

THE MODERN PARADOX OF FIBERGLASS BOATS: HEALTH AND SAFETY RISK AWARENESS AND ADAPTATION OF FISHERMEN IN EAST LOMBOK, WEST NUSA TENGGARA

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ABSTRACT

Research on the impact of fiberglass boats has so far focused more on the impact of fiberglass on workers or boat builders. This study aims to provide an analysis of the risks involved in the manufacturing process for the community; the level of comfort and safety when using fiberglass boats; and innovations made to minimise risks and improve comfort and safety. The research approach used is qualitative with an ethnographic method. Data sources include interviews with craftsmen and fishermen in seven villages/areas, observations, documents, and documentation. Data analysis techniques consist of domain analysis, taxonomic analysis, component analysis, and cultural theme analysis. Data validity is strengthened using triangulation. The research findings indicate that: 1) dust from fiberglass boats during sanding in open areas/along the coast poses a risk of causing itching and shortness of breath among the local community, a problem that persists to this day; 2) fiberglass boats are uncomfortable to use, and according to some community members, the vibrations caused by large waves can have adverse effects on heart health; 3) the use of fiberglass boats is considered more risky in terms of safety in the event of an accident; 4) considering the risks, comfort levels, and safety factors, some fishermen have already implemented various innovations.

Keywords: Paradox of Modernity; Health and Safety Risks; Fiberglass

PARADOKS MODERNITAS PERAHU FIBERGLASS: KESADARAN RESIKO KESEHATAN, KESELAMATAN, DAN ADAPTASI NELAYAN DI LOMBOK TIMUR NUSA TENGGARA BARAT

ABSTRAK

Penelitian ini bertujuan untuk menganalisis risiko modernisasi alat tangkap dan proses adaptasi dalam pembuatan dan penggunaan sampan *fiberglass* pada aspek kesehatan dan keselamatan perspektif masyarakat nelayan di Tanjung Luar Lombok Timur, Nusa Tenggara Barat. Pendekatan penelitian yang digunakan adalah pendekatan kualitatif dengan metode etnografi. Sumber data dari hasil wawancara dengan tukang dan nelayan di tujuh kadesun/wilayah, hasil observasi, dokumen dan dokumentasi. Teknik analisis data terdiri atas analisis domain, analisis taksonomi, analisis komponensial, dan analisis tema budaya. Sedangkan untuk penguatan keabsahan data menggunakan triangulasi. Hasil penelitian menunjukkan bahwa terdapat berbagai risiko yang dihadapi masyarakat di Tanjung Luar yaitu: 1) penghalusan sampan *fiberglass* yang dilakukan di tempat terbuka menyebabkan gatal pada kulit dan sesak napas terutama pada anak-anak; 2) sampan *fiberglass* kurang nyaman digunakan apabila terkena ombak besar, bahkan dapat berefek pada kesehatan jantung; 3) penggunaan sampan *fiberglass* dianggap lebih berisiko terhadap keselamatan jika terjadi kecelakaan. Meskipun masyarakat memahami risiko tersebut, terdapat paradoks di dalamnya, karena disatu sisi mereka tetap memproduksi sampan *fiberglass* karena kebutuhan. Selain itu, sejauh ini sebagian nelayan melakukan berbagai adaptasi dan inovasi seperti pembuatan sampan *fiberglass* di tempat tertutup dan jauh dari pemukiman warga serta menyesuaikan bentuk perahu dan tabung *fiberglass*.

Kata kunci: Paradoks Modernitas; Resiko Kesehatan dan Keselamatan; Fiberglass

INTRODUCTION

Innovations in fishing fleets and gear among fishing communities continue to undergo changes, driven by highly complex factors such as environmental changes and modernisation (Pitriani, 2020; Rahmawati & Prastiwi, 2021; Maurizka & Soeryo Adiwiwono, 2021; Marlina, 2024). One form of innovation is the manufacture of boats from fibreglass. In Indonesia, this change has been underway since the 1980s, as fibreglass is considered more efficient and effective in various aspects (Asrori, et al., 2023; Richard, 2024). This innovation has also been implemented by the fishing community in Tanjung Luar Village, East Lombok Regency, West Nusa Tenggara, Indonesia, particularly in the manufacture of fibreglass boats with a size of 1–6 Gross Tonnage (GT) (Profil Desa Tanjung Luar, 2025).

The reasons why small-scale fishermen mostly use fibreglass as a material for making boats include: 1) It has advantages, such as being lightweight, easy to shape, and mechanically stronger and more resistant to seawater corrosion when compared to boats made of wood or metal (Wahrhaftig et al., 2016; Siswandi et al., 2021; Pambudi et al., 2021; Wicaksono et al., 2024; Hasanudin et al., 2025); 2) It reduces the increasingly limited logging of timber, which in turn reduces the occurrence of natural disasters (Romadhoni & Nuhasanah, 2017; Alamsyah et al., 2021); 3) Wooden boats are less resistant to weather changes and seawater, and have a higher wear rate (Halid et al., 2023; Ziliwu et al., 2023); 4) Damage to fibreglass boats is easier to repair than damage to wooden boats (Fitriadi et al., 2018). This is why small-scale fishermen engaged in traditional fishing, who make up around 95% of Indonesia's fishing industry, including those in Tanjung Luar, mostly use fibreglass boats (Pambudi et al., 2021).

In addition, fishermen in Tanjung Luar also face risks and several disadvantages, ranging from the manufacturing process to the use of fibreglass boats. The community of Tanjung Luar has been experiencing these risks for quite some time, even since the introduction of fibreglass in 2007. However, in the process, some fishermen have made various adaptations to reduce the negative impacts and shortcomings during the manufacturing process with the aim of improving comfort and strength to survive in the event of an accident at sea.

According to the community in Tanjung Luar, several risks have been identified in terms of health and safety, namely: 1) people exposed to dust during the manufacturing and sanding

processes often complain of itchy skin and shortness of breath. This occurs when sanding/smoothing/grinding fibreglass is carried out in open areas such as on the beach. This risk occurs because the production of boats/canoes from fibreglass contains chemicals that are very dangerous to the human body if they come into direct contact or enter the body, causing skin irritation, respiratory disorders, and other mild effects such as flu, coughing, and sore eyes (Kusumawardani et al., 2018; Rumselly & Peluw, 2024); 2) most fishermen consider fibreglass canoes to be less comfortable than wooden canoes because they vibrate strongly when hit by large waves, and are even considered to be more likely to cause heart disease; 3) the level of safety when using fibreglass canoes is very low compared to wooden canoes. If a fibreglass boat leaks, it will sink more quickly and immediately sink to the bottom of the sea, whereas wooden boats can survive for a day to provide shelter.

The concept of risk is used in this study because some of these negative impacts arise as a result of modernisation, which stems from individual or personal behaviour, rather than natural or external factors. Meanwhile, the concept of 'danger' usually arises from external factors (Beck, 1992; Connell, 2008; Kinasih, 2024). According to Ulrich Beck (1992) modernisation, including fibreglass in this case, can be a solution, but it also carries artificial risks, namely health and safety risks. However, on the other hand, the community experiences a paradox and still chooses to continue because of necessity (Saputra & Hidayah, 2023; Haq et al., 2023; Kusvianti et al., 2023). In the process, the community also attempts to adapt, which Douglas & Wildavsky, (1982) refer to as an adaptation process that is not only rational but also reinforced by cultural values or collective values in certain communities, including the Tanjung Luar community (Khumairoh et al., 2023). These two theories can at least provide a more structured understanding of the risks and adaptation processes in the fishing community of Tanjung Luar.

Research with the same friends in Tanjung Luar and East Lombok in particular has not been conducted. However, there are quite a number of topics related to the risks faced by workers/craftsmen who make fibreglass boats, but those related to the risks of fibreglass manufacturing, comfort and safety levels for users/fishermen, and how the community adapts have not been studied (to say there are none at all) and are a cause for concern. Latief et al., (2018), for example, researched the safety of craftsmen during the manufacture of fibreglass boats. The results showed that the most risky stage of

fibreglass manufacture is during the construction of the frame, where the level of risk varies greatly, ranging from minor risks to death. Nugraha & Basuki (2023) researched the operational risks during the manufacture of fiberglass boats. In this study, the researchers identified various types of obstacles encountered in the fiberglass boat manufacturing process, ranging from employees/workers to the availability of materials to be used.

Based on the description and several research results above, this study differs in terms of both theme and research method, which also constitutes the novelty of this study. This study focuses on the history and risks of modernisation, which in this case can be identified in several aspects, namely: 1) health risks during the manufacture of fiberglass boats among fishing communities exposed to dust; 2) comfort when using fiberglass boats and its effects on health; 3) safety risks of using fiberglass compared to wood. However, in addition to this, an analysis of adaptation and innovation was carried out after understanding these various risks. In terms of methodology, whereas previous studies used descriptive qualitative methods, this study used ethnography, so that it was easier to see what the fishing communities who were the subjects of this study felt directly.

METHOD

This study utilises a qualitative approach with an ethnographic method. The ethnographic method itself is an effort to capture the social and cultural world as actualised in the actions of subjects (Hamzah, 2018). Therefore, this study focuses on the emic perspective, namely what is felt by the community in Tanjung Luar Village (Fetterman, 2024).

This research was conducted in Tanjung Luar Village, Keruak Subdistrict, East Lombok Regency, West Nusa Tenggara. The research was conducted over a period of eight months, from September 2024 to June 2025. The reason the researcher used a fairly long period of time was to understand the behaviour of the community repeatedly, and several ethnographers such as Liliweri (2018) and Fetterman (2024) require that ethnographic research be conducted for at least two semesters or approximately eight months, as was done in this study.

The data sources for this study consist of primary and secondary sources, where primary sources were obtained directly from interviews with village officials, community leaders, and fishing communities in seven hamlets/areas in Tanjung Luar Village, as well as direct observations of fiberglass canoe manufacturing

and finishing sites, both on the coast and in specialised locations. Secondary sources were obtained from village and local government documents such as the Village Profile; the Village Government and the Tanjung Luar Fishing Port Marine and Fisheries Service (P2TL) as well as data from the East Lombok Marine and Fisheries Service.

Data analysis techniques involve several stages, namely: 1) domain analysis, in which the researcher identifies and groups key terms from units and meanings from interviews, observations, and document data; 2) taxonomic analysis, in which the researcher organises the categories from the domain analysis into a hierarchical structure; 3) component analysis, in which the researcher highlights the dimensions of differences and similarities to obtain the unique meaning of each concept; 4) cultural theme analysis, in which the researcher integrates all the categories and dimensions of the previous analyses into the main theme of the study to understand the cultural patterns of fishermen in Tanjung Luar. To maintain data validity, this study uses a triangulation strategy, in which the researcher cross-checks the results of interviews, observations, documents, and documentation.

RESULTS AND DISCUSSION

Overview of the Research Location

Tanjung Luar Village is administratively located in Keruak Subdistrict, East Lombok Regency, West Nusa Tenggara, with an area of 106,985 hectares. The population is 9,866 people spread across seven hamlets/areas, namely: South Toroh, Central Toroh, Central Village, Koko Village, Muhajirin Village, South Baru Village and Baru Village (Profil Desa Tanjung Luar, 2024; Murdi et al., 2023; Habibuddin, 2023).

The number of vessels/marine transport used by fishermen in Tanjung Luar is 1,100 units, consisting of: 40 non-motorised boats, 800 outboard motor boats, 3-10 GT motorboats (260 units), and ketinting canoes (1,505 units) (Profil Desa Tanjung Luar, 2024; Dinas Kelautan dan Perikanan Pelabuhan Perikanan Tanjung Luar, Tahun 2024). Most of the canoes with ketinting engines are made from fiberglass.

The History of Fiberglass Boat Manufacturing in Tanjung Luar

Nationally, fiberglass as a basic material for boats in Indonesia, especially on the island of Java, has been known since the 1980s (Richard, 2024). However, the process of introducing it to other areas, including Lombok, West Nusa

Tenggara, took quite a long time, namely after the 2000s.

The introduction and manufacture of fiberglass boats in East Lombok, particularly in Tanjung Luar, began in 2007. The first ten fiberglass boats were manufactured through a collaboration between the Tanjung Luar Village Cooperative and PT Coral Biru from Surabaya. Additionally, PT Coral Biru sent six experts to train local craftsmen in Tanjung Luar and surrounding areas (S, 04-06-2025). Over time, fishermen in other regions, including Sumbawa, began using fiberglass around 2012 (Chandra, 2007).

Figure 1. Construction of a Fiberglass Boat in 2007 in Tanjung Luar



Source: Personal Documentation of M. Saifullah, 2007)

Muhammad Saifullah (84 years old) is one of the figures who is considered by the people of Tanjung Luar to be a reformer of the fleet and fishing gear, including pioneering the procurement and training of fiberglass boats in 2006. His position as head of the KUD and the Teluk Jukung Marine Fisheries Management Committee (KPPL) made it easier for Saifullah to access cooperation, especially with government agencies, for the procurement of fishing fleets and equipment in Tanjung Luar (MS, A, S, 20-05-2025). The existence of 2,714 fishing gear units in 2011, the highest number in East Lombok, is evidence of the rapid development of the fleet and fishing gear in Tanjung Luar (Nurlaili et al., 2014).

The manufacture of boats using fiberglass as the base material in East Lombok and Tanjung Luar in particular cannot be separated from the deforestation that was already very noticeable in both Lombok and Sumbawa Island in the 1990s (Alfany et al., 2017). This situation led to a ban by the Forestry Service on the felling of large trees for use as boat building material. In response, the fishermen, through their cooperative, sought an alternative, which was to build fiberglass boats (MS, 04-05-2025).

In its development, in addition to training in Tanjung Luar, several craftsmen gained direct experience during visits to both Labuhan Lombok and Ampenan. Through these visits, several fishermen in Tanjung Luar observed the manufacturing process and materials used to make fiberglass, and many of them immediately helped out and then tried to make it in Tanjung Luar after returning home (U, 21-05-2025; N, 16-05-2025).

In addition to the decline in timber as a raw material for boats since the 2015s, there are several other reasons why fishing communities have switched to using fiberglass, namely: 1) ease of obtaining raw materials for manufacturing; 2) ease of manufacturing; and 3) ease of manufacturing; 4) greater resistance to weather and water bugs (rutus), leading the community to nickname it the *molah* (easy) boat, despite the risks that will be discussed later (N, 16-05-2025; K, U, 21-05-2025).

For several years, canoes were made from fiberglass, which was initially commonly produced on the coast or in open areas close to residential areas. During this process, the community also understood the various risks and disadvantages compared to wood. One of these was the effect of dust during the smoothing/grinding process, which caused itching of the skin and shortness of breath (A, 04-05-2025). This understanding then led to new adaptations, starting with the use of tarpaulins to make shelters that could block dust from reaching residential areas, renting special places that currently exist in Kampung Koko, or at the western end of South Toroh, which is quite far from residential areas (N, 16-05-2025).

Dust Risk and Comfort of Using a Fiberglass Boat

One of the processes in the manufacture of fiberglass boats that is considered unhealthy by the fishing community in Tanjung Luar is the *gerinde* (smoothing/polishing) process. The dust produced during the sanding process is harmful to the skin and can even cause respiratory problems. A fisherman in Toroh Tengah said that (U, 21-05-2025). The risk of skin irritation and respiratory problems, as experienced by the Tanjung Luar community, is also a concern for fishermen in general (Latief et al., 2018; Zumala, 2023; Rumselly & Peluw, 2024).

Although there are now special places where fiberglass boats can be rented, in some villages/hamlets/areas people still smooth/grind the boats on the beach, even though sometimes they are not whole boats. Although tarpaulins are used when the west wind blows, they do not provide protection when the east wind blows, which often has an impact on the health of the

community exposed to fiberglass dust (R, 13-12-2025). Another fisherman confirmed this:

"The danger of this fibre is when it is rubbed/ground, and many people still do this around here' (pointing to the beach in Kampung Baru). But now, to prevent residents from being exposed to too much dust, they usually make protective covers from tarpaulins, especially when the wind is blowing from the east. When the wind is blowing from the west, they don't use tarpaulins, so there is still a possibility that people will be exposed even if the wind is not strong. Some people experience itching and others feel short of breath" (K, 21-05-2025).

Although the community is aware of the negative risks to their health, if fishermen engage in gerinde on the beach, they are sometimes left alone because of a sense of mutual understanding among fellow fishermen. For them, this has become a habit that they are likely to continue in the future.

The same thing happens in other villages such as Kampung Koko. Muhammad Ari, a millennial fisherman, explains as follows:

"The manufacture of fibre boats, especially when sanding, is also done on the beach (Kampung Koko), but when the wind is strong, they cover them with tarpaulins. Some rent special places that are quite far from fishing settlements, such as Lapangan Kebun Roek. However, most people do not follow standard operating procedures because they do not want to complicate things" (Muhammad Ari, 25-05-2025).

Figure 2. Construction of Fiberglass Boats on the Beach near a Residential Area



Source: Personal Document, Lalu Murdi, 2024

Despite the fact that there are still some people who carry out grinding on the beach without any cover, most people are now increasingly aware of the dangers of fiberglass dust, which is harmful to the community, especially to children playing on the beach. As a result, many people rent special areas in Kampung Baru and at the southern tip of

Toroh, specifically in Kebun Roek (N, 16-05-2025).

Figure 3. Specialised Fiberglass Boat Building Facility



Source: Personal document, Lalu Murdi, 2024

In addition to the harmful effects of fiberglass dust, comfort and its impact on health during use are also major concerns for the community. For them, wooden boats are much more comfortable and even considered to be many times more comfortable than fiberglass boats (S, 30-05-2025).

In addition to being less comfortable, it also affects health during the manufacturing process, such as causing itching and shortness of breath. For this reason, fishermen sometimes line their boats with carpets to sleep on, as even though the fiberglass has been painted, it remains sensitive and causes skin irritation. This is certainly different from those who use wooden boats (N, 16-05-2025).

Not only are they uncomfortable, but according to the fishermen, fiberglass boats also often have an impact on physical health, such as the heart or other internal organs. A source explained: 'Now I use a wooden boat, although I have also used a fiberglass boat, because wood is more resistant to waves, whereas fiberglass, when hit by big waves, feels like our hearts are being attacked. From what I've observed, it seems that fiberglass causes many heart attacks among fishermen' (K, 21-05-2025).

In addition, thin fiberglass boats usually cause their owners to bounce off their seats when there are big waves, which they refer to as *teperujuk isik ombak* (being shaken violently by the waves). This can even cause the users to jump and sometimes fall off the boat (U, 21-05-2025). The fishermen also explained that lightweight fiberglass boats with a flat bottom are more vulnerable to waves, causing greater vibration, which also has an impact on health (U, 21-05-2025; S, 30-05-2025). In addition, the thickness of the fiberglass boat affects its durability and resistance to waves (Setyawan et al., 2025).

According to Beck (1992), this condition is a paradox in society, where the decision to continue using this material (fibreglass) is driven by necessity despite the underlying fear. It is a meeting point between unavoidable risk and the need to survive as a fisherman. The strength to continue to survive for the sake of this need, according to Douglas & Wildavsky, (1982) can then obscure the risks, making them seem subjective and dependent on the collective values of society. The expression 'mutual understanding' in some communities proves that these risks are understood subjectively, because communities also select which risks to ignore or tolerate depending on the dominant culture in that place.

Safety Risks of Using Fiberglass Boats

Fiberglass boats' ability to stay afloat in the sea in the event of a leak or sinking is also a concern for fishermen, as these boats pose other risks, particularly in terms of safety in the event of an accident at sea, although there are other aspects that also need to be considered.

Based on the Marine Accident Report in Tanjung Luar Village between 2018 and 2015, there were 25 marine accidents, and based on confirmation from the village and community, only two people used wooden boats. Some examples of cases include an accident that occurred to a millennial fisherman, SH (37), in 2020, whose body has not yet been found. At that time, he was using a fibreglass boat (Kompas, 2020; K, 21-04-2025). Accidents resulting in the death of fishermen also occurred in 2001 and 2002, claiming two lives, both of whom were using fibreglass boats at the time (Tanjung Luar Village Document 2025). In comparison, there are many fishermen who use wooden boats and ships that have been involved in accidents, but they were rescued. In 2023, there was an accident involving a motorboat with 12 crew members, all of whom survived; then in 2025, a motorboat carrying seven fishermen and a boat, both made of wood, and the owner were rescued (Dokumen Desa Tanjung Luar, 2025; Radarselaparang, 2025; K, 21-04-2025; U, 21-05-2025;).

The habits of fishermen, especially millennial fishermen, to brave the waves, storms, and winds, and sometimes disregard the weather at sea, have led to many accidents that often result in death. Many of the 1980s generation no longer use the knowledge of the older generation to ascertain the currents, wind direction, or signs from nature that indicate it is safe to go out to sea. For them, phrases such as 'we are not looking for wind, but fish' are often heard (Z/WD, 19-05-2025).

The consequences are very clear. Recently, there have been many accidents that have not only destroyed boats and engines, but also left many

fishermen missing (Observations, 05-10-2024; Z/WD, 19-05-2025). This information is consistent with the 2018-2015 Marine Accident Report in Tanjung Luar Village, which states that of the 25 marine accident cases, 15 of the victims were millennial fishermen born between 1985 and 1990. WD explains this situation as follows:

"In the past, it was rare to hear of anyone drowning and disappearing at sea, even if their boat was damaged, they could sometimes survive. Now, almost every year, there are cases of boats and people disappearing completely, with their bodies never found, because there is nowhere to survive once the boat has sunk. If using wood, we could survive for three days on the wreckage of the boat, but with fibre, it would only be ten minutes before we were dead if we didn't have life jackets or someone to help us" (Z/WD, 19-05-2025).

Unlike wooden boats, fiberglass boats are much lighter than wooden boats, but they are very vulnerable and cannot stay afloat at all without tubes. While wooden boats can remain afloat for several days even if they are leaking or broken, fiberglass boats will usually sink to the bottom of the sea within minutes if their tubes are broken (N, 16-05-2025).

For fishermen, fiberglass boats are very dangerous in the event of an accident at sea. It is rare for anyone to survive, especially since most boats nowadays use two engines, which increases the weight, so that if the tubes break, the boat will sink to the bottom of the sea even faster. Nevertheless, fishing activities at sea, which have recently been ongoing even for 24 hours, sometimes result in fishermen who have accidents surviving (K, 21-05-2025).

Adaptations in the Manufacture of Fiberglass Boats

The lengthy process, which took around 19 years, involved using fiberglass boats, while also helping some members of the community to understand and find ways to adapt to some of the risks and shortcomings associated with using fiberglass boats. Here are some of the things that the fishing community in Tanjung Luar Village did to reduce health risks and improve the comfort of using fiberglass boats.

First, the localisation of the manufacture and smoothing of fiberglass canoes. Although to this day a small number of people still smooth/grind canoes in open areas such as on the beach, this is not done for entire canoes, but rather for certain parts of the canoe, especially when repainting, and this is still often done on open beaches. Regardless, due to protests and public discomfort, some people have taken several measures, namely: 1) building and sanding in special

locations, albeit not far from residential areas. One such special and 'somewhat' enclosed place is in Kampung Baru. Although this boat building and sanding site is not far from residential areas, it is considered safer because it is sheltered from the wind by the village, and even if dust flies, there are only bushes behind it and no houses. 2) Building and sanding boats in special places far from residential areas. A place for making and smoothing fiberglass boats is also located in Ujung Selatan Toroh Selatan, which is close to traditional houses but quite far, about 150 metres, from residential areas. The people who make and smooth boats in this place are not only from Toroh Selatan but also from other hamlets; 3) smoothing on the beach but minimising the spread of dust by covering it with tarpaulin. The people who smooth/polish/grind on the beach are mainly those from Kampung Koko, Kampung Muhajirin, and some from Kampung Baru. If the wind is coming from the west, they will make a kind of canopy to prevent dust from disturbing the surrounding community. However, if only a small part of the boat is being grinded, it can usually be done in a public place (B, 21-11-2024).

Figure 4. Fiberglass Sampan Sanding/Grinding Site at South Toroh Tip



Source: Personal Document, Lalu Murdi, 2024

Secondly, although only a small number of fishermen have adapted and begun to find ways to improve and develop parts of their fiberglass boats to make them more comfortable, this is still a form of innovation that can serve as a reference for other fishermen, most of whom do not yet understand the innovations that need to be made. There are two things that are done to make fiberglass boats more comfortable, namely: 1) changing the shape of the bottom (the part that comes into direct contact with the water) to make it more oval/pointed so that it does not clash too much with the waves. So far, the base of fiberglass boats has been made flatter (locally known as

depak); 2) the thickness of fiberglass boats also greatly affects user comfort; boats made of thicker materials are usually more comfortable because they do not vibrate as much, even in large waves. However, it is acknowledged that so far, they cannot match the comfort of wooden boats.

Udin, one of the fishermen who is quite innovative in this regard, recounts the following:

"The vibration level of a fibre boat also depends on its bottom shape and thickness, so if a fibre boat is well-made, it will still be comfortable even though it is not as comfortable as a wooden boat. If the bottom of the fibre boat is made slightly flat (depak), the wave vibrations are usually stronger because they are in opposition, but if it is made slightly pointed/oval, the vibrations are not too noticeable. Another advantage is that fibre boats are more resistant to capsizing, as they can withstand strong winds" (U, 21-05-2025).

The above information is in line with several recent studies on the minimum thickness of fiberglass boats for greater comfort, which requires a thickness of six to eight layers, and layers that are less than the standard cause fiberglass boats to be less comfortable to use (Imam, 2022).

Third, innovations to make fiberglass boats more buoyant in the event of an accident at sea, such as capsizing or leaking. The experience of Udin, a fisherman in Tanjung Luar, can serve as an example of such innovation.

"In Toroh Tengah and even in Toroh Selatan, my boat is the largest and it is made of fibre. About a week ago, I had an accident in Labangka (Sumbawa) and my boat capsized. However, even though it uses a heavy diesel engine, it was able to survive because, in addition to having a good tube, I also use cork as a precaution in case the boat tube breaks. The proof is that my boat was able to return here, but because many people here do not understand this, many people and their boats did not return, so they must also use cork" (U, 21-05-2025).

Strong winds since May, which according to the community will continue until August at their peak, have caused many fishermen to be reluctant to sail to distant locations. Based on observations from September 2024 to around April 2025, when evening arrives, fishermen usually set sail before sunset (around 6 p.m.) or at the latest after Isha (around 7 p.m.), but for the past two months they have had to wait for the wind to subside, so many of them have simply been sitting on the beach. If any fishermen dare to go out, they must at least be mentally prepared and have boats that can withstand the rough waves at sea.

This adaptation process among fishermen is in line with the concept of cultural adaptation in

Douglas & Wildavsky's Grid-Group Theory (1982) which in the context of the Tanjung Luar community has so far remained an individual or personal innovation. On the other hand, the community is also sometimes able to simplify the complexity of the risks involved, depending on the 'cultural lens' used.

CONCLUSION

The use of fiberglass boats by the fishing community in Tanjung Luar Village can be seen as a risk of modernisation, which, despite its positive impacts, also carries risks that must be studied over a long period of time. This study found several risks, namely: 1) sanding/grinding carried out by some people on the beach or in open areas poses a risk of several diseases, such as itching and shortness of breath; 2) according to most people, compared to wooden boats, fiberglass boats are less comfortable and even tend to have a negative effect on heart health due to the intense vibrations caused by large waves; 3) fiberglass boats also offer less safety for their users in the event of an accident at sea, because if the hull breaks, the boat will sink to the bottom of the sea within minutes, leaving the owner with nowhere to survive, unlike wooden boats, which can survive for days. However, the fishing community also understands this and weighs the risks based on collective needs, so that technological modernisation using fibreglass continues.

In addition to simplifying the existing risks due to greater needs, some have made innovations, and this is mostly done individually or privately. Several fishermen have made innovations such as making and smoothing the fibre in special places or places far from residential areas, innovating the basic shape of the boat to improve comfort, and strengthening the boat's tubes to increase durability in the event of an accident at sea.

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