

CHALLENGES TO SUSTAINABLE SMALL-SCALE FISHERY IN PANGKOR ISLAND: A PERSPECTIVE FROM COASTAL FISHERMEN

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Abstract: *This study focuses on the challenges faced by small-scale coastal fishermen in Pangkor island. Pangkor island is known among locals for its duty-free goods, coastal activities, fresh sea produce and fisheries products. The seafront is mostly lined with fishing jetties, bustling to supply fish for both local and international markets. Over the years, this fishing community felt the declining of fish resources due to various reasons. The purpose of this study is to explore the factors that contribute to the decline of fishes in the area and challenges faced by small-scale coastal fishermen from the perspective of both commercial and small-scale fishermen. Through in-depth interviews with 15 coastal fishermen, this study found that overfishing is the largest threat to the sustainability of small-scale fishery industry in Pangkor. Other reasons include coastal development, reclamation activities, water pollution, preference to foreign workers, lack of capital, high maintenance expenses, culture and lifestyle changes, climate change and being side-lined by the government. In response, this paper proposes solutions based on fishermen's perspective that could be considered for better small-scale fisheries governance and future sustainability of Pangkor's fishery industry.*

Keywords: *Small-Scale Fishery, Food Security, Ecotourism*

Introduction

Small-scale fisheries, also known as artisanal fisheries, depicts imperative role in many coastal communities around the world. This small industry is responsible for almost 90 percent of global fisheries employment, generating 37 million tons of aquatic food annually or about 40 percent of the world's catch (FAO, Duke University & WorldFish, 2023). They are crucial for ensuring food security and source of nutrition, eradicating poverty, promoting equitable development, and utilizing natural resources sustainably for local, national, and worldwide markets (Munguía-Vega et al., 2015). Fishing communities especially artisanal fishing communities are commonly characterized by low levels of education, overcrowded and substandard living conditions, with limited access to services such as schools, healthcare, and amenities such as roads or markets (Solaymani & Kari, 2014). They are also often associated with poverty, exploitation, marginalization, exclusion, discrimination and living in impoverished conditions (Nayak, Oliveira, & Berkes, 2014). Despite their function as a safety net in many low-income countries, small-scale fisheries are vulnerable to inequality and exploitation by larger fishing interests (FAO, Duke University & WorldFish, 2023). They are frequently overlooked and underestimated by governments and policy makers. On top of these, they face declining of fish resources that could jeopardise their income. Department of Fisheries Malaysia (DOF) revealed that the country had lost 96 percent of its demersal fish stock in less than 60 years due to overfishing (Bernama, 2021). Malaysian waters are also hit by the ocean warming, depleting fish stock, displacement of certain species leading to smaller fish sizes (Khoo, 2023). It is further reported that illegal, unreported and unregulated (IUU) fishing in Malaysian waters led to losses of RM2.1 billion between 2020 and 2021.

One of the small islands in western coast of Peninsular Malaysia famous among tourists with fishing industry is the Pangkor island. The island is known for its fresh sea produce and premier dried sea products such as fish satay, honey roasted cuttlefish, dried shrimps and anchovies (Noor & Zulkepli, 2018). Anchovies (Teleostei: Engraulidae), also known as ikan bilis in Malaysia, ranging from 2 to 40 centimetres, serve as one of the famous tourism products of Pangkor and highly valued in Malaysian food industry. They are described as a small green fish with blue reflective skin and silver horizontal stripe along its fin. Anchovies usually live and move around in large schools and plays important ecological role in tropical coastal ecosystems (Lavoué et al., 2022). The anchovies consist of a high-level of macronutrients and micronutrients, for instance, protein, carbohydrate, fat, and amino acids (Kari et al., 2022). According to Malaysian Department of Fisheries statistics, the number of anchovy landings in Perak has decreased from 100,068 metric tonnes in 2020 to 945 metric tonnes in 2021 (Department of Fisheries Malaysia, 2020, 2021). Sahabat Alam Malaysia and Consumer Association Penang also expressed their concern over the depleting fish resources due to use of spotlight by purse seine fishermen in Pangkor island. If this situation is left unchecked, it could directly affect the income and livelihood of small-scale fishermen on the island. A few studies have explored on the adaptation to climate change impacts (Abu Samah et al., 2019) and livelihood of coastal fishermen (Ho, 2019) in Pangkor, but lacking scrutiny on the obstacles faced by small-scale fishermen on the island. Therefore, this study examines challenges faced by small-scale fishermen (SSF) on Pangkor island and proposes solutions based on based perspective of both commercial and small-scale fishermen.

Literature Review

Fish is an integral part of human diet, a healthy source of protein and provides balanced nutrients for majority of the global population (Tacon & Metian, 2018). Consumption of fish are known to offer valuable source of essential amino acids, polyunsaturated fatty acids,

minerals and other trace elements serving important role for healthy human growth and physiological functions (Lise et al., 2021). According to Pauly (2019), nutrient composition of locally caught fish, if retained for local consumption, may help in fighting against diseases caused by nutrient deficiencies and could boost public health. Consuming fish is a basic diet for some, while it is a cultural practice for others. Consuming fish is regarded to be closely intertwined with traditional theological and cosmological ideas about the status of humanity within particular environment and ecosystems (EPA & TERA, 1999). To consume fish, it is rather important to know how to catch it first. Catching fish is generally a learned activity, knowledge and experience passed down from generations (Muis et al., 2020). Traditionally, is one of the main components in “local food systems,” and majorly contributes to local consumption (Arthur et al., 2022).

There is a great array of small-scale fisheries definitions available and they vary between countries (Smith & Basurto, 2019). According to the United Nation’s Food and Agriculture Organization (FAO, 2015), small-scale fisheries or artisanal fisheries can be described as “traditional fisheries involving fishing households as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, and mainly for local consumption. Artisanal fisheries can be subsistence or commercial fisheries, providing for local consumption or export.” In Malaysia, the Department of Fisheries has defined small-scale fishermen (SSF) as “fishermen who use traditional tools such as drift nets, traps and others. Fishermen in this category A are allowed to operate from 1 nautical mile - 5 nautical miles and upwards. The department does not limit the operation of the sampan and vessels with less than 40 Gross Registered Tonnage (GRT) maximum load value, laden with traditional equipment as they are more resource friendly. However, they are only allowed to operate in state waters where their vessels are licensed (licence A).” SSF will go out to sea in the early morning and return with their catch in the evening. They usually travel alone or in pairs. As they still rely on traditional technology, their catch is lower compared to other types of fishermen working in other zones.

As the global seafood consumption has increased dramatically over the last three decades and is likely to continue to expand, it is critical to fish sustainably while ensuring equitable growth for SSF. It is usually highlighted that SSF is vulnerable to poverty and is imprisoned in poverty owing to poor income and low education (Awi et al., 2023). In relation to this, it is imperial to address the challenges met by SSF with the United Nations Sustainable Development Goals (SDGs) founded in 2015. There are 17 Goals in SDGs set to address the concurrent global concerns and acting as a universal call in balancing social, economic and environmental growth (UNDP, 2024). Usually, SSF is commonly associated with SDG 14- the goal on life below water (Said and Chuenpagdee, 2019; WorldFish, 2020). However, actually, SSF spans across the numerous realms of Sustainable Development Goals (SDGs). SSF, as according to Viridin et al. (2023) and Mills et al. (2023), covers SDG 1(No poverty), SDG 2 (Zero Hunger), SDG 5 (Gender equality), SDG 8 (Decent work and economic growth), SDG 10 (Reduced inequality), SDG 14 (Life below water) and SDG 17 (Partnerships). Henceforth, specific attention on the challenges faced by SSF is noteworthy in ensuring sustainability of millions lives that depend on it.

Methodology

This study was conducted in Pangkor Island to examine the challenges faced by the local small-scale fishermen (SSF). Qualitative method was applied in this study using semi-structured in-depth interviews. The study managed to interview 10 Malay artisanal fishermen and five

Chinese commercial fishermen, all male with age ranging from 28 to 69 years old. Most of them live in the fishing villages of Teluk Dalam, Sungai Pinang Kecil, Sungai Pinang Besar, and Teluk Gedung. According to Ho (2019), most fishermen in Pangkor live adjacent to sea to allow them to anchor their fishing vessels at the back of their houses. Pangkor island is a small island, 300 times smaller than Bali island, Indonesia. With land area just approximately 18 square kilometres (Md Arof et al., 2019), Pangkor is a duty-free island receiving more than 1 million tourist arrivals annually (Manjung Municipal Council, 2022). Purposive sampling was applied to determine only fishermen with minimum of five years' experience are chosen to be interviewed. Snowball sampling was also applied to get to get to "hard-to-reach" (Etikan et al., 2015) respondents. These two sampling techniques were used as most of the fishermen were busy and some were slightly shy or even hesitate to be interviewed. With recommendation from their friends or family members from the same industry, they are persuaded and more willing to be interviewed and spend their precious time with researchers.

Before conducting interviews, respondents were informed about the research and permission were asked to record the interview sessions using voice recorder. The interview took approximately twenty to thirty minutes for each respondent either in Bahasa Malaysia, Mandarin or Hokkien language. All data collected were translated into English with the help of language expert to ensure accuracy. A few respondents were invited to read the transcripts, ensuring interpretations of data are consistent and transparent (Hayashi Junior et al., 2019). According to George and Apter (2004), researchers must constantly compare the data they have collected from the original sources, either by themselves or with other researchers, to ensure that they are accurate in terms of form and context (Paton, 1999). Thematic analysis was applied to analyse interview transcripts. Thematic analysis is defined as an independent qualitative descriptive approach whereby a theme can be generated after the interview data is interpreted (Braun & Clarke, 2006).

Findings

A. Challenges to Small-Scale Fishermen (SSF)

Pangkor island is a small island, located in the state of Perak, off-shore of Lumut. This island is well-known for its fisheries produce and one of the main fishery suppliers in Malaysia. However, over the years, the fishermen noticed their catch is slowly decreasing in volume and for some fish species, their size is getting smaller. Similar situation is also observed on the famous local produce in Pangkor Island which is the widely known blue-eyed anchovies. Half of the respondents revealed that the number of blue-eyed anchovies is plummeting and rarely caught in bulk if fished near the island. A respondent lamented:

"...When you first arrived on Pangkor Island, you would see blue-eyed anchovy signboard advertising this fish as our key product. We used to just throw nets near these areas (pointing out to the sea). But now, we could hardly find them swimming near the beach and we need to go further away from the island to catch them..."

The declining of fish caught around Pangkor waters will affect national food security as Pangkor has long been supplying fish to most western states of Malaysia. Fish is one of the cheaper sources of protein unfortunately, the lower supply has caused fish prices to hike.

"...declining of fisheries products will in future affect national food security. Fish is essential to everyone, not matter what races you are, we like to eat fish. It is

essential for everyone. You see nowadays the fish price is very expensive due to declining of fish out there in our ocean."

Overharvesting of fish resources

All of the SSF respondents including one commercial respondent believed that over-harvesting fish resources around Pangkor area is the main reason of fish depletion. They commented that big boats equipped with sonar and high-tech equipment incline to chase schools of fish especially anchovies out to the open sea. Most of these big boats, or commercial boats, do not come back to jetty until their internal storage is filled up with fish up to the brim. These boats which usually cost more than few hundred thousand comes well-equipped with freezer compartments and onboard kitchen. Lack of strict enforcement of relevant regulations on fishing operations, the minimum legal permitted size for harvesting, and catch quota, create loopholes for the commercial boats to make big profit. One of the SSF respondents shared:

".. big boats have big money... Compared to us, they can reap all the advantage by chasing fish with high-tech equipment. They can know where the fishes are. No quota enforced by the government, they can take it all... Who is on the losing side? We with small boats..."

Another SSF respondent complaint:

"...We cannot compete with big boats. They get big revenue, they can go further away to the sea... We can see that the number of fish depleting because they do not leave anything behind. We cannot venture far as our boats are small, we cannot detect fish and we do not have the same capacity like big boats..."

Development and land reclamation projects

Respondents pointed out that development projects such as land reclamation, ports and mining activities were among the major issues leading to outmigration of fishes from Pangkor waters. Majority of SSF respondents also experienced foul odour emanating from murky waters during reclamation process and low-quality fishes. One artisanal fisherman revealed that his friends' houses have been demolished to make way for the project. On top of that, they were not permitted to conduct fishing activities along the reclaimed area, forcing them to travel further away from their used fishing grounds. This has undeniably imposed higher cost to their normal fishing activities. Sadly, a few respondents claimed that their plight seemed to fall on deaf ears. They were also unable to produce any strong supporting data to back up their claims.

"...When the project was on, the surrounding area smells terrible because I think they pumped or dig the water and mud out from the area. The water was very murky and the color also changed... We use to fish there... But now, no more fishing in the same area and no more shells to collect. The muddy area was then a good breeding ground for shells and we can get good amount of shells (*siput*) to sell for local consumption and side income for us..."

Another respondent added:

"We do not have any actual data to prove that the reclamation project affected the fisheries industry... Of course, we experienced it but we do not have any real data to prove that this new island affects our life as fishermen"

However, a few respondents reassured that the number of fishes has steadily increased after two years of the project completion. Furthermore, they believed that ports also contributed to outmigration of fish. They observed that fish stayed and caught near the port tend to be less fresh compared to those caught further away. They even decompose faster than normal rate. The respondents even revealed that some fish caught were found to be sick, discoloured or having flaccid flesh.

“...There is less fish production, and the supply for it has taken a long time to recover. But after recovering, everything was not like before...”

On the other hand, most of the commercial fishermen mentioned they were not affected with the development projects. Nevertheless, they expressed their concern and hope for the government to not overdevelop Pangkor island for tourism industry development as this will destroy the identity and heritage of the local fishing communities. They further revealed that fishing communities are the main selling point for Pangkor Island to lure in tourists. At the same time, tourists may gain knowledge when visiting dried seafood processing factories in Pangkor Island.

Water pollution

Water pollution from tourism activities and inland development harm fish populations in various ways. Spilled fuels, floating rubbish and siltation may deplete oxygen levels in the water and cause fish to out-migrate. According one respondent, beach coastline is prone to sea water pollution caused by ferry and marine debris (human-created waste). One can see many empty bottles, plastics and other litters along the beach during low-tide. He further added:

".... Normally the rubbish will follow the current. But sure, have rubbish, just in deep sea area, you won't see much of the rubbish, the rubbish only much seen at the sea water that near to coast area. You can see, now is high tide period, when comes to low tides, you will see a lot of rubbish."

Culture and lifestyle of artisanal fishermen

After the recent Covid-19 Movement Control Order (MCO), many artisanal fishermen switched jobs to become e-hailing driver as the income was more stable, does not require high educational qualification and was considered an easier job compared to fishing. Catching fish is unpredictable and depends heavily on the weather. During rainy days, fishermen are unable to go out to the sea. A few of SSF respondents strongly agreed that if they were better educated, they would have left their job and searched for a more stable job. For them, being a fisherman is hard life and not sustainable. They would rather encourage their kids and future generation to find other jobs.

There are two different types of fishermen in the Pangkor fishery industry; traditional fishermen (SSF) and commercial fishermen. According to one commercial respondent, SSF only requires one to two person and usually the boat owner joins the fish hunt. However, for commercial fishermen, the boat owners allow their workers (*'awak-awak'*) to catch fishes using their boats. All respondents agreed that most of the commercial fishing boats in Pangkor are owned by Chinese fishermen, while Malays fishermen are usually involved in artisanal fishing. One commercial fisherman revealed that a few Malay fishermen used to own more than 100 fishing boats. But now the number has reduced to only two boats. He believed that work performance

and efficiency are vital to survive in this industry. Hence, all the commercial fishermen employ foreign workers as they are more competent and hard-working, if compared to Malays.

"... The fishing boat has 10 buckets for fish, and the Thai foreign workers threw 4 nets to fill the four buckets. They will continue to fill all 10 buckets before coming back. Malays workers could only fill three buckets and already came back. I have hired Malay workers to fish with my boat twice, and both times I lose money. We catch at least 30kg every time we go fishing..."

Preference for Foreign Workers

Four commercial respondents revealed that they chose to hire foreign workers instead of locals. Two commercial respondents revealed that families of the local workers were staying on Pangkor Island. Working long hours at sea is not preferable for local workers with families as there were family commitments to be fulfilled. Conversely, foreign workers would have no qualms staying on the boat for the whole day and will return to their hometown only if there is an emergency. Another commercial respondent claimed foreign workers from Thailand, Cambodia, and Myanmar helped their business operations to run smoothly and are able to handle pressure better compared to local workers. Usually, foreign workers from Thailand will lead foreign workers from Cambodia and Myanmar during the fishing operation.

"They are more hardworking. They are able to burn midnight oil to work. After coming back from fishing, they have to work until everything is done (sorting, packing for distribution), then only will they be able to rest. Later, they will go out to the sea again to catch fish at one or two o'clock in the morning."

On the other hand, two SSF respondents revealed:

"We cannot compete with foreign workers as they do not have families here and they come here solely just to work and get money. They can live in the most basic living conditions and do not need to pray or perform any other duties here. They also can work long hours and are cheaply compensated."

"...If we join commercial fishing, we have no time for family and we are cheaply paid. It is not worth it. I prefer to fish alone. This also give me pleasure to fish and be connected to the sea..."

High expenses

All respondents agreed that fishing cost is high due many reasons. Among them is the high cost of buying petrol. Due to pollution, reclamation and development, artisanal fishermen are now forced to move their fishing spot further away from coastal lines. This has inevitably increased cost as they need more money to buy fuel for the extended journey. Apart from that, they have to bear the fuel and engine maintenance costs even though revenue from fishing is getting lesser.

"There are days when we feel like it is not worth going to sea to fish. The cost of petrol is high and yet we could not get many fish to cover the cost. I feel very sad and this is such a big burden for us..."

Lack of capital

In order to increase catch and profit, SSF respondents believed that they need to adopt high technologies on their boats such as powerful engine and sonar. Apart from that, they also mentioned securing a bigger fishing vessel would be an added advantage and increase their

income. However, they do not have enough money to purchase a bigger boat. Applying for financial loans from bank are also almost impossible as they do not have stable monthly income.

"... we have small boat... Not able to travel further... If we want to purchase big boat, we have no capital. The maintenance for big boats is also expensive..."

Climate Change

A few respondents revealed that the climate changes are real. It is getting harder for them to predict weather as they used to. Fishermen are known to use natural elements such as waves, wind and sky to predict weather when they are at sea. They try to escape being at sea during bad weather as it is dangerous to be out in the sea at these times and catching fish is hardly possible.

"...Nowadays, I could not predict weather. I used to dip my hand and feel. Now, I could not even feel the changing weather. Suddenly, it starts raining. Caught in thunder storm is dangerous.... It will affect fish landing..."

Lack of concern from the government

Three respondents stated that one of the challenges that fishermen face is a lack of concern from government sectors regarding the fishing industry and especially SSF. Access to aids and financial assistance is insufficient with the rising cost of living. Two respondents revealed that there is lack of cooperation among governmental agencies.

"I received financial aid and subsidies from the government. However, it is insufficient as the cost living is rising fast..."

"...We are often neglected when not much governmental policies focused on helping us..."

B. Solutions

Tourism is usually regarded as panacea to reduce poverty among fishermen. According to commercial respondents, SSF should involve themselves with tourism activities. They believed that tourism activities such as fishing trips and sightseeing using fishing boat could improve quality of life and promote the culture and heritage of fishing communities among tourists. Another commercial respondent also suggested investing in other businesses, such as homestay services for tourists, rather than just solely relying on the fishing industry. Three SSF respondents also revealed that they offer fishing trips to tourists and most of their weekends are occupied doing this form of side income. They are convinced that tourism can supplement their income and helped improve their living standards.

"I believe fishermen can bring tourists for sightseeing and fishing trips. It can promote the preservation of fishing communities' culture and heritage, and improve people's quality of life."

"... A fishing trip can also be done here; the boatman can actually bring the anglers out for fishing or tourists to experience fishing activities...."

In addition, one SSF respondent has suggested that SSF needs to be more creative in order to earn alternative income. They need to venture out, adapt and learn new skills. Most of them did not receive proper secondary education or stopped schooling after form three. Their low education level hinders them to pursue new knowledge and this has left artisanal fishermen doubting their ability to succeed.

"If fishermen want to earn alternative income, they have to be creative. They have to ask themselves, what other job can they do instead of catching fish."

One SSF also revealed that the water surrounding most of Pangkor's bay are suitable for oyster breeding. This could create an alternative income for artisanal fishermen with lucrative returns. It could be one of the alternative incomes for fishermen to venture into aquaculture industry. Another commercial fisherman suggested that all types of fishermen in Pangkor including artisanal fishermen should cooperate with environmental agencies and non-governmental agencies (NGOs) in order to conserve and preserve the natural ecosystems in Pangkor.

Discussions

Overfishing, according to Department of Fisheries Malaysia in 2019, has unprecedentedly diminished 96 percent of Malaysian demersal fish in less than 60 years (Selan, 2021). Selan (2021) further reported that Malaysian fishermen catch nearly one million metric tonnes of seafood each year, with approximately 40,000 metric tonnes kept as frozen reserves, and it is predicted that if overfishing continues, none of the species currently fished for food will survive by the year 2048. Overfishing will deplete the fish supply and responsible harvest is a must to ensure continuity to enjoy fish resources. This particularly concerns with SDG 12 Responsible consumption and production. According to Reilly et al. (2015), coastal development is perceived as a navigational hazard. Fishermen would be displaced if heavily fished grounds were reduced leading to lower catches in fisheries. At the same time, Asha et al. (2014) and Tung et al. (2021) acknowledged that the decline of the fishery product due to the land reclamation eventually affect the traditional fishers' livelihood support. For instance, the reclamation project at Teluk Muroh had affected daily harvest and earning of 117 fishermen due to the declining of the fish, crab and seashells (Mat Arif, 2017). Reclamation activities cause increased turbidity in the seawater (Spearman et al., 2020). This will directly destroy the coral reefs and fish organism due to the reduce of light intensity that cause by the turbidity in the seawater (Bejarano & Appeldoorn, 2013). In this particular case, development and reclamation projects around Pangkor mainly deals with industry and very much related to SDG 9 Innovation, industry and infrastructure. Water pollution is highly associated with SDG 14 Life below water. It is reported that the ferry services caused water pollution (Nguyen et al., 2021) and decreased fishery productivity (Panigrahi & Pattnaik, 2020). Not only that, the noise produced by these motorised vehicles has the potential to destroy coral reefs and fisheries in the surrounding waters (Selamat et al., 2016). Consequently, the destruction of coral reefs would cause the fisheries' resources to decrease and directly impacting fishermen's livelihood (Owusu, 2019). The findings from the interview also indicated that marine debris can be seen in the seawater around Pangkor Island. Research found that marine debris can be transported to the seas via wind, river discharge, or direct dumping (Consoli et al., 2019). The floating trash can flow horizontally for a long distance before it becomes heavier due to fouling and sinks to the sea floor, where a significant amount of the world's marine garbage eventually accumulates (Consoli et al., 2018).

Almost 70 percent of the Malaysia's fishermen are of the older generation and lacks youth participation (Amir et al., 2021). Fishery sector has long been stigmatised as poor, dirty, difficult and dangerous and this job is shunned by younger generation (Anna et. Al, 2019). Younger generation nowadays prefer jobs that can offer financial security and the changing culture has hinder their involvement. In relative to competition and preference over foreign workers, Malays are more family-oriented and likely to have shorter-term thinking (Zawawi, 2008). Malays in particular have a greater sense of control over their lives through recreational

and leisure activities (Wahab et al., 2015). They also tend to spend value time with family and friends as an effective way to get fresh ideas (Yeoh & Yeoh, 2015). Hence, they tend to prefer work-life balance by achieving short-term goals and earning the amount of money that can support their livelihood. Unlike Malaysian Chinese, they have values of hard work and economical thrift, and they are usually long-term oriented people compared to other races (Idris, 2011; Lim, 2001; Yeoh & Yeoh, 2015). Malaysian Chinese are likely to focus on building business networks and working hard (Yeoh & Yeoh, 2015). Thus, there is a stark difference of fishing boat sizes in Pangkor Island between Malay and Chinese fishermen. Consequently, the fishery operator was forced to hire foreigners to ensure the smooth running of the fishing operation. The fact is confirmed by Wong and Yong (2020), who revealed that local fishing operators hired approximately 80% of the foreign workers, who tend to exert greater fishing effort than local fishers due to an appealing profit-sharing scheme in Malaysia. However, it is difficult for the employers to hire foreign workers as the procedures required by the Immigration Department of Malaysia for employing foreign workers are too complicated (Norhana & Noreha 2019). Despite the complexity of the procedure, the fishing operator is still willing to hire them as employees due to the low wages paid to foreign workers (Marhani et al., 2012), their willingness to work "tough jobs," and their willingness to work long hours (Jun, 2020).

SSF usually have a small amount in the form of equity and financial capital comes from their family with a relatively small value (Tan et al., 2023). The buying power for these intermediate traders is quite low. Fishermen's lack of capital is due to the imbalance in the market and middlemen weakened the fishing marketing network (Cahaya, 2015). This situation caused SSF to generate less income, fail to maintain and upgrade their fishing vessels and gears, to expand their fishing area. New fishing boat technology, which has higher speed and can reach the fishing grounds faster and return to port in a timely manner, ensuring freshness sea harvest for customers (Emdad Haque et al., 2015; Zainol et al., 2019). Income inequality is a specific household economic problem that has recently been identified as a problem in fishing communities (Kim and Choi, 2020). Preference for foreign workers, high expenses and lack of capital mainly concerns with SGD8 Decent work and economic growth. Even though fishermen received fuel subsidies from the government, their income was influenced by their fishing abilities, marketing strategies, types of boats used, and fishing equipment (Mgt Husain et al., 2020). Some traditional fishermen even downsized their fishing operations by replacing their mid-sized, diesel-powered otter trawlers with smaller boats due to the high operating costs of boats and an inability to finance repairs through credit or savings. The recent news in Malaysia reported that the maintenance fees for traditional and commercial boats cost more than RM 10,000 to RM 70,000, depending on the level of damage (Bernama, 2019). Based on the findings, a summary of main themes with connections to SDGs are integrated and illustrated in Figure 1 below:

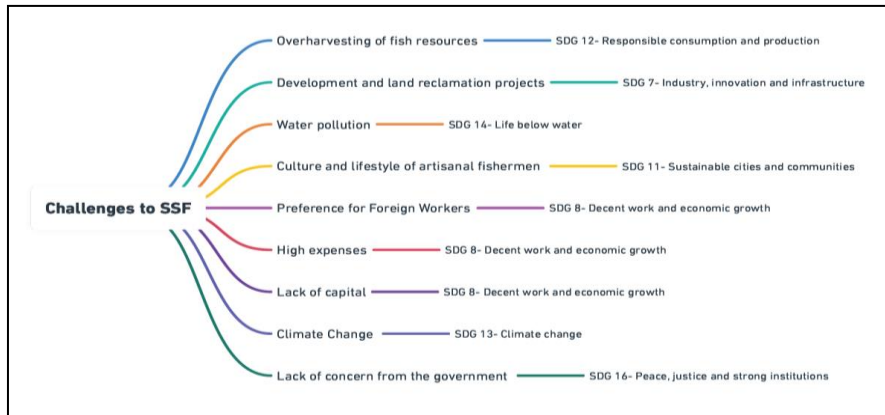


Figure 1: Challenges to SSF in connections to SDGs

Across the globe, fishermen are seen to harmonise with the coastal ecotourism sector by providing local boat services, selling local seafood products, and providing accommodation for tourists (Fabinyi, 2019; Stacey et al., 2021). It started with national objectives implemented in order to encourage fishermen involvement in tourism to strengthen the local economy (Noor et al., 2022). However, after their involvement in coastal ecotourism, most of the local fishermen began to display lack of interest to continue fishing as their main source of income (Nurul Islam et al., 2017). Since Pangkor received her duty-free island status in 2020, it has attracted much attention and tourism opportunities (Bernama, 2020). However, it is imperative that small-scale fisheries' culture to be preserved as it acts as an important coastal eco-tourism attraction. Its unique culture should be protected for future generation to appreciate and carry on.

Conclusions

SSF is one of the major stakeholders in the fishing industry that contribute to the economy of Malaysia. Addressing the challenges to this group should remain central in governmental policies and action plans especially in addressing food security, sustainable livelihoods and eradicating poverty among B40 group. The challenges found are related to declining of fisheries resources due to overfishing, land development and reclamation projects and water pollution. This study also uncovers the changing lifestyle and culture of artisanal fishermen after global pandemic towards stable income and easier jobs, preference of foreign workers as *awak-awak*, cheaper alternative of workforce, high expenses in fishing maintenance and lack of capital among SSF to improve their operation in yielding high catch. Climate change and lack of concern from government are among other themes emerged in this study. A few suggestions were acknowledged from the perspective of fishermen. The most significant suggestion was to build a strong relationship with tourism industry. Tourism industry may act like panacea to buffer and compliment the low income of fishermen. The cultural heritage of fishing communities and villages in Pangkor serve as a platform for tourism attraction, a pit-stop for tourists to learn and appreciate. Involving in tourism activities by providing accommodation and services are seen as viable ways to improve standard of living among target group. As Pangkor is unique in term both flora and fauna, on land and in the sea, conservation and preservation of natural resources deemed essential for the sustainability of the island and future generation of SSF. Future research should include government officials and policy makers as key informants, reinventing good governance of fishery resources and transforming SSF into sustainable profession. The sustainability of SSF industry on Pangkor Island will secure long term prosperity of the national economy and continuous supply of healthy protein, in parallel to attain the goals stated in the SDGs.

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