



(RESEARCH ARTICLE)



## Occupational Health and Safety (OHS) small fishing vessels at Jayanti Fishing Port Indonesia

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### Abstract

Fishermen are one of the jobs that have high risk and danger. Data from The National Transportation Safety Committee shows the number of ship accidents in Indonesia from 2013 to 2021 was 124, including sinking, collision, overturning, burning, and running aground. This paper is conducted to analyze the accident occur in Jayanti Fishing Port and formulate mitigation strategies to reduce fishermen's work accidents at Jayanti Fishing Port. The research uses a purposive sampling method for fishermen, boat owners, and fishing port officers analyzed using content analysis. The result indicated that fishermen have good fishing competencies but lack safety gear and equipment. The strategy for increasing fisherman safety is by providing fishermen's work safety equipment and increasing fishermen's insight regarding work safety through counseling and training to increase knowledge about Occupational Health and Safety (OHS).

**Keywords:** Accident; Fishermen; Fishing Port; Safety; OHS

### 1. Introduction

The utilization of marine biological resources cannot be separated from the fishing operations of fishermen who catch fish. Working on fishing vessels is classified as dangerous, so it is prone to causing work accidents [1]. A large number of workers and high work intensity on board ships increases the chances of work accidents [2]. Thus, the crew and the ship owner need serious concern for worker safety.

Small fishing vessels have a higher chance of an accident than large ships. Research by Cabeças and Nunes [3] states that Portuguese fishermen using small vessels less than 12 meters have a greater chance of accidents than medium and large vessels. The percentage of fatal accidents experienced by ships measuring 12 meters, namely as many as 43% suffered minor injuries, 22% were bleeding injuries, 9% were broken bones, 9% were muscle injuries, and the rest had internal injuries. This accident can be minimized with comprehensive work safety management.

Indonesia's number of ship accidents from 2013 to 2021 was 124, including sinking, collision, overturning, burning, and running aground [4]. According to FAO [5], the main causative factor is the factor of human error or the fishermen themselves, which is called human error at 43.67%. According to Purwangka *et al.* [6], 80% of the causes of sea accidents in fishing activities carried out by fishermen are human errors. Based on this, fishermen's knowledge of work safety as fish catchers is essential for their survival of fishermen.

Jayanti FishingPort is a fishing port located in Cidaun District, Cianjur Regency, West Java. Indonesia, where fishermen carry out fishing activities. This port is the backbone of coastal communities' economy, most of whom work as

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fishermen. Fishermen at Jayanti Fishing Port have a very high occupational risk. There were 11 incidents from 2017 to 2021, with an average of 2 accidents occurring yearly [7]. This shows that fishermen's work safety aspects have not received particular attention in port management. If this continues, it is feared that the number of accidents will increase. Therefore it is necessary to research the characteristics of small boat fishermen on work safety at sea.

## 2. Material and methods

This research was conducted in the Jayanti Fishing Port located at 7.4988° S, 107.3859° E, West Java, Indonesia, from August to October 2022. The type of data in this study used primary data and secondary data. Primary data was obtained from respondents through structured interviews using a questionnaire. Primary data collected comes from interviews with fishermen. Secondary data was obtained from data referring to related institutions such as the Cianjur Animal Health and Fisheries Service and others. The method of sampling used in this study is the purposive sampling method. The fishermen who were used as respondents were 60 people. Determination of the characteristics of respondents, namely fishermen who own boats and fishermen with the crew who use small boats less than 12 meters in Jayanti Fishing Port.

Data processing was carried out in this study, namely qualitatively and quantitatively. Qualitative data processing is in the form of descriptive, namely making descriptions, systematic, factual, and accurate descriptions of the facts. Quantitative information has been tabulated to calculate the average or percentage of sample respondent data. Qualitative and quantitative data processing is presented in tables and pictures.

## 3. Results and discussion

### 3.1. Fishing Vessel Accident

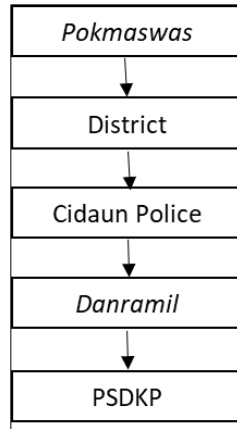
The results of research on Small Fishing vessels in Jayanti Fishing Port show that during the 2017-2022 period, there were 16 accidents involving fishermen in Jayanti Fishing Port, with the most types of accidents being rolling waves in 2022, shown at Table 1.

**Table 1** Accident in Jayanti Fishing Port

Accident	Number of Incidents	Victims Survived	Victims Passed Away	Missing Victims
<b>2017</b>				
Fishing Vessel Sinking	1	0	1	0
Fishing Vessel Capsized	2	2	0	0
<b>2018</b>				
The fishing Vessel Capsized during the loading	1	1	0	0
<b>2019</b>				
Fishing Vessel Sinking	1	0	2	0
Fishing Vessel Capsized	2	1	0	1
<b>2020</b>				
Fishing crew sunk	1	0	1	0
<b>2021</b>				
Fishing Vessel Sinking	2	0	1	1
<b>2022</b>				
Fishing Vessel Overturned	4	6	0	0
Fishing Vessel Sunk	1	0	1	0
The ship Overturned and sunk	1	0	2	0
Total	16	10	8	2

Jayanti Fishing Port has an institution for disaster management and fishing accidents in the form of a Search and Rescue (SAR) team handled by the National Disaster Relief Agency of Cianjur. The search for missing fishermen is also assisted by Fisherman Community Monitoring Groups (*Pokmaswas*), organizations established by fishermen groups in each village in Cianjur Regency

Suppose an accident happens at Jayanti Fishing Port. In that case, *Pokmaswas* will create an accident report, proceed to the District, and send it to the Cidaun Police, then to the District Military Commander (*Danramil*), and then to The Directorate General of Marine and Fisheries Resources Surveillance (PSDKP) of West Java. The reporting path is presented in Figure 1.

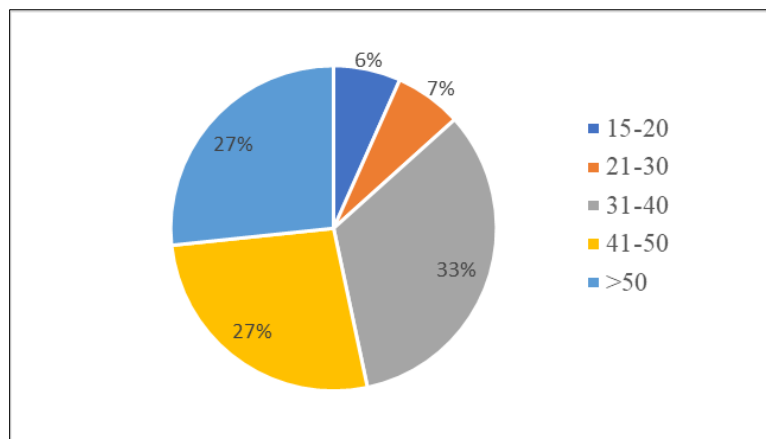


**Figure 1** Accident Reporting path at Jayanti Fishing Port

Jayanti Fishery Port has 3 *Pokmaswas* divided by sub-district, namely the Cidaun *Pokmaswas*, the Sindangbarang *Pokmaswas*, and the Agrabinta *Pokmaswas*. The *Pokmaswas* that were most active in carrying out the activity were the Agrabinta *Pokmaswas*, who did not have complete safety equipment. *Pokmaswas* were only given safety equipment in the form of boats, GPS, and life jackets for victims.

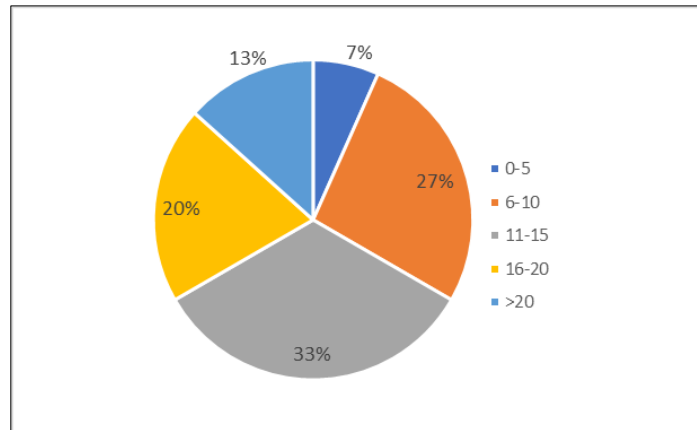
### 3.2. Fisherman Competences

Fishermen in Jayanti Fishing Port have various ages, from 15 to more than 50 years old. The age distribution of fishermen can be seen in Figure 2. Fishermen are dominated by the age of 31-40 years as much as 33% and fishermen aged 41-50 years with a percentage of 27%. The youngest fisherman, who is 15 years old, became a fisherman starting by accompanying his parents to sail, using the boat owned by his parents.



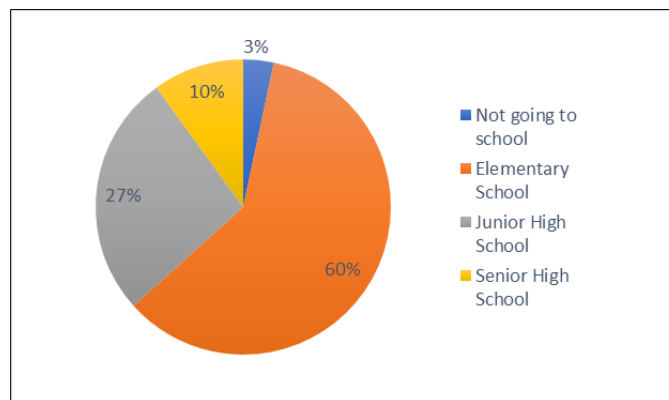
**Figure 2** Age Distribution of Fishermen (years) in Jayanti Fishing Port

The sailing experience of fishermen in Jayanti Fishing Port is dominated by 11-15 years of experience, as much as 33%. The vastest sea experience is more than 20 years, as much as 13%. And at least 7% experience at sea 0-5 years (Figure 3).



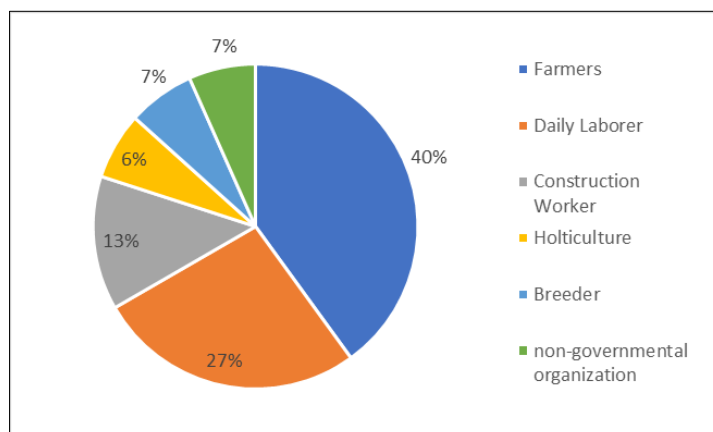
**Figure 3** Fishermen's Sailing Experience (Years) in Jayanti Fishing Port

Fishermen in the Jayanti Fishing Port area are generally not very educated. 60% of fishermen graduated from elementary school, 27% graduated from junior high school, 10% graduated from senior high school, and 3% did not attend school (Figure 4). Even though most fishermen do not have higher education, fishermen still have good competence in fishing. All fishermen have the skills to use the proper fishing gear. This information is obtained from their experience helping their parents catch fish.



**Figure 4** Fishermen's Education in Jayanti Fishing Port

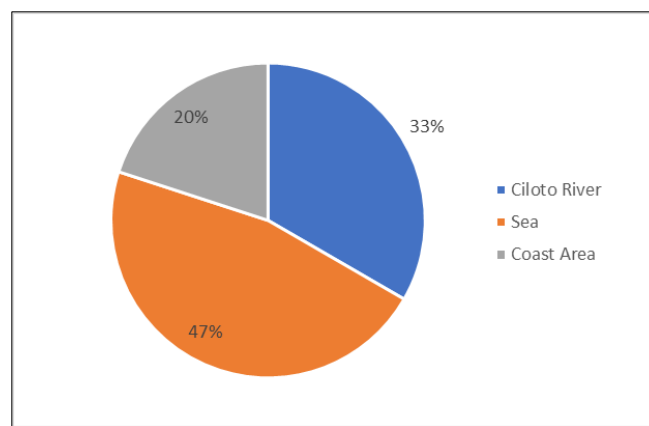
Apart from being a fisherman as their primary source of income, additional work as an alternative to supplementing income is, for the most part being farmers, daily laborers, and carpenters (Figure 5)



**Figure 5** Alternative Jobs for Fishermen in Jayanti Fishing Port

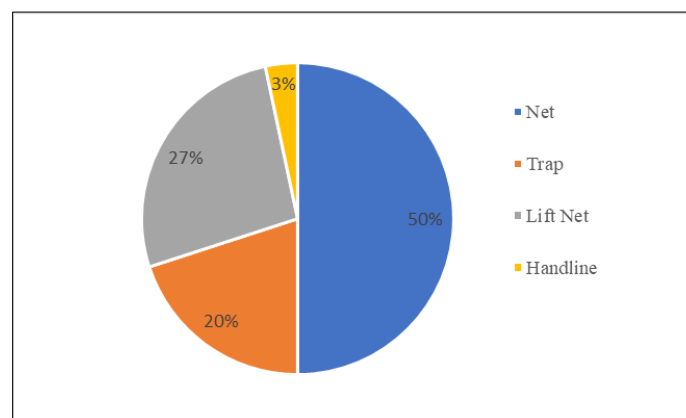
As many as 40% of fishermen have alternative jobs as seasonal farmers. In the west wind season, which occurs from September to December, fishermen will start planting rice and tending it until harvest. As many as 27% work as casual daily laborers, some harvest rubber latex, work as drivers, and work in wood processing or food processing factories. Construction workers are also an alternative job for fishermen. As many as 13% of fishermen choose to become construction workers because of their better income than other alternative jobs. Construction workers usually use a contract payment system for approximately 2-4 weeks with a wage of 1.5 million to 3 million Rupiah. Gardening is one of the alternative jobs that fishermen can do in Jayanti Fishing Port, and fishermen usually garden by planting rubber, coconut, secondary crops, and oil palm trees. As many as 7% of fishermen in Jayanti Fishing Port have an alternative job of raising livestock, namely cattle and goats, which they prepare to raise and sell to meet the needs of the Moslem Celebration Such as aqiqah and Eid al-Adha holidays. Another 7% of fishermen chose to join community organizations.

Most of Jayanti Fishing Port's fishing locations are in the sea area, and the others catch on the coast or rivers (Figure 6). As many as 33% of fishermen choose to catch fish in the Ciloto River, 20% of fishermen choose to catch fish on the coast using hand lines and nets, and 47% still choose to catch fish in the sea. The large number of fishermen catching fish on the coast and rivers is caused by the conditions of the West monsoon, which makes bad weather so that fishermen choose not to catch fish in distant fishing areas.



**Figure 6** Fishing Area

Fishing gear most used by fishermen in Jayanti Fishing Port is nets reaching 50%. The rest use traps, lift nets, and handlines, as shown in Figure 7. All fishermen have the skills to use all fishing gear, and fishermen usually use nets to catch pelagic fish in the sea. The rest use traps to catch shrimp and crabs.



**Figure 7** Fishermen Fishing Gear

Fishermen in Jayanti Fishing Port catch fish in the sea with fishing nets and have a relatively low level of education but have long experience at sea. Fishermen who experience accidents in fishing activities average two accidents per year, but in 2022 this will increase to 6 incidents. According to FAO [5], fishing activity is included in the high-risk category if the number of accidents is as much as one incident per year. Based on the accident category, it is included in the moderate and severe categories. Moderate accidents are accidents that cause damage to boats used by fishermen and

cause injuries or physical damage to victims. Severe accidents or fatal accidents, namely accidents that cause the loss of fishing boats and some fatalities cannot be saved [8].

The most frequent incidents of fishermen's accidents are ships rolling over the waves. This happens because the engine of the 15 PK ship given by the government is considered unsuitable for the conditions of the waves on the South coast. Fishermen often experience being swept away by the waves and rolled over because the engine turns off while driving and fighting the waves. According to local fishermen, a good machine for a fishing trip is a machine with a power of over 40 PK. In addition, the condition of the relief ship was also considered not to meet the fishermen's wishes because the ship had a thin wood thickness of 2 cm. According to FAO [9], the thickness of the ship's wood was suitable and good for use in South coastal ocean waters, which is 5 cm. The thin thickness of the ship's wood causes it to leak frequently, so it can quickly sink.

The high number of fishermen's accidents at Jayanti Fishing Port is likely due to external factors, such as not having work safety equipment. According to FAO [9], fishermen must have work safety equipment: a life jacket, life buoy, first aid equipment in an accident, lifeboat, GPS, radio, compass, goggles, gloves, shoes, and fire extinguisher [10]. The safety equipment that fishermen do not have and the lack of knowledge and awareness of safety when working causes high work accidents for fishermen. The cause of accidents in the form of human error can occur either due to ignoring weather warnings, fishermen's inability to make the right decisions when an accident occurs, or physical conditions that are not good at sea.

Jayanti Fishing Port already has a fisherman disaster and accident management agency, the SAR team, which is handled by the National Disaster Relief Agency of Cianjur (*BPBD*), assisted by SAR volunteers and Community Monitoring Groups (*Pokmaswas*). Searching for and handling accidents is usually carried out by forming a joint team of *Pokmaswas*, police, and SAR volunteers for up to 5 days, and if they are not found, the fisherman is declared lost at sea and cannot be saved. The SAR team plays a vital role in the search for survivors when an accident occurs [11], where the SAR team has full authority in rescue accidents at sea. The fast response from the SAR team, combined with volunteers, will save more victims [12].

Efforts to overcome the number of accidents classified as high risk and medium and severe categories require a mitigation strategy in the form of implementing fishermen's work safety management [13]. Fishermen at Jayanti Fishing Port can already save themselves, namely by swimming. Fishermen start practicing swimming from 3-5 years old, starting from helping parents who primarily work as fishermen. Fishermen must have swimming skills and be able to use safety equipment because the wave height on the south coast of Cianjur ranges from 2 to 3 meters [14]. Swimming can increase safety when an accident occurs at sea, assisting in self-rescue especially in reducing drowning victims [15]. Swimming abilities and skills, knowledge of the surrounding location, health conditions, and the ability to make the right decisions when problems occur are essential elements of safety in the waters [16]. Fishermen at Jayanti Fishing Port have good competence and sufficient experience in fishing activities so that accidents originating from human error can be minimized [17].

Fishermen need to know about Occupational Health and Safety (OHS) and be equipped with minimum standard work safety equipment such as life jackets, life buoys, first aid equipment in accidents, lifeboats, GPS, radio, and others. Fishermen's work experiences at sea, such as nearly drowning, injury, and others, will interfere with the safety and health of fishermen [18]. The relatively low education level of fishermen is closely related to their low knowledge of work safety. In mitigating, accidents caused by human error is necessary to provide counseling and training to fishermen about the importance of work safety on board. This counseling and training activity for fishermen is essential, following the results of Camara's [19], which states that after being given work safety training, the result is that 89% of fishermen go to sea using life jackets, and it is proven to reduce accidents due to drowning.

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#### 4. Conclusion

The highest cause of accidents for small-sized fishing boats in Jayanti Fishing Port is due mainly to the boat being overturned by the waves. The strategy to reduce fishermen's work accidents is by providing fisherman's work safety equipment and increasing fisherman's insight regarding work safety through counseling and training to increase knowledge about Occupational Health and Safety (OHS).

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

The authors declare that there is no conflict of interest regarding this paper's main research, authorship, and publication.

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