

A Review Paper on Production Efficiency Factors for the Small-scale Fisheries Entrepreneur in Fishery Industry

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Abstract

The research aims to analyze factors affecting production efficiency in the Fishery Industry. It considers factors such as knowledge, technology, marketing, finance, socioeconomics, culture, climate change, and government support. Improving management skills and utilizing resources effectively are crucial for sustainable business growth. The study emphasizes the importance of efficient factors in the Fishery Industry. To improve business performance, entrepreneurs need basic management skills and efficient resource utilization with skilled personnel and innovative management. This research focuses on factors affecting performance in the Fishery Industry. In this study, a few ways will be used to offer feedback on whether certain techniques are effective or poor for the fishery industry. The results of the study provide insights into the current state of production efficiency in the fishery sector in Malaysia and identify areas for improvement. The framework developed in this study can be used as a tool for policymakers and industry stakeholders to evaluate and enhance the efficiency of fishery production in the country.

Keyword: Production Efficiency, Entrepreneur, Small-Scale, Fisheries Sector, Malaysia

Introduction

Malaysia is some country rich in natural resources. One of the important sectors for the country is the agricultural sector. This sector plays an important role because it will guarantee

the security of food supply to the country. The fishing sector is one of the economic sectors that supply the supply of raw materials to increase the production of Malaysia. With that, this sector can help increase Gross Domestic Product (GDP), energy use, and the development of upstream and downstream industries based on fisheries (Soh & Ghee-Thean, 2020). In the twelfth Malaysia Plan, the government has outlined various measures implemented in the agricultural sector to increase sustainable production in improving food security as well as generating high and sustainable income for farmers. However, there are various constraints and challenges that small and medium entrepreneurs have to face (Economic Planning Unit, 2021).

There is total of RM133 million in loans have been approved for 3,700 agricultural entrepreneurs to carry out various activities in the agro-food subsector. Smart agriculture has been identified as one of the Key Economic Growth Areas (KEGA) of WKB 2030, the National Agro-Food Policy 2021-2030 (DAN 2.0) and the National Agricommodity Policy 2021-2030 (DAKN2030) (Economic Planning Unit, 2021). But to what extent the allocation by the government can increase efficiency in production in the fisheries sector (Parichatnon et al., 2018). In line with that, research to identify factors that increase efficiency is needed to help the government achieve its objective.

A variety of internal and external influencing factors are needed to improve performance in the economy. Continued global population growth and changes in eating habits affect the composition and structure of food demand, including the demand for seafood. An increase in production is necessary to meet demand, especially by the local food production system. In this direction, although important developments in fisheries have been experienced, such as industrialization and modernization, artisanal techniques such as small-scale fishing (SSF) are still very important, especially in rural coastal zones in developing countries (Allison, 2011; Béné, n.d.).

Literature Review

The research objective for this study as below:

- to find out more at academic research on how Malaysia Entrepreneurs can increase the efficiency in production for the fishery sector as well as factors that influence the production efficiency in fishery industry.

Overview Fishery Industry in Malaysia

Since ancient times, the fishing sector has been one of the main activities of the community due to its contribution to the public economy and the ability to meet nutritional needs. The fishing sector is still an important sector for the modern world because it provides food and maintains income and employment, especially for developing countries (Szirmai, 2018). The fisheries sector provides a significant portion of income for more than 106,000 local fishermen and farmers in Malaysia Department of Fisheries Malaysia, 2020, In addition, fisheries provide up to 12% of agriculture's gross domestic product (GDP) and 0.9% of the country's GDP (Department of Fisheries Malaysia., 2019). While it may seem insignificant, the fisheries sector is vital in supplying food, jobs, nutrition, and a healthy lifestyle and supporting other downstream businesses. Malaysia's capture fisheries and aquaculture production totaled 1.6 million tons in 2020, a decrease of 2.36% from 2019. Malaysia's capture fisheries and aquaculture production totaled 1.6 million tons in 2020, a decrease of 2.36% from 2019.

Table-1, the data from Fisheries Development Authority of Malaysia compares the overall fisheries productivity in Malaysia from 2016 to 2020.

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Fisheries and aquaculture production between 2016 and 2020 in Malaysia

Year	2016	2017	2018	2019	2020
Production Capture	(Tonnes, live weight)				
Inland	5847.97	5177.19	6089.08	5568.70	5625.14
Marine	1574.447	1465.113	1452.862	1455.446	1383.299
Total Capture	1,580,295.0	1,470,290.2	1,458,951.1	1461,014.7	1,388,924.1
Aquaculture ¹					
Inland	103,348.21	102,596.83	101,269.88	104,601.56	97,209.74
Marine	98,049.9	212,453.02	116,112.08	119,069.47	120,739.51
Total Aquaculture	201,398.11	224,049.85	217,381.96	223,671.03	217,949.25
Total Fisheries and Aquaculture ²	1,781,693.1	1,694,340.0	1,676,333.0	1,684,685.7	1,606,873.4

¹Exclude production of seaweed

²Total may not match due the rounding

Factors of production efficiency for Fishery Industry in Malaysia

Productivity reflects the ability of a firm, industry or economy to produce more output by better combining labour, capital and other inputs, owing to new ideas, technological innovations, more efficient processes, and new business models. Productivity growth is already the key driver of growth for many advanced countries, but is also expected to become the main driver of economic growth in ASEAN countries over the coming decades.

Knowledge

Production efficiency and knowledge for small-scale fisheries entrepreneurs is a multifaceted and crucial aspect of sustainable fisheries management. The literature highlights the significance of knowledge in enhancing production efficiency and sustainability in small-scale fisheries. For instance, the study by emphasizes that the lack of knowledge about the small-scale sector jeopardizes informed decision-making for sustainable ecosystem-based fisheries planning and social development (Teh & Pauly, 2018). Furthermore, the study by underscores the contribution of participatory governance and subsidies to fishers' adaptive capacity, indicating that knowledge dissemination and participatory approaches play a vital role in enhancing the resilience and adaptive capacity of small-scale fisheries (Nenadović et al., 2016). Additionally, the study by highlights the necessity of incorporating other disciplinary perspectives, knowledge sources, and local information for understanding the fishery system and identifying appropriate management responses, indicating the importance of diverse knowledge sources in fisheries management (Sowman, 2011).

Moreover, the study by addresses lifestyle entrepreneurship in tourism and the constraint within regional economic development, emphasizing the importance of knowledge and entrepreneurship in sustaining small-scale businesses (Ateljevic & Doorne, 2000; James et al.,

2020). This underscores the role of knowledge in fostering entrepreneurship and economic sustainability in small-scale sectors. The knowledge plays a pivotal role in enhancing production efficiency, sustainability, adaptive capacity, and entrepreneurship in small-scale fisheries. Incorporating diverse knowledge sources, participatory approaches, and informed decision-making are crucial for the sustainable management of small-scale fisheries.

Technological Advance

Technological advancement in small-scale fisheries is a multifaceted issue. Small-scale fisheries are characterized by the use of less advanced gear and vessels, low technology, and a reliance on traditional methods (Elsler et al., 2021; Szirmai, 2018). The success of small-scale fisheries has been attributed to community-based management, where local communities develop context-dependent solutions for matching exploitation rates to the productivity of local resources (Worm et al., 2009). However, the study by Tingley et al (2005) suggests that with the current level of technology, fishermen can increase production by adding effectively fixed inputs, indicating the potential for technological advancement to enhance production efficiency. On the other hand, Worm et al (2009) emphasize the importance of understanding the technological factors that may hinder the pursuit of improved livelihoods in small-scale fisheries. This highlights the need to consider not only the economic and social conditions but also the technological aspects when developing policies to advance the welfare of small-scale by (Lembaga Kemajuan Ikan Malaysia, 2020). Additionally, Sargani et al (2022) found that seasonal factors and fish migration greatly affect capture fisheries production, indicating that natural factors also play a significant role in production efficiency.

These challenges can impact the economies of scale and efficiency of small-scale capture fisheries businesses (Adnan et al., 2021). Additionally, Foale et al (2013) emphasize the importance of addressing food security from fish by optimizing and managing industrial fleets, as well as supporting small-scale trade and local market development. The small-scale fisheries entrepreneurs highlight the relationship between production efficiency and technological advancement. Studies such as the one conducted by Cánovas-Molina & García-Frapolli (2022) emphasize the vulnerabilities in small-scale fisheries, indicating the need for technological advancements to address challenges and improve production efficiency.

Marketing Strategy

The marketing strategy for small-scale fisheries entrepreneurs is a complex interplay influenced by various factors. Small-scale fisheries are characterized by low capitalization and labor-intensive management, with relatively little power over the marketing of their catch (Prosperi et al., 2019). The efficiency of small-scale fisheries is affected by factors such as tight competition among business actors, seasonal variations, and the impact of fish migration on production (Adnan et al., 2021). Additionally, the development of marketing in the fisheries sector is influenced by external factors such as market infrastructure, cost-efficient fish storage, and processing facilities that can support the development of fisheries micro and small enterprises (Namotemo et al., 2021). Furthermore, the study by Qiu (2022) highlights the importance of strong product market conditions in promoting efficiency, ensuring that entrepreneurs generate immediate and sufficient profit by promoting existing products to existing customers in domestic and foreign markets.

Moreover, the literature emphasizes the significance of small-scale fisheries in contributing to food security and nutrition at various levels, including household, domestic markets, and

international food security (Prosperi et al., 2022). The research underscores the positive impact of new institutional arrangements of small-scale fishers and social capital on social-ecological resilience, indicating the importance of adaptive business arrangements in enhancing the resilience of small-scale fisheries. Additionally, the development of marketing strategies in the fisheries sector is crucial for sustainable small-scale fisheries markets, as impediments in the organization of value chains and market structures can hinder access to markets by small-scale fisheries (Penca et al., 2021). Direct marketing can help fishers build social capital and develop strategies to address issues affecting fisheries' resilience (Stoll et al., 2015). The link between production efficiency and marketing strategy for small-scale fisheries entrepreneurs is complex, influenced by competition, seasonal variations, market infrastructure, social capital, and adaptive business arrangements. Addressing these factors is essential for improving efficiency and sustainability.

Financial Resources

One of the crucial factors influencing the production efficiency is financial resources. Al-Haddad et al (2019) found that the cost component of labor costs is greater than other costs, indicating the influence of financial resources on the cost structure and potentially the overall production efficiency of small-scale capture fisheries. Additionally, Jamaludin Malik (2021) emphasize the importance of the nutritional value of fish in building and maintaining food security, underscoring the significance of financial resources in sustaining the productivity and livelihoods of small-scale fisheries entrepreneurs. These references collectively underscore the influence of financial resources on the production efficiency and sustainability of small-scale fisheries entrepreneurs, highlighting the need for adequate financial support to ensure the viability of small-scale fisheries.

The literature on small-scale fisheries emphasizes the intricate relationship between production efficiency and financial resources. Adnan et al (2021) highlight the impact of economies of scale on the efficiency of small-scale capture fisheries, indicating the influence of financial conditions on the economies of scale in these fisheries. This suggests that the availability of financial resources can significantly affect the operational efficiency and productivity of small-scale fisheries (Adnan et al., 2021). Furthermore, Garcia & Rosenberg (2010) discuss the characteristics, trends, and drivers of marine capture fisheries, shedding light on the financial aspects of these fisheries. The paper addresses the contribution of marine capture fisheries to food security, emphasizing the importance of financial resources in sustaining the productivity and livelihoods of small-scale fishers. This underscores the critical role of financial support in ensuring the stability and resilience of small-scale fisheries, particularly in the context of food security (Garcia & Rosenberg, 2010). These references emphasize the importance of financial resources in small-scale fisheries, which play a key role in efficiency, productivity, and sustainability. Financial support, economies of scale, and ensuring food security are crucial factors that influence the relationship between production efficiency and financial conditions in small-scale fisheries. Further research is needed to improve efficiency in production due to the high risk associated with small-scale fisheries.

Socioeconomic

Socioeconomic factors play an important role in small-scale fisheries, impacting their sustainability and livelihoods. For example, a study from Cinner & McClanahan (2006) has examined how socioeconomic factors can affect artisanal coral reef fisheries of various

species in Papua New Guinea, highlighting the influence of overfishing on production from the resource. Meanwhile, Elsler et al (2021); Purcell et al (2016) discuss how external drivers increasingly affect small-scale fisheries around the world, pointing to broader socioeconomic and environmental factors. Moreover, Purcell et al (2016) emphasized the importance of understanding the socioeconomic characteristics of fisheries for planning regulatory measures to enhance resource sustainability. It is important to consider the socioeconomic context when developing management strategies for small-scale fisheries, as studies have shown that socioeconomic conditions can impact the efficiency of these fisheries.

For instance, Adnan et al (2021), found that small-scale vessels exhibit varying levels of technical and scale efficiency, indicating the influence of socioeconomic factors on their performance. They also highlighted the impact of scale economies on the efficiency of small-scale capture fisheries, showing the influence of socioeconomic conditions on economies of scale in these fisheries. Nenadović et al (2016) discussed the role of subsidies and participatory governance in enhancing fishers' adaptive capacity, emphasizing the socioeconomic factors affecting the resilience of small-scale fisheries. Meanwhile, Mondaca-Schachermayer et al (2011) conducted an empirical analysis of the social and ecological outcomes of state subsidies for small-scale fisheries in Chile, highlighting the influence of socioeconomic factors on the results of government interventions in these fisheries.

Cultural and Traditional Beliefs

The cultural and traditional beliefs of small-scale fishermen are complex and influenced by various factors. The references provided offer insights into entrepreneurship, cosmopolitan change agents, and institutional impact on intersectoral conflict in global fisheries, but do not directly address the relationship between production efficiency and cultural beliefs among small-scale fisheries entrepreneurs. According to Malkanthi (2017), there is an emphasis on the strong cultural identity and association with traditional customs and beliefs within small-scale fishing communities. Furthermore, Beyerlein (2004) discusses the constraining nature of cultural orientations, particularly in conservative Protestant contexts, for material pursuits. While this reference does not directly address small-scale fisheries, it provides insight into how cultural and traditional beliefs can influence the priorities and activities of communities, potentially affecting their approach to fishing practices and production efficiency.

According to Khairallah et al (2023) they highlight the significance of traditional and artisanal techniques in the production of goat milk products, representing cultural heritage and region-specific practices. This underscores the influence of cultural traditions on the methods and processes employed in small-scale fisheries, which can ultimately impact their production efficiency. Cultural and traditional beliefs impact small-scale fisheries practices and efficiency. Recognizing this influence is essential for developing effective strategies in these communities (Ghazali, 2022).

Climate Change and Environmental

The small-scale fisheries have a significant impact on climate change and environmental factors affecting fisheries production. Studies by Blanchard et al (2012); Cheung et al (2009) highlight the influence of climate change on primary production, fish production, and marine biodiversity. These references emphasize the potential consequences of climate change on the ecological aspects of fisheries, including food web interactions, species distribution, and

biodiversity patterns. Moreover, Christensen et al (2015); da Rocha et al (2014) discuss the economic and management challenges posed by climate change in fisheries. They emphasize the need for policy and management actions at regional, national, and international levels to address the large-scale environmental impacts of climate change on fisheries.

Additionally, Brander (2007) emphasizes the strong interactions between fishing effects and climate change, indicating the sensitivity of marine ecosystems to additional stresses such as climate change. Furthermore, Kurniawan & Aini (2022) highlight the importance of understanding the spatial distribution of small-scale fisheries to avoid overexploitation of marine products, indicating the need to address environmental changes to ensure sustainable fisheries. The substantial influence of climate change and environmental factors on small-scale fisheries affects primary production, biodiversity, economic aspects, and management challenges (Hadi et al., 2022). Understanding and addressing these impacts are crucial for the sustainable management and resilience of small-scale fisheries in the face of climate change.

Government Support and Policies

The relationship between production efficiency and government support and policies for small-scale fisheries entrepreneurs is a critical aspect of sustainable fisheries management. According to Macusi et al (2022) emphasize the importance of full government support, including the promotion of diverse livelihoods and the implementation of fishery management regimes, such as closed season policies, to achieve marine fishery conservation goals. This highlights the potential positive impact of government policies on supporting fishers financially and promoting sustainable fishing practices. Additionally, Léopold et al (2019) found that formal government support for collective institutional design and enforcement improved the performance of institutional building processes in small-scale fisheries. This suggests that government support can enhance the effectiveness of institutional innovation and co-management efforts in fisheries.

Furthermore, Ali et al (2021) discusses the impact of government funding policies on entrepreneurship, highlighting the role of government support in fostering the development of new technologies and supporting smaller private companies and individual entrepreneurs. This underscores the potential for government policies to facilitate innovation and growth in small-scale fisheries businesses. In contrast, Said & MacMillan (2020) caution against the unintended consequences of institutionalized government approaches, which may lead to conflicts and the destitution of fishers. This highlights the need for careful consideration of the potential negative impacts of government policies on small-scale fisheries.

Conclusion

The parameter for factors to achieve production efficiency for entrepreneurs in Fishery Industry are investigated in this study. According to this study, the sustainability of the production efficiency and the establishment of a practical business model are the two critical production efficiency criteria. Many business struggle to sustain the productivity due to inability to identify their important factors determining their efficiency. According to Fauzi et al (2023) has shown that identifying the right factors when starting a business is important to determine the success of a business. However, businesses also need to constantly identify efficiency factors in production so that entrepreneurs can increase the amount of production and subsequently be able to increase efficiency in business (Fauzi et al., 2023). The

sustainability of the company through in order to thrive the businesses, entrepreneur must have or establish a specific factor which is a set of facts, skills or know-how and personality traits (Fauzi et al., 2022). By reviewing past studies, this study analyzes factors that influence small fisheries entrepreneurs' efficiency throughout production. To ensure these factors are significant, we suggest that future studies leverage questions and answers with small-scale and successful entrepreneurs to validate the factors (Ghazali et al., 2023). This paper is valuable as it identifies the significant factors influencing production efficiency. However, every factor carries its weight since they are not all equally important (Ghazali et al., 2022). Thus, future studies must rank these factors and evaluate their weightage so that they can be used as a guideline for entrepreneurs in the Fishery Industry and to develop mathematical index formulations for them (Ghazali et al., 2023).

References

- Adnan, N., Bashir, A., & Harunurasyid, H. (2021). The Economies of Scale and Efficiency of Small-Scale Capture Fisheries in Kurau Village, Central Bangka District. *Marine Fisheries : Journal of Marine Fisheries Technology and Management*, 11(2), 121–133. <https://doi.org/10.29244/jmf.v11i2.32463>
- Al-Haddad, L., Sial, M. S., Ali, I., Alam, R., Khuong, N. V., & Khanh, T. H. T. (2019). The role of small and medium enterprises (SMEs) in employment generation and economic growth: A study of marble industry in emerging economy. *International Journal of Financial Research*, 10(6), 174–187. <https://doi.org/10.5430/ijfr.v10n6p174>
- Ali, A., Ahmed, M., & Hassan, N. (2021). Socioeconomic impact of COVID-19 pandemic: Evidence from rural mountain community in Pakistan. *Journal of Public Affairs*, 21(4). <https://doi.org/10.1002/pa.2355>
- Allison, E. H. (2011). Aquaculture, Fisheries, Poverty and Food Security. In *Security*. <https://doi.org/Working Paper 2011-65>.
- Béné, C. (n.d.). Increasing the contribution of small-scale fisheries to poverty alleviation and food security. *FAO Fisheries Technical Paper, Rome*. <https://doi.org/https://doi.org/10.1016/j.worlddev.2015.11.007>
- Beyerlein, K. (2004). Specifying the Impact of Conservative Protestantism on Educational Attainment. *Department of Sociology*, 4, 505–518.
- Blanchard, J. L., Jennings, S., Holmes, R., Harle, J., Merino, G., Allen, J. I., Holt, J., Dulvy, N. K., & Barange, M. (2012). Potential consequences of climate change for primary production and fish production in large marine ecosystems. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 367(1605), 2979–2989. <https://doi.org/10.1098/rstb.2012.0231>
- Cánovas-Molina, A., & García-Frapolli, E. (2022). A review of vulnerabilities in worldwide small-scale fisheries. *Fisheries Management and Ecology*, 29(5), 491–501. <https://doi.org/10.1111/fme.12538>
- Cheung, W. W. L., Lam, V. W. Y., Sarmiento, J. L., Kearney, K., Watson, R., & Pauly, D. (2009). Projecting global marine biodiversity impacts under climate change scenarios. *Fish and Fisheries*, 10(3), 235–251. <https://doi.org/10.1111/j.1467-2979.2008.00315.x>
- Christensen, V., Coll, M., Buszowski, J., Cheung, W. W. L., Frölicher, T., Steenbeek, J., Stock, C. A., Watson, R. A., & Walters, C. J. (2015). The global ocean is an ecosystem: Simulating marine life and fisheries. *Global Ecology and Biogeography*, 24(5), 507–517. <https://doi.org/10.1111/geb.12281>
- Cinner, J. E., & McClanahan, T. R. (2006). Socioeconomic factors that lead to overfishing in

- small-scale coral reef fisheries of Papua New Guinea. *Environmental Conservation*, 33(1), 73–80. <https://doi.org/10.1017/S0376892906002748>
- da Rocha, J. M., Gutiérrez, M. J., & Villasante, S. (2014). Economic effects of global warming under stock growth uncertainty: The European sardine fishery. *Regional Environmental Change*, 14(1), 195–205. <https://doi.org/10.1007/s10113-013-0466-y>
- Economic Planning Unit. (2021). Twelve Malaysia Plan 2021-2025. In *EPU*.
- Elsler, L. G., Frawley, T. H., Britten, G. L., Crowder, L. B., DuBois, T. C., Radosavljevic, S., Gilly, W. F., Crépin, A. S., & Schlüter, M. (2021). Social relationship dynamics mediate climate impacts on income inequality: evidence from the Mexican Humboldt squid fishery. *Regional Environmental Change*, 21(2). <https://doi.org/10.1007/s10113-021-01747-5>
- Fauzi, S. N. M., Ghazali, P. L., Abdul Razak, R., Mohamad Zain, E. N., & Muhammad, N. (2022). Risk Management of Start-up Business for SMEs: A Review Paper. *The Journal of Management Theory and Practice (JMTP)*, 3(1), 67–72. <https://doi.org/10.37231/jmtp.2022.3.1.215>
- Fauzi, S. N. M., Ghazali, P. L., Rohim, R. A., & Razak, R. A. (2023). *Weighting Risk Factors for Start-up Businesses in Small and Medium Enterprises: A qualitative approach and ATLAS ti procedure*. June, 21–22.
- Foale, S., Adhuri, D., Aliño, P., Allison, E. H., Andrew, N., Cohen, P., Evans, L., Fabinyi, M., Fidelman, P., Gregory, C., Stacey, N., Tanzer, J., & Weeratunge, N. (2013). Food security and the Coral Triangle Initiative. *Marine Policy*, 38, 174–183. <https://doi.org/10.1016/j.marpol.2012.05.033>
- Garcia, S. M., & Rosenberg, A. A. (2010). Food security and marine capture fisheries: Characteristics, trends, drivers and future perspectives. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1554), 2869–2880. <https://doi.org/10.1098/rstb.2010.0171>
- Ghazali, P. L., Abdul Hadi, A. A., Mohammed Foziah, N. H., Lambak, S., Mohammed, I. S., Mamat, M., Mohamad Zain, E. N., Abdul Rohim, R. A., & Sukono. (2022). Analysis of Interviewing Experts in Weightage for Start-Up Business Factors of Edible Bird Nest Swiftlet Ranching Industry. *International Journal of Academic Research in Business and Social Sciences*.
- Ghazali, P. L., Fauzi, S. N. M., Rohim, R. A. A., Razak, R. A., Arifin, J., Zain, E. N. M., & Foziah, N. H. M. (2023). Construction of Mathematical Start-Up Business Index Formulation for Swiftlet Ranching Industry in Malaysia. *Contemporary Mathematics (Singapore)*, 4(4), 1125–1134. <https://doi.org/10.37256/cm.4420232748>
- Hadi, A. A. A., Ghazali, P. L., Foziah, N. H. M., Razak, R. A., & Arifin, J. (2022). A Review Paper on The New Business Factors for The Malaysian Edible Bird Nest Swiftlet Ranching Industry. *The Journal of Management Theory and Practice (JMTP)*, 3(1), 62–66. <https://doi.org/10.37231/jmtp.2022.3.1.211>
- Malik, J. H. K. (2021). Jurnal Pengelolaan Perikanan Tropis Journal of Tropical Fisheries Management. *Journal of Tropical Fisheries Management*, 05(2018).
- K.M.Brander. (2007). Global fish production and climate change. *National Academy of Sciences*, 104(50), 1–393. <https://doi.org/10.1017/CBO9780511482922>
- Khairallah, L., Chedid, M., Jaber, L., Martiniello, G., & Hamadeh, S. K. (2023). Traditional dairy goat value chain in Lebanon: an uneven distribution of values. *Journal of Agribusiness in Developing and Emerging Economies*, 13(4), 555–569. <https://doi.org/10.1108/JADEE-06-2021-0144>
- Kurniawan, F. E., & Aini, Y. N. (2022). Mapping of Changes in the Utilization of Marine

- Resources in the Small-Scale Fisheries Subsector in Indonesia (2008-2017). *Jurnal Perikanan Universitas Gadjah Mada*, 24(1), 21. <https://doi.org/10.22146/jfs.68659>
- Lembaga Kemajuan Ikan Malaysia. (2020). *Laporan Tahunan 2020*.
- Léopold, M., Thébaud, O., & Charles, A. (2019). The dynamics of institutional innovation: Crafting co-management in small-scale fisheries through action research. *Journal of Environmental Management*, 237(July 2018), 187–199. <https://doi.org/10.1016/j.jenvman.2019.01.112>
- Macusi, E. D., Sabino, L. L., & Macusi, E. S. (2022). Closed Season Policy Is Only Partly Practiced in Surigao del Sur, Philippines. *World*, 3(4), 1067–1079. <https://doi.org/10.3390/world3040061>
- Malkanthi, S. H. . (2017). Importance of Underutilized Crops in Thanamalwila Divisional Secretariat Division in Monaragala District in Sri Lanka. *Journal of Agricultural Sciences*, 12(3), 197. <https://doi.org/10.4038/jas.v12i3.8266>
- Mondaca-Schachermayer, C. I., Aburto, J., Cundill, G., Lancellotti, D., Tapia, C., & Stotz, W. (2011). An empirical analysis of the social and ecological outcomes of state subsidies for small-scale fisheries: A case study from Chile. *Ecology and Society*, 16(3), 14. <https://doi.org/10.5751/ES-04239-160317>
- Namotemo, H., Kour, F., Dilly, A., Akerina, F., & Amahorseja, A. (2021). Strategy for Micro and Small Businesses Development in the Fisheries Sector in North Halmahera Regency, Indonesia. *Indonesian Journal of Business and Entrepreneurship*, 7(1), 63–72. <https://doi.org/10.17358/ijbe.7.1.73>
- Nenadović, M., Basurto, X., & Weaver, A. H. (2016). Contribution of Subsidies and Participatory Governance to Fishers' Adaptive Capacity. *Journal of Environment and Development*, 25(4), 426–454. <https://doi.org/10.1177/1070496516670448>
- Parichatnon, S., Maichum, K., & Peng, K. C. (2018). Measuring technical efficiency of Thai rubber production using the three-stage data envelopment analysis. *Agricultural Economics (Czech Republic)*, 64(5), 227–240. <https://doi.org/10.17221/19/2016-AGRICECON>
- Penca, J., Said, A., Cavallé, M., Pita, C., & Libralato, S. (2021). Sustainable small-scale fisheries markets in the Mediterranean: weaknesses and opportunities. *Maritime Studies*, 20(2), 141–155. <https://doi.org/10.1007/s40152-021-00222-5>
- Prosperi, P., Kirwan, J., Maye, D., Bartolini, F., Vergamini, D., & Brunori, G. (2019). Adaptation strategies of small-scale fisheries within changing market and regulatory conditions in the EU. *Marine Policy*, 100(December 2018), 316–323. <https://doi.org/10.1016/j.marpol.2018.12.006>
- Prosperi, P., Kirwan, J., Maye, D., Tsakalou, E., Vlahos, G., Bartolini, F., Vergamini, D., & Brunori, G. (2022). Adaptive business arrangements and the creation of social capital: Towards small-scale fisheries resilience in different European geographical areas. In *Sociologia Ruralis* (Vol. 62, Issue 1). <https://doi.org/10.1111/soru.12362>
- Purcell, S. W., Ngaluafe, P., Foale, S. J., Cocks, N., Cullis, B. R., & Lalavanua, W. (2016). Multiple factors affect socioeconomics and wellbeing of artisanal sea cucumber fishers. *PLoS ONE*, 11(12), 1–20. <https://doi.org/10.1371/journal.pone.0165633>
- Qiu, T. (2022). The effects of opportunity motivation and environmental contingencies on market growth strategies of African early-stage entrepreneurs. *African Journal of Economic and Management Studies*, 434–451. <https://doi.org/10.1108/AJEMS-06-2021-0298>
- Said, A., & MacMillan, D. (2020). 'Re-grabbing' marine resources: a blue degrowth agenda for

- the resurgence of small-scale fisheries in Malta. *Sustainability Science*, 15(1), 91–102. <https://doi.org/10.1007/s11625-019-00769-7>
- Sargani, G. R., Jiang, Y., Chandio, A. A., Shen, Y., Ding, Z., & Ali, A. (2022). Impacts of livelihood assets on adaptation strategies in response to climate change: evidence from Pakistan. *Environment, Development and Sustainability*, April. <https://doi.org/10.1007/s10668-022-02296-5>
- Soh, B. H., & Ghee-Thean, L. (2020). Macroeconomic variables affecting the fish trade balance in Malaysia. *Journal of Economics and Sustainability (JES)*, 2(2), 52–62.
- Stoll, J. S., Dubik, B. A., & Campbell, L. M. (2015). Local seafood: Rethinking the direct marketing paradigm. *Ecology and Society*, 20(2). <https://doi.org/10.5751/ES-07686-200240>
- Szirmai, A. (2018). Developing countries and the concept of development. *Socio-Economic Development*, 1–40. <https://doi.org/10.1017/cbo9781107054158.002>
- Tingley, D., Pascoe, S., & Coglán, L. (2005). Factors affecting technical efficiency in fisheries: Stochastic production frontier versus data envelopment analysis approaches. *Fisheries Research*, 73(3), 363–376. <https://doi.org/10.1016/j.fishres.2005.01.008>
- Worm, B., Hilborn, R., Baum, J. K., Branch, T. A., Collie, J. S., Costello, C., Fogarty, M. J., Fulton, E. A., Hutchings, J. A., Jennings, S., Jensen, O. P., Lotze, H. K., Mace, P. M., McClanahan, T. R., Minto, C., Palumbi, S. R., Parma, A. M., Ricard, D., Rosenberg, A. A., ... Zeller, D. (2009). Rebuilding Global Fisheries. *Science*, 325(5940), 578–585. <https://doi.org/10.1126/science.1173146>