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The Endangered Malaysian Artisanal Fisherman: Battered by Climate Change and Covid-19

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Artisanal fishermen in the southwest of Johor working together to repair a faulty engine. Photo taken on 3 January 2020 by Serina Rahman, ISEAS – Yusof Ishak Institute.

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EXECUTIVE SUMMARY

- Malaysia's artisanal fishermen are beginning to suffer the impacts of climate change, which include more frequent extreme weather, changes in fish species availability and behaviour, and rising sea-levels.
- These climate change impacts come on top of harmful effects arising from coastal development, reclamation, transboundary pollution and run-off from land, which damage marine habitats that are breeding and feeding grounds for fish species.
- Covid-19 management measures further disrupted supply chains and market access for customers. Rural fishing communities were also infected as younger residents brought the virus home from surrounding factories and other work clusters. With rampant misinformation on vaccine efficacy, some lives were lost due to Covid-19 complications. Nevertheless, some innovations such as the launch of online sales platforms and civil society initiatives to redistribute unsold fish helped to mitigate their plight.
- More needs to be done to protect endangered artisanal fishermen and their intangible heritage as they are key to Malaysia's long-term marine environmental sustainability and food security.

INTRODUCTION

Malaysia's artisanal or small-scale fishermen are symbolic of the nation's long-standing fisheries heritage. With a total coastline of 4,675 km, nearshore fishing has been the backbone of its coastal communities throughout the ages, but is now a traditional natural resource-based livelihood that stands to be lost.

Any analysis of the fisheries sector, especially with regards to changes in fish landing volumes or environmental and other impacts must differentiate between the myriad types of fishermen. Conditions, complications and obstacles faced are varied and unique.

After a brief immersion into the world of artisanal fishers, this paper will examine the impact of both climate change and the recent Covid-19 pandemic on Malaysian artisanal fishermen, citing in particular, observations of a fishing community in southwest Johor.² A brief analysis of efforts to help these communities overcome these challenges concludes the discussion.

UNDERSTANDING MALAYSIA'S ARTISANAL FISHERS

In the past, artisanal fisherfolk (both men and women) would only need to row out in small wooden boats, with or without sails, to nearby fishing spots as there was little need to go very far out to get a substantial catch. Today, they use mostly fiberglass vessels of less than 22 feet (6.7 metres) with small outboard engines of less than 40 horsepower, and fish within five nautical miles from shore.³ They fall under the Fisheries Department's classification of inshore and nearshore fishermen who extract resources within Zone A. Their equipment includes fish traps, floating gill nets, cast nets, scoop nets, traditional long-lines (*rawai*) and the basic rod and line.

Depending on the tide, wind and weather, these fishermen spend a total of between five to nine hours at sea, including the time required to catch bait fish, often heading out late at night or just before the break of dawn. The rest of their day is spent onshore making and repairing nets, engines and boats. They do not stay out at sea for extended periods of time like the purse seiners and trawlers which fish further away.

It is often assumed that fishermen are the main cause of fish stock depletion, but artisanal fishers do little damage compared to large-scale fisheries which are known to use large weighted trawl nets of more than two kilometers in length that are dragged across the seabed, destroying everything in its path, and do not discern between target species and bycatch.⁴

The importance of small-scale fishermen in terms of coastal community food security and incomes is hugely underestimated (Teh, L.C.L. and Pauly, D., 2018). Seafood is the most consumed protein for Malaysian families; almost double that of Thailand and China (Teh, E. 2012). While the government tends to support and invest in large-scale commercial fisheries (Lim, T.G. and Valencia, M.J., 1990), small-scale fisheries actually make up 65

percent of all Malaysian fishermen (Shaffril et al., 2017). However, their combined impact is minimal compared to the extent of damage that can be incurred with a single trawl net.⁵

Climate change is already beginning to have a severe impact on these marginalised and vulnerable communities. In Malaysia, most artisanal fishermen fall under the bottom 40 percent (B40) economic percentile, suffering multi-dimensional poverty ranging from insufficient income to education, healthcare and human insecurity (Solaymani, S. and Kari, F. 2014; Zainudin, L.M. et al., 2019; Dzulkifly D., 2019). While they make up the majority of the sector, they often earn the least,⁶ given their high equipment maintenance costs (nets, boats, engines), low fish landing prices paid by middlemen, and debts owed to those same middlemen.⁷

While already beginning to suffer the impacts of climate change, coupled with natural habitat damage from coastal development, fisheries communities then had to suffer the consequences of the recent Covid-19 pandemic. Distribution channels were scuttled during myriad movement lockdowns, buyers could not reach seafood markets and the economy as a whole was debilitated. This is in addition to the onslaught of the virus itself, which managed to reach and infect rural fishing communities who initially disbelieved its severity and the necessity and safety of vaccines.

CLIMATE CHANGE IMPACTS ON MALAYSIAN FISHING COMMUNITIES

The link between climate change and induced sea-level rises on the whole of Malaysia has already been documented (Zubaidi, 2010; Md. Din et al., 2012), and also observed in the area of focus, Mukim Tanjung Kupang, between 2013 and 2022.⁸ This has multiple effects on fishing communities; not only on displacement as coastal erosion endangers homes and physical safety, but it also results in saltwater damage to subsistence crops which adds to food insecurity (Shaffril et al. 2017; IPCC, 2019). A 2015 National Coastal Erosion Study reported that 15 percent of Malaysia's shoreline is eroding, with one-third in critical condition.⁹

Poor fishing communities often live in homes with poor structural integrity, leaving them more vulnerable to strong winds and extreme weather. Warming sea surface temperatures increase the frequency of severe storms and typhoons; extreme wind speeds are already occurring (Razali, A.M. et al. 2010) and the number of days of extreme rainfall is more than the 90th percentile at a number of meteorological stations since the 1980s (Wan Azli, W.H. 2010).

Studies on the east coast of Peninsular Malaysia have recorded a 20 percent drop in catch over the monsoon season (Jafar-Sidik, M. et al. 2012), but west coast fishermen have noted that monsoon seasons and wind directions have changed noticeably over the past few decades.

Fishermen in Mukim Tanjung Kupang have reported more frequent and severe storms, and that while in the past, winds remained consistent and predictable over a day, but would now change over the span of a few hours. This adds severe risks to their work conditions. It also

reduces their ability to head out to sea as their small boats are unable to overcome high waves and heavy rainfall.¹⁰

The loss in fishing days directly affects fishermen's livelihoods through reduced fish landing incomes, which then affects their ability to provide food and cash for their families.¹¹ The extreme weather also negatively impacts those who depend on supplementary incomes through tourism and agriculture.

Marine habitats are also greatly affected by changes in temperature, severe storm surges and shifts in monsoonal patterns (Cheung, W. et al. 2016). More frequent rainstorms can lead to harmful algal blooms which affect fisheries species availability (van der Lingen et al. 2016), as well as spawning patterns and fish migration (Ottersen, G. et al. 2009). Studies have shown that myriad coastal locations across Malaysia have recorded significant increases in both daytime and night-time temperatures (Kwan, M.S. et al. 2011).

These studies are corroborated by reports from Mukim Tanjung Kupang, where unusually cool or unusually warm waters have adversely affected crab catch and created unseasonably high volumes of algal growth, which has hampered fishing efforts and destroyed nets.

Seasons for catching specific species have also changed, and it is no longer possible to predict the onset of prawn or squid catches as they no longer follow past patterns.¹² As mangrove coasts and even seagrass meadows erode under severe wave and storm impacts, fish species' habitats are lost, affecting their natural movements and presence within the seascape, as well as feeding, breeding and nursery grounds. There is now less fish to catch – even if they can be caught.

Unfortunately, climate change impacts do not occur in isolation. Many fishing communities are already suffering natural habitat damage as a result of coastal development, sand-mining, dredging and reclamation. Narrow channels such as the Johor Strait, suffer the consequences of development on both coasts, as well as transboundary pollution, including industrial, agricultural and waste run-off from land.¹³

As shorelines expand, seas become smaller. Artisanal fishermen struggle to get to sea as marine areas are carved out for private or industrial use. They either lose access completely or have to travel a long way around new islands, adding to petrol costs even as they have to navigate new, often unmarked, shallows and dumped construction waste.

Seagrass meadows are a key habitat in estuaries especially along the coasts that artisanal fisherfolk depend on; where, in tandem with coastal mangroves, fisheries species breed, feed, and mature to adulthood and reproductive stages. Coastal development that damages seagrass meadows stands to incur an ecosystem services value loss of at least USD\$57,531 per hectare per year.¹⁴ This is but a fraction of the overall costs that can result in rampant and unsustainable development in fisheries areas (Sahabat Alam Malaysia, 2020).

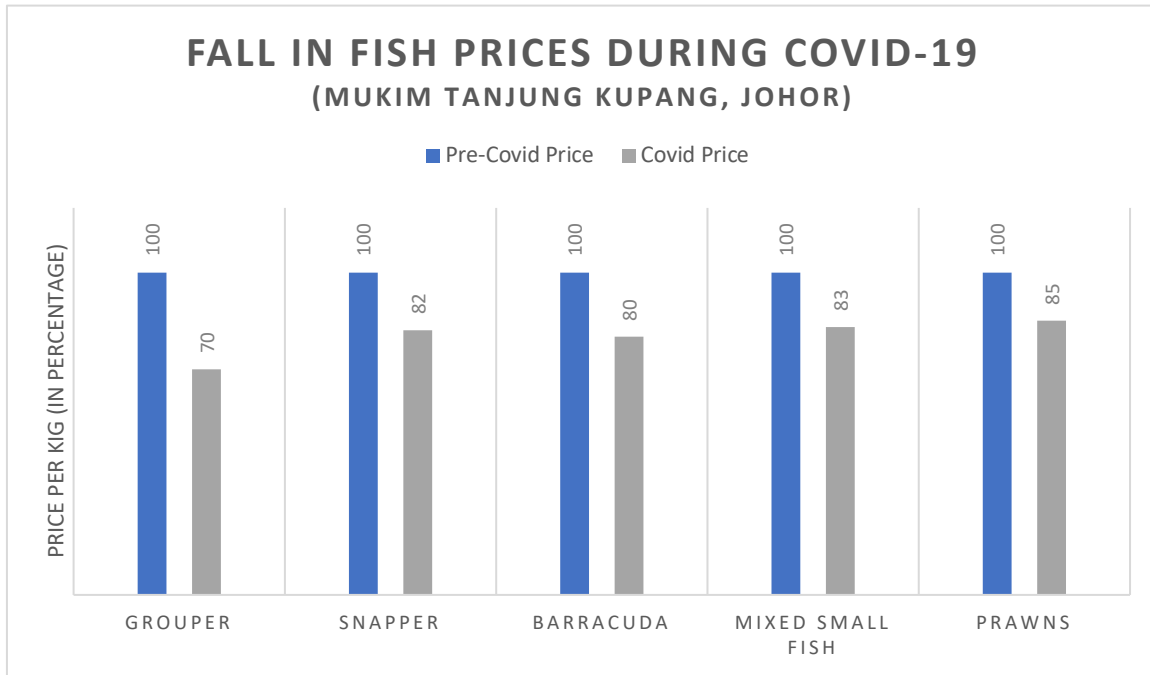
As marine habitat damage occurs all along the coastline, fishermen from other areas move to the remaining healthy areas to garner a catch, collectively adding pressure onto an already limited resource, further compounded by global decreases in fish stock. Climate change impacts are one of the very last straws that can break the traditional fishermen.

COVID-19 IMPACTS ON MALAYSIAN FISHING COMMUNITIES

In 2020, a new unexpected calamity arrived in the form of the Covid-19 pandemic. Fishermen's fortunes across the country floundered. With movement control restrictions (MCO) in place, supply chains were disrupted, and many jetty-based fish markets lost customers as people could not travel more than 10 km from their areas of residence. Larger central markets were forced to shut as workers became infected, especially as global studies suggested that the original source of the virus was a seafood market.

Border closures had a severe impact on fishermen in Johor and Selangor. In the early days of the border closures (March-May 2020), as export processes were being sorted out, much of the fish produce that was meant for export to Singapore were left stranded. This was in addition to oversupply due to domestic travel restrictions and Malaysians' inability to travel to fish markets.

On the east coast of Peninsular Malaysia, some fishermen were forced to dump their catch at sea, while others resorted to giving it away.¹⁵ While this was helpful for those in need, the fishermen themselves had little to no income. Fish that were sold suffered drastically lower prices given the oversupply. In Mukim Tanjung Kupang, seafood prices fell by at least 15 to 30 percent during this period, and initially much was left unsold.¹⁶



Note: This data is extracted from an ongoing study by the author in Mukim Tanjung Kupang, Malaysia. Fish prices (in Malaysian Ringgit) and landing volumes were collected between 2016 and 2022 at one jetty in this area and are representative of other markets in the vicinity. Pre-Covid prices refer to prices in January 2020, versus prices in May 2020 when the strictest movement restrictions were in place in Malaysia. The catch selected for representation are the main species caught in the nearshore waters at this location. Prices shown are those paid by the customer to the market. The market sampled (Pasar Pendekar Laut) is a fishermen’s collective that offers the best fish landing prices to the fishermen (between 80-90 % of sale price per kilogramme goes back directly to the fishermen), yet maintains standard market prices for its customers.

Between July and September 2021, just as exports to Singapore were returning to relatively acceptable levels, the Jurong Fisheries Port and several other smaller seafood markets were forced to close as a result of Covid infections.¹⁷ This meant that stocks from Selangor and the east coast of Peninsular Malaysia were stuck in Johor, resulting in excess supply. With restaurants and other F&B outlets in Johor used to a Singaporean clientele still closed, there was very little demand for seafood beyond those needed for local personal consumption.

In southwest Johor, a similar scenario occurred. The fisherfolk in Mukim Tanjung Kupang struggled for most of 2020, as their location is more than 22km from the nearest town and affected primarily by movement restriction orders. Pre-Covid, their market had buyers from Johor Bahru, Masai, Pontian, Kluang and Singapore, areas more than an hour’s drive or an immigration crossing away. Much of their catch was therefore unsold and the community suffered.¹⁸

INNOVATIONS TO OVERCOME COVID-INDUCED OBSTACLES

In light of these difficulties, the seafood market studied (Pasar Pendekar Laut) raised funds to support fishermen, then donated the seafood to those in need in Johor Bahru (JB). This was a timely collaboration between civil society groups as many Johor residents had lost jobs due to border closures.¹⁹ The JB homeless who were relocated to a camp in Gunung Pulai also received this seafood.²⁰ In this way, donors were able to provide some fishing income to the community, the seafood was not wasted and the poor got their necessary protein. The fishermen were also empowered by their ability to help others in more difficult situations than themselves.

Other innovations included applications that brought seafood and farmers' markets online, with many stepping forward to help rural community groups overcome technical hurdles, including inconsistent internet access, and the handling of orders and delivery.²¹

Fishing became a safety-net for villagers who lost jobs during the first MCO. In Mukim Tanjung Kupang, several residents headed out to sea to bring home food and any available cash income. However, this also added pressure to already limited resources.

Covid-19 was initially thought to only occur in town centres, and would not reach the rural fringes. During subsequent MCOs, many fringing rural communities were severely affected by the virus. This was primarily because younger residents worked in factories which were the main pandemic clusters at the time. They then infected others at home, including the elderly and unvaccinated. In early 2021, much of the vaccination focus was in Selangor and Sarawak. Vaccinations only began to roll out beyond the Klang Valley as case numbers rose in more rural states.

At its worst, Mukim Tanjung Kupang had more than 500 new infections daily. Several, including elderly fishermen, died of Covid-19 complications. While this encouraged some to get vaccinated, it has been hard for these communities to 'rest' post-vaccination, as is the recommended procedure. Work at sea or in farms cannot stop. Uncorroborated reports of post-vaccination complications and deaths have since dissuaded many from taking booster shots.

While civil society organisations were often the first to provide assistance to fishermen,²² official financial aid was available at both the state and federal levels. However, fishermen struggled to access these for lack of information and technological know-how (many of the application processes were done through online applications and websites), unsupportive village heads, and limited means to head into town centres to deal with administrative processes.²³

Most fishermen are not registered under the Employment Provident Fund (EPF), the Social Security Organisation (SOCSO) or the Inland Revenue Board (LHDN), the mechanisms through which much of the promised Covid-19 aid was distributed. This made it harder for them to access assistance. Long-term observations in Mukim Tanjung Kupang have shown that associations meant to represent the fishermen have not been transparent or fair in their assistance and distribution of promised aid.²⁴

THE WAY FORWARD

There are multiple difficulties facing the small-scale traditional fisherman.²⁵ In the case of those in Mukim Tanjung Kupang, the halt in coastal development during Covid-19 lockdowns proved that climate change impacts had hit home.²⁶ While past reductions in fish landings could be blamed on reclamation, dredging and other issues, none of this existed during the first year of the pandemic. Yet, catch volumes fell drastically. Increasingly frequent extreme weather phenomena and changes in fisheries species availability and behaviour were observed between March 2020 and March 2022.

Ongoing efforts by the authorities to help fishermen in light of global decreases in fish catch include the provision of fishing equipment and supplies to licensed fishermen, facilitating the learning of alternative skills and developing supplementary sources of income such as aquaculture and community farming. The aquaculture and community farming programmes were strengthened during the Covid-19 recovery period.²⁷

However, not all of these opportunities will work, especially for older fishermen. While aquaculture seems similar to fishing, it is a vastly different occupation, and requires capital. Most fishermen cannot do the required paperwork, nor have the financial credibility to garner grants or loans to start alternative businesses. While subsistence farming might be common, a lack of land titles complicates the possibility of shifting to larger-scale farming. Garnering access to markets for farmed produce is an arena completely alien to those who live, work and breathe by the sea.

Purported aid and suggested alternative livelihoods must be stratified to meet the needs and abilities of different types of fishermen. While some existing initiatives may be relevant and applicable to fishermen with more access to capital or to those at higher economic levels within the fisheries industry, they may not apply to small-scale low-income fishing communities.

The key to artisanal fishermen's success is access to and ownership of boats, engines and equipment; many fishermen are in severe debt. Capacity-building needs to revolve around more relevant sectors such as boat and engine repair and passenger boat captain training and licenses. The provision and maintenance of jetties and the protection of fishing grounds are necessary for fishermen's long-term health and well-being. It is also important to ensure fishermen's navigational safety, which is always compromised when coastal developments occur.

The biggest issue that artisanal fishermen face, however, is fishing licenses. These have traditionally been limited in order to ensure resource viability, but cronyism, at association and other levels, means that licenses are not held by those who actually head out to sea. A fishing license not only enables a fisherman to fish legally, but also gives him access to subsidised petrol and other financial assistance schemes. Many fishing licenses are currently held by individuals who hold positions of power but do not actually spend time at sea. Existing processes for the issue and renewal of licenses need to be revamped and made more transparent.

Ground-up initiatives such as those mentioned earlier are growing across Malaysia, and the Fisheries Department is actively promoting the Fisheries Community concept (*MyKomuniti*

Perikanan) to support fishermen directly through business development, diversification and access to market in addition to grants, training, licenses and other support. Initiatives that provide help directly to fishermen, and which can sidestep entities that try to redirect assistance and opportunities to cronies are vital for the survival of artisanal fishermen.

Grassroots sustainable fishing programmes, community-managed habitats and efforts to improve fish stock or release fry are also essential. Endangered species law enforcement and coastal development environmental impact monitoring must be done effectively. Fisherfolks' knowledge, climate change observations and input into assistance and training schemes must be taken into consideration when new policies or programmes are devised.

Malaysia's artisanal fishermen, as well as their craft, skills and knowledge, are an invaluable intangible heritage that stands to be lost if nothing is swiftly done to protect it. Fisherfolk are not 'lazy' because they cannot transition to other sectors or jobs. Theirs is work that requires a deep understanding of the sea, an ability to read the weather and an intuitive connection with marine resources. It is difficult work under the harshest of elements that puts their lives at risk, even as they ensure that millions get the seafood that they crave.

These communities are vital for Malaysia's long-term marine environmental sustainability and food security, and should be accorded the attention and assistance that they deserve and require.

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ENDNOTES

¹ This paper is the outcome of more than a decade's ethnographic observation of the Mukim Tanjung Kupang fishing community in southwest Johor, including the last two years under Covid-19 restrictions within the community. A number of other publications are in progress from this study, and not all data and relevant details can be included in this summary paper. Serina is hugely indebted to the Tanjung Kupang fishermen and community for their patience with her incessant questions and interminable presence in their world.

² For more information on this fishing community, refer to: Rahman, S. 2017. The Socio-Cultural Impacts of Forest City. Perspective 2017/42. ISEAS-Yusof Ishak Institute.

³ Artisanal fishermen usually fish within Zone A as determined by the Fisheries Department (Ministry of Agriculture) which includes nearshore and inshore (estuary and riverine) areas. Refer to: <http://www.seafdec.org/fisheries-country-profile-malaysia/>

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- ⁸ The change in king tide height was visible and documented through photographs over the past decade, corroborated by tide table records (of Tuas monitoring station) between 2013 and 2022 (as published by Maritime and Port Authority of Singapore).
- ⁹ Department of Irrigation and Drainage Malaysia. 2015. National Coastal Erosion Study (NCES). <http://nces.water.gov.my>
- ¹⁰ Ethnographic observation and reporting by local fishermen in Mukim Tanjung Kupang, especially over the last few years (2020-2022).
- ¹¹ The author’s extensive ethnographic observations in this community have revealed that the fishermen here embody the Malay saying “*kais pagi, makan pagi; kais petang, makan petang*” – scrape [income] in the morning, eat that morning; scrape income in the evening to eat that evening; their daily expenses rely entirely on what they are able to catch and earn on that day. Many are heavily in debt, hence climate change and any other threat to their natural habitats and subsequent fish catch severely affect their ability to meet their basic needs.
- ¹² Ethnographic observation and reporting by local fishermen in Mukim Tanjung Kupang, especially over the last few years (2020-2022).
- ¹³ Ethnographic observation over the past decade in Mukim Tanjung Kupang as the fishermen coped with changes in the Johor (Tebrau) Strait with the development of Forest City and the Tanjung Piai Maritime Industrial Park which have led to myriad increased difficulties for the local fishermen, as well as accidents and loss of life. Refer to: Rahman, S. 2017. The Socio-cultural impacts of Forest City. Perspective 2017/42. ISEAS – Yusof Ishak Institute. And Rahman, S. 2017. Johor’s Forest City faces critical challenges. Trends in Southeast Asia 2017/3. ISEAS – Yusof Ishak Institute, Singapore.
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- ²⁵ Refer to: Musa, Z. 3 March 2022. “Fishermen in south Johor beset by challenges at every corner,” The Star. <https://www.thestar.com.my/metro/metro-news/2022/03/03/fishermen-in-south-johor-beset-by-challenges-at-every-corner>.
- ²⁶ Refer to: Musa, Z. 3 March 2022. “Fishermen in choppy waters,” The Star. <https://www.thestar.com.my/metro/metro-news/2022/03/03/fishermen-in-choppy-waters>.
- ²⁷ Refer to: The Star, 15 July 2021. “Fishermen urged to take up aquaculture, fish farming.” <https://www.thestar.com.my/metro/metro-news/2021/07/15/fishermen-urged-to-take-up-aquaculture-fish-farming>. And The Star, 15 July 2021. “South Johor fishermen want state govt to develop agro-tourism products.” <https://www.thestar.com.my/metro/metro-news/2021/07/15/south-johor-fishermen-want-state-govt-to-develop-agro-tourism-products>. Note that with regards to the second article, the author’s interviews on the ground indicate that this request is put forward by the South Johor Fishing Association with little to no input from artisanal fishermen. Those interviewed were not entirely comfortable with switching their traditional income source to farming as it required completely different skill sets, land titles that many did not have and myriad other investments and financial capital that they did not have. These fishermen were also not able to apply for grants nor seek assistance due to difficulties dealing with the government bureaucracy; many are also illiterate.

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