

Future Outlook Toward Sustainable Supply Chain of Capture Fisheries in Rembang District, Central Java Indonesia

Hasrul

Lecturer, Faculty of Economy and Business
Universitas Pakuan, Bogor Indonesia
hasrul@unpak.ac.id

Yuary Farradia

Lecturer, School of Postgraduate and Faculty of Economics and Business
Universitas Pakuan, Bogor Indonesia
yuary.farradia@unpak.ac.id
juaryfarradia@yahoo.com

Herman, Retno Martanti Endah Lestari, Hamzah

Lecturer, Faculty of Economy and Business
Universitas Pakuan, Bogor Indonesia

Abstract

Sustainable Supply Chain Management concerns with simultaneously improving social, economic and environmental performance through supply chain management practices. Sustainable practices in supply chains include reducing waste and emissions, using renewable energy, sourcing materials from sustainable sources, and promoting fair labor practices. Once practiced, this will lead to sustainable supply chains. Rembang Regency is the area with the largest capture fisheries production and production value in Central Java, Indonesia. Currently Rembang Regency capture fisheries face various challenges on the economic performance of its fishermen, environment issue at its both fish auction site and fishing water as well as its fishermen social performance, therefore it is important to improve its capture fisheries supply chain management to achieve their supply chain sustainability. In depth interview was carried out with some fishermen and stakeholders in order to identify the root cause of their sustainable supply chain. The analysis result indicates that capture fisheries stakeholders have to make some changes in order to achieve the triple bottom line of their sustainable supply chain. Economic Performance should be improved from the auction payment lead time procedures. Whilst the environment performance should be improved through the improvements to the handling of the catch before it is brought to the auction site. Furthermore, waste management at capture waters locations needs to be a concern of the local fisheries service policy. Social performance improvement should be done by improving its local auction procedure policies. Active participation from the stakeholders is one of the major improvement success factor.

Keywords

Sustainability, Supply Chain, Fishery, Social, Economic,

1. Introduction

Indonesia is the world's largest archipelagic nation, a member of the Group of 20 (G20), and possesses the world's richest marine biodiversity as well as the world's second-largest seafood producer (Napitupulu, et al., 2022). With the world's second-longest coastline and vast marine waters, Indonesia is one of the most fertile fishing grounds in the world. It is the world's second- largest producer of marine wild-capture fish (Tran et al. 2019) and meets about 25 percent of global fisheries demand (BKPM 2018).

Fisheries contributed 2.8 percent of Indonesia's gross domestic product (GDP) in 2020 (BPS 2021). The

ocean makes a critical contribution to livelihoods, food and nutritional security, and well-being for many households in Indonesia, including disadvantaged families. It was in 2004 when the Indonesia government have launched the *Gemar Makan Ikan* (Enjoy Eating Fish) campaign to increase awareness about the importance of fish consumption. It continues to operate (Kontan 2021).

1.1 Capture Fisheries Outlook in Rembang

Rembang is one of the Regencies on the northern coast of Java with a coastline length of 61.5 km (BPS-Statistics of Rembang Regency 2020a). Based on data from Statistics of Central Java Province (2021), Rembang regency sector in fisheries which includes capture fisheries, became the number one of the major economic sources of Rembang Regency. In addition to the marine fishery products in Rembang Regency were also as the largest in Central Java Province (BPS-Statistics of Central Java Province 2021). Furthermore, by combining the fisheries, agriculture, and forestry sectors, it contribute as the largest Rembang Regency gross domestic product as much as 25.02% (BPS-Statistics of Rembang Regency 2020b). Hence, fisheries development including capture fisheries has a strategic role in the development of Rembang Regency. Below is the figure of GDP in Rembang district in 2022.

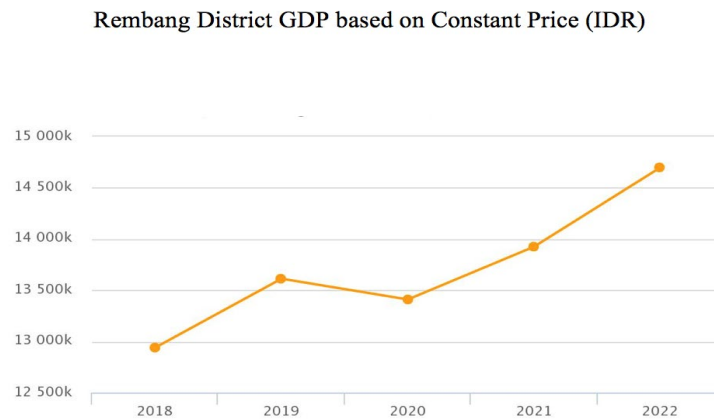


Figure 1. Rembang Regency GDP Based on Constant Price (IDR)
Source: BPS-Statistics of Rembang Regency, 2023

Based on the Rembang Regency's Regional Regulation Number 6 of 2019, fisheries development (including capture fisheries) was one of the strategic sectors that becomes a priority in the development of Rembang Regency.

Capture fisheries have a strategic value for the socio-economic development in Rembang Regency in terms of food security, employment, poverty reduction, and economic growth (Wijayanto, *et al.*, 2021). Rembang Regency has 10 Fish Auction Places (TPI) and 3 Fishing Ports (PPI) as well as a fleet of 3,998 vessels (Investment and One-Stop Services Office, DPMTSP, 2022). Table 1 illustrated the list and condition of 10 fish auction places in Rembang Regency. Based on table 1, fish auction place at Tasik Agung II is the biggest fish production.

In term of fishermen in Rembang Regency, it can be classified by skipper and labor fishermen. Practically, labor fishermen get wages from profit sharing on each fishing trip in which their wages received are lower than those of the skipper. Fishermen's economic life is very dependent on the results of the fish obtained when going to sea, the results are usually sold at (Fish Auction Place). Indeed, Rembang Regency has the largest production and production value of captured fisheries in Central Java. The labor fishermen distribution, the number of fishermen at each sub district area of Rembang Regency is presented in table 2.

Table 1. Capture Fish Production at Various Fish Auction Place in Rembang Regency

Fish Auction Place in Rembang Regency	Capture Fish Production (Kg)		
	2018	2019	2020
Tunggusari	6 509.00	30 896.00	72 763.00
Tanjungsari	134 717.00	11 950.00	1 867.00
Tasikagung I	8 424 722.00	7 341 570.00	5 752 278.00
Tasikagung II	64 180 350.00	81 001 856.00	84 096 359.00
Pasarbanggi	3 800.00	141 862.00	130 879.00
Pangkalan	5 089.00	40 833.00	36 233.00
Pandangan	4 566 240.00	4 604 415.00	6 669 548.00
Karanglincak	1 833.00	20 750.00	7 824.00
Karanganyar	5 718 417.00	4 252 510.00	3 698 472.00
Sarang	13 360 845.00	13 290 470.00	11 254 818.00
Total	96 402 522.00	110 747 112.00	111 721 041.00

Source: BPS-Statistics of Rembang Regency, 2023

Table 2. Fishermen Distribution in Rembang Regency

Sub district	Fishermen		
	Skipper	Labor	Total
Sumber	-	-	-
Bulu	-	-	-
Gunem	-	-	-
Sale	-	-	-
Sarang	412	-	412
Sedan	-	-	-
Pamotan	-	-	-
Sulang	1	1	2
Kaliori	370	-	370
Rembang	1178	-	1178
Pancur	-	-	-
Kragan	1781	-	1781
Sluke	505	127	632
Lasem	260	258	518
Total Rembang District	4 507	386	4 893

Source: BPS-Statistics of Rembang Regency, 2023

1.2 Sustainable Fishery Supply Chain

A sustainable supply chain is one that fully integrates ethical and environmentally responsible practices into a competitive and successful model. An examples of sustainable practices in supply chains include reducing waste and emissions, using renewable energy, sourcing materials from sustainable sources, and promoting fair labor practices. Once practiced, this will lead to sustainable supply chains.

A fish supply chain can be described as a set of independent fishers, agents, processors, distributors, and wholesalers/retailers/food services who work together to supply a fish or derived product to the consumer. The flow

of the catch supply chain has several parties with their respective roles, whilst good supply chain management will ensure the availability of fish to be consumed and provide benefits evenly from upstream to downstream (Ghaffar, *et al.*, 2023). On the other form of sustainability which relate to sustainable fisheries development, sustainability can not only be seen from the level of capture fisheries or biomass utilization but also other fisheries aspects, such as ecosystems, social and economic structures, fishing communities, and institutional management (Charles,2001).

1.3 Problem in Rembang Regency Capture Fisheries Sustainable Supply Chain

Despite the role of Indonesia in ensuring a continued prosperous global ocean economy, however, it is still not reflected in the sector's economic performance. Hence an urgent action is needed to ensure the sustainability of production and conservation of marine resources in Indonesia subject to seafood demand, competition in the use of ocean resources and coastal areas, and climate change. Indeed, there is an indication that Indonesia's fish stocks are fully exploited or overexploited, as problems in collecting, analyzing, and using data in management continue to challenge management and law enforcement (Napitupulu, et al., 2022).

Rembang Auction place (TPI) in particular, still have some problems relate to its sustainable supply chain such as economic performance of the fishermen and the facility of auction place up to the fishing location subject to its environment performance. Furthermore, the social welfare of fishermen community is also need an attention from the government. Earlier study by Ihtirohmah (2018), found that auctions held at TPI Tasik Agung II Rembang were paid in advance which impact to fishermen losses.

An preliminary observation was conducted by the research team in June 2023. The result indicates that currently the fishermen still have problem in their auction payment, in particular for the term of payment. The receivables for payments to fishermen might reach 1-3 months. Moreover, Some fishermen who have vessels in operation enter into contracts for the taking of catches from a number of fishing lift nets and shore operated stationary lift nets by providing advance payments to the fishermen. Consequently, the existence of receivables of more than 30 days will become an obstacle and a problem for fishing vessel owners. It is also a practice of fishermen to sell their caught fishes to the middlemen who bought fish outside auction place subject to late payments or too cheap fish prices condition.

Which regard to the environment performance, an attention on fish handling at the auction place also need some improvement subject to the hygiene quality and waste water outflow from the auction place as illustrated in figure 2 below:

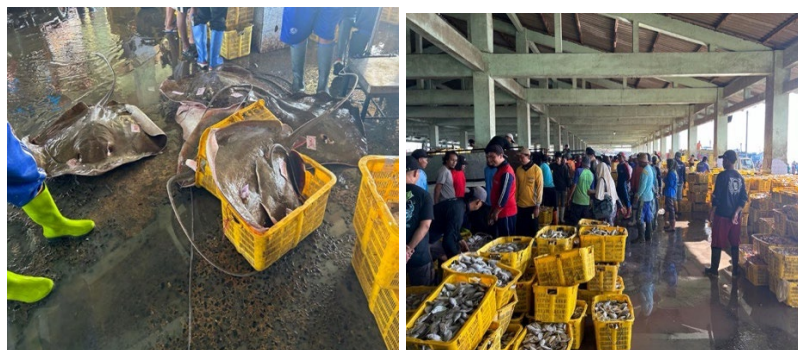


Figure 2. Fish handling in Tasik Agung II Auction Place, Rembang
Source: Research team observation, 2023

Prior study on fishing operation in Tasik Agung II Rembang by Falach (2022), emphasized on the fishing gear matter. His study concluded that it was a need to select any fishing gear which can maintain the fish population toward sustainable fisheries.

Based on various problem which still face by the fishermen, therefore it is a need to study the future outlook of capture fisheries in Rembang Regency, Central Java. It is expected trough proper and sustainable management, Indonesia's fisheries could improve their economic, social, and environmental performance.

1.4 Objectives

The objective of this study is to find the outlook of capture fisheries supply chain in Rembang Regency, Central Java, in particular at Tasik Agung II auction place. This study also has an aim to find the current fish distribution model as the basis to develop a sustainable supply chain model.

2. Literature Review

In general understanding, sustainable seafood is seafood fished or farmed in a manner that can maintain or increase production in the long term. Thus, it is suggested that consumers should choose seafood from sustainable capture fisheries. Bawole and Apituley, (2022) recommended that sustainability of capture fisheries have to be seen from four aspects of sustainability, namely ecological, socio economic, community and institutional sustainability. The ecological sustainability can be achieved by maintaining stock or biomass sustainability and increasing capacity and quality ecosystem. Whilst the socio-economic sustainability is measured through the welfare of fisheries actors on the individual level. Similarly, the community sustainability refers to the community welfare sustainability. Finally, the institutional sustainability achievement is through the maintenance of financial and administrative aspects healthy.

2.1 Rembang Capture Fisheries

Fisheries in Central Java Province are dominated by fish resources obtained from fishing at sea. Fish resources in Central Java waters have a potential of around 1,873,539 tonnes/year which is divided into two waters, namely the Java Sea and the Indonesian Ocean Sea (Cristinawati, et al., 2013). Data from Investment and One-Stop Services Office-DPMPTSP, (2022) recorded that there were about 328 types of fisheries business in Rembang district consist of various types of business activities, such as processing industry (18%), trading (36%), cultivation, rearing and hatching (6%), fishing (35%) and other businesses (5%). These business have contributed to a total investment potential of IDR. 1.05 trillion and a workforce absorption of 13,097 workers.

Table 3. Number of Fishing Gears in Rembang District in 2022 (BPS-Statistics of Rembang Regency, 2023)

District	Fishing Gears										
	Mini Purse Seine	Seine nets	Danish Seine	Fishing hooks	Trap	Cantrang	Trammel nets	Gill-nets	Sorrounding nets	Dredges	Cotok nets
Sumber	-	-	-	-	-	-	-	-	-	-	-
Bulu	-	-	-	-	-	-	-	-	-	-	-
Gunem	-	-	-	-	-	-	-	-	-	-	-
Sale	-	-	-	-	-	-	-	-	-	-	-
Sarang	180			21	180	-	41	95	-	-	41
Sedan	-	-	-	-	-	-	-	-	-	-	-
Pamotan	-	-	-	-	-	-	-	-	-	-	-
Sulang	-	-	-	-	1	-	1	1	-	-	-
Kaliori	-	-	76	-	269	4	319	383	-	-	18
Rembang	-	-	298	30	894	213	1184	361	-	-	-
Pancur	-	-	-	-	-	-	-	-	-	-	-
Kragan	429	-	-	70	56	-	59	339	-	135	1387
Sluke	-	-	104	-	384	-	29	72	-	-	238
Lasem	-	-	37	-	168	2	86	116	-	-	75
Total Rembang District	609	-	515	121	1952	219	1719	1367	-	135	1978

Fishermen in Rembang uses various type of fishing gears, as stated in the table 3. However, instead of getting fish in sufficient quantities it is also requires environmental friendly fishing gear in order to utilize sustainable fish resources.

Pakpahan et al., (2019) study concluded that in fishing operations, fishing gear used should balance in its ability in catching a large number of fish subject to maintaining fish populations.

Based on table 3, it can be seen that cantrang fishing gear still be used mostly by the fishermen in Rembang sub district. Trap and cotok nets are the most fishing gears used in majority of Rembang sub district, followed by trammel nets and gillnets.

2.2. Sustainable Capture Fishery Supply Chain

Sustainability is aimed to meet the needs of the present without compromising the ability to fulfill the future generation needs. Thus, it refers to the effort of balancing the natural resources. Sustainability can also be applied across the seafood supply chain. According to Lart (2022), fisheries can exert effects on marine ecosystems such as the impact of fishing gear on habitats and other non-target species, either as a mixed fishery targeting several species, or species caught unintentionally. Furthermore, Lart (2022) stated that some of these aspects were considered in a similar way to fish stock assessment, where the assessment was made on the basis of whether the effects are sustainable.

The fish supply chains are not much different operationally from the supply chains of other commodities (Muslimin, *et al.*, 2021). The main priority in fish supply chain is the its freshness when reaching to the end consumer. Furthermore, Mubaraq *et al.*, 2019, stated that various activities in seafood supply chain management have involved both suppliers in the upstream sector and consumer in the downstream. With regard to the triple bottom line of sustainable supply chain, Muslimin, *et al.*, (2021) study concluded that environmental aspects, apart from social and economic, were the main priorities that must be considered in maintaining the sustainability of fishery supply chain. This was due to environmental damage would affect the image of business destinations and might lead to the very long negative implications for fishery sector.

3. Methods

This field research is a qualitative approach. The location of the study is at the fish auction place (TPI) Tasik Agung II, Rembang District. The sampling method used is based on convenient sampling. The unit analysis are TPI stakeholders consist of :

- Fish Auction Officer
- Skipper Fisherman
- Fisherman
- Fish seller at Fish market retail / Small fish traders
- Fish Auction Helper

4. Data Collection

Data collection used for this study is a combination from primary and secondary data. The primary data is gathered from various informants such as TPI employees, fishermen, skippers, and small fish traders. The secondary data is gathered from various Government of Indonesia's publicly available databases, including fisheries statistics from several sources as well as from gray literature (information produced by government agencies, academic institutions, and the private sector), and newspaper articles.

5. Results and Discussion

5.1 Tasik Agung II Fish Auction Place Description

Fish auction place (TPA) at Tasik Agung II is a large auction place. There are many ships are docked to carry out loading and unloading fish that have been produced for auction and loading supplies when going sailing to fish.

Docked ship not only from Rembang District but also from Sarang, Kragan, Outlook, Juwana, Jepara, etc. The TPA is supported by its infrastructure facilities such as:

- Main Facilities (Land, Unloading pier, Loading pier, Harbor pool, Break Water, Complex road/paving, Drainage, Gap/Plate)
- Functional Facilities (auction floor, Packing Place, Administration Office, Workshop, Water tank and installation, Ice Factory, Scales, Baskets, Fish Carriage Train, Net Repair Place, Drying Place fish, Electricity)
- Supporting Facilities (Parking, public toilet, Transportation Office, Integrated Services Building, Cooperation and fishermen association representative office, Prayer Room)

Source: <https://dkp.jatengprov.go.id/index.php/bidangupt/ppptasikagung>

The captured fish production volume and value are presented in the table 4 below:

Table 4. Captured Fish Production, Value and Fish Auction Place Retribution Value
TPI TASIKAGUNG II, Rembang District Regency

MONTH	2020			2021		
	PRODUCTION (KG)	VALUE (RAMAN) (IDR)	RETRIBUTION 2,85% (IDR)	PRODUCTION (KG)	VALUE (RAMAN) (IDR)	RETRIBUTION 2,85% (IDR)
January	5,306,950	32,042,725,000	148,594,600	4,672,075	27,642,300,000	130,818,100
February	6,423,475	39,335,200,000	179,857,300	4,743,250	27,997,435,000	132,804,000
March	6,643,725	40,632,825,000	186,024,300	5,790,000	34,839,150,000	162,127,000
April	2,812,625	31,935,212,500	78,753,500	5,423,125	33,156,407,500	151,847,500
May	-	23,000,112,500	-	1,810,975	11,080,187,500	50,707,300
June	-	11,554,887,500	-	4,088,300	24,529,800,000	114,472,400
July	6,200,500	38,589,675,000	173,614,000	5,560,300	33,045,095,000	155,688,400
August	6,102,625	36,649,360,000	170,873,500	6,056,300	36,026,345,000	169,576,400
September	8,931,575	53,149,055,000	250,084,100	5,808,600	34,640,500,000	162,640,800
October	9,054,500	52,535,747,500	253,526,000	6,382,925	38,069,525,000	178,721,900
November	8,900,300	52,294,795,000	249,208,400	5,709,450	34,020,190,000	159,864,600
December	6,081,425	33,447,837,500	170,279,900	5,671,875	33,943,205,000	158,812,500
TOTAL	66,457,700	445,167,432,500	1,860,815,600	61,717,175	368,990,140,000	1,728,080,900

source: primary data from TPI Tasik Agung II, Rembang District Regency (2023)

5.2 Fish Supply Chain

In general practice, fishermen sells fish caught at TPI Tasik Agung Rembang through an auctions system. Based on the auction regulation, every fish vessels that comes want to sell their fish at TPI must dock. This is due to the regulation that caught fish can't be sold directly on the ship. Fish must be auctioned at TPI. However the distance between TPI and the loading and unloading dock is not so far, about 400 – 500 meters.

There are various party in the supply chain involved such as the TPI, skipper fishermen, the owner of vessel, labour fishermen, who rent the skipper vessel, fishmonger who will buy a bulk of fishes at the TPI and sell it to the fish traders, fish traders and fish wholesaler who will distribute it mainly to the small scale fish processing industries.

TPI Tasik Agung II Rembang auctions plays a role as the intermediary between fishmonger (called as bakul / basket) and fishermen to carry out transactions which TPI will gets a percentage of the agreement price that occurs in the auction (retribution charge).

However, it also a practice when the system developed by TPI has problems such as late payments or too cheap fish prices, the fishermen then will sell it to fishmonger (called as bakul) or middlemen outside TPI system. The delayed payment system makes it difficult for fishermen to find capital to go to sea for the next day.

The captured fish supply chain can be illustrated in the figure 3 below:

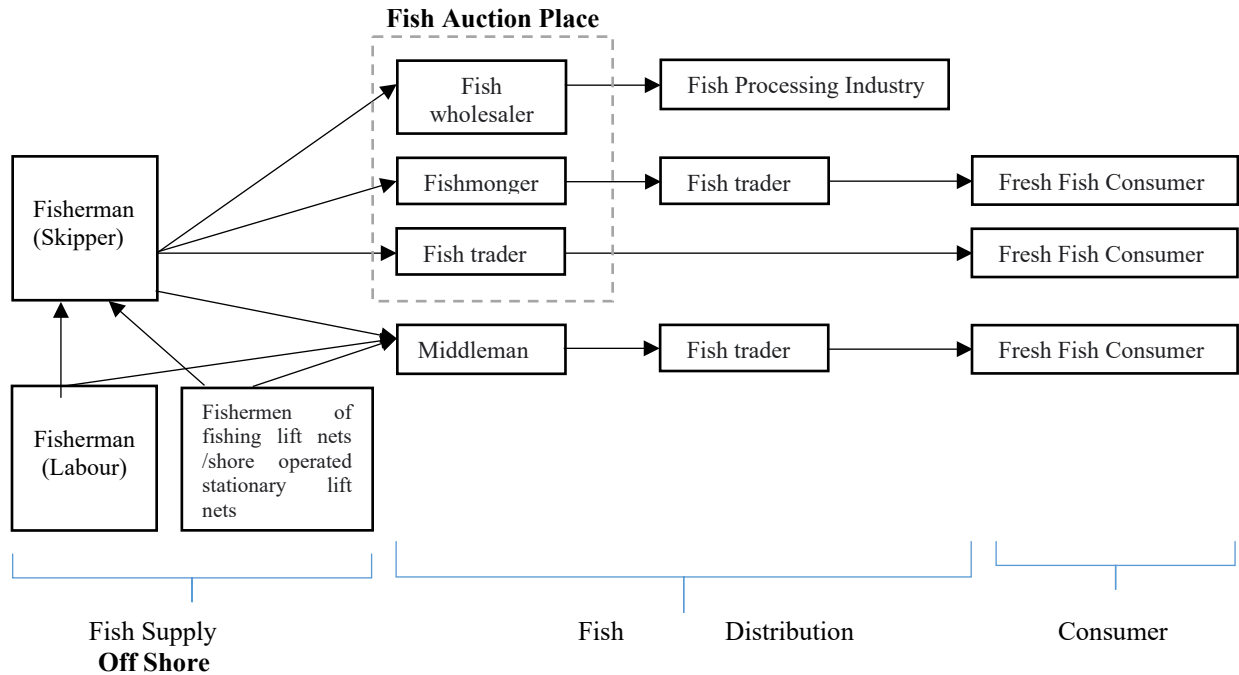


Figure 3. Tasik Agung II Fish Supply Chain

5.3 Sustainability Supply Chain Best Practice Discussion

5.3.1 Economic Performance

Toward sustainable supply chain of capture fisheries in Rembang District, Central Java Indonesia need to emphasize on the triple bottom line aspects, first is the economic performance. The Economic performance at this study is refer to the Economic performance of the fishermen looking at long term outcomes, such as sustainable growth and development, or short term outcomes including how fishermen can still survive with the unpredictable payment term constraint. As the key supplier actor, fishermen need to have their well economic performance so they will able to keep supply local caught fish. One effort to solve this payment matter is by have collaboration with any financial institution. This effort has been planned by Rembang Regent to make a collaboration with financial insititutions that can back up all payments matter.

Other effort needed is to stabilize fish auction price, so that it will decrease any practice of trading outside auction place. So far medium-class fishermen and fishmonger (bakul /basket) who have capital to participate in auctions always provide some of their fish to be sold to small traders outside the fence at a more friendly price. At this level prices become non-standard because considerations of social relations become important.

The role of fish processing companies are also important for the economic performance subject to their payment term. Again the Rembang Regent has motivate these fish processing company for not to pay the fishmonger (bakul/ basket) in the long debtstored day so that the circulation of fishermen's money and fishmonger (bakul /basket) does not take too long and fishermen are not burdened.

5.3.2 Environment Performance

The second pillar for sustainability supply chain is environment performance perspective. One effort to support the environment performance is from the fishing gear selection. Fishing gear is one of the main means of exploiting marine resources which is regulated so as not to have a negative impact on users of water resources and the water environment and users of other water services. even so these fishery resources are not unlimited (Tuasikal, 2020). The fishing gear used by fishermen at TPI Tasik agung Village consists of mini purse seine fishing gear and pocket drag nets. Prior study about fishing gear by Falach (2022) indicated that the level of fishing gear friendliness in both mini purse sein and pocket drag fishing gears is classified as very environmentally friendly with criteria 28-36. However, there are still some fishermen used non environmental fishing gear namely 'cantrang'. Indeed, *Cantrang* is an active fishing gear. The workings of the *Cantrang* is by drawn on the bottom of the water and the size of the small mesh, included in the category of fishing equipment damaging the environment and marine biota. Hence, the government has enforced fishermen to replace or reconstruct the investment of cantrang used. To support this enforcement then it was a ministry regulation issued in 2015, namely the PERMEN-KP/2/2015 stated that *Cantrang* can no longer be used.

Other environment effort is concern about waste water management. In order to achieve a hygienic Fish Auction Place (TPI) at the Tasikagung Coastal Fishing Port Technical Implementation Unit, Rembang Regency, waste water management installation channels (IPAL) will be built at the Tasikagung PPP in order to reduce environmental pollution, especially in the marine and fisheries sector.

5.3.3 Social Performance

One effort for the social performance is refer to the welfare of honorary workers at TPI which was adjusted to the Rembang Regency minimum wage. Improvement on the auction payment system also will have a multiplier effect to the fishermen society.

The objective of this study is to find the outlook of capture fisheries supply chain in Rembang Regency, Central Java, in particular at Tasik Agung II auction place. This study also has an aim to find the current fish distribution model as the basis to develop a sustainable supply chain model.

6. Conclusion

Rembang regency in Central Java has abundance of potential captured fish. All caught fish will be distributed through the supply chain from the fish auction place. Tasik Agung II rembang auction place (TPA) is the largest auction place. To support the sustainability of captured fisheries, it is a need to emphasized the economic, environment and social performance of the supply chain management. Main effort to support the economic and social performance is by improving the auction payment system. Whilst for the environment point of view is based on managing the fishing gears used by the fishermen as well as waste water management.

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Biographies

Hasrul, is a Lecturer and member of the Centre Economics Regional Studies at the Faculty of Economics and Business Universitas Pakuan, Bogor Indonesia. He completed his bachelor's degree in Management at Universitas Pakuan and completed his Masters in Marketing Management at the same university. Hasrul is a former Business Development Manager at International Bank of Indonesia (BII). Currently he is also run his own business in concrete, farm and aluminium profile. Hasrul has conducted research and community service as well as published scientific articles in various national and international journals. Hasrul conducts research and assistance for marketing management and entrepreneurship, especially for Village-Owned Enterprises and Micro, Small and Medium Enterprises in Bogor

Regency and several other areas in West Java. Hasrul has participated in several national and international conferences in various regions in Indonesia and abroad, taking part as presenter and participant.

Yuary Farradia, currently is a Lecturer in Management at Postgraduate Schools and The Faculty of Economics and Business, Universitas Pakuan, Bogor Indonesia. She used to be the lecture in management (marketing) department at the Faculty of Business, Economics and Social Development – Universiti Malaysia Terengganu in 2021- 2023. Her main background is on Green Supply Chain Management, Marketing and Management. Her ongoing International Research publication in 2023 is on Circular Economics and Smart Village Development. Her publication within the last four years are about Green Supply Chain Management, Green Marketing, Green Management, Sustainability, Environment Sustainability, Ecotourism, Consumer Purchase Decision up to Marketing Strategies. Yuary Farradia, graduated from Universitas Padjadjaran, Bandung Indonesia majoring in Fisheries. She pursued her Master of Natural Resources Economics from Universiti Pertanian Malaysia (UPM). She received her PhD from the Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia. Yuary Farradia is also a Management practitioner. Currently she is a professional Management Consultant, Trainer and Internal Auditor for Operation. She has more than 15 years working experiences mostly in the Multinational Companies with her highest position as Managing Director of Indonesia.

Herman, is a Lecturer and head of the Center for Bases and Scientific Data Processing at the Faculty of Economics and Business at Universitas Pakuan, Bogor Indonesia. He is also serves as head of the quality assurance center at Universitas Pakuan. He completed his bachelor's degree in Accounting at Ibn Khaldun University in Bogor. He continued his Masters and Doctorate in Human Resource Management at Universitas Pakuan. Herman has conducted research and community service as well as published scientific articles in various national and international journals. He conducts research and assistance for human resource development, especially for Village-Owned Enterprises and Micro, Small and Medium Enterprises in Bogor Regency and several other areas in West Java. He already has several competency certifications, namely CPHCM, CHRMP, CIRP, CPMP and CPSP. Herman has participated in several national and international conferences in various regions in Indonesia and abroad, taking part as presenter and participant. He is also a resource person in various Village Owned Enterprise development activities and entrepreneurship development as well as as the Village evaluation team at the Bogor Regency for four time periods. Currently he is a member of several professional and community organizations, namely as a member of the Village Consultative Council (BPD), administrator of the West Bogor Association of Muslim Intellectuals (ICMI) Bogor Barat, member of the Indonesian Management Forum (FMI), administrator of the Indonesian Economic Scholars (ISEI) Bogor Raya, Forum Administrator Doctor of Business (Fordobi), member of the Association of Indonesian Private Schools of Economics and Business (Afebsi).

Retno Martanti Endah Lestari, graduated with a Bachelor's degree in the Accounting Study Program, Faculty of Economics, Pakuan University (FEUP), in 1999, graduated with a Master's Degree in the Accounting Masters Program, Muhammadiyah University, Jakarta in 2007 and graduated with a Doctoral Degree in the Accounting Science Doctoral Program, Padjadjaran University in 2020. Take Certified Management Accountant and Certified Analyst in Project Management licensed in Australia in 2019. Currently he is a permanent lecturer in the Undergraduate Accounting Study Program, Faculty of Economics, Pakuan University, in Bogor. Taught Introduction to Accounting, Cost Accounting and Management Accounting courses. Also a lecturer at the Universitas Terbuka in Bogor. Before becoming a lecturer, he served as Accounting Supervisor at PT. PIBIB Jala Jagad Indonesia, PT. Sarana Indoboga Pratama in 2003 and several of its branches. He was once the 3rd place outstanding lecturer at Pakuan University. Has Copyright for Research on Mosque Accounting Practices in Bogor in 2019. Has attended Accounting Technician Training in 2019, Accurate Online Training in 2019, attended Student Colloquium at the Faculty of Management Multimedia University Malaysia in 2018, University Putera Malaysia in 2018, in Bangkok in 2018 and in Korea in 2018, also various scientific meetings.

Hamzah, is a PhD in Natural Resources and Environment has worked in IT, MIS, and data analytics since 1995. Hamzah has worked at the IPB University and Business School as R&D Staff and Computer Laboratory Supervisor. He is a trained strategic business analyst as well as an internationally recognized quantitative techniques expert and data analytics specialist with a global reputation in applied and quantitative research methods for over 20 years. He has worked in many institutions as a research specialist for statistical and non-statistical approaches, systems approaches, and multi-criteria decision making. Hamzah was the founder and President Director of a consulting firm PT KUNCI KONSULTASI. He is a lecture at the postgraduate program in Sharia Banking Management at FEB UIN

Jakarta. He teaches Applied Quantitative and Qualitative Methodology, Applied Statistics, Research Methods, and Strategic Marketing. He used to work as a Permanent Expert for Human Resources and Benefits at BPKH RI. He is also a lecturer at Universitas Pakuan Bogor Indonesia at Postgraduate School and Faculty of Economics and Business and used to be the Director of the Centre for Scientific Data Bases and Processing as well. He has also served as Advisor to the Chairman of the Foundation at STEI Indonesia Jakarta from November 2022. Hamzah is a well-known national and worldwide speaker and has published books, essays, and scientific papers in national and international magazines. He has provided research consultations, data analysis, seminars, and training to over 300 Masters and 274 doctorate candidates in Indonesia and overseas.