

Status of Sarawak Fisheries: Challenges and Way Forward

Wen Chiat Lee¹, K. Kuperan Viswanathan², Thalany Kamri³ and Siew King Ting⁴

^{1,3 &4} Universiti Teknologi MARA, Cawangan Sarawak, MALAYSIA

²Universiti Utara Malaysia, Sintok, Kedah, MALAYSIA

¹wenchiat@uitm.edu.my; ²kuperan@uum.edu.my; ³tings036@uitm.edu.my;

⁴thalany@uitm.edu.my

Received: 10 September 2020

Accepted: 2 December 2020

Published: 31 December 2020

ABSTRACT

Fisheries are important to Sarawak's economy. Fisheries provide job opportunities and income to the people besides contributing to Sarawak's gross domestic product. Sarawak's fisheries can be divided into marine capture fisheries and aquaculture. In this paper, we discuss the status of Sarawak fisheries. Moreover, challenges of fisheries in Sarawak are also discussed. The major challenges are encroachment by illegal fishers and poor institutional organizations of fishers, and more recently, the impact of Covid-19 on Sarawak's fisheries. There are three suggestions for sustainable fisheries development in Sarawak. Firstly, the control of illegal and undocumented fishing; secondly, the transformation of fishermen associations into functioning cooperatives to improve welfare and livelihood of fishers; and thirdly, the development of aquaculture to augment fisheries production and increase the income of fishers and rural people.

Keywords: *Fisheries, Sustainable development, aquaculture, Fishermen Associations Sarawak, Covid-19*

INTRODUCTION

Sarawak is an important fishing state with a long coastline within the Federation of Malaysia. The state is very strategic as it is located in the Island of Borneo with a long border with Indonesia. The Exclusive Economic Zone in Malaysia is about 160,000 km² (Department of Marine Fisheries Sarawak, 2018). The Department of Fisheries Malaysia found out that there are significant opportunities for Sarawak to explore the deep-water fisheries, especially concerning small pelagics. However, the harvest of demersal fish is at the optimum level at the moment. In fact, Sarawak accounts for about 10.6 per cent of total fishers in Malaysia. Of these 13,537 fishers in Sarawak, 11,255 are local fishers and 2,282 are foreign fishers. The foreign fishers consist of 1,410 Indonesian fishers, 461 Thai fishers and 411 other foreign fishers. The biomass in Sarawak waters is 1,273,081 metric tonnes and the potential yield of fish is at 582,809 metric tonnes per year.

In this paper, the authors discuss the key issues in the Sarawak fisheries, such as illegal, unreported and unregulated (IUU) fishing, as well as the effect of Coronavirus (Covid-19) and the importance of fisher associations to combat poverty among fishers. The ways to overcome these issues and move forward to develop the fisheries in Sarawak are also highlighted here.

FISHERIES INDUSTRY IN SARAWAK

Sarawak's fisheries are regulated under the Fisheries Act of Malaysia 1985. The regulations pertaining to the management and development of fisheries resources in the country are all provided in the Fisheries Act of Malaysia 1985 and its amendments of 1993. These regulations specify the specifications of fishing vessels, fishing gear licensing, prohibition of fishing methods, establishment of fishing zones, prohibited areas, marine parks, as well as prohibits the catch of endangered species and establishes closed seasons for specific areas and species of fish. These regulations are enforced by the Department of Fisheries Malaysia to prevent the

overexploitation of the fishery resources. Among the important regulations provided for in the Fisheries Act 1985 are as follows: cod-end mesh size of the trawl nets should not be less than 38 millimetres (38mm), prohibition of the destructive fishing methods, such as explosives and poisons, electric fishing and pair trawling, and the regulation of fisheries zones in sea. The fisheries zones in Malaysia are divided into five zones, namely:

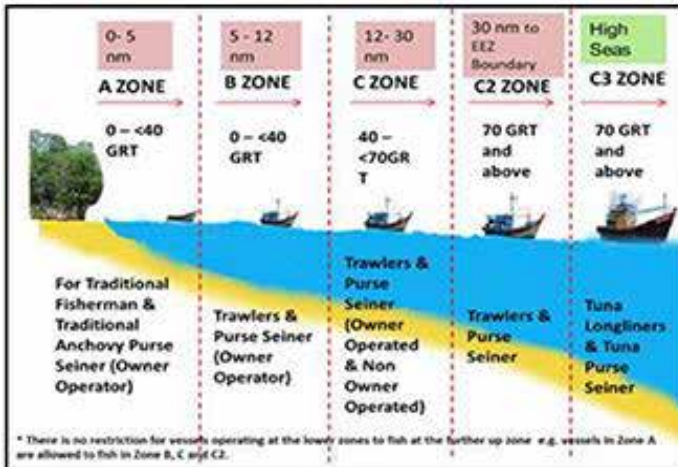
Conservation Zone (0-1 nautical mile from the coastline)

Zone A: < 40 GRT vessels (1-8 nautical miles from the coastline). Traditional vessels are used. Purse seines can be used. Most of the fish harvested in these zones are anchovies. Only Malaysian fishers can fish in this zone.

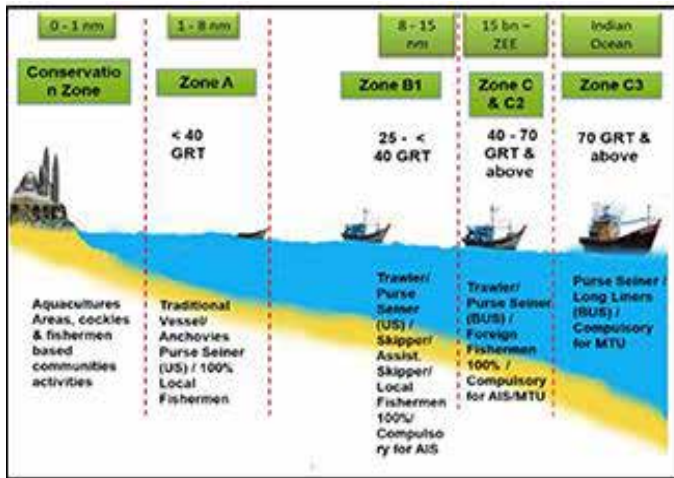
Zone B1: 25 to <40 GRT vessels (8-15 nautical miles from the coastlines). Trawls and purse seines are used. Only Malaysian fishers are allowed to operate in this zone.

Zone C & C2: 40-70GRT vessels (15 nautical miles from the coastline to Exclusive Economic Zones). Trawlers and purse seiners are used. Foreign fishers can operate in this zone.

Zone C3: 70 GRT vessels and above operate in this zone. Purse seiners and long liners are used. Foreigners can operate in this zone.



(a)



(b)

Figure 1. Fisheries Zones in Malaysia. Figure (a) shows the old version and figure (b) is the latest Fisheries Zones. Source: Southeast Asia Fisheries Development Centre (2017)



Figure 2: Types of fishing vessels in Malaysia and Sarawak. Source: Southeast Asia Fisheries Development Centre (2017)

There are 6,531 registered fishing vessels in Sarawak in the year 2018 (Department of Fisheries Malaysia, 2018). Outboard powered vessels or small vessels that mostly operate in Zone A are the most recorded vessels at 4,174, inboard powered vessels come second at 2,156 vessels, and non-powered vessels come third at 201 vessels.

Table 1: Types of Fishing Vessels and Total Vessels in Sarawak in Year 2018

Types of Fishing Vessels	Total Vessels
Inboard Powered	2156
0-4.9 GRT	779
5-9.9 GRT	484
10-14.9 GRT	236
15-19.9 GRT	55
20-24.9 GRT	77
25-39.9 GRT	152
40-69.9 GRT	285
>70 GRT and above	88
Outboard Powered	4174
Non-powered	201
Total	6,531

Source: Department of Fisheries Malaysia (2018)

Marine Capture Fisheries Production in Sarawak

Marine capture fisheries production in Sarawak is divided into two, namely; in-shore fisheries landings and deep-sea fisheries landings. In-shore fisheries landings fell from 102,590 tonnes in the year 2007 to 70,221 tonnes in the year 2010 and increased again to 129,631 tonnes in the year 2017 and fell again to 115,746 tonnes in the year 2018. For the deep-sea fisheries landings, the landings increased from 37,643 tonnes in 2007 to 60,563 tonnes in 2009 and fell to 31,153 tonnes in 2015. However, the landings of deep-sea fisheries increased from 31,153 tonnes in 2015 to 64,858 tonnes in 2018. This more than two-fold increase in landings from the deep-sea indicates the potential of deep-sea fisheries in Sarawak. The landings of in-shore fisheries and deep-sea fisheries in Sarawak from year 2007 to 2018 are shown in Table 2.

Table 2: Landings of in-shore fisheries and deep-sea fisheries in Sarawak in years 2007-2018

Year	In-shore fisheries landings (tonnes)	Deep-sea fisheries landings (tonnes)	Total landings (tonnes)
2007	102,590	37,643	140,233
2008	79,311	57,013	136,324
2009	64,573	60,563	125,136
2010	70,221	51,193	121,414
2011	72,487	46,972	119,459
2012	93,132	47,970	141,102
2013	114,029	45,797	159,826
2014	115,620	41,630	157,250
2015	116,426	31,153	147,579
2016	111,861	36,132	147,993
2017	129,631	29,305	158,936
2018	115,746	64,858	180,604

Source: Annual Fisheries Statistics, Department of Fisheries Malaysia (2018)

Table 3 shows the landing of marine capture fisheries according to different types of nets in 2018. In Sarawak, marine capture fisheries production using trawl nets provides for most of the fish landings of 66,314 tonnes (accounting for 37 percent of total fish landings), followed by drift nets at 51,926 tonnes or 29 per cent of total fish landings.

Table 3: Landing of Fishes according to different Types of Nets in 2018

Types of Nets	Landing of Fishes (Tonnes)
1. Trawl Nets	66,314
2. Drift Nets	51,926
3. Fish Purse Seines	31,179
4. Anchovy Purse Seines	136
5. Bag Nets	7,940
6. Hook & Lines	2,722
7. Portable Traps	2,609
8. Others	17,779
Total	180,605

Source: Fisheries Department of Malaysia (2018)

Aquaculture in Sarawak

Aquaculture is important to complement marine capture fisheries to feed the increasing population of 2.9 million people in Sarawak. Aquaculture also provides job opportunities and income for aquaculturists. The total aquaculturists in Sarawak are 4,295, about 23 percent of the total 18,871 aquaculturists in Malaysia. From the 4,295 aquaculturists in Sarawak, there are 193 brackish water culturists and 4,102 freshwater culturists. Sarawak has the second highest aquaculture culturist in Malaysia after Sabah, which records 6,686 aquaculture culturists in the year 2018 (Department of Fisheries Malaysia, 2018).

In terms of aquaculture production, Sarawak records 7,444.38 tonnes of fisheries products in a year, about 1.9 per cent from the 391,465.16 tonnes of aquaculture fisheries production in Malaysia. This is relatively low compared to other states in Malaysia. Sarawak is the eighth largest aquaculture producing state in Malaysia after Sabah (191,185 tonnes), Perak (67,489 tonnes), Johore (31,380 tonnes), Penang (29,027 tonnes), Selangor (19,253 tonnes), Pahang (12,569 tonnes) and Kedah (10,169 tonnes). This shows that the aquaculture productivity in Sarawak is still low and needs to be developed further through the financial assistance of the state government and the support of local universities and fisheries departments in assisting aquaculture farmers to increase productivity and encourage more fishers or young people to venture into aquaculture farming.

Number of Fishers in Sarawak

The number of fishers in Sarawak increased from 9,405 in 2000 to 16,813 in 2012. However, the number of fishers started to fall from year to year since 2012. The number of fishers reduced about 16.5 per cent from 16,210 in the year 2013 to 13,537 fishers in the year 2018. Table 4 presents the number of fishers from year 2000 to year 2018.

Table 4: Number of Fishers in Sarawak from Year 2000 to 2018

Year	Number of Fishers	Year	Number of Fishers
2000	9,405	2010	15,572
2001	9,686	2011	16,000
2002	9,686	2012	16,813
2003	13,206	2013	16,210
2004	13,206	2014	16,349
2005	10,344	2015	15,666
2006	13,913	2016	16,905
2007	11,440	2017	14,499
2008	12,694	2018	13,537
2009	16,278		

Source: Table 4, Department of Fisheries Malaysia (2018)

Fishing Nets Used in Sarawak

There are seven types of nets in Sarawak that are used to capture fish, namely; gill or drift nets, trawl nets, purse seine nets, bag nets, hooks and lines, portable traps or bubu, and barrier nets. Most fishers use gill nets to capture fish (9073 fishers). The second most used nets are trawl nets, which are used by 2123 fishers. The details on the number of fishers and types of nets used in Sarawak waters in year 2018 are shown in Table 5.

Table 5: Number of Fishers and the Types of Nets Used in Sarawak waters in year 2018

Types of Nets	Number of Fishers Involved
1. Gill/ Drift Nets	9073
2. Trawl Nets	2123
3. Purse Seine Nets	808
4. Bag Nets	550
5. Hooks and Lines	315
6. Portable Traps/ Bubu	276
7. Barrier Nets	208
Total	13,537

Source: Department of Fisheries Malaysia (2018)

KEY ISSUES IN SARAWAK FISHERIES

Illegal Fishing by Foreign Vessels

Sarawak rivers and waters are rich with fisheries resources, and invite encroachment by illegal fishers. There are a number of cases of illegal encroachment on Sarawak waters in 2020. For example, 24 Vietnamese fishers were arrested on 24th July 2020 by the Malaysian Maritime Enforcement Agency (MMEA) for encroaching into Sarawak waters using two vessels. The vessels were caught some 221 nautical miles north of Muara Tebas in Kuching Sarawak. A total of two tonnes of catch, 19,000 litres of diesel, two vessels, and fishing equipment worth RM2.5 million were seized (David, 2020).

In a separate case, about 113 nautical miles from Tanjung Kidurong in Bintulu, a Vietnamese fishing vessel was detained by MMEA on July 11, 2020. The value of fish caught and the vessel including the fishing equipment was worth RM1 million (Yussop, 2020). The encroachment of foreign fishing vessels especially trawlers into the Sarawak waters reduces fisheries resources for the local Sarawak fishers. When the fishers' catch falls, the income of the fishers will reduce as well and the livelihoods of fishers will be negatively affected (Dawum, 2019).

We provide the number of illegal foreign fishing vessels detained in Sarawak over the last five years in the table below.

Table 6: Number of Illegal Foreign Fishing Vessels Detained in Sarawak

Year	Number of Illegal Foreign Fishing Vessels
2014	2
2015	11
2016	14
2017	37
2018	57

Source: Malaysian Maritime Enforcement Agency (2018a, 2018b)

From Table 6, it shows that the number of illegal foreign fishing vessels in Sarawak increases every year for the past five years, from only two vessels in 2014 to 57 vessels in the year 2018. Most of the illegal fishers reported are fishers from Vietnam as the country is a large fishing nation

and is near to Malaysian sea waters (Malaysian Maritime Enforcement Agency, 2018b). Illegal fishing is thus a serious problem, which increases over time.

Impact of COVID-19 to Fishers

The coronavirus pandemic (COVID-19) breakout in March 2020 in Malaysia has caused fear among the general public. The announcement of lockdown (Movement Control Order) from 18th March 2020 onwards by the Malaysian government has caused disruption of supply chains. The public including the fishers are restricted from travelling far due to the movement control order announced by the Sarawak government. Fishers who catch fish face difficulties in selling their fish because they cannot sell their fish at the fish market. This has resulted in a fall in the income and welfare of the fishers. For example, the fishers in Miri experienced a drop in fish sales as the number of customers dropped drastically. This drop was due to fear of being stopped by the authorities as customers were urged to stay at home despite the fact that the number of fish caught did not decrease (Abdullah, 2020). Currently, there are about 13,000 fishers in Sarawak facing this decrease in demand for fish as a result of the movement control orders.

Realizing the impact of the coronavirus (COVID-19) pandemic to the welfare of fishers, the Sarawak government has allocated RM600,000 to the Malaysian Fisheries Development Authorities (LKIM) to buy the catch from the affected fishers (Ling, 2020).

Status of Fisher Associations in Sarawak

Fisher associations are important to organize small-scale fishers and improve the welfare of individual fishers. Fisher association members cooperate and take joint actions to organise and combine their resources to build processing plants, fish collection centres, and undertake the marketing of their fisheries products. In effective fisher associations, fishers are able to arrange cooperatively for the purchase of equipment and supplies, such as fishing vessels, fishing nets, and diesel fuel.

In Sarawak, the state fisher association is located in Kuching, and there are 18 area fisher associations throughout the state. However, fishermen associations in Sarawak are weak and are heavily dependent on

the government for support and financial resources. Fisher associations in Sarawak receive grants, such as the processing facilities grant, and Education Assistance Fund from the Fisheries Development Authority, an agency under the Ministry of Agriculture and Agro-based Industry. For example, the Fisher Association received a RM30,000 grant to upgrade the belacan processing facilities in Buntal and another RM6,070 for Education Assistance Funding for the Buntal Fishers' Children in 2020 (Dawum, 2019). Moreover, fisher associations depend on the allocation from the Malaysian Fisheries Development Board (LKIM) to buy the fishers' catch. If there is no funding given by the government, the fishers will be saddled with unsold fisheries products, especially during the recent Movement Control Order imposed. Due to the coronavirus pandemic in 2020, fishers cannot travel around to sell their fisheries products (The Star, 2020). The fisher associations are heavily dependent on government funding to assist the small-scale fishers. The small-scale fishers are very vulnerable to risks if government funding is not available.

THE WAY FORWARD

Transformation from Marine Capture Fisheries to Aquaculture

The depletion of fisheries resources in the sea due to overexploitation reduces the sustainability of fisheries resources in the long run. Therefore, the alternative solution to marine capture fisheries is aquaculture. Fishers who have lost their jobs and are willing to venture into aquaculture can be financially assisted by the state government. The state government can provide incentives to train aquaculture farmers and allocate funding to the Department of Fisheries to conduct short courses and equip the fishers with skills to perform aquaculture activities.

With the population expected to increase in future, the demand for fish will definitely increase. It is impossible for marine capture fisheries alone to provide for the protein requirements of the population in the long run. Marine capture fisheries can be complemented with aquaculture fisheries to sustain fish consumption.

Enhancing and Developing Functional Fisher Associations

Fisher associations are cooperatives. A cooperative is a democratic business institution, where people organize themselves to increase bargaining power and improve the welfare of every member. A fisher association serves as a platform for the fishers to share opinions to increase their bargaining power and their welfare. A functional fisher association will have a good membership support from the fishers. The support of the members provides consensus to solve fisheries problems, such as overfishing, illegal, unreported and unregulated fishing, the control of destructive fishing gears and marketing problems in fisheries including the low prices for fisheries resources. Functional fisher associations are important as they help the small and unorganized fishers to become organized and solve their marketing and technological problems, as well as help the small fishers process the fish catch to become fisheries products, such as fish sauce and fish crackers to increase the fishers' income. Moreover, small-scale fishers can get better value of their catch and lower the post-harvest fisheries losses. They are able to organise well in a functional fisher association, as well as present and speak out their problems in a more unified way to the Fisheries Development Authority in order for the authority to collaborate with the fishers' communities to solve problems together using a co-management approach.

Universities agricultural education department officers can educate the fishers to participate in fisher associations and become functional in organizing themselves. Universities and community service officers from agricultural and education departments, researchers and fisheries scientists can enter the fishers' villages and communicate with the fishers to understand the fishers' problems at the ground level and find solutions to lessen the problems. Moreover, the university's community officers, researchers and scientists can help train the fishers to have skills and use technology to increase productivity and add value to their fish catch.

CONCLUSION

Sarawak fisheries are important in supplying fish protein for the state's population. Furthermore, it is important in their contribution to the gross domestic product of the state and in providing job opportunities and income

to the fishers. However, there are some challenges, such as encroachment of Sarawak waters by illegal fishers, which will reduce fishery resources. The government through the Malaysian Maritime Enforcement Agency can always increase patrols along the sea waters to protect the interest of local Sarawak fishers.

In order to develop Sarawak fisheries, everyone has a role to play. The universities can assist the Sarawak Fisheries Development Authority to help fishers organize themselves through developing the functionality of fisher associations, and educating fishers with skills and latest technology to increase productivity. Moreover, fishers must also be appreciated by the people of Sarawak by recognising their contribution to food production and food security of Sarawak. With the efforts from all players, the Sarawak fisheries sector can be developed further in a sustainable way.

ACKNOWLEDGEMENT

We appreciate all the authors for contributing their ideas and effort in writing this manuscript. We also thank Universiti Teknologi MARA and the committee members of International Journal of Service Management and Sustainability for helping the authors in publishing this manuscript.

REFERENCES

- Abdullah, M. (2020, March 30). Fishermen bemoan drop in sale. *The Borneo Post*. Available at <https://www.theborneopost.com/2020/03/30/fishermen-bemoan-drop-in-sale/>.
- David, J. (2020, July 28). MMEA nets 24 Vietnamese fishermen for encroachment. *The Borneo Post*. Available at <https://www.pressreader.com/malaysia/the-borneo-post/20200728/281496458610417>
- Dawum, G. (2019, July 18). 'Enough fish for Sarawak despite foreign encroachment'. *New Straits Times*. Available at

<https://www.nst.com.my/news/nation/2019/07/508020/enough-fish-sarawakians-despite-foreignencroachment>

Department of Fisheries Malaysia (2018). *2018 Yearly Fisheries Statistics of Malaysia*. Available at <https://www.dof.gov.my/index.php/pages/view/3754>

Department of Marine Fisheries Sarawak (2018). *Capture Fisheries Sector*. Available at <https://jpls.dof.gov.my/sarawak.php/pages/view/2897>

Ling, S. (2020, April 11). Help for farmers. *The Star News*. Available at <https://www.thestar.com.my/metro/metro-news/2020/04/11/help-for-farmers>

Malaysian Maritime Enforcement Agency (2018, June 20) a. APMM Wilayah Sarawak tahan 37 bot nelayan, tertinggi sejak 13 tahun lepas. *Utusan Borneo Online*. Available at <https://www.utusanborneo.com.my/2018/06/20/apmm-wilayah-sarawak-tahan-37-bot-nelayan-tertinggi-sejak-13-tahun-lepas>

Malaysian Maritime Enforcement Agency (2018, December 11) b. APMM tahan 57 bot nelayan asing di perairan Sarawak. *Utusan Borneo Online*. Available at <https://www.utusanborneo.com.my/2018/12/11/apmm-tahan-57-bot-nelayan-asing-di-perairan-sarawak>

Southeast Asia Fisheries Development Centre (2017). *Fisheries Country Profile: Malaysia*. Available at <http://www.seafdec.org/fisheries-country-profile-malaysia/>

The Star (2020, April 7). Special allocation assures fishermen's livelihood. *The Star News*. Available at <https://www.thestar.com.my/metro/metro-news/2020/04/07/special-allocation-assures-fishermens-livelihood>

Yussop, Y. (2020, July 12). MMEA detains foreign vessel, 16 crew for encroaching into Sarawak waters. *The Borneo Post*. Available at <https://www.theborneopost.com/2020/07/12/mmea-detains-foreign-vessel-16-crew-forencroaching-into-sarawak-waters/>