Below are excerpts related to the lack of training.

Table 5. Statement on OHS training

Informant	Statement on OHS Training
IF-07	"I've been working here for 5 years, but no one has ever told me about safety procedures or protocols that should be followed."
IF-09	"We only know how to do the work, but we've never had any training on hazards or how to prevent accidents."

6. Social and Economic Dependence

Workers' feel powerless to demand better protection or safety facilities, showing an economic dependence on the workshop owners. Below are excerpts related to this dependence.

Table 6. Statement on Social and Economic Dependence

Informant	Statement on Social and Economic Dependence
IF-02	"We can't demand anything. If we protest or ask for more protection, they might stop hiring us."
IF-04	"I want to protest, but I'm afraid I won't be hired again. I have to work here because there are no other jobs."

7. Worker Vulnerability with Suboptimal Health Conditions

Some informants have chronic health conditions but continue working in harsh conditions. Below are findings related to workers' health conditions

Table 7. Statement on physical health conditions

Informant	Statement on Physical Health Conditions
IF-04	"I have high blood pressure and need to take medication every day, but I still have to work. If I don't work, who will earn the money?"
IF-12	"Sick or not, I still work. There's no other choice."

DISCUSSION

The findings of this study support (Kanrak et al., 2023)'s conclusion that high work pressure can result in compliance with safety procedures only if management is committed to a safety culture. However, in the case of Kendari, the absence of such a culture makes economic pressure a source of increasing work risks. In this context, safety becomes an aspect that is compromised for the sake of production efficiency.

As explained by (Ludwick et al., 2023), management decisions to implement safety procedures depend on economic considerations. This is clearly reflected in statements by workshop owners who viewed the procurement of PPE as unnecessary expenditure. As a result, safety becomes rhetoric rather than an operational practice.

The health risks faced by workers' further support the findings of (Saragih et al., 2022) and (Fitriadi et al., 2025), who observed that exposure to heavy metals and noise can lead to chronic diseases if not adequately addressed with protective measures. The lack of masks, ear protection, and technical training has caused ongoing health damage that is not documented. In the long term, this not only harms the workers' but also creates a broad public health burden.

The issue of access to occupational health services is also part of the structural inequality. Studies by (Kamiluddin Saptaputra et al., 2024) and (Nugraha et al., 2023) show that informal workers' often lack connection to social security systems. This is compounded by geographic challenges, low health literacy, and social stigma, as noted by (Ramdani & Tiarapuspa, 2023). In the context of Kendari, this is clearly demonstrated by workers' who preferred to avoid medical treatment out of fear of being perceived as weak or no longer needed.

From a policy perspective, this study shows that Government Regulation No. 50 of 2012 on OHS Management Systems, as discussed by (Candra et al., 2023), has not reached the informal sector. The enforcement of workplace safety regulations has yet to touch areas such as Kendari, which has high-risk potential. (Anthony et al., 2024) emphasize the importance of consistent monitoring and evaluation to ensure the actual implementation of policies, but on the ground, even the existence of regulations is almost unknown to workers'.

This study contributes significant theoretical and practical insights. Theoretically, it extends the application of industrial economics theory to the context of occupational health in the informal sector. Industrial economics has traditionally been used to analyze market structures and production efficiency. However, this study shows that economic principles also shape risky work patterns. Practically, this study shows that without a participatory and localized policy approach, protection for workers' in the informal sector cannot be achieved.

Policy implications derived from these findings include:

1. The importance of community-based OHS training, involving NGOs, universities, and local health professionals.
2. The provision of subsidized PPE, particularly for small workshops with limited capital.
3. The implementation of mobile occupational health services to reach informal work areas
4. The creation of regulations that provide protection for informal workers', particularly in labor-intensive sectors like shipbuilding and ship scrapping.

The limitations of this study lie in the small number of informants and the specific research area. These findings are contextual and cannot be generalized to all of Indonesia or similar industries. Further research with a quantitative approach and broader coverage can address these limitations and provide a stronger foundation for OHS policy in the informal sector nationwide.

CONCLUSION

This study concludes that the economic structure of the shipbuilding and ship scrapping industries in Kendari significantly influences the occupational health and safety (OHS) conditions of workers'. The pressure to minimize operational costs has led to the normalization of unsafe work practices, both by management and workers' themselves. The findings indicate that the majority of workers' do not use personal protective equipment (PPE), lack access to OHS training,

and work in high-risk environments without formal support systems, such as standard operating procedures (SOPs), first aid facilities, or occupational health services.

The health complaints reported by workers' include respiratory issues, skin irritation, hearing impairments, and prolonged work fatigue. On the other hand, access to healthcare services is severely limited, mainly because most workers' lack social security, are unaware of their rights, and work in informal employment relationships without contracts. Moreover, social and cultural pressures—such as the fear of losing employment if refusing high-risk tasks—reinforce the cycle of vulnerability faced by workers'. These findings emphasize that occupational safety cannot be separated from the economic, social, and institutional contexts that shape the way industries operate.

Theoretically, this study demonstrates that economic pressures not only affect efficiency but also create patterns of neglect regarding workplace safety, especially in the informal sector. Work practices driven by cost-efficiency logic contribute to the widespread occurrence of work-related diseases and a decrease in workers' quality of life. Therefore, the implementation of OHS should be viewed as a cross-sectoral issue that requires comprehensive policy interventions, including regulations for informal labor, community-based training, and access to occupational health services at the worksite.

Recommendations for future research include:

1. A quantitative and comparative approach across different regions to assess the generalizability of these findings.
2. Exploration of community-based approaches to building a safety culture among informal workers'.
3. In-depth analysis of policy barriers and the involvement of local actors in implementing OHS in the informal sector.
4. Future studies should also address the gender aspect, social vulnerabilities, and institutional transformations that could strengthen worker protection in high-risk economic sectors.

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Authors' contributions and responsibilities

ID: Writing original draft, visualization, conceptualization, data collection, formal analysis. **EAM:** Writing supporting draft, review and editing, validation.

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Availability of data and materials

All data and supporting materials for this study are available and can be requested directly from the corresponding author.

Competing interests

The authors declare no conflict of interest in the conduct or reporting of this research.

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