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FINAL REPORT

BUSINESS AND HUMAN RIGHTS IN THE FISHERIES SECTOR: THE ROLE AND SUPPORT OF STAKEHOLDERS IN SHRIMP AQUACULTURE

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ACRONYMS AND ABBREVIATIONS

AMDAL	: Analisis Dampak Lingkungan / Environmental Impact Assessment
APBN	: Anggaran Pendapatan dan Belanja Negara / State Budget
AP5I	: Asosiasi Pengusaha Pengolahan dan Pemasaran Produk Perikanan Indonesia / Indonesian Fisheries Product, Processing and Marketing Association
Atin	: PT. Alter Trade Indonesia
AWS	: PT. Aruna Wijaya Sakti
BLBI	: Bantuan Likuiditas Bank Indonesia / Bank of Indonesia's Liquidity Assistance
BMKG	: Badan Meteorologi, Klimatologi, dan Geofisika / Meteorology, Climatology, and Geophysics Agency
BPJS	: Badan Penyelenggara Jaminan Sosial / Social Security Agency
BPS	: Badan Pusat Statistik / National Statistical Office
CSO	: Civil Society Organization
CPP	: PT. Central Proteina Prima
CPB	: PT. Central Pertiwi Bahari
DCD	: PT. Dipasena Citra Darmaja
DP	: Down payment
FAO	: Food and Agriculture Organization
FCR	: Food Conversion Ratio
FGD	: Focus Group Discussion
Forsil	: Forum Silaturahmi / Friendship Forum
GAP	: Good Aquaculture Practices
IOJI	: Indonesian Ocean Justice Initiative
Kemenko	: Kementerian Koordinator / Coordinating Ministry
KIARA	: Koalisi Rakyat Untuk Keadilan Perikanan / The People's Coalition for Fisheries Justice
KOIN	: Konservasi Indonesia / Indonesia Conservation
KPBD	: Koperasi Petambak Bumi Dipasena / Bumi Dipasena Farmers' Cooperative
LBH	: Lembaga Bantuan Hukum / Legal Aid Institute
MAI	: Masyarakat Akuakultur Indonesia / Indonesian Aquaculture Society
Marves	: Kemaritiman dan Investasi / Maritime and Investment Affairs
MEF	: Ministry of Environment and Forestry
ML	: Ministry of Labor
MLHR	: Ministry of Law and Human Rights
MMAF	: Ministry of Marine Affairs and Fisheries
MSC	: Marine Stewardship Council
NGO	: Non-Governmental Organization
NTB	: Nusa Tenggara Barat / West Nusa Tenggara
NTPi	: Nilai Tukar Pembudidaya Ikan / Fish Farmer Exchange Rate
NTUPi	: Nilai Tukar Usaha Pembudiaya Ikan / Fish Farmer Business Exchange Rate
OECD	: Organization for Economic Co-operation and Development
POKDAKAN	: Kelompok Pembudidaya Ikan / Fish Farmer Group
PPA	: Perusahaan Pengelola Aset Negara / State Asset Management Company
PPNI	: Persaudaraan Perempuan Nelayan Indonesia / Sisterhood of Indonesian Fisherwomen
P3UW	: Perhimpunan Petambak Pembudidaya Udang / Shrimp Farmers' Association
RZWP3K	: Rencana Zonasi Wilayah Pesisir dan Pulau-Pulau Kecil / Zoning Plan of Coastal Areas and Small Islands
SHM	: Sertifikat Hak Milik / Certificate of Ownership
SLR	: Shrimp Loss Reserve
SNI	: Standar Nasional Indonesia / Indonesian National Standard
TIR	: Tambak Inti Rakyat / Nucleus Estate-Smallholder Farm
TNBBS	: Taman Nasional Bukit Barisan Selatan / Bukit Barisan Selatan National Park
UMP	: Upah Minimum Provinsi / Provincial Minimum Wage
UU	: Undang-Undang / Law
WALHI	: Wahana Lingkungan Hidup Indonesia / The Indonesian Forum for the Environment
WWTP	: Waste Water Treatment Plant

FOREWORD

Economic progress without the respect and fulfillment of human rights will be unsustainable and will sharpen socio-economic inequalities. It will move us further away from the notion of social justice and humanity as enshrined in the Pancasila state ideology and the Constitution. Hence, Indonesia's decision ten years ago in 2011 to endorse the UN Guiding Principles on Human Rights and Business. By doing so, Indonesia is socially and morally bound to promote corporate accountability in Indonesia.

The research report on Business and Human Rights in the Fisheries Sector: The Role and Support of Stakeholders in Shrimp Aquaculture seeks to promote the advancement of human rights in the aquaculture sector, where the rights of vulnerable groups are fulfilled and business operations are environmentally friendly. The report examines the extent to which the State and other stakeholders support the realization of the rights of aquaculture farmers and other relevant groups, through legislation, guidelines, social protection, and other aquaculture-related initiatives.

For 4 months, researchers collected data and analyzed the support that stakeholders have thus far provided. The research process involves interviews, focus group discussions, and peer reviews with key stakeholders, including civil society, business, farmers, and the government. Researchers conducted an in-depth analysis by also reviewing official documents, journals, books, reports and articles.

The study has identified the challenges, opportunities, and limitations in ensuring corporate accountability in the aquaculture sector. The key issues are as follows: 1) the rights of traditional farmers are increasingly under threat, 2) the rights of women farmers have yet to be recognized, 3) environmental issues that remain unresolved, and 4) lack of government support.

Based on these findings, the report puts forward specific recommendations to stakeholders, with a view to promoting sustainable shrimp farming, including in making every effort to respect and implement human rights principles in shrimp farming practices in Indonesia.

The utmost appreciation extends to everyone involved, including researchers Yanu Endar Prasetya and Era Purnama Sari, who have generously dedicated their time and energy to this research and the completion of this report.

Wishing you an interesting read.

Sugeng Bahagijo
INFID Executive Director

EXECUTIVE SUMMARY

Aquaculture serves as a significant source of protein and an important source of income. Currently, more than half of fish (53%) consumed worldwide comes from aquaculture. Indonesia's post-harvest aquaculture industry is growing rapidly given its favorable climate and huge potential for aquaculture. With total ocean area spanning 6.4 million square kilometers, Indonesia's **economic potential is estimated to reach USD 1.3 trillion per year or more than sixfold higher than the 2021 APBN (state budget) at USD 196.43 billion.** The government should harness this opportunity to improve the welfare of aquaculture producers, including shrimp farmers, particularly as shrimp is a major fisheries commodity in Indonesia. From 2016 to 2020, shrimp dominates Indonesia's fisheries exports by around 35-40% (MMAF, 2021).

Since 2016, Indonesia has become the second largest shrimp producer in the world (around 900 thousand tons per year) with an average growth of 11.8% from 2014 to 2018 (FAO, 2020). Shrimp export value from Indonesia alone is worth USD 1.38 billion (2020) with the United States, Japan and China being the main export destination countries (BPS, 2021). Data from the Ministry of Marine Affairs and Fisheries (MMAF) show that the tax revenue from the fisheries sector in 2018 was the highest in the last five years, reaching Rp1.6 trillion or growing by 22.6% compared to the tax revenue in 2017 (Rp1.3 trillion). However, in 2020, as a result of the COVID-19 pandemic, the Ministry of Finance recorded only Rp456.4 **billion as of October 22, 2020** in non-tax revenue from the fisheries sector in the APBN.

In 2020, at least **283 fish farming companies** are in active operations in Indonesia, most of which are engaged in brackish water aquaculture (67.72%), followed by hatcheries (22.6%), oceanic aquaculture (9.2%), and the rest in freshwater aquaculture (2.5%). These companies employ **11,413 workers in total of whom only 14.46% (1650 people) are women, and the remaining 85.54% (9763 people) are men**. Of the total women workers, the majority work in production (64.42%), while the rest in non-production jobs (35.58%). In production, 12.42% of workers are female, while in non-production, 20.57% are women workers.

Since 2020, the Government of Indonesia has made plans to ramp up shrimp production and exports through the **Major Farm Revitalization Project in Shrimp and Milkfish Production Hubs through Presidential Decree No. 18/2020 on the 2020-2024 RPJMN** (National Medium-Term Development Plan). The target is to boost shrimp exports by 250% by 2024. This ambitious project aims to rev up economic growth in the fisheries sector, increase foreign exchange earnings from exports, and bolster shrimp business and investment for expanding employment opportunities (495,606 traditional farmers), and improving farmer welfare. The project focuses on four regions: the North Coast of Java, Lampung, South Sulawesi, and West Nusa Tenggara (NTB).

This study delves further into the issue of protecting and respecting human rights in the aquaculture sector, especially shrimp farming. An overview of the current situation

of shrimp farmers is illustrated in case studies on the provinces of Lampung and East Java. This research seeks to identify the vulnerable groups in the shrimp trading system amid the government's shrimp estate revitalization policy and a large-scale integrated shrimp estate development plan to be implemented in regions such as Kebumen, Central Kalimantan, and NTB in order to meet the target of increasing exports by 250% by 2024. It is therefore critical for everyone involved to make sure that the past failures and mistakes made in previous large-scale aquaculture projects are not repeated.

Through virtual interviews, the study gathers the latest information on the objective situation of shrimp farming communities and businesses in Lampung and East Java. The key respondents were farmers, leaders of farmers' associations/organizations, entrepreneurs (shrimp business/industry actors), community facilitators (NGOs and LBH), academics and practitioners who have good knowledge and experience on the ground. In addition to virtual interviews, information was also gleaned from the relevant government ministries or agencies through focus group discussions on existing government laws, regulations, and policies. The study also involved a desk research of reports by international institutions, research journals, and official government data.

The study has identified the vulnerable groups in the shrimp supply chain, to include: (1) the farmers/cultivators/producers, as shown in the conflict between farmers (smallholders) and the nucleus estate in Dipasena and Bratasena, Lampung; (2) the crew working on trawlers supplying trash fish to companies to be processed into flour as fish meal. Crew members are an overlooked group who are not considered an important component in the shrimp supply chain; (3) and women.

In an intensive shrimp farming system, women take on the extra work of getting the generator and water wheels started, removing pests, and preparing for harvest. Even so, women are typically excluded from pricing decisions. **Not to mention the denial of the rights of women working in shrimp processing units who are not provided with proper protective equipment** nor adequate sanitation, working long hours where work targets are set high. These work conditions are detrimental to the reproductive health of women workers.

In terms of the legal framework, there are **at least 28 legal instruments**, ranging from Laws to Government Regulations and Ministerial Regulations that are directly related to fish farming. There is however no specific policy for shrimp farming. The only relevant legal instrument is Law No. 7/2016 on the Protection and Empowerment of Fishers, Fish Farmers and Salt Farmers. The policy however is considered ineffective due to poor implementation.

The uncertainties or threats to shrimp aquaculture are also the result of government programs and policies, within the MMAF itself, such as the granting of aquaculture permits for intensive farms located in proximity to traditional farms. Not to mention the program and

policies introduced by other government ministries, such as permit issuance for sand mining in the upstream section of the river, which poses a threat to the supply of good quality water needed for shrimp farming. Due to such lack of protection, the duty and responsibility to protect the aquatic environment around farms are therefore unfair and unevenly distributed.

Any form of regulation on the aquaculture sector is currently limited only to a certification scheme that is highly contingent on the market mechanism and does not fully address the issue of human rights. The certification scheme places more emphasis on the technical aspects of aquaculture, paying no attention to the protection of producers (farmers), women workers, and fishing crew. There is also weak oversight of the certification process. Furthermore, certification by the MMAF based on Good Aquaculture Practices (GAP) has not benefited farmers as it has failed to provide price certainty nor is it internationally accepted.

The study has identified multiple issues, including the **increasing threat that traditional farmers are under, women farmers who continue to go unrecognized, unproductive farms due to environmental degradation, lack of government support, unresolved environmental impacts (waste in water bodies, damaged mangroves, and extreme weather), and persistent violations of women workers' rights in the post-harvest shrimp industry**. For the aforementioned issues, this research provides specific recommendations to stakeholders (government, business sector, and civil society organizations) in working towards ensuring sustainable shrimp farming, including in regards to the respect and implementation of human rights principles in shrimp aquaculture business practices in Indonesia.

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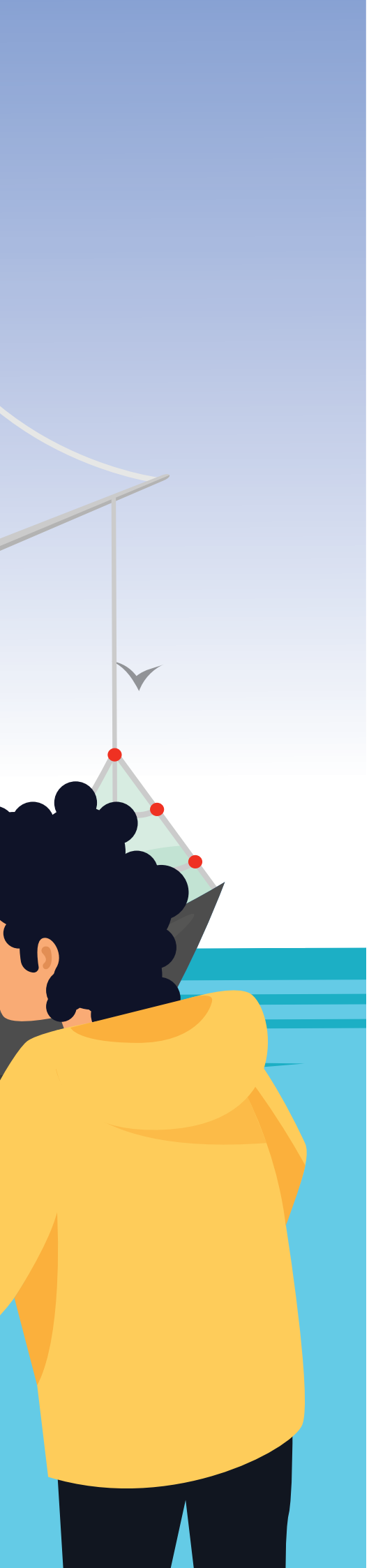


INTRODUCTION

UNGPs on Business and Human Rights

Businesses can have a direct or indirect impact on the fulfillment of the rights of workers, employees, consumers and the communities in which they operate. These impacts can be positive (increased access to employment and public services), or negative (environmental pollution, low wages, and forced evictions from communal land). Given this reality, businesses must also take on the responsibility of managing and preventing these adverse impacts.

In 2008, the United Nations (UN) adopted the **United Nations Guiding Principles on Business and Human Rights (UNGPs)**[1]**.** This framework explicitly recognizes that States have an obligation under international human rights law to protect every person within their jurisdiction from human rights violations committed by businesses. This obligation means that States must have effective laws and regulations in place to prevent and address business-related human rights harms and ensure access to effective remedies for those whose rights have been taken away.

Business entities have the responsibility to respect human rights wherever they operate, regardless of their size or type. They must also know the impacts, and are expected to prevent and mitigate the harms arising from their business practices. In other words, businesses need to know—and show—that they respect human rights in all their business activities, regardless of the State's ability or willingness to meet its own duty to protect the human rights of its citizens. As such, the State and businesses (companies) share different but complementary responsibilities.

1 https://shiftproject.org/resources/ungps101/

The UN Framework also recognizes the fundamental right of individuals and communities to access effective remedies when their rights are negatively affected by business activities. When a company commits a human rights violation, the State must make sure that those affected have access to effective remedies through the court system or other lawful non-judicial process. Companies are also expected to establish or participate in an effective complaint mechanism for any individual or community adversely affected by their business practices.

To protect, respect, and remedy are three simple terms but are indeed immensely complicated in practice. Each of them requires concrete steps from the government and companies to fulfill their respective duties and responsibilities in order to prevent human rights violations and provide remedies if such abuses were to occur. The State has the duty to protect every citizen from human rights violations by all actors in society, including companies/businesses. This means that the State must prevent, investigate, punish and redress human rights violations in connection with domestic business operations. Furthermore, the UN guiding principles recommend States to set clear targets on the need for companies domiciled and operating in their territories/jurisdictions to respect and uphold human rights.

Figure 1. The three pillars of the UNGPs

(Source: https://shiftproject.org/)

Based on the UNGPs framework above, this study seeks to explore and assess whether the core principles in Business and Human Rights have been fulfilled and implemented, especially in the aquaculture industry. This particular sector was chosen as it is still rarely discussed, in spite of its economic value, the number of workers involved, the number of companies operating, and its significant social and environmental impacts. As such, the aquaculture sector can serve as an example of how the human rights framework in business

can be implemented and guide both the State and Enterprises to ensure compliance. The study focuses on the key aspects related to the Business and Human Rights framework in companies and business practices in the aquaculture sector, especially shrimp farming as shrimp has become Indonesia's main commodity in the fisheries sector.

Business and Human Rights in the Aquaculture Sector

The issue of human rights violation in the fisheries sector is mostly raised in regards to business practices in the capture fisheries sector, and not so much in aquaculture. In the fisheries industry, we know of irresponsible fishing practices or known as **illegal, unreported, unregulated fishing** (IUUF), which remain a persistent problem in the capture fisheries sector throughout the world, including in Indonesia[2]. These practices lead to other acts of crime that directly relate to IUUF, such as **human trafficking[3], people smuggling, and/or forced labor**. Such irresponsible practices may take place offshore in capture fisheries, and in aquaculture. The capture fisheries industry has seen its fair share of cases that have caught public attention, including the slavery-like conditions endured by Indonesian crew members, such as non-payment of wages, acts of violence leading to death, and burial at sea without the consent of the family of the deceased person[4].

A 2016 study conducted by Coventry University found that cases of labor exploitation mostly befell Indonesian crew members, accounting for 48.4 percent of total cases or 1,148 cases. This was followed by human smuggling at 35.1 percent or 833 cases, and human trafficking at 12.1 percent or 287 cases. Regarding the situation for crews on foreign fishing vessels, the Indonesian Migrant Workers Protection Agency (BP2MI) had dealt with 432 cases of sea-based crew and facilitated the repatriation of 22,553 crew members in 2020. Complaints primarily revolved around non-payment or underpayment of wages[5]. In a study by Rini Tresnawati (2021), it was revealed that over the 13 months spent working on board the Long Xing 629, the Indonesian crew worked excessively long hours, without adequate food or water, and not paid the promised salary as stipulated in their employment contract. The inhumane treatment endured by the Indonesian crew on board the Long Xing 629 constitutes human rights abuse in the form of discrimination and modern slavery. A summary of such cases is provided in the table below.

2 https://www.mongabay.co.id/2019/04/22/cara-identifikasi-pelanggaran-ham-di-atas-kapal-perikanan/
3 https://www.mongabay.co.id/2018/04/23/kenapa-praktik-perdagangan-manusia-dan-perbudakan-belum-hilang-dari-kapal-perikanan/
4 https://www.greenpeace.org/indonesia/siaran-pers/45787/abk-terjaring-perbudakan-siapa-pelanggar-ham/
5 https://biz.kompas.com/read/2021/04/16/171747828/sengkarut-permasalahan-pelanggaran-ham-tak-kunjung-usai-ioji-angkat-suara-abk

Table 1. Cases of Human Rights Violations in the Capture Fisheries Industry

NO	CASE (YEAR)	DESCRIPTION
1	Vessel belonging to PT. Kwo Jeng, Taiwan (2012)[6]	Some 203 Indonesian crew members were stranded in the open waters of Trinidad-Tobago. They were not paid as promised.
2	Fishing vessel belonging to Taiwan (2014)	Some 203 Indonesian crew members were abandoned in South African waters. They were only paid for the first 4 months of work.
3	Benjina case, Aru Island (2015)	Enslavement in the marine fishing industry perpetrated by PT. Pusaka Benjina Resources, a Thai-owned company. Most of the victims were Myanmar nationals.
4	Illegal fishing vessel, KIA STS 50 (2017)	Trafficking and enslavement of 20 Indonesian migrant workers
5	Hanrong 363 vessel (2019)[7]	Forced labor, underpaid, passport withheld, contract fraud written in a foreign language, prohibited from going ashore even when the boat is docked at the port, and denied the right to seek medical help when sick.
6	Chinese fishing vessel, Long Xing 629 (2020)	Alleged exploitation and human rights violation against an Indonesian crew.
7	De Hai and Wei Fa vessels, Taiwan (2021)	Seven (7) Indonesian crew members disappeared in Mauritian waters with alleged crimes committed on board.
8	KM Jaya Utama (2021)[8]	Seven (7) crew members were abandoned at the Merauke fishing harbor, Papua

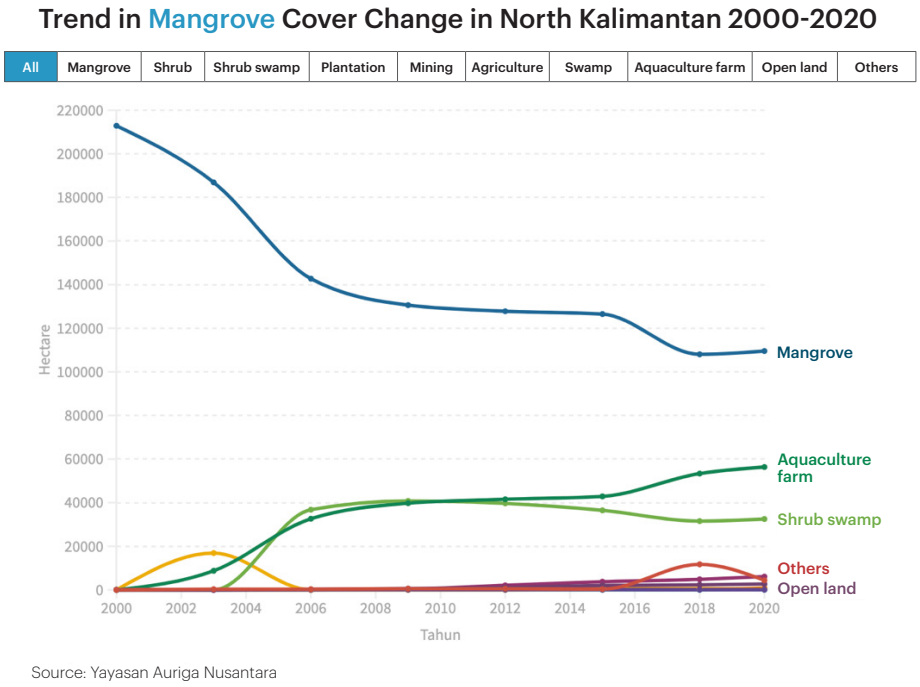
Human rights and fisheries observers opined that **Law No. 18/2017 on the Protection of Indonesian Migrant Workers does not sufficiently address the maritime labor issues in the fishing industry**. In addition, Law No. 17/2008 on Shipping and Law No. 40/2007 on Limited Liability Companies that set the benchmark for manning agents reflect the Government's lack of control and oversight of maritime labor cases.[9] The latest modus operandi of stealing fish in Indonesian waters by foreign fishing vessels is by employing an Indonesian crew. In 2021, MMAF arrested 140 fishing vessels, consisting of 92 Indonesian boats in breach of law and 48 foreign vessels stealing fish. Seventeen of the foreign fishing vessels caught were Malaysian-flagged, 6 were Philippine-flagged, and 25 were Vietnamese-flagged.[10]

Research conducted by the Indonesian Ocean Justice Initiative (IOJI) highlighted at least four key issues related to crews on foreign vessels. *First*, overlapping spheres of authority in crew recruitment and placement. *Second*, unintegrated database systems on crews. *Third*, ineffective supervision and law enforcement, especially against human trafficking. *Fourth*, lack of awareness and information among prospective crew members.[11]

6 https://www.alinea.id/nasional/diperbudak-di-laut-gaji-disunat-badan-disuntik-morfin-b1ZNd9u14
7 https://www.benarnews.org/indonesian/berita/greenpeace-abk-wni-kerja-paksa-06032021145057.html
8 https://www.antaranews.com/berita/2032984/dfw-tujuh-orang-awak-kapal-perikanan-terlantar-di-merauke
9 https://www.antaranews.com/berita/2699697/tragedi-yang-menimpa-awak-kapal-ikan-wni-jangan-sampai-terus-berulang
10 https://www.mongabay.co.id/2021/10/04/maraknya-kapal-asing-pencuri-ikan-gunakan-abk-dari-indonesia/
11 https://www.antaranews.com/berita/2099662/ioji-temukan-masih-ada-pelanggaran-ham-abk-indonesia-di-kapal-asing

This study however will focus more on business and human rights in the aquaculture industry, especially shrimp farming. Aquaculture practices are not only about human rights issues, but also concern **environmental degradation**, such as the destruction of mangrove forests in coastal areas. In North Kalimantan for example, aquaculture practices have led to environmental damage.[12] In the last two decades, its mangrove forests have shrunk by 48.53% to mostly make way for shrimp and milkfish ponds. However, many of these lands have now been abandoned for being unproductive (**less than 10 kg/ha per year**).[13]

In 2020, the North Kalimantan Provincial Government found that 41% of mangroves were heavily damaged due to **conversion into aquaculture farms**. North Kalimantan is listed among the provinces where the mangrove deforestation rate is high. From 2000 to 2020, mangrove acreage in the province decreased by 48.53%, from 212,858.91 hectares to 109,547.62 hectares. The impact is undeniably devastating as the entire mangrove forest ecosystem and the life it supports would be lost. Damage to mangrove forests also hampers climate change mitigation.



Source: Yayasan Auriga Nusantara

Figure 2. Trend in mangrove cover change in North Kalimantan (2000-2020)

12 https://korankaltim.com/headline/read/21783/waduh-hutan-mangrove-kaltara-berubah-jadi-tambak
13 https://www.ekuatorial.com/2021/06/hutan-mangrove-telanjur-dibabat-namun-tambak-tak-menghasilkan/

The government has made attempts to curtail mangrove deforestation driven by land clearance for aquaculture farms. **Pursuant to MMAF Regulation No. 75/2016**, the government prohibits farmers from opening new aquaculture farms in mangrove forests and in the core zones of conservation areas.[14] As an alternative, farmers are encouraged to build shrimp ponds using **simple technology** with the *wanamina* (silvofishery) technique. The government recently collaborated with the World Bank to initiate the Mangrove for Coastal Resilience Program (M4CR).[15] The government ban however **contradicts its own policy of boosting shrimp exports** by 250% in 2020-2024. The economic value of large-scale shrimp farms will clearly be a factor perpetuating the conversion of mangrove forests. Forest entrepreneurs who have mangrove forests in their concession areas will not hesitate to capitalize on the economic opportunity (multibusiness).

History has shown that human rights violations in the aquaculture sector have long been perpetrated by large companies, specifically in Dipasena, South Lampung (Fadilasari, 2012). Such abuses arise out of a relationship pattern in the production process that is akin to slavery and extortion.[16] Companies offer a business scheme to farmers that involves land or property collateral in return for a loan to buy feed and the purchase of their yields. This type of collaboration in principle is a loan scheme. Farmers however have no bargaining power whatsoever on how long it would take to pay the debt off, not to mention the company's lack of transparency. Furthermore, farmers are not allowed to leave the farms, not even to visit their hometowns. If they were caught taking fish (for own consumption) from the river canal, the company will threaten to press criminal charges. The company uses the fish in canals to feed on the waste from shrimp feeding. As farmers fall deeper into debt (failure to repay) and are denied the right of association, any attempt of objecting or protesting will only to be met with violence that can even lead to fatalities (Fadilasari, 2012).

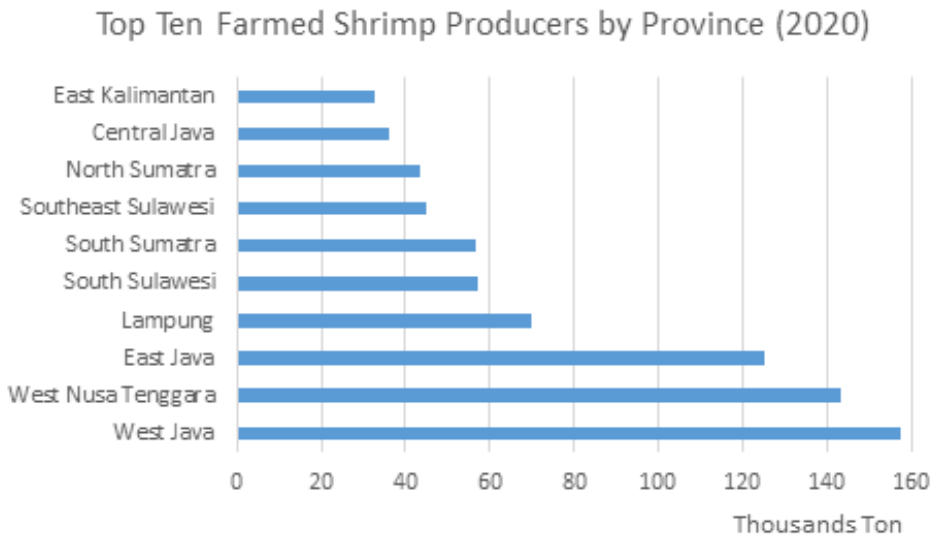


Figure 3. Farmed shrimp producers in Indonesia

14 https://www.forestdigest.com/detail/693/mangrove-antara-tambak-udang-dan-kelestarian

15 https://bisnis.tempo.co/read/1562234/selaras-isu-utama-g20-indonesia-gandeng-world-bank-dalam-proyek-mangrove/full&view=ok

16 https://nasional.kompas.com/read/2018/07/26/17543191/petambak-udang-dipasena-merasa-diperas-perusahaan-milik-sjamsul-nursalim?page=all

The vulnerable groups identified in the shrimp supply chain are as follows: (1) the farmers/producers; (2) the crew working on trawler boats that supply trash fish to companies for further processing into flour as fish meal. Crew members are an overlooked group who are not seen as an important component of the shrimp supply chain; (3) women. In intensive shrimp farming, women do the extra work of getting the generator and water wheels started, removing pests, and preparing for harvest. Even so, women are typically excluded from pricing decisions.

In the fisheries supply chain, women are typically found working in the post-harvest chain, especially in developing countries. In Indonesia, women workers dominate the fish processing and marketing sector, where their participation rate is estimated to be 1.5 to 1.7 times higher than that of men. An FAO study showed that women tend to have lower value opportunities. There is a notable dearth of studies pertaining to women's involvement in the aquaculture supply chain and what the benefits and risks are to them. A deeper understanding of this is necessary to improve aquaculture policies, programs and projects in order to better involve, benefit and empower women (Worldfish, 2017).

Meanwhile, an Oxfam study (2018) found that women shrimp peelers at a processing plant in Surabaya reported having their rights violated for the sake of meeting production targets. These violations included the lack of proper safety and protective equipment, inadequate sanitation, long working hours, and demanding performance targets. This has affected the reproductive health of the women workers. This illustrates how women workers' rights are far from being fulfilled (Widyaningrum & Rohman, 2020).

Problem Statement

Given the background above, this study raises the following key research questions:

1. What is the general picture of the current situation of shrimp farming in Indonesia?
2. What are the forms of human rights violations found in shrimp farming practices in Indonesia?
3. What is the role of stakeholders in protecting and respecting human rights and providing access to effective remedy for those involved in the shrimp farming business?
4. How are the gender relations in shrimp farming practices in Indonesia?
5. What are the potential and actual impact of shrimp farming practices on the environment in Indonesia?

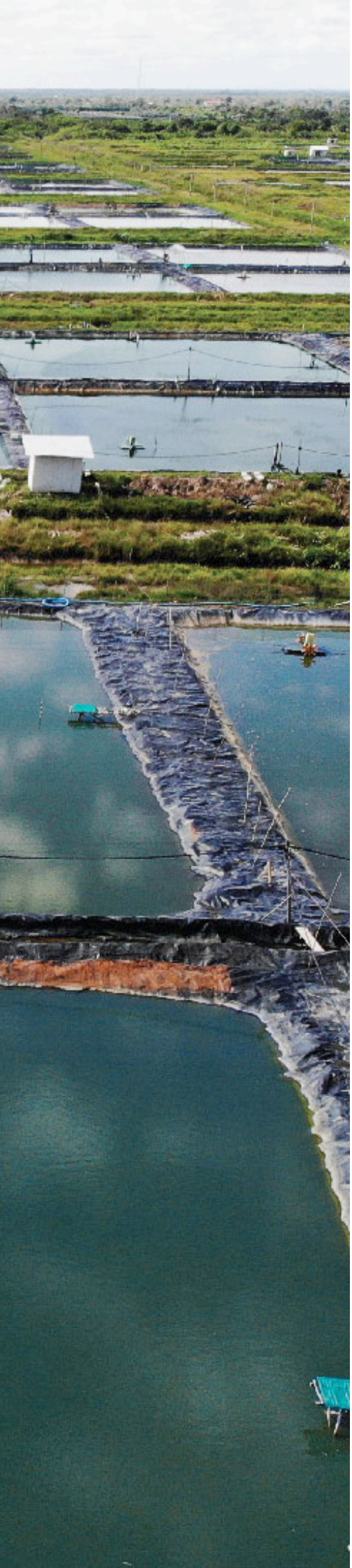
Methodology

This research was conducted in the midst of an ongoing COVID-19 pandemic, specifically during the third wave of the pandemic from late 2021 to early 2022. Data were mostly collected virtually and through a literature review. Using a qualitative approach, the researchers gleaned in-depth information from key respondents considered to have the knowledge, experience, and expertise in the field of aquaculture, especially shrimp farming. The key respondents represented stakeholders that included the National and Local Government, Academics/Researchers, NGOs/CSOs working with farmers/cultivators, and enterprises operating in the shrimp business and shrimp supply chain in Indonesia. The respondents were initially selected through purposive sampling based on the research location. Along the way, respondents were also selected through the snowball sampling of key respondents who had been previously interviewed.

The Key Respondents interviewed for this study represent the following institutions:

1. People's Coalition for Fisheries Justice (KIARA)
2. Indonesia Aquaculture Society (MAI)
3. PT. Alter Trade Indonesia (ATINA)
4. Indonesia Conservation (KOIN)
5. Sisterhood of Indonesian Fisherwomen (PPNI) of Lampung
6. LBH Lampung
7. MSC (Marine Stewardship Council)
8. Shrimp Farmers' Association (P3UW) of Lampung
9. Friendship Forum (Forsil) of Bratasena Lampung

The literature review for this research drew primarily from reports released by international institutions, relevant research journals, and the government's official statistical data. News reports in the mass media and the internet on ongoing cases were also reviewed. Data were also collected through **Focus Group Discussions (FGD)**. The first FGD was held virtually on February 10, 2022 to discuss government policies and regulations aimed at increasing farmed shrimp production and ensuring the sustainability of shrimp farming in Indonesia. This first FGD was attended by representatives from the Ministry of Marine Affairs and Fisheries, the Coordinating Ministry for Maritime and Investment Affairs, the Ministry of Law and Human Rights, and Universities (IPB University). In addition, the research underwent internal and external peer reviews, involving government ministries/agencies such as Komnas Perempuan (National Commission on Violence against Women), Komnas HAM (National Commission on Human Rights), and other organizations/institutions deemed qualified to provide suggestions and inputs to strengthen research data and quality.



FINDINGS AND DISCUSSION

Aquaculture (Shrimp Farming) Potential in Indonesia

The term aquaculture broadly refers to the cultivation of aquatic organisms that include finfish, mollusks, crustaceans, and seaweeds. It is part of the solution to food security due to efficient protein production compared to other branches of animal husbandry. Fish farming, for example, is sevenfold more efficient in terms of feeding than beef production. The aquaculture industry also has a lower carbon footprint compared to other branches of animal husbandry as it requires less water, energy, feed and fuel per cycle.

Fish farming is also one of the sustainable solutions to feed the world's growing population. Today, 53% of all fish consumed comes from aquaculture, making it an important source of protein for people around the globe. As the world's fastest growing food industry, aquaculture grew by more than 21 times since the 1970s (Green Trade Initiative Foundation, 2018).

Aquaculture can be carried out using different systems, such as ponds, tanks, nets and cages. An important difference between these systems is the degree of intensification based on the use of technology and production inputs such as feed, seeds, labor, capital, and management. Aquaculture can take place in fresh water, sea water or brackish water. It can be done extensively, semi-extensively, and intensively. Based on FAO data (2018), Asia is the largest contributor to aquaculture production (89%).

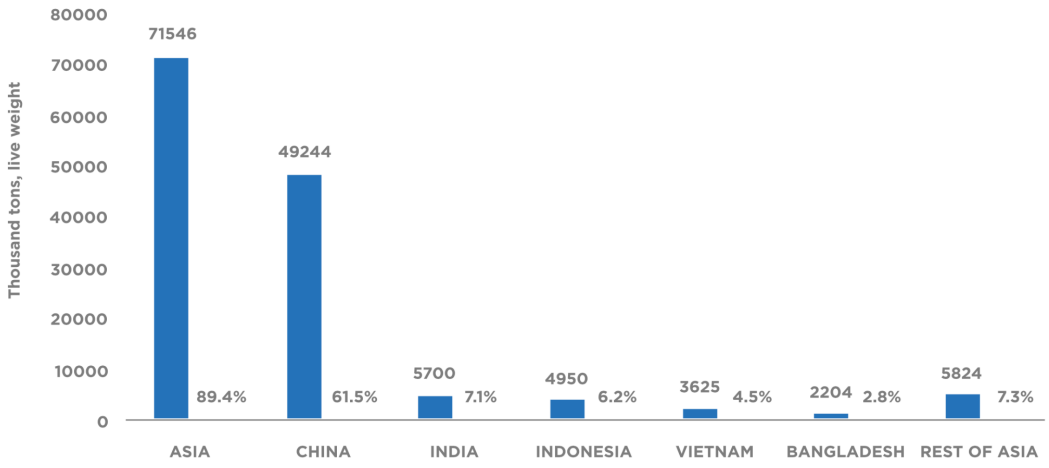


Figure 4. Contributors to global aquaculture production (2018)

Indonesia has a diverse array of aquaculture species, ranging from freshwater aquaculture to marine aquaculture, from onshore to offshore aquaculture. Indonesia cultivates more than ten freshwater aquaculture species, including tilapia, silver catfish, goldfish, walking catfish, gourami, silver barb, nilem carp, snakehead, giant prawn, and others. The vannamei or whiteleg shrimp and Asian tiger prawn fetch the highest value in brackish water aquaculture. In marine aquaculture, Indonesia produces high-value products such as grouper, sea bass, pomfret, mollusks, and seaweed. Of all fish producers in Indonesia, 80% are small-scale farmers,[17] and the remaining 20% are large companies. As for shrimp production, 70% of the farms are smallholdings and 30% are owned by large companies.

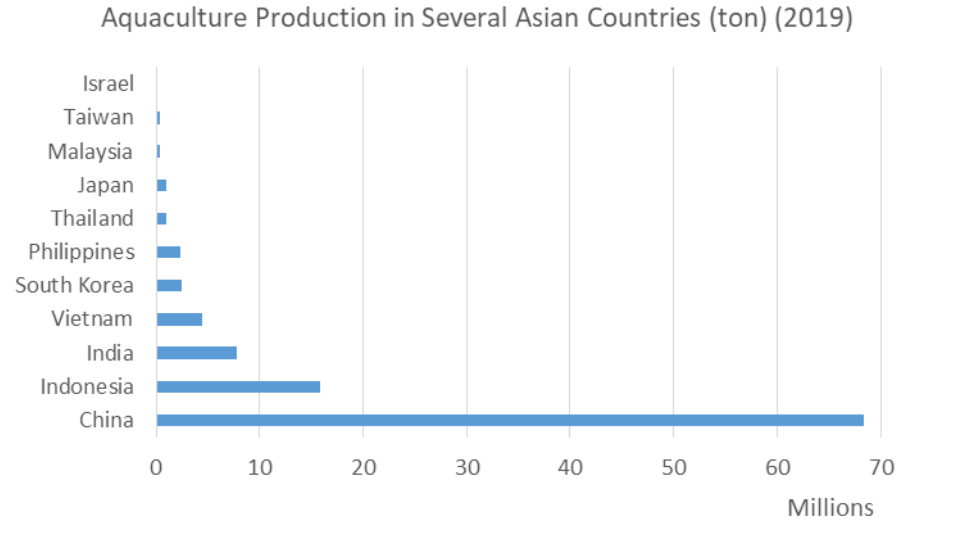


Figure 5. Indonesia ranks second in global aquaculture production (2019)

17 The government's definition of small-scale farmers: adopting simple technology in aquaculture on at least 2 hectares of farm acreage in freshwater and seawater, and less than 5 hectares in brackish water.

Aquaculture production is projected to overtake capture fisheries production by 2027 to account for 52% of all fish production by 2030 (OECD/FAO, 2021). Vast stretches of coastline and a warm tropical climate have enabled Indonesia to become one of the top 4 fisheries producers. Indonesia's coastline is the second longest in the world after Canada (95,181 km). The archipelago also has roughly 24 million ha of coastal waters suitable for mariculture with a sustainable production potential of around 60 million tons/year (the largest in the world) and an on-farm economic value worth US$120 billion per year. Around 3 million ha of coastal lands are suitable for aquaculture with a production potential of 30 million tons/year and an on-farm economic value of US$60 billion/year.

It is an undeniable fact that marine fish stocks are fast depleting due to multiple reasons, including the climate crisis. In addition, capture fisheries are understood as the exploitation of fisheries resources. As capture fisheries are on a decline, compounded by an exploitative practice, aquaculture production is therefore highly encouraged. As a result, shrimp with its high economic value has become Indonesia's main commodity in fisheries industry. In 2016-2020, shrimp dominates Indonesia's fisheries exports in terms of value at around 35-40% (MMAF, 2021). Since 2016, Indonesia has become the world's second largest shrimp producer at 900 thousand tons per year with an average growth (2014-2018) of 11.8% (FAO, 2020). **The export value of shrimp from Indonesia alone is worth USD 1.38 billion (2020) to major destination countries that include the United States, Japan and China (BPS, 2021).**

About 30% (60 million ha) of Indonesia's total land area (190 million ha) consists of freshwater ecosystems, such as rivers, lakes, dams, and swamp waters. Of the 60 million ha of freshwater, around 5 percent (3 million ha) are suitable for aquaculture with a production potential of 15 million tons/year and an on-farm economic value of US$22.5 billion/year. Aquaculture production potential is estimated to reach more than 105 million tons/year, while on-farm economic potential for aquaculture in seawater, brackish water (ponds) and freshwater water (inland) is worth more than US$202.5 billion/year, almost the same amount as the APBN (State Budget) in 2016. If every hectare of an aquaculture farm requires only one worker, total on-farm employment would be around 30 million people. Not to mention the economic value and labor absorption in the backward- and forward-linkage industries of the aquaculture business.[18]

As growth in the capture fisheries sector has been relatively stagnant, the growth of the fisheries industry becomes increasingly dependent on aquaculture, especially on shrimp, fish and seaweed production. The shrimp farming industry, for example, is experiencing rapid growth with an export value of USD 2.3 billion (2014), exceeding the combined value of the fish and seaweed industries (Halim & Juanri, 2015). Based on 2020 data on fishing companies, at least **283 fish farming companies** are in active operations in Indonesia. In regard to

18 https://www.kompasiana.com/rdteam1/58291f0e7a93737b073f4a51/melongok-potensi-industri-akuakultur?page=all&page_images=1

the type of aquaculture business, most of the companies, at 67.72% (186 companies), are engaged in brackish water fish farming, followed by 64 companies in hatchery production, 26 companies in mariculture, and 7 companies in freshwater fish farming.

These companies employ **11,413 workers in total, of whom only 14.46% (1650 people) are women, and the remaining 85.54% (9763 people) are men**. Of the total women working in aquaculture enterprises, the majority, at 64.42%, work in production, and the remaining 35.58% in non-production. However, in both production and non-production jobs, the majority of workers are male. Only 12.42% of those working in production are female, and only 20.57% of women workers in non-production.

Apart from working in processing sector, the majority of coastal households depend on aquaculture as their main source of livelihood. Based on MMAF data (2020), there are **126,193 mariculture households** in Indonesia. This is a 0.91% increase from 2019 at 125,045 households. East Nusa Tenggara (NTT) has the highest number of mariculture households (27,116), followed by Central Sulawesi (12,313) and East Java (8,039). With oceans covering an area of 6.4 million square kilometers, Indonesia's **total economic potential is estimated at US$ 1.3 trillion per year or more than six times the 2021 APBN at US$ 196.43 billion.**

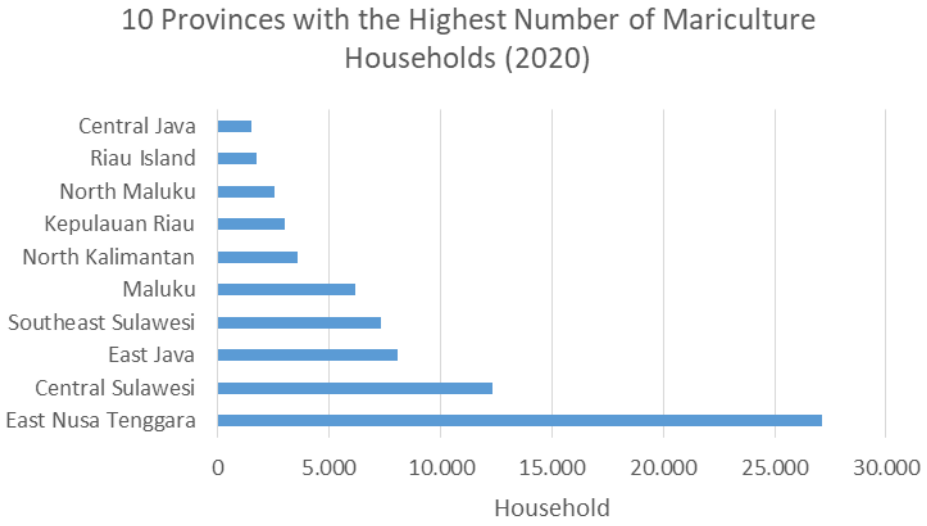


Figure 6. Number of mariculture households in Indonesia (Top Ten, 2020)

According to MMAF data, tax revenue from the fisheries sector in 2018 was the highest in the last five years. It amounted to IDR 1.6 trillion, up 22.6% compared to 2017 at Rp1.3 trillion. However, in 2020, the Ministry of Finance recorded only Rp456.4 billion in non-tax revenues in the APBN from the fisheries sector as of October 22, 2020. As state revenue fell as a result of the COVID-19 pandemic, the Revenue Sharing Fund from Natural Resources (DBH SDA) distributed to local governments has also decreased. According to the Ministry of Finance, the share of DBH SDA contracted by 24.62% to Rp46.5 trillion in 2020 compared to the previous year at Rp61.68 trillion.

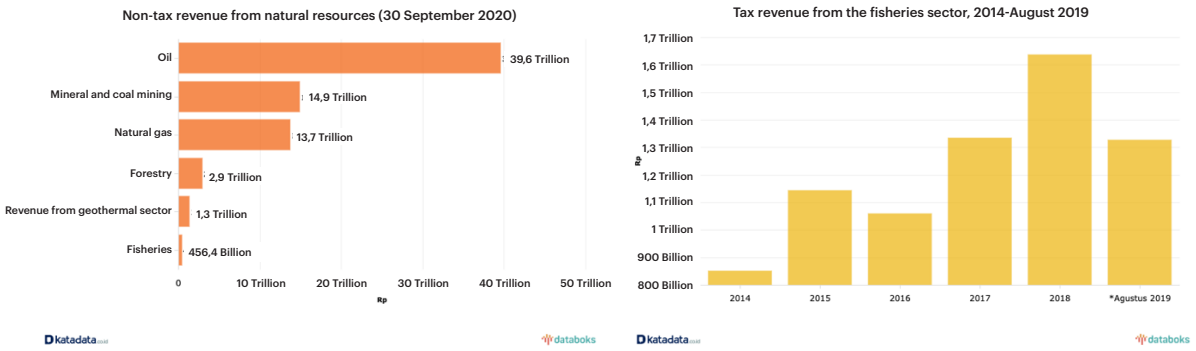


Figure 7. Tax revenue from the fisheries sector

In 2021, based on MMAF data, non-tax revenue from the aquaculture sector surpassed the government's target that was set at Rp19.91 billion. As of November 2021, non-tax revenue amounted to Rp27.8 billion.[19] This was derived from four main commodities—shrimp, lobster, crab, and seaweed. Shrimp and fish production by the third quarter of 2021 totaled 12.25 million tons. Compared to 2020, production in 2021 increased by one million tons. By the third quarter of 2021, the MMAF recorded Rp4.36 billion in revenue from the aquaculture sector. The Fish Farmer Exchange Rate (NTPi)[20] unfortunately **still hovered at 103.08, much lower than the target set by the MMAF at 140**. Nevertheless, the NTPi and NTPUi continued to experience an upward trend.

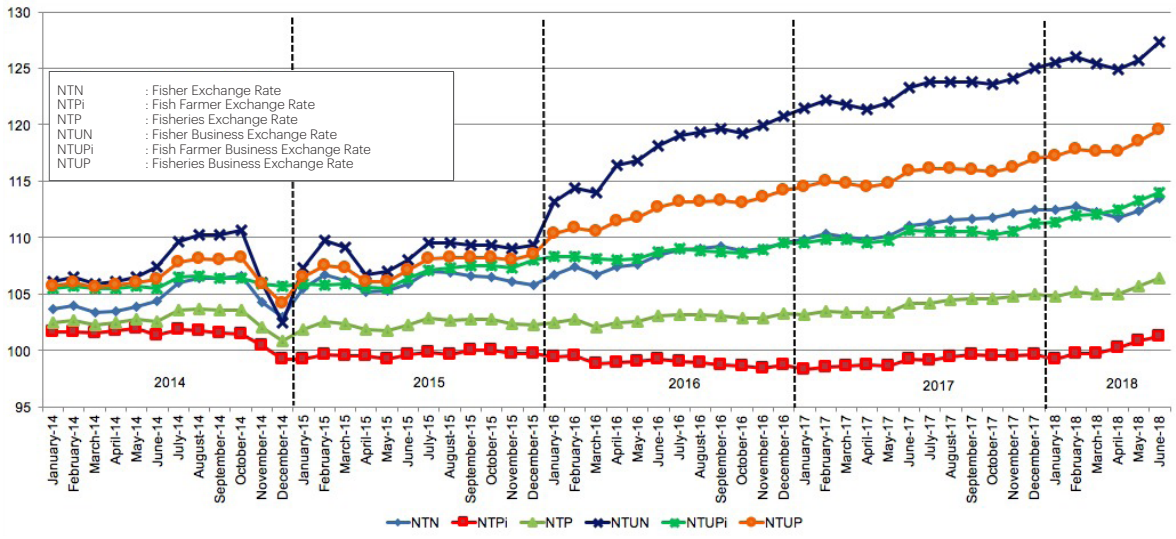


Figure 8. Trend in Fish Farmer Exchange Rate (NTPi) (2014-2018)

19 https://mediaindonesia.com/ekonomi/452103/capai-pnbp-perikanan-budidaya-278-miliar-kkp-lewati-target

20 By definition, the Fish Farmer Exchange Rate (NTPi) is the ratio between the price index received by fish farmers (It) and price index paid by fish farmers (Ib), expressed as a percentage.

Shrimp is the mainstay of Indonesia's fisheries industry. From 2016 to 2020, shrimp dominated Indonesia's fisheries export value at around 35-40% (MMAF, 2021). Since 2016, Indonesia has become the world's second largest shrimp producer at 900 thousand tons per year with an average growth (2014-2018) of 11.8% (FAO, 2020). **The export value of shrimp from Indonesia alone is worth USD 1.38 billion (2020), mostly destined for the United States, Japan and China (BPS, 2021).**

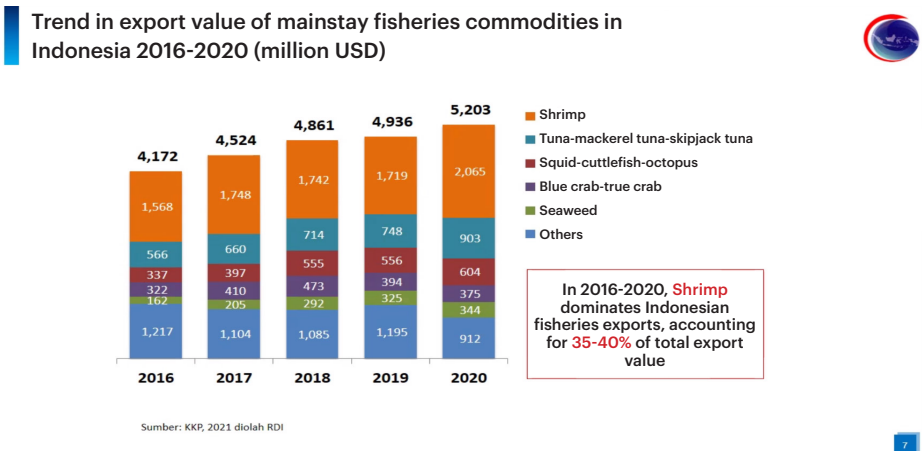


Figure 9. Trend in export value of mainstay fisheries commodities in Indonesia (2016-2020)

There are at least **5 categories or models** of shrimp culture systems that are common to Indonesia. *First*, **traditional (extensive) farming**. This model relies heavily on wild shrimp seeds. This calls for the selection of the right location where shrimp fry or seeds can be found. At high tide, the pond's sluice gate will be opened to allow shrimp to enter before closing it. The captured shrimp will be harvested after 6 months. Maximum productivity per year per hectare will only reach 1 ton.

Second, **improved traditional farming**. Like traditional farming, this model also depends on nature, but with higher stocking density of shrimp seeds and greater human intervention in aquaculture management. Third, **semi-intensive farming**. This model uses shrimp fry (seeds) that are not obtained from the wild but from hatcheries. However, it has low stocking density at less than 20 shrimps per square meter. The shrimp pond has no more than two waterwheels per hectare.

Fourth, **intensive farming**, with a minimum stocking density of 60-150 shrimps per square meter and a minimum of 8 water wheels per hectare. Due to a denser/higher level of stocking, more feed is required. For example, if the shrimps are nourished with 1.3 kilograms of feed, it will produce 1 kg of shrimp meat. A commercial feed packaging would normally provide information on the FCR (feed conversion ratio) of either 1.3 or 1.2. This means that if the feed ratio is 1.3 kilograms, it will produce 1 kilogram of shrimp, and the remaining 0.3 kilograms will become waste. Meanwhile, saltwater farms without waterwheels installed will generate inorganic waste, which will in turn pollute the pond water. The waterwheels therefore have an important function in waste management.

Fifth, **super-intensive farming**. This model is characterized by highly controlled pond conditions, high productivity, multiple benefits, and has a good Waste Water Treatment Plant (WWTP). In super-intensive ponds, densities range from 500 to 1250/sqm. However, super-intensive shrimp farming leads to a culture system waste load that can reduce the quality of the aquatic environment.[21]

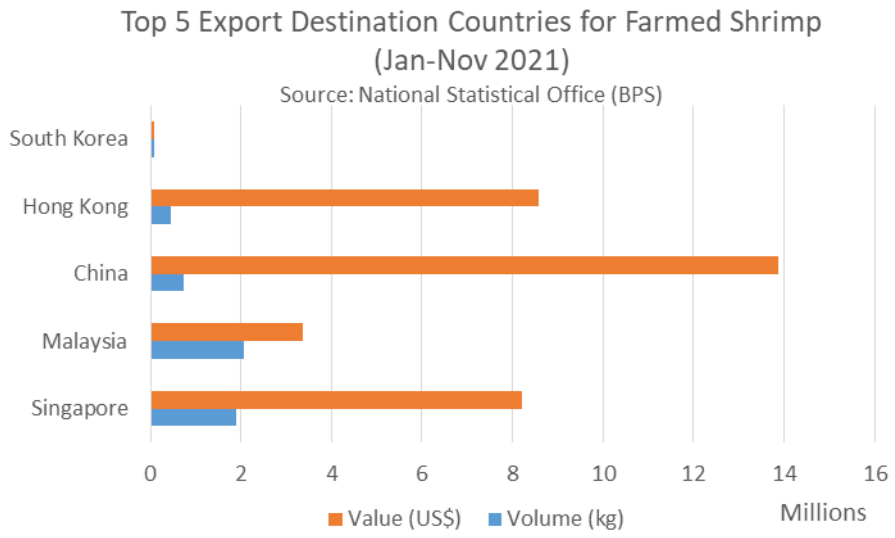


Figure 10. Largest shrimp export destination countries (2021)

In traditional shrimp farming, the farm owners are also the workers. Semi-intensive and intensive farms on the other hand usually hire workers. In a semi-intensive farm, for example, one hectare generally requires 4 people to manage the feed and monitor water quality. The shrimp farm is an aquabusiness model consisting of **3 subsystems**:

First, the **on-farm subsystem** for pond-based cultivation or rearing. The key actors are the capital owners and the workers. A typical modern farm would have a chief engineer or hire aquaculture graduates. A ten-hectare farm would normally have a university graduate/head who manages around 40 workers. *Second*, the **production input subsystem** that consists of: 1) Shrimp fry or seeds. A semi-intensive farm obtains their fry or seeds from a hatchery; 2) Feed; and 3) Enzymes (growth stimulants) to accelerate shrimp growth. Other factors of production are electricity or fuel as modern farms require waterwheels for aeration. Hatchery owners, facility and infrastructure providers, shrimp feed mills and others are involved in the production input subsystem. There are 2 (two) types of feed companies: multiproduct and single product manufacturers. For example, Charoen Pokphand is a multinational company engaged in more than 2 or 3 core businesses, which include the production of fry, medicines and feed. Other examples are Java Comfeed Indonesia (Japfa/JPFA), and Matahari Sakti, a mono-product company that only produces feed and nothing else. *Third*, the **post-harvest subsystem**, which includes the processing, packaging and marketing sectors. The key actors are the capital owners and factory workers/employees.

21 https://infopublik.id/kategori/nasional-ekonomi-bisnis/480481/kkp-kembangkan-budidaya-tambak-super-intensif

The MMAF is a government body responsible for managing and developing fisheries resources, including aquaculture. The scope of its economic duties and functions focuses on the following areas.[22] *First*, **capture fisheries**, both marine and inland. The sustainable production potential of Indonesia's marine capture fisheries is 12.5 million tons/year. As for inland capture fisheries, the sustainable production potential for species such as snakehead fish, anchovies, knifefish, redtail catfish and walking catfish, is 3 million tons/year. The habitats of inland fisheries include lakes, rivers, freshwater swamps, and reservoirs.

Second, **aquaculture**. Based on the projections of the MMAF and other research institutions, Indonesia's sustainable aquaculture production potential is estimated at 1 million tons. Aquaculture consists of three habitats: the sea (mariculture); coastlines (coastal culture) such as shrimp, seaweed and milkfish ponds; and inland waters such as in Maninjau, Lake Toba, Jatiluhur, Saguling, and other freshwater ponds. In addition to the three habitats, other ecosystems have also been developed, such as the Mina Padi (integrated rice-fish farming) model, which includes product diversification that is not only limited to fish and rice, but also eggplants and chilies. Polyculture combines fish and food crops (agriculture), not only rice, but also melons and others.

Third, the **processing industry** that includes businesses that produce processed fish products, such as tempura, canned fish, seaweed, and carrageenan. *Fourth*, **biotech resources** management, which includes the use of marine biota or aquatic biota. Aquatic biota can be found in marine or oceanic ecosystems, as well as in freshwater. *Fifth*, **small island management**. *Sixth*, **salt** production. The salt production system falls within the purview of the MMAF, while the process is under the authority of the Ministry of Industry. *Seventh*, **unconventional marine resources**. This includes an ocean energy model that comes under MMAF's authority, and not the Ministry of Energy and Mineral Resources.[23]

Since 2020, the Government of Indonesia has made plans to Accelerate Shrimp Production and Exports through a **Major Project for Revitalization of Shrimp and Milkfish Farms in Production Hubs under Presidential Decree No. 18/2020 on the 2020-2024 RPJMN (National Medium-Term Development Plan)**. Based on the plan, the target is to boost shrimp exports by 250% by 2024. This ambitious project aims to bolster economic growth in the fisheries industry, increase foreign exchange earnings from exports, and to bolster shrimp businesses and investment for job expansion (495,606 traditional farmers) and elevating farmers' welfare. The MMAF has initiated pilot project modeling and a revitalization program in several regions across Indonesia, including East Aceh (500 ha), Sumba in NTB (500 ha), Kebumen in Central Java (100 ha), and Muna in Southeast Sulawesi (500 ha). The revitalization program (on-farm) will cover an area of 250 ha in Kota Baru, South Kalimantan, and another 250 ha in South Konawe, Southeast Sulawesi.[24]

22 Interview with MAI
23 Interview with an MAI respondent
24 https://www.agrofarm.co.id/2022/02/44255/

The farm revitalization policy adopts a four-pronged strategy:

1. Revitalize smallholdings and modeling of semi-intensive and intensive farms, shrimp estates and aquaculture villages.
2. Promote technological innovation and adoption to increase production and productivity.
3. Develop supporting infrastructure: roads, electricity, water, markets, WWTPs, and cold storage.
4. Develop the national shrimp hatchery and broodstock industry and fish health management.
5. Manage and implement coastal spatial planning and simplify permitting procedures.

Given the government's ambitious goals, it comes to no surprise if two points of view emerge; optimistic, and pessimistic or fear of policy failure and its adverse impact. Within the aquaculture and shrimp supply chain, there are bound to be vulnerable groups that are in dire need of more support. This research delves further into who these vulnerable groups are and how they fare amid the government's proposed farm revitalization policy. There is also the question of potential human rights violations, such as forced labor, child labor, and even human trafficking, which is commonplace in capture fisheries. This research on human rights violations in the aquaculture industry is important considering the enormous economic and labor absorption potential of the fisheries sector.

Traditional Shrimp Farming in Sidoarjo, East Java

Traditional farms are highly dependent on environmental conditions, from beginning to end of the culture process. It starts with the selection of shrimp seeds or fry to be reared for optimal growth. Most traditional farmers do not pay much attention to the quality of the seeds, simply buying and stocking them into ponds. Within 2 or 3 months, they will be harvested. Whether harvest is successful or not, solely depends on nature and the environment. The shrimp mortality rate is often much higher. Traditional farmers use natural feed through pond conditioning to maintain the natural food source for shrimps. As juveniles feed on plankton and zooplankton, water and soil management is crucial. As they grow, they will also feed on worms, and this requires a suitable environment for the growth of worms as a feed source.

Traditional farmers rely more on visual water quality control. Rarely do they use technology-based tools, such as in measuring water salinity. They would simply have to rely on their tongue. Traditional farmers avoid artificial feed as it requires special pond treatment. Artificial feed leaves residue on the soil, which impacts on the environment. This will also drive on-farm processing costs upwards.

Traditional farmers in Sidoarjo, for example, have an average of 3 hectares of land, which is fairly large compared to traditional farmers in other regions such as in Pinrang, South Sulawesi. In Pinrang, the typical farmer owns only 1 hectare of land. **They mostly produce**

tiger prawns that are highly sensitive creatures. Worsening environmental conditions will inevitably affect shrimp productivity, especially tiger prawns. Tiger prawns fetch a higher price, usually double the price of the vannamei shrimp.

In the past, traditional farmers only had to stock the seeds and leave them to grow naturally. After three months, the pond is ready for harvest. These golden times however took place only from 1998 to 2000. It was a time when environmental conditions were favorable, and farmers could carry on with their usual routine. For example, when the dry season arrives in October, farmers would start the drying process, which usually takes one month. Seasonal weather conditions are now no longer the same or "normal". Under normal circumstances, farmers can harvest within 3 months. However, farmers may have to harvest earlier, after two months and not the usual three months, when shrimps are infected by disease. After harvest, the farmers will take one week to dry the pond before restocking. On average, traditional farmers can harvest 3 times a year.

Extreme weather changes also have had a significant impact on shrimp farming, specifically on the supply of oxygen. In the event of rain with wind, shrimps tend to become inactive, preferring to stay still at the bottom soil with reduced appetite, thereby rendering them weak and susceptible to disease. Traditional ponds are ill-equipped to increase the oxygen level or to anticipate a decrease in pH.

The current situation makes it harder for traditional farmers due to lack of intensive treatment. This is attributable to the significant decrease in the environmental carrying capacity. Farmers need be more adaptive to technological innovations as they can no longer rely on their old ways of leaving everything to nature. In the past, traditional farmers could not care less about BMKG's (Agency for Meteorology, Climatology and Geophysics) weather forecasts. Farmers are now more informed of BMKG weather predictions, even sharing them on WhatsApp group.

If a shrimp farm is no longer productive, it may be sold off. To switch to intensive farming, farmers would have to seek and depend on financiers. This is usually not a preferred option for genuine farmers, but it is for those backed by feed companies and suppliers. These new farms are generally located close to a village where access to tidal waters is relatively difficult. Consequently, the farms become less productive and would eventually shift to intensification. **These intensive farms mostly culture vannamei shrimp.**

The new intensive farms have had a major impact on traditional farms, especially relating to water quality. Water quality degradation where ammonia levels are higher than they should be, occurs due to residues from shrimp feed, when the flow of water in traditional farms passes through a single canal. The presence of an intensive farm in the upper area meant the merging of water flows, which will affect the quality of shrimp cultured in the lower area.

Farmers thus far simply accepted the situation. They tend to get around the problem rather than meeting it head-on. For example, if an intensive farm is draining water, the farmer would warn the traditional farmer to temporarily not use the poor-quality water. They consider this manner of cooperation somewhat helpful. Furthermore, shrimp cultured in concrete tanks will have environmental consequences. The soil will quickly saturate, and within five years, the farm will usually be abandoned due to a broken ecosystem cycle.

For the farmers, the traditional system is actually more profitable as it involves minimal costs but generates a reasonable yield. As environmental conditions significantly affect shrimp health, farmers operating in the same area should no longer be working in silos, but need to support each other.

Based on trials carried out by KOIN, a one-hectare farm stocked with 20,000 shrimps would costs around Rp7 million for seed purchases and maintenance. During harvest, the shrimp yield is worth Rp27 million for one cycle (80 days). This does not include the milkfish yield, usually cultured in the same location. Milkfish has a high survival rate that normally reaches 80%. A one-hectare farmed stocked with 2500 milkfish seeds can be harvested after 5 months or more where a kilogram would consists of 6 to 8 fish. Milkfish feed on algae and rotting aquatic plants in the pond. In traditional farms, this particular source of food can be naturally found, and therefore do not require artificial feed or trash fish. It also means far less residues. In addition, they use very little supporting equipment.[25]

This culture method is considered fairly profitable. Intensive farming involves a fixed feeding schedule, but not necessarily for traditional farming. The floodgate to control the inflow and outflow of water follows the ebb and flow of tidal waters. Farmers only need to observe water quality conditions. They would replace the water if they think it is necessary. Otherwise, it will be left as it is. As such, farmers can focus more on pond management to ensure the growth of plankton and zooplankton. This can be done, for example, by removing aquatic weeds that grow in the pond, and repairing leaking pond bunds.

Traditional farms in Sidoarjo are mostly managed by families (family-owned farms), who also hire workers. The work relationship is not overly formal. A profit-sharing scheme (percentage) between the farm owner and caretaker is preferred. The amount depends on the mutual agreement of both parties. However, the caretaker typically gets 20% share of the total harvest yield, after deducting costs incurred during the production cycle. If the yield after expenses amounts to Rp27 million, then 20% or around Rp6 million is the amount due to the caretaker. The caretaker will receive a larger share when profits from other fish yields, such as milkfish or wild shrimp that has entered the pond, are added to the calculation, which he is entitled to for his own daily expenses.

25 Interview with KOIN

In Sidoarjo, shrimp farming is considered heavy work reserved for men, while women are only expected to help out during harvest. The traditional way of harvesting is a labor-intensive endeavor. People would flock to the farm to help haul up the nets. Getting to the farm itself is challenging. Farmers' wives are mostly involved in the post-harvest processing stage, which includes prawn cracker production. Traditional farm yields are sold to local markets and factories. Farmers have no knowledge of whether their harvests are also meant for export as they do not interact directly with exporters.

Companies would send a team to assess harvest quality and the farmers' asking price. By then, farmers would have already determine their prices. They also have a calendar or schedule that companies have agreed on. The agreed price is usually based on shrimp size. The final offer is the price agreed by both parties. As there is no binding arrangement, a farmer may sell to another buyer or company if he disagrees on the price. Farmers would compare prices with nearby markets or local depots that buy shrimp harvests.

Modern Shrimp Farming in Dipasena, Lampung

Human Rights Violations during the Nucleus Estate-Smallholder Era (1993-1999)

The Dipasena shrimp aquaculture hub is an extensive farming area that was once the largest in Southeast Asia. In biotechnical terms, it was also once considered the best in the world. However, such grandness deflated following the 1998 economic turmoil. The collapse of the Dipasena production hub was triggered by social, economic, and political problems.

The Dipasena project was launched in the 1990s and farmers began joining in 1993. The government project—Indonesia's first ever modern aquaculture scheme—followed the *Tambak Inti Rakyat* (TIR) model, also known as the nucleus estate-smallholder (NES) system. The local people act as the smallholders, while companies function as the nucleus estate that manages shrimp farming activities. The first company to join was PT. Dipasena Citra Darmaja (1993-1999). At the time, shrimp aquaculture was relatively problem-free, except for the BLBI (Bank of Indonesia's Liquidity Assistance) corruption scandal involving the owner of the company, Sjamsul Nursalim.[26] The case impacted on the management of Dipasena to the point of hampering production, compounded by an economic slump set off by the monetary crisis.

In that era, the farming area stretched across 40 thousand hectares. **The NES system is essentially philosophically and conceptually sound, but its implementation lacks a fair "referee".** The nucleus estate is a tech-savvy, market-dominant and capital-abundant corporation, while smallholders neither have access to the market, technology or capital. The nucleus company was back then seen as a villain that resort to intentional misconduct. First, markup pricing of the farm or pond unit. Second, smallholders were forced to buy production

26 https://www.beritasatu.com/nasional/461646/diusut-kongkalikong-sjamsul-nursalim-dan-ayin-di-tambak-dipasena

input from the nucleus company much higher than the market price. Third, smallholders were obliged to sell their harvests to the nucleus company at a low price, at only 75% of the market price.

Such offenses were also driven by the considerable number of blank shares owned by government officials that had prevented the government from fulfilling its role as referee. During the New Order regime, speaking up was unheard of. However, when a wave of reforms swept the country, smallholders seized the momentum to protest, voice their aspirations, and demand their rights to the nucleus company. Through P3UW (smallholders' management agency), the farmers had an outlet to challenge the company. They aired their objections over the company's lack of transparency, low shrimp price and prohibitive input prices. Farmers also lamented the lack of corporate support when facing difficulties.

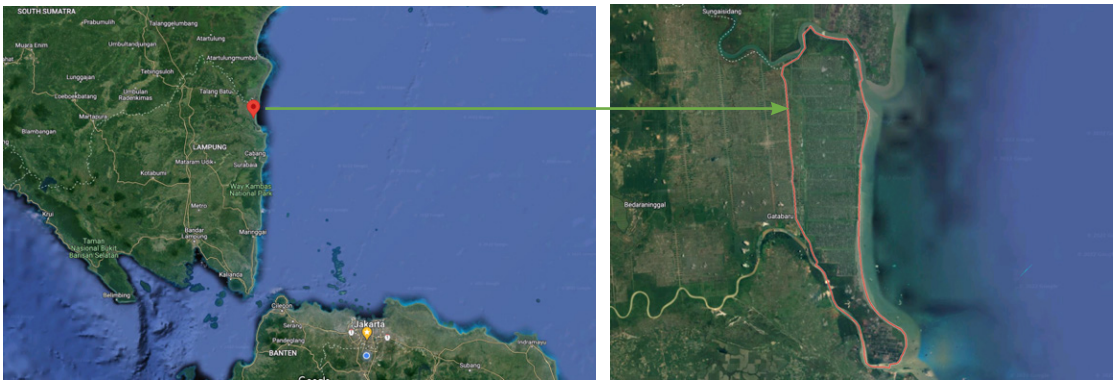


Figure 11. Location of the Dipasena aquaculture hub in Tulang Bawang, Lampung

On March 24, 2004, Dipasena Group's assets, including the aquaculture ponds, were handed over to PT. PPA (State Asset Management Company). In September 2004, Dipasena was included in the government's revitalization project at the behest of the national parliament (DPR RI). The revitalization project also formed part of the 100-day work agenda of the then newly elected President Susilo Bambang Yudhoyono. Under the project, Dipasena aquaculture ponds will be restored to their original condition by improving the NES partnership scheme through a cooperation agreement entered into between farmers and PT. DCD.[27]

However, on May 24, 2007, PT. PPA went on to sell Dipasena Group's credit assets and shares to PT. Central Proteina Prima (CPP Group), a subsidiary of Thailand-based Charoen Pokphand. This was a controversial move as the assets valued at Rp2.388 trillion were sold at a bargain price (Rp688 billion). From that moment on, PT. DCD as the nucleus company was replaced by PT. Aruna Wijaya Sakti (PT. AWS/CPP) and a cooperation agreement with smallholders were signed on December 17, 2007. The agreement stipulates that PT. AWS/CPP will provide credit to farmers with guaranteed certification. Unfortunately, from the outset the agreement was not executed accordingly as PT. AWS reneged on it commitments and obligations.[28]

27 https://www.gresnews.com/berita/hukum/84500-dipasena-riwayatmu-kini/

28 https://www.change.org/p/ketua-mahkamah-agung-ri-tolak-gugatan-pt-aruna-wijaya-sakti-charoen-pokhpand-terhadap-385-petambak-udang-eks-dipasena-lampung

But the problems did not stop there. In the purchase agreement, it was mentioned that the remaining company assets worth Rp1.7 trillion that PT. CPP still held, should be allocated for farm revitalization over a span of 12 months as a continuation of the revitalization mandate in 2004. The company however failed to execute, leaving farmers disappointed, sparking protests against the nucleus company. Of the 16 blocks, the company only managed to revitalize 5 of them.[29] Furthermore, most farmers whose farms had been revitalized and were already in operation, objected to the company's continued high-handedness when it failed to distribute to farmers the profits generated from the sale of shrimp harvests, which amounted to Rp38 billion.

PT. AWS finally ceased its operations as of May 7, 2011. The farmers henceforth became self-supporting or independent farmers, without corporate or State involvement. At the time, there were 9,306 farmers in total. Smallholder aquaculture ponds cover 4,000 ha of land area. The farming area stretched across 16,250 ha in total, with 17,800 ponds. A farmer would typically own 2 ponds, each of which covered an area of 2000 meters. There was also limited power supply. Meanwhile, the nucleus company continued to retain control of the land, where a proportion of it had been turned into rice fields. A respondent mentioned the marked difference between past and current production volumes. "*One hectare now will only yield 1 ton/harvest. Many are less than that. Some produce more, even up to 5-6 tons. That is the case for those who can maintain quality and where the technology is already available. It's difficult for the neglected ones. It's worse when there is a disease outbreak, there's nothing to harvest*."[30]

The Dipasena lands and ecosystems stretch far and wide. The local farmers even admitted to not being able manage on their own. This is of course unfortunate considering the assets involved and the production capacity. Even now, no follow-up plan is forthcoming on the further development of Dipasena. Meanwhile, many of the ponds and pieces of equipment are damaged. Farmers face myriad challenges. Dipasena was initially a modern intensive aquaculture hub before shifting to semi-intensive and traditional farming. In addition, many canals are now filled with mud or sediment, which affects the ability to optimally discharge water. A mud-suction dredger was previously used to deepen the canals. But now, farmers lack space for the disposal of the accumulated sludge, thereby polluting the mangroves of which many have either been damaged or died. Based on available information, the government has since provided 2 (two) units of heavy equipment for deepening the canals, in addition to a sludge remover that only arrived late last year. Apart from technical support, Dipasena is also in dire need of capital and proper management.

29 Interview with P3UW

30 Interview with a Dipasena respondent

The Latest Developments in Dipasena

Five cooperatives have been established in Dipasena, including the Bumi Dipasena Farmers Cooperative (KPBD) under P3UW, and the Fish Farmers Group (Pokdakan).[31] The Pokdakan can be found in every village. P3UW also has a collective enterprise known as a sub-block that is managed similar to that of a cooperative and can be found in every neighborhood. In the past, an area consisting of 10 lanes on which each has 100 houses is known as a sub-block. A sub-block is similar to a neighborhood association. Farmers from different areas form an economic entity or a collective enterprise.

The collective enterprise is managed by P3UW. The enterprise's profit-sharing scheme has helped set the local economic wheels in motion. After deductions for operating costs, the profits are split following an 80:20 ratio, with 80% to farmers and 20% to management. This arrangement provided farmers a lifeline in difficult times. For example, in the event of shrimp deaths, the losses are not borne by the participating members of the enterprise, but are covered by the Shrimp Loss Reserve (SLR) funds. The SLR funds are derived from 10% of the harvest yields to assist farmers in case of harvest failure so they would not need to be weighed down further in debt.

Dipasena pond farmers sell their harvests to collectors or buyers. Buyers are sometimes directed to companies in Jakarta, Lampung or Palembang, or to the local market. Collectors can also be regarded as buyers who deal directly with the farmers. During harvest season, buyers would provide farmers' with supporting resources and facilities, such as ice and transportation, which are considered services. Farmers are free to sell their harvest at better offers. "*Say for example, there is only an Rp500 difference per kilo. Farmers would take that offer because if you multiply it by 1 ton, it's not bad. The difference can sometimes be Rp1000. If it's a cooperative, even though it is a collective enterprise, the profits are shared*".

Dipasena farms now mostly produce fresh shrimp. There have been recent efforts to develop innovative, value-added shrimp products through women's entrepreneurial groups. However, due to poor marketing, these efforts have not gained enough momentum. Furthermore, the existing distributors lack the capacity to take on new products. The Dipasena aquaculture community in fact has the ability to produce value-added products such as shrimp balls, prawn crackers, and even fish crackers. There is also immense potential to establish MSMEs in this region, especially now that electricity is in adequate supply. Having said that, fresh shrimp still fetches a higher price than processed shrimp products. This means that the livelihood of many still depend on the sales of fresh shrimp than processed shrimp.

31 Interview with P3UW

Infrastructure and Environmental Maintenance at Dipasena Farms

Each farmer is subject to a deduction of Rp1000 per kilogram of shrimp harvest for the maintenance cost of the environment and ecosystem services. Total harvest tonnage is provided in the receipt. Each buyer holds a receipt, from which the amount deducted is calculated. The system works as farmers are fully aware that it would otherwise be impossible to maintain infrastructure. In making the deductions, P3UW does not deal with the farmers, but directly with the buyers. This is how P3UW and buyers need to cooperate as each has their own interests at stake. P3UW communicates with buyers on a daily basis. They would go around looking for information on potential buyers and the price range, especially one week before harvest. On-site price is usually higher than factory price. Shrimp size 60 at the factory is valued at Rp64,000 per kilogram, while on-site it would fetch Rp65,000 - Rp66,000 per kilogram.

Dipasena currently houses at least 10 feed supply companies. Their contribution to maintenance is calculated from the amount of feed sold to farmers. Every 20 kg bag of feed contributes Rp1,500 to Rp2,000. These contributions are deposited to P3UW. Owing to Dipasena's one-gate system, every farmer who brings in feed into the area is well-monitored and recorded. This also applies to fry suppliers. Every shrimp that leaves the area must make a contribution. Although this will inflate prices, it will not be significant. For example, one kilogram of shrimp within the Rp12,000-Rp15,000 price range will be charged Rp100 in contribution. The percentage may not be much, but is in fact extremely helpful for P3UW. Likewise, every fry is levied Rp1 in contribution. These contributions and how they are managed have been a longstanding practice. Over time however, to avoid legal issues, such allegations of illegal charges, their management has been formalized under a subdistrict regulation. The regulation governs on the contribution of farmers and P3UW as operators. P3UW is expected to submit a report to the government and members as part of its transparency policy.

The contributions help cover the cost of operations and infrastructure maintenance, such as canal dredging due to sedimentation (siltation). P3UW's operating costs for heavy equipment maintenance are fairly substantial. However, owing to excessive sediment deposits, P3UW is unable to effectively tackle the problem alone. P3UW could only fix damaged infrastructure that requires urgent repair, such as damaged embankments. P3UW also helps with road repairs as the government's national roadwork program does not extend to the area. If the farmers themselves do not take matters into their own hands, roads would be inaccessible to vehicles, which does not augur well for the Dipasena community.

Modern Shrimp Farming in Bratasena, Lampung

Human Rights Violations in the Bratasena Aquaculture Hub during the NES Era

Like Dipasena, the Bratasena shrimp aquaculture hub was opened in 1992 and started operations in 1995. It administratively consists of two villages that accommodate 2200 households with a population of 7000 people. Bratasena was originally a traditional aquaculture or aquaculture encroachment area as well as an agricultural area. When PT. Central Pertiwi Bahari (CPB) entered the hub, they compensated the aquaculture encroachers whom they then provided support and assistance to become smallholders under the NES scheme. The encroachers were lured with many promises, such as assistance to construct better ponds, working with the company as partner farmers, and eventual ownership of the ponds. The farmers in Bratasena were therefore originally aquaculture encroachers and newcomers that the company brought in. Currently, only 10% are former encroachers.

The Bratasena Nucleus Estate-Smallholder (NES) scheme was based on a cooperation agreement between the company and farmers. The shrimp farming scheme was expected to facilitate technology and capital transfer. However, in practice, instead of prospering the farmers, the scheme had placed farmers in a disadvantageous position on many fronts including in terms of culture practices, social control, and financing schemes.

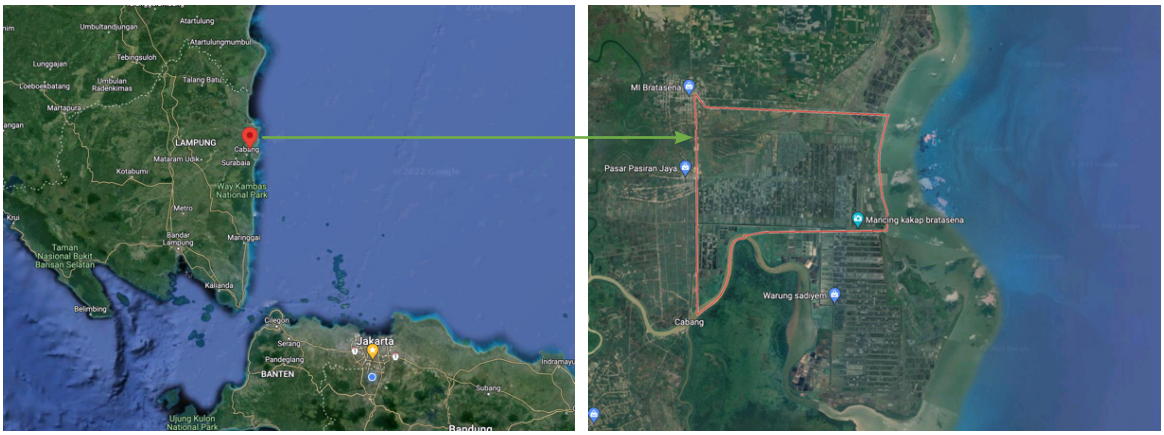


Figure 12. Location of Bratasena Aquaculture Hub in Tulang Bawang, Lampung

Precisely the opposite applies to PT. PCB as the nucleus company who clearly has the upper hand in the arrangement. This is because the company makes all the management decisions. Similar to the situation at Dipasena, farmers who joined the Bratasena development project would first need to construct their own ponds. Once a farm is certified, the company will help the farmer gain access to capital. Each pond compartment gets Rp145 million, broken down to Rp120 million for the purchase of the pond and Rp25 million for capital. The company manages the capital funds, primarily for the technical aspects of aquaculture, from seeding to harvesting. Farmers function as aquaculture operators. Harvest pricing decisions are to be made by the representatives of the company, aquaculture farmer groups and the local

fisheries office. However, according to farmers, in reality the prices were unfavorable to farmers, set below the market price. Given the issues above, the factors contributing to the misfortunes that farmers continue to endure include the following:

First, farmers obtain feed, medicines and other inputs from the company who also guide and advise them. In a pond compartment of 500 square meters in size stocked with 600 thousand seeds, based the company's previous scheme, it would only yield 6 to 7 tons of harvest. Under the company's new scheme, farmers can generate 9-10 tons of harvest. However, this meant a much larger amount of feed, causing culture expenses to swell. Meanwhile, the price of the harvested shrimp is largely determined by the company.

Second, the company's monopoly power over farmers' lives. Farmers are denied by the company the right to freedom of assembly and association. Like P3UW in Dipasena, Bratasena farmers have formed the Farmers Friendship Forum (FORSIL) to discuss common concerns that the community shares, not only related to aquaculture, but also daily life problems, such as their need for drinking water and food. Even the supply of these basic necessities is monopolized by the company. Under the company's security system, anyone entering the area must notify in advance, and must not bring in goods or supplies of any kind. As a consequence, the community is wholly dependent on the company to meet their needs in all respects. The company provides financial assistance for food worth Rp1.5 million/month. However, as it is a closed area, everything comes under the company's control.

Under these circumstances, farmers find themselves in a debt trap. The Bratasena area has almost 3000 ponds, of which only 2500 are in active operations. Of this amount, a mere 2% of the farmers have managed to settle their debts. Meanwhile, 95% still owe the company for an average amount of Rp200 million to Rp800 million. In fact, the remaining 3% have outstanding loans for as much Rp1.3 billion on average.[32]

Shrimp harvested outside the Bratasena area is valued at Rp50,000-Rp70,000 per kilogram. This however is not the case with Bratasena shrimp farmers. They are only allowed to sell shrimp to the company at no more than Rp30,000 or Rp35,000 per kilogram. In 1998, when the company was in financial distress, the farmers were also affected. There was less capital to borrow and the profit-sharing scheme was increasingly unrewarding. Between 2001 and 2008, business began to pick up. In 2004, for example, a farmer on average can borrow Rp145 million in capital under a profit-sharing mechanism. For 457,000 shrimp seeds raised per farmer, an average of 10 tons of shrimp can be harvested. Oddly enough, despite better yields, the farmers are not seeing their debts getting any smaller.

The situation above have stirred up conflict between Bratasena farmers and the company. In 2011-2012, farmers established a friendship forum (Forsil) to discuss matters aimed at improving systems and management, and fostering more transparent and fairer collaborative

32 Interview with LBH Lampung

ties. Forsil membership initially consisted of 3,000 Bratasena farmers.[33] In 2013, clashes broke out when the company established a front group called Farmers in Partnership (P2K), claiming two lives[34] and injuring 20 people.[35]

Forsil and the company later agreed to sit down and talk to find common ground, which resulted in a new partnership scheme. Both parties agreed among others to increase the farmers' share of profits from 15% to 35%. A total of 22 points of agreement were reached, including debt cancellation for all farmers, granting of title deeds to the land, and allowing farmers the use of company assets, including inlets/canals and outlets. Even when farmers are no longer in the partnership, the company still has the obligation to assist the farmers to learn the ropes, and to provide electricity as well as seeds or fry (each for a one-year duration, at no cost). Unfortunately, the scheme was short-lived, lasting only 1.5 years. In 2016, the partnership between farmers and PT. CPB was finally dissolved.

Latest Situation at Bratasena Aquaculture Hub

Aquaculture farms owned either by the company or local farmers still operate in Bratasena. Company assets, especially public facilities and canals, remain accessible. Canals are vital in shrimp farming. These assets still belong to the company under a usufruct arrangement. This means that farmers are not entirely separable from the company. Regarding the usufruct right to public facilities based on the 2016 agreement, farmers are expected to buy feed from the company at a discounted price but based on market price. This shows how the farmers to some degree are still tied to the company. The farmers acknowledged how the current cooperation scheme was more transparent and the situation more favorable to farmers.[36] Farmers reported only being able to stock from 50,000 to 200 thousand or 300 thousand shrimps. The yields of which would only come up to 8 quintals or one ton or 1.5 tons. Nevertheless, this amount is considered more profitable than the company's previous target of 7-10 tons.

Farmers who choose not to sell to PT. CPB, would usually turn to other vendors who have started operating in the area. They are what local farmers call "illicit" buyers, who are none other than middlemen, or sometimes known as "foster fathers". They normally harvest directly from the pond, which has lately been considered an ill-advised practice due to the risk of unchecked spreading of viruses or diseases in the farming area. Harvesting should not take place near the pond to reduce possible harms. In addition, the presence of "illicit" buyers can disrupt the system. Ponds are usually managed under a single mechanism, and as such the illicit purchase of shrimp will have broad implications. For example, viruses that may have been carried into the farming area could easily spread to nearby ponds. This has prompted

33 Currently, only 40% of Bratasena farmers are still FORSIL members, the rest chose to leave the group to be independent. This actually makes it difficult to maintain a strong community spirit for shared responsibility in the maintenance of Bratasena's ecosystems (Interview with FORSIL).

34 https://tekno.kompas.com/read/2013/03/13/20525876/~Regional~Sumatera

35 https://nasional.kontan.co.id/news/bentrok-antar-petambang-udang-20-orang-terluka

36 Interview with FORSIL

farmers to reach an agreement to protect each other's ecosystems. The new agreement will be discussed with and informed to farmers, village institutions, the Village Supervisory Board, subdistrict leaders and Muspika (Subdistrict Leaders Consultative Forum).

Farmers' Environmental Initiatives

Bratasena farmers mostly adopt the intensive culture method for breeding vannamei shrimp. This farming approach is associated with a large environmental footprint. A typical aquaculture area has lanes separated by canals to irrigate the ponds. Should the partnership with the company terminate, canal and environmental maintenance lies in the hands of the farmers. This is indeed a huge responsibility as it involves efforts to revitalize, dredge and deepen canals, and other maintenance procedures that require hard work and incur substantial costs. Farmers who have been collectively involved in canal cleanups said that it would cost close to Rp50 million per canal. This is a heavy financial burden that cannot be shouldered by individual farmers, but calls for collective action.

In view of the situation, Bratasena farmers came to the agreement that all sales should go through a single portal. This will allow them to collect dues for every shrimp sold. They have agreed on a fee of Rp3000 for every 1 kilogram of shrimp sold. The funds collected will help finance the management and maintenance of Bratasena's environment. The money will be managed by the Cooperative in collaboration with Forsil. In addition, the Cooperative also collects dues based on mutual agreement, which later caused friction among farmers.

Another issue concerns the exploitation of fish resources, especially when farmers experience harvest failure. Large-scale fishing will have undesirable consequences on shrimp farming as fish are a vital component of the pond biosecurity ecosystem, which therefore requires collective rules. For example, in Dipasena, farmers may fish in the inlet canal area, but it should only be enough to meet their daily needs. Meanwhile, fishing for a larger catch or that uses nets should be carried out only in an outlet canal. This is because an inlet canal supplies water to the pond. Bratasena farmers on the other hand are looking for alternative sources of livelihood, instead of concentrating solely on aquaculture. During times where a virus outbreak is more likely to occur, Bratasena farmers would switch to milkfish culture or duck rearing outside the aquaculture area.

Social Vulnerability at Bratasena

Dipasena and Bratasena share significant similarities, in terms of the conflict situation and the local community's response to common problems. Potential situations of conflict can at any time materialize in both Dipasena and Bratasena, especially between farmers and the company. Both areas also have to deal with an immense environmental burden. If no one in the community cares about the environment, aquaculture operations will be profoundly impacted even to the point of their complete cessation.

Moreover, these are lucrative areas as they create a potential market for large feed manufacturers. Conflict on the other hand is not exclusive to aquaculture, but can also occur in other business sectors such as fuel, electricity, water, and other life essentials. Power supply for example can have an impact on aquaculture management. The available power supply in Bratasena is designed for household use. This means an inadequate supply of electric power for aquaculture farming, leaving farmers with no other option but to use diesel fuel. If there are 2500 ponds in operations, the daily consumption of diesel fuel will be considerable.

The situation above shows the high level of vulnerability and conflict potential in Bratasena. Meanwhile, in Dipasena a fundamental issue relates to gender relations, such as the rise of women's movements advocating equal recognition and treatment of women farmers. In contrast, women in Bratasena face no barrier to participation in aquaculture activities, although their formal recognition remains elusive. Other issues concern safety or security, especially during harvest failure where cases of carpet/plastic thefts become rife.

To deal with these issues, Bratasena farmers have contemplated on ways to ensure that their business stay afloat. Every culture period would involve some kind of virus outbreak. Farmers have to come up with alternative ways to avoid being wholly dependent on aquaculture. They have opted to involving women in vegetable farming or animal husbandry.

In terms of public facilities, Bratasena has schools only up to middle education. You can also find places of worship and primary health centers. Not all farmers however have social security benefits, such as the BPJS health insurance. The local residents of Bratasena are mostly workers. The overwhelming majority have homes outside Bratasena, even though administratively they are registered as Bratasena residents. They are free to go in and out of the area as the company only has a weigher stationed in the area.

Bratasena farmers are also looking for more support and assistance from state-owned companies and the government (national and local). They have managed to secure some capital assistance, including from Pertamina to finance their aquaculture operations, and from MMAF to purchase supporting equipment such as generators.

The company previously supplied electricity and clean water. Even after the termination of cooperation (2016), the company continued to provide power for another year, after which supply was completely shut off. The farmers' forum fought hard to get the area electrified. Bratasena was eventually recently connected to electric power, but only for household use. Power supply for businesses is unavailable, which is a major setback particularly as Bratasena is a business hub that requires a substantial amount of electrical energy. Farmers are still waiting for the Government or PLN (state-owned electric utility) to step in and solve the problem.

In addition, farmers continue to bear the burden of environmental maintenance as the government's role remains minimal. Certain local government policies have even contributed to environmental losses that affect farmers. An example is the sea sand mining permit regulation. "*Lampung already has the RZWP3K, where a local regulation has been issued. From 2015 to 2017, the Lampung Provincial Government has been granting sea sand mining permits. This is detrimental to fishing groups and even aquaculture farmers*."[37] The damage to the coastal environment is particularly felt by fishers operating in areas with crab abundance, especially in shoal waters. In 2015, at least 5 permits were issued, including for sand mining in Mount Anak Krakatau, Sekopong, and Tulang Bawang.

The situation spiraled into conflict. In 2019, the corporation-farmer dispute ended in the burning of fishing boats owned by the local fishers.[38] The Lampung provincial government recently issued a permit to deepen the channels, which in reality is no different from sand mining. Under the RZW2P3K, sand mining is banned, but the nomenclature was changed to channel mining. This was the case for the rivers in Dente District in Tulang Bawang, located adjacent to Dipasena and Bratasena.[39]

Over the last 5 years, new aquaculture farms have been popping up in the west coast of Lampung. Aquaculture farms in Lampung are usually located on the east coast of Tulang Bawang, East Lampung and South Lampung coastlines. However, aquaculture in general is concentrated in Bratasena and Dipasena. The rest can be found around East Lampung and South Lampung, mostly traditional ponds. The west coast has sandy soil, while sand in the east coast tends to be silty. Apart from shrimp farms, the west coast is also a potential lobster farming area. Farmers in the west coast have now started traditional aquaculture. In 2019, LBH Lampung together with Walhi launched an investigation somewhere on the west coast near the Bukit Barisan Selatan National Park (TNBBS). At the time, a Korean Company was setting up aquaculture ponds after clearing land on the TNBBS area. Upon release of the investigative report, all construction activities halted, and the project now discontinued. It has even led to charges being brought against the company's director.[40]

Crucial Issues in Shrimp Aquaculture

This study has identified multiple problems, primarily the threats to the survival of traditional farmers, unproductive ponds due to environment degradation, lack of government support, unaddressed environmental impacts, discrimination against women farmers, and the persistent human rights violations of women working in the post-harvest shrimp industry. With regard to the **survival of traditional farmers, the threats and challenges have increasingly intensified**.

37 Interview with a Bratasena aquaculturist
38 https://www.antaranews.com/berita/1355662/kontroversi-penambangan-pasir-laut-di-lampung-timur-picu-konflik
39 Interview with LBH Lampung
40 Interview with LBH Lampung

The threats mainly revolve around the worsening state of the natural environment, such as wastewater and extreme weather that impact on shrimp production. Structural threats on the other hand arise from the permits for intensive farms located near traditional farms that were granted in recent years. They have had a disproportionate impact on traditional farmers, especially concerning water quality. Impact mitigation is mostly at the initiative of the farmers themselves, where traditional and intensive farmers would rather deal with water-quality problems by notifying and coordinating with each other if such issue arises. For example, if an intensive farm is discharging water (waste), the farmer informs the traditional farmer to temporarily close the canal leading to his pond as the water quality has been compromised. Traditional farmers will only reopen the inlet canal once water quality has improved.

In addition, the increased popularity of intensive shrimp farming using concrete structures has also affected the quality of water and soil, which has quickly saturated. Farms like these will usually be abandoned within five years due to ecosystem disruptions. Government policy on shrimp estate that encourages traditional farms to shift to the semi-traditional or the more recent improved-traditional system, will also make matters worse. The policy will transform how traditional farms operate, particularly as they rely more on natural sources of food than artificial feed.

Women Farmers Go Unrecognized

Certain types of activities in aquaculture are considered as tough work that only men can get done. Getting the water wheels started in aquaculture farms typical in Dipasena and Bratasena is an example. However, this does not entirely exclude women from involvement in aquaculture. Women instead carry a double workload of having to tend to the ponds and raise their children, seek loans in difficult times, and do extra work for additional income (e.g., making shrimp chips, and others). From morning, women are kept busy with household chores, from house cleaning to serving breakfast, before leaving for the farm, taking turns with their husbands, who would stay up late at night to check on the shrimps. Women also keep tabs on the feed and *ancung* in between sending their children to school through Dipasena roads that are mostly in poor condition. "*It takes a tough woman to ride a two-wheeled vehicle in Dipasena through steep paths across elevated bridges*."

In certain areas, men and women assume somewhat equal roles, but not in others where women struggle to gain recognition as farmers, both in terms of their social relations with their male counterparts and with the State. Women continue to go unrecognized, especially in certain communities where even their right to movement is limited. Many still strive to carve enough space for them to be creative and self-actualize through their right to freedom of assembly and association, where they should not merely be defined as the "wife" of an aquaculture farmer.

Shrimp farms in Sulawesi are predominantly run by men, especially for work that requires physical labor, including pond management, cleaning and maintenance. There are however a few female farmers, at least three or four of them. Farmers would typically bring their shrimp harvest home before selling them. Some however sell directly to collectors. Harvesting starts early in the morning to maintain shrimp quality. At half past four in the morning, they start harvesting the shrimps. If it is done too late in the afternoon, the harvested shrimp will go limp, which affects quality and price. After early morning harvesting, farmers take a short break before delivering the shrimp to collectors at around 9 or 10 o'clock, with their children or wives in tow, or just the farmers themselves. Payment can be made in cash or deposited with the collectors to be withdrawn at any time. Both farmers and collectors keep their own records of shrimp sales transactions, which will then be shared and matched.[41]

Farmers buy shrimp fry from two sources, in the form of fingerlings or directly from hatcheries. The juveniles are then raised for 15-20 days. Women assist in counting the number of fry in each bag, as they are known to be faster and more thorough in getting the job done. Women also provide essential services during harvest. They help out their husbands in counting, weighing, and measuring shrimp, which is carried out collectively by each family (husband and wife). After all calculations have been made, the proceeds from the harvest are handed over to the woman/wife. The next stocking schedule will be consulted with the wife as the money manager. The harvest cash flow of farmers is arranged in such a way that it follows the company's harvest period. "*We have a yearly schedule, using tidal water (traditional farms). Farmers follow this schedule, which affects household cash flow. No matter the size, the shrimps will be harvested when it's time. Decisions cannot be made singlehandedly by men.*"[42]

Meanwhile, in aquaculture farms in East Java, women are more likely to take charge of the finances. They are rarely seen at the farm. However, work at the processing section, such as in cold storage, is usually dominated by women, accounting for up to sixty-five percent.

In the shrimp supply chain, women play a central role. They are present at almost every stage of the supply chain (see Figure 19). The wives of Dipasena farmers, for example, wake up at 4 or 5 in the morning to perform housework while monitoring the ponds. They would then return home to remove grass from the yard, before treating pests around the ponds, and checking the water wheels. This is their daily routine. Men are also responsible for spreading feed, which usually involves women. Women work a total of 17 hours on the farm. When their husbands need to go elsewhere, the wives would oversee the ponds. Shrimp ponds cannot go unattended as swift action is required in case of a problem. Unlike fish, shrimp require quick response when a problem arises. Otherwise, it will become stressful for the shrimp, and can lead to harvest failure.

41 Interview with PT ATINA
42 Interview with PT ATINA

Women aquaculturists in Dipasena are facing more challenges today as the current environmental conditions have made it harder for them to meet their daily need for clean water, among others. They have to rely on rainwater. The cost of living is fairly high due to the exorbitant price of rice, water gallon, and gas. There are even times of shortage or scarcity. Women would sometimes have to look for firewood for their stoves. They make full use of the narrow space between one pond to another to plant chilies, vegetables and fruits. Some of them would still make time to participate in a local organization, while making processed foods as an additional source of family income. The food products are traded at the marketplace, and the money used to make the necessary purchases or set aside as savings. In the event of a harvest failure, they would at least have some money saved from the sale of processed shrimp or fish products.

In times of a bad harvest, women would be the ones to seek out loans, and to think about the continuity of farm operations, the early supply of feed, expenditures, children's schooling, meal planning, and even their husbands' cigarettes, and so on. This shows the central role that women play in the farmer's household. Some women even have the habit of talking to the shrimps during daily stocking. They would help lift nets to check for possible diseases. In case a disease is detected, they would look for the proper treatment.

That being said, women's involvement in aquaculture has yet to gain recognition from the government and society. In Bratasena, women farmers are excluded from strategic decision-making processes. When it comes to price-setting—even when it falls under the purview of the respective farmer's household—women in Dipasena are generally not consulted. Nevertheless, there has been heightened awareness of the pivotal role that women play. Many of these women make the most of empty lots for cultivating other aquaculture commodities, such as milkfish, or for animal husbandry. However, as these activities can pose a threat to shrimp farming, they are being limited. In the past, the company had even completely banned such endeavors.

Since 2015, the women's movement in Dipasena has been gathering momentum. They advocate for the recognition of women aquaculturists, and for building household food security. Farmers would initially rely only on 2 shrimp ponds for their livelihood. Every household at some point is sure to experience harvest failure, yet still needs to think of their children's school fees, future savings and other expenditures.

In Dipasena, women are becoming more open to making changes. Shrimp stocking and harvesting are part of their daily farming routine. Shrimp harvests however are not always good or as expected. In the past, a bad harvest would simply be disposed of, and if the shrimps appear reddish in color, they would be dried in the sun. Over time, women began considering making shrimp processed products, such as shrimp balls, shrimp cake, shrimp crackers, and shrimp nuggets. Shrimp heads and shells were initially considered unfit for

human consumption. They then worked with university students to study their nutritional content. It was found that shrimp heads and shells are beneficial for preventing premature aging and a good source of calcium for pregnant women. They have since succeeded in developing crispy shrimp shells and shrimp heads as their flagship products.

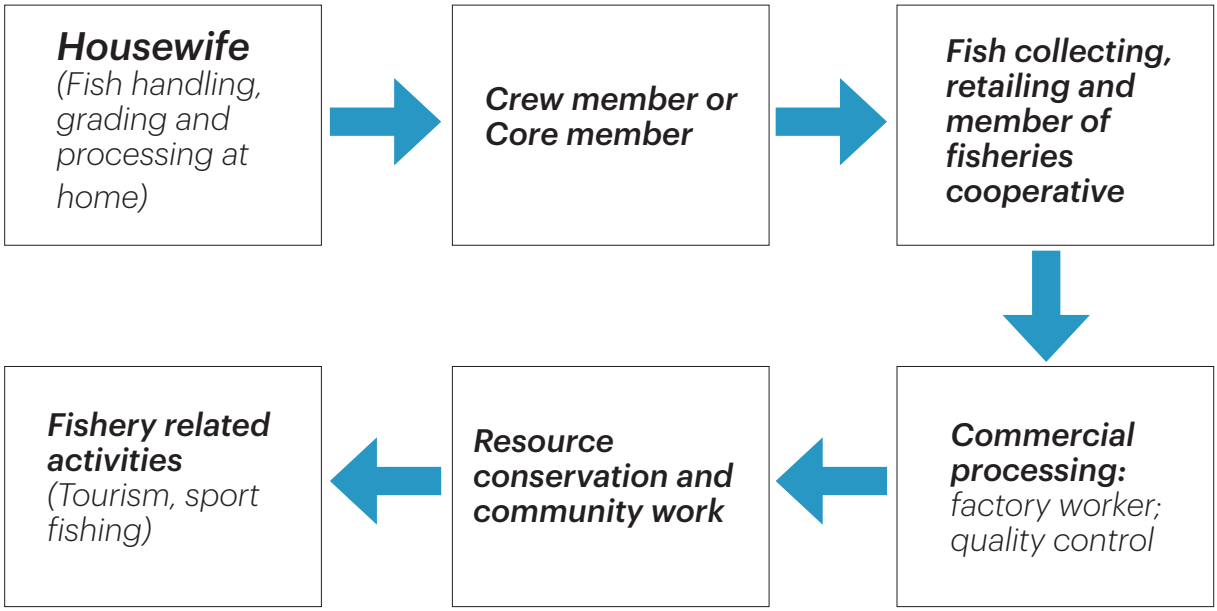


Figure 13. Women's role in the shrimp supply chain (DeSilva, 2011)

Violations of Women Workers' Rights in the Shrimp Processing Industry

Another crucial aspect in relation to the rights fulfillment of women workers is the **work environment** in commercial processing. This covers workplace cleanliness and hygiene, as well as the physical, chemical, and biological factors detrimental to the health of workers, especially women. In shrimp processing, a major concern at the workplace is the **slippery floors of the production room due to the use of large quantities of water**. This is an occupational hazard that compromises work safety. To prevent slip and fall accidents at work, the company must provide **boots** for every worker.

The typical production room consists of several work units including: **(1) shrimp washing; (2) shrimp sorting; (3) shrimp peeling; (4) shrimp steaming; (5) fresh shrimp packaging; (6) shrimp paste processing; and (7) cold storage.** Before entering the storage facility, workers must go through a **chlorinated** shallow pool of water to keep shoes germ-free. Work spaces have **no windows or ventilation** as they are designed for central air conditioning. Another physical factor is the lighting system. Good lighting is necessary for meticulous work, but as it is not ergonomically correct, workers experience **eye-strain often accompanied by headaches**. Meanwhile, the shrimp washing unit has poor lighting, probably as the work does not require precision and accuracy.

Table 2. Health hazards of women workers in a shrimp processing plant in Sidoarjo

TYPE OF COMPLAINT	OFTEN	SOMETIMES	NEVER
Headache	4	16	5
Fatigue	4	17	4
Stiff neck	4	13	8
Gastric pain	2	16	7
Menstrual disorder	1	11	13
Nausea or vomiting	2	9	14

Source: Martiana, 2006

Due to the use of **chemicals**, where fairly large amounts of chlorine are required, every worker must wear personal protective equipment. A hazardous biological factor is the wastes from shrimp shells and tails that can easily rot, which can create health issues as women workers have complained about dizziness or headache, nausea, gastric pain, stiff neck, fatigue and coughing (see Table 2).

Unanticipated and Unaddressed Environmental Impacts

Compared to traditional farming, the intensification of aquaculture leads to a much heavier environmental burden. This is evident in Bratasena and Dipasena, despite farmers trying to deal with it independently, for example, by levying fees on harvesting farmers. The collected funds are used to finance measures needed to address environmental impacts. However, the community alone cannot shoulder such a heavy environmental burden, especially aquaculture hubs that are as large as Bratasena and Dipasena.

The considerable environmental burden attributable to aquaculture operations is borne solely by farmers. Due to the non-binding nature of the partnership scheme, the participating companies feel unobligated to share responsibility in dealing with the issue. Aquafeed companies or shrimp fry producers in fact make a fortune from the business. Any farmer initiative to secure corporate contribution to aquaculture is generally production-oriented. For example, companies or feed distributors provide loans so that farmers can purchase feed and start production. The loans are repaid after harvest.

A noteworthy initiative was introduced in Dipasena. Farmers managed to get feed or fry companies to commit to contributing a certain agreed amount of fee to P3UW, who will manage the funds. However, upon closer scrutiny, farmers in the end are in fact paying for the corporate contribution as the companies would hike the price of feed or fry.

For the aquaculture farmers, environmental issues arise due to the lack of technology and capital. The environmental impacts caused by aquaculture sites managed by the company remain unresolved. For example, the local community near a shrimp aquaculture company in Cukuh Balak Subdistrict in Tanggamus District, questioned the lack of proper treatment facility for pond waste.[43] There are four shrimp aquaculture companies in the villages of Pekon Waykhilau, Tengor, and Pekondoh. Local residents also had doubts over their business permit, particularly on whether they comply with the requirements of the Environmental Impact Analysis (Amdal) guidelines. The aquaculture farms have been emitting a foul odor that has become a cause of grave concern to the local community.

The distance from the shoreline to where the farms are located averages less than 300 meters. The shrimp farms in Pekon Waykhilau is located a mere 18 meters away from the beach. Meanwhile, the distance between shrimp farms in Pekon Tsengor and Pekon Tengor (Karang Bebai) and the beach is just 31 and 9 meters, respectively. Similarly, the farms in Pekondoh (Waybangik) are only 25 meters from the beach. Pursuant to the guidelines issued by the Directorate General of Aquaculture under the MMAF, aquaculture farms should be located 300 to 1000 meters away from the shoreline. This means that the existing farms do not take the environment into account as regulated in the Aquaculture Law and the MMAF Regulation No. 28/2004, which among others sets the mangrove vegetation buffer zone at a minimum ratio of 20%.

The degradation of mangrove ecosystems has brought about such complex and harmful impacts, including: (1) erosion of coastlines and river boundaries; (2) sedimentation; (3) pollution; (4) reduced ecological functioning, which directly affects the economic function due to declining fish catch; and (5) sea water intrusion. The socio-economic implication is heightened risk of food insecurity and increased population movement or migration in search of other livelihood opportunities. To improve mangrove ecosystems and mitigate environmental degradation, a study suggests participatory, community-driven mangrove ecosystem rehabilitation and the adoption of sustainable fishing practices (Witomo, 2018).

In addition to its impact on the mangrove ecosystem, another major environmental concern in shrimp farming is the aquaculture waste discharged into water bodies. In super-intensive aquaculture, for example, the volume of waste load reaches 43.09-50.12 kgTN/ton of shrimp production and 14.21-15.73 kgTP/ton of shrimp production. Given the thresholds for type N, P, and C wastes, the waste load of super-intensive vannamei shrimp farms at a productivity level of 6-8 tons/1,000 m2/mt, has exceeded the permitted pond waste load, which can lead to a deterioration in the quality of the aquatic environment (Shah, et al., 2014). Hence, the importance of aquaculture waste management through a Waste Water Treatment Plant (WWTP) within the super-intensive culture system.

43 https://www.rmollampung.id/empat-perusahaan-tambak-tanggamuz-diduga-langgar-aturan

Other studies show how different shrimp harvesting methods affect ammonia levels in water. The two harvesting methods are partial (65 days) and total harvesting (80 days). In the former, the concentration of ammonia is relatively lower than the latter. The water quality index of the two harvesting techniques remains within the moderate range of 51.11. During total harvest maintenance, ammonia emissions contribute 7,667 kg/ha/year to environmental pollution, while in other farms that apply the partial harvesting technique, it is 3,164 kg/ha/year. Economically, the partial harvesting technique is also more profitable than the total harvesting technique (Romadhona, et al., 2016).

The degradation of the environment will in turn be conducive to the emergence and spread of diseases affecting farm-raised vannamei shrimp. Farmers will inevitably consider using chemical and biological products to maintain pond production. Research has identified 48 types of chemicals and biologicals used in aquaculture, which can be divided into 5 groups: disinfectants, pesticides, fertilizers, soil and water enhancement, as well as supplementary feed, each of which is further classified into several sub-groups (Mustafa, et al., 2010). Organic pesticides and lime are the commonly used product sub-group, while inorganic pesticides are a sub-group of products least used in vannamei shrimp farming. These chemicals and biologicals are highly toxic, hardly biodegradable, can accumulate in individual organisms, and are food safety hazards, and therefore should be kept within acceptable limits considered safe. The use of these chemicals and biologicals over a certain period of time can be a source of pollution in shrimp aquaculture.

The three factors above (the mangrove ecosystem, water quality, and waste or pollution management) are the key indicators of sustainable shrimp farming practices (Salahudin, et al., 2012), both economically and biologically. In addition, the three indicators can also serve as the parameters of the extent to which shrimp farming affects the quality of the aquatic environment in general. It is therefore important to build farmers' understanding and knowledge of these factors and thresholds to improve culture practices.

Disaster Mitigation and Climate Change Impact in Aquaculture

Policy responses to the climate crisis that poses a serious threat to coastal activities, including aquaculture, are sorely lacking. The climate crisis is still not considered an important variable in aquaculture. Last February, the IPCC launched a study, which projected the demise of 90% of aquaculture farms in Southeast Asia, among others as a result of drought that renders the areas unsuitable for shrimp farming. Aquaculture farms are mainly located in coastal areas that are vulnerable to climate change and natural disasters. For example, Aceh's coastlines are among those with disproportionate vulnerability to natural hazards (such as earthquakes and tsunamis) and to global climate change (drought, sea level rise, and flash floods). In 2004, the tsunami that struck Aceh had a devastating impact on coastal ecosystems, leading to a drastic decline in aquaculture farms. Coastal communities in Aceh who depend on shrimp farming had lost their livelihoods, affecting their social and economic status (Yunara, et al., 2019).

Another study in Tuban's coastal areas called attention to the impact of climate change on shrimp farmers who reported experiencing harvest failure, declining productivity, and rising farm operating costs. A survey of 50 shrimp farmers in Tuban showed how they have all felt the impact of climate change, which saw a drop in shrimp production (Suwarsih et al., 2019). Climate change in the region is characterized by an increase in (a) rainfall, the number of rainy days, (b) the number of dry days or months during the dry season, (c) the average temperature, flood level, tide intensity, and (d) level and intensity of river floods. This has resulted in a drop in overall shrimp production by 25-50% (traditional farms 40-50%; semi-intensive farms 30-40%, and intensive farms 25-30%). Meanwhile, operating costs to prevent the adverse impacts have leapt by 150-200%. As part of climate change mitigation, farmers have had to adapt, including by rescheduling harvest times, planting trees around ponds, and raising the embankments.

The coastal areas along Demak also face the same situation. Local communities that rely heavily on the coastal ecosystems are similarly vulnerable. Coastal erosion and sea level rise have caused most of the aquaculture farms owned by the local community to be damaged or wiped out. Adapting to climate change has become an urgent priority for the local population, which include livelihood transitions. Confronted with such harsh realities, disaster mitigation (risk reduction) in shrimp farming areas becomes of utmost importance. Unfortunately, a definitive master plan or roadmap to address this problem has yet to materialize. Meanwhile, the local community has had no other choice but to adapt, including through house relocation or floor elevation, soil stockpiling, construction of stilt houses, mangrove forest rehabilitation, construction of rainwater reservoirs, and changes in livelihoods (Wacano, 2013).

A somewhat different situation was observed in East Kalimantan. As part of climate change mitigation, the East Kalimantan provincial government plans to reduce emissions from mangrove forests. A set of policies on mangrove management, both at the national and provincial (East Kalimantan) levels, has been issued before and after the climate change program was launched. However, a study highlighted on the ineffectiveness of ongoing climate change mitigation in mangrove management. This is reflected in the absence of sound policies and adequate measures, such as follow-up technical regulations that spell out the existing national policy, provide unified data on mangroves and land use, and offer eco-friendly mangrove management options. Intersectoral coordination is also crucial, in addition to sensitization and assistance to coastal communities on the sustainable use of mangroves, especially relating to aquaculture (Salminah & Alviya, 2019).

The rate at which sea level rises can actually be projected for the next 100 years. In many areas, sea level rise shows a rising trend at a much faster rate, as indicated by a projected increase of 90 mm by 2040, which will continue to climb to an additional 90 mm by 2055 (Rositasari, et al., 2011). This upward trend will lead to a changing landscape and shifting vegetation patterns in coastal areas due to inundation, more frequent storms, and erosion.

Vital infrastructure, settlements and socio-economic support facilities of coastal communities will be under grave threat. In planning adaptation actions, it is critically important to know in advance the costs and benefits. By identifying coastal areas that are prone to erosion and disasters, the central and local governments can effectively reduce the risk of adverse impacts, specifically through education and viable solutions to create a better future for shrimp farmers in coastal regions across Indonesia.

Shrimp Estate Development Plan and Risks

The Ministry of Marine Affairs and Fisheries (MMAF) has set aside a budget of **Rp250 billion to build large-scale shrimp estates**. The project will become one of the priority agendas of the Ministry's Directorate General of Aquaculture. It will integrate the key components of a shrimp estate layout, including waste water treatment plants (WWTP), reservoirs, irrigation canals, feed supply, hatcheries, and laboratories. All for the purpose of achieving more cost-efficient production. The shrimp estate will be in partnership with smallholder farmers. Under the project, damaged smallholdings will be revitalized within the shrimp estate. The partnership will be different from the previous nucleus estate-smallholder scheme.[44] The MMAF is working in concert with the **Kebumen District Government** in Central Java to develop the first-ever large-scale shrimp estate in the country.[45] The shrimp estate is an aquaculture scheme built on a grand scale where the upstream and downstream processes are consolidated under one roof. The production process will be environmentally friendly and technology-driven to boost production and prevent disease outbreaks. The underlying concept is that of an integrated shrimp aquaculture system with an upstream-downstream approach, area-based and zero-waste aquaculture operations, downstream aquaculture products, modern aquaculture 4.0, and integrated aquaculture management. The stakeholders involved include the central and local governments, the community, and the private sector.[46]

Kebumen is considered to be a potential region for vannamei shrimp farming through the integrated aquaculture scheme. Under the project, Kebumen is expected to be a pioneer in modern shrimp farming in Indonesia, with high-level productivity and quality.[47] However, this ambitious undertaking has elicited criticism from aquaculture observers. Muhamad Karim, Director of the Center for Marine Development and Maritime Civilization Studies, also a Lecturer at Trilogy University in Jakarta, wrote that the government's plan to promote shrimp estate warrants criticism.[48] This is because the project requires at least 11,000 hectares of land, of which 5,000 hectares (45%) will be developed by the government and the remaining 6,000 hectares (55%) by the private sector (MMAF, 2021). As a consequence, *first*, pristine lands that remain intact with coastal vegetation may be at risk of being wiped out for the sake of shrimp estate development. *Second*, the rehabilitated coastal lands will be reconverted into shrimp estates. *Third*, there is no certainty of the fate of traditional farmers under a

44 https://nasional.kontan.co.id/news/kkp-siapkan-anggaran-rp-250-miliar-bangun-shrimp-estate
45 https://mediaindonesia.com/ekonomi/425008/kkp-bangun-shrimp-estate-pertama-di-indonesia
46 https://www.mongabay.co.id/2021/08/21/shrimp-estate-bakal-dibangun-di-kebumen-ahli-kelautan-minta-lingkungan-harus-dijaga/
47 https://www.antaranews.com/berita/2322154/shrimp-estate-pertama-di-indonesia-akan-dibangun-di-kebumen-jateng
48 https://investor.id/opinion/276887/shrimp-estate-dan-kesejahteraan-petambak

shrimp estate scheme. Despite plans to transform some traditional farms into shrimp estates, Karim hopes that the Government will not repeat the mistakes of the past.

A supporting argument for intensive shrimp farming is the fact that traditional aquaculture and its production success are dependent on nature. Theoretically, a favorable location will generate maximum results. For example, a new pond with good water quality, and less at risk of infectious diseases can produce 40 tons/ha per cycle. However, this windfall will only last 2-3 years. As it enters the 4th and 5th year, problems would tend to arise, such as the entry of new aquaculture operators. This is why technological innovation is key to reduce barriers or dependence on nature. Dependency on location or nature is an outdated approach. More innovative methods are needed. This includes anticipating climate change impacts. We need to invest in supporting research to enable us to effectively tackle emerging problems. "*The clustering is already good. And so is the investment, equipment assistance, and hatchery. Focus on the future: efficient use of natural resources!*"[49]

The progression from traditional to improved-traditional farming, or to semi-intensive farming, will require SOPs (from the Indonesian Shrimp Forum, for example). Setting up new aquaculture farms should be avoided if they are not furnished with a WWTP that is particularly required for semi-intensive, intensive, and super-intensive farms. Although a good biosecurity system (to prevent the spread of disease) is already in place, shrimp fry that fall under the SPF (specific pathogen free) category will still be more expensive. Unfortunately, farmers would opt for cheaper fry. This is indeed an obstacle. Hence, the need to build awareness. In addition, there is the unresolved issue of the transmission of air-borne diseases.

Regarding the importance of the conservation of mangroves and aquaculture ponds, a key respondent from IPB stated,[50] "*Instead of leaving 10 ha of traditional farms operating at low productivity levels, perhaps it would be better to make them smaller (2 ha), then turn them into intensive farms, and the rest restored as mangroves. Intensive farms emit lower carbon emissions*". Furthermore, the old "nucleus estate-smallholder" partnership model should be improved as it is no longer appropriate. More in-depth research is needed on the scale, partnership scheme, facilities and infrastructure, and other aspects that contribute to creating a win-win solution for corporations and farmers.

The proposed shrimp estate in Kebumen will be located in two villages: Jogosimo Village in Klirong District, and Tegalretno Village in Petanahan District. In the two areas, aquaculture farms already exist, albeit small-sized (about 10 hectares of shrimp ponds).[51] The shrimp farms along the coast of Kebumen are still managed traditionally, producing 6-10 tons per year. It is nothing like the modern farms that the government has in mind. Theoretically, the potential production capacity of a shrimp estate can reach a maximum of 80 tons. In reality, the maximum yield will amount to 40-60 tons. The shrimp species to be cultivated is the

49 Results of an FGD with a government ministry/agency

50 Results of an FGD with a government ministry/agency

51 https://www.mongabay.co.id/2021/08/21/shrimp-estate-bakal-dibangun-di-kebumen-ahli-kelautan-minta-lingkungan-harus-dijaga/

whiteleg shrimp (Litopenaeus vannamei). Another consideration in choosing Kebumen is its relatively close distance to the New Yogyakarta International Airport, making it easier for distribution.[52]

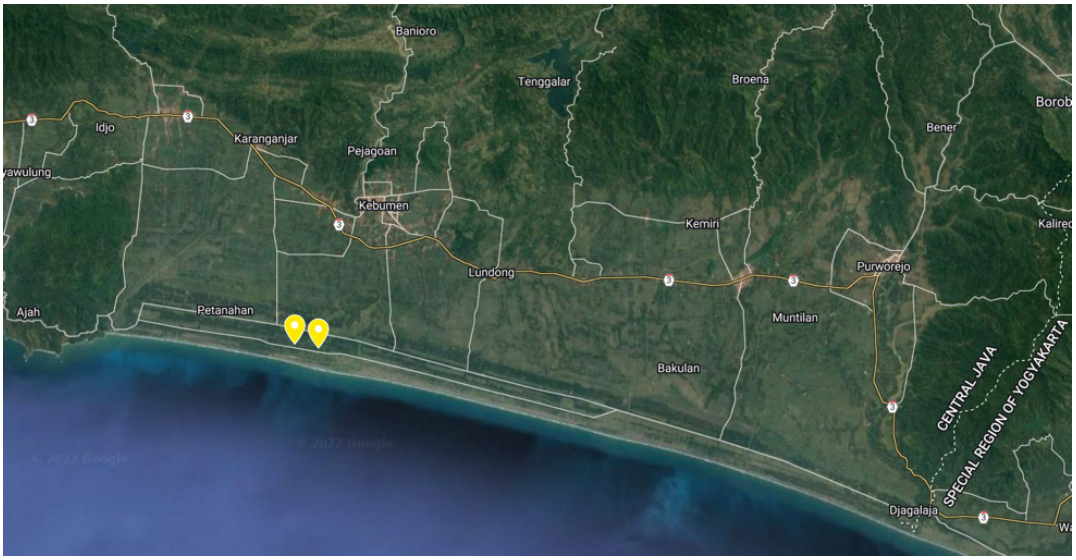


Figure 14. Site plan for the shrimp estate in Kebumen, Central Java

Apart from Kebumen in Central Java, the shrimp estate development project will also be rolled out in Central Kalimantan and West Nusa Tenggara (NTB). Potential project sites in Central Kalimantan are Tanjung Selaka, Sungai Damar, Sungai Lunci District; Sungai Damar Village Shrimp Farm, Sungai Lunci District; and Sungai Raja Village in Kuala Jelai Subdistrict. The local government is fully supportive of plans to develop shrimp estates in the region, starting in Sukamara District. The provincial government is working with Sukamara District to make the necessary adjustments to the RTRWK and RDTR spatial plans, and with banking institutions for financing. The project has also been included in the Provincial Spatial Plan (RTRWP) laid out in the revised Local Regulation No. 5/2015 on Central Kalimantan Provincial Spatial Plan for 2015-2035.[53]

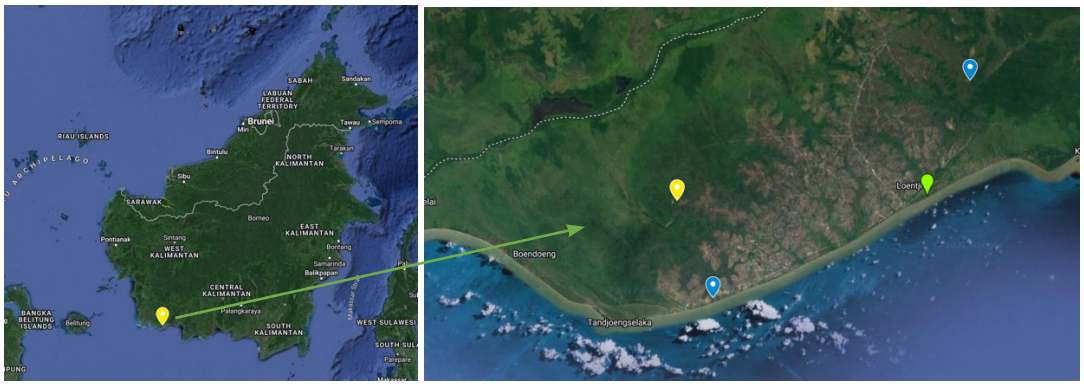


Figure 15. Site location of the shrimp estate in Sukamara District, Central Kalimantan

52 https://www.antaranews.com/berita/2094174/dirjen-shrimp-estate-jamin-ekosistem-bisnis-terintegrasi-hulu-hilir
53 https://news.detik.com/berita/d-5851241/tambak-udang-vaname-di-kalteng-dinilai-bisa-dongkrak-ekonomi-daerah

The MMAF has also decided to develop NTB Province into the national hub for shrimp and lobster aquaculture. The government has prepared a budget of Rp5 trillion to build the necessary facilities and infrastructure, including ponds, feed factories, road networks, and packaging manufacturing factories.[54] At least one thousand hectares of land are needed in order to bring the project into fruition. Currently, only half are available based on the current spatial plan.

The NTB shrimp estate development project is also part of national priority programs designed to keep the wheels of the national economy in motion. Under the cooperation scheme, land owners will get a share of the business profits. The project will also entail hiring workers locally. To prepare the workforce, the government will provide the necessary training or education. As for the lobster estate in NTB, the MMAF will develop aquaculture farms in areas such as Sekotong in West Lombok, as well as Ekas and Telong-elong, Jerowaru in East Lombok. The government plans to transform Telong-elong into a village-based lobster industry. These preparations call for the government's serious attention and oversight to avoid repeat the same mistakes made in previous mega-projects that ended in conflicts and human rights abuses.

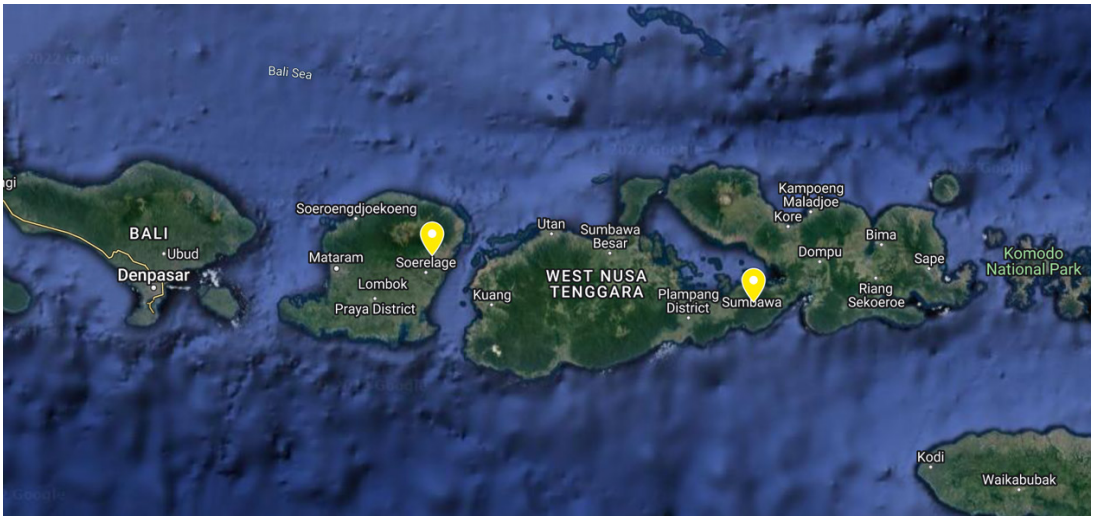


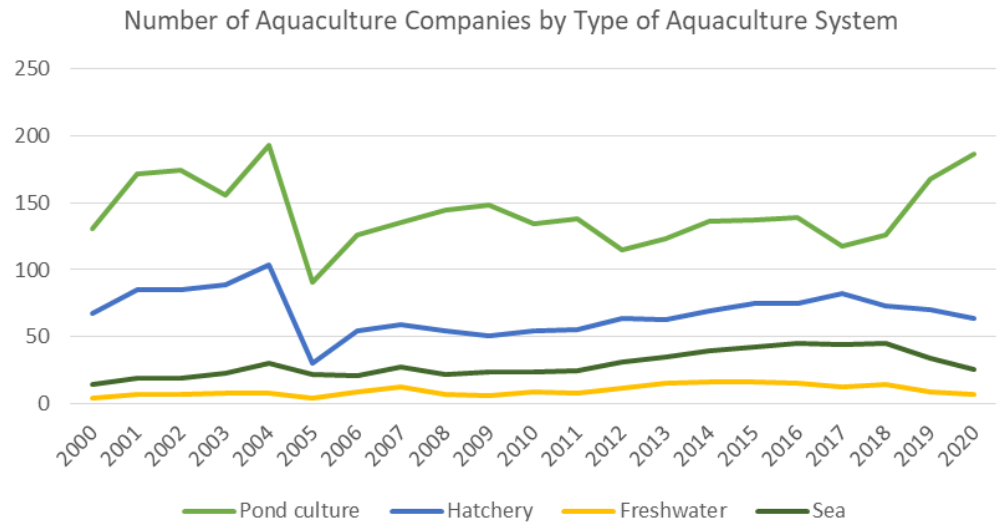
Figure 16. Site location of the shrimp estate (Sumbawa) and lobster estate (East Lombok)

54 https://www.suarantb.com/shrimp-estate-dan-lobster-estate-di-ntb-senilai-rp5-triliun-masuk-rpjmn/

The Role and Accountability of Businesses

Aquaculture Companies and their Efforts to Respect Human Rights

BPS statistical data (2000-2021) show that in terms of number, aquaculture companies, especially in pond-based aquaculture, are still the highest compared to hatcheries and freshwater and seawater aquaculture. This is indicative of the promising business opportunities of pond-based aquaculture. At the time when the number of other types of aquaculture companies saw a downward trend from 2007-2020, pond aquaculture companies instead grew in the same period (see figure below). Moreover, as the shrimp production target was raised by 250% by 2024, the pond-based aquaculture business will most likely continue to grow, considering that it contributes to the bulk of shrimp production.



Source: BPS (2021)

Figure 17. Number of aquaculture companies by type of aquaculture system (2000-2020)

Shrimp farming companies appear to be continuously expanding their businesses, as observed in Lampung. One of these companies is PT. Poseidon Blue Aquaculture (PBA).[55] In 2016, PT PBA has set up a farm in Kalianda, South Lampung, to cultivate vannamei shrimp. The farm has 14 ponds, each measuring 3 thousand meters at a depth of 2 meters. It is also equipped with a one-hectare reservoir. The owner of PT. PBA is Nuraga Bakrie. Unlike other farms, PT PBA **combines shrimp farming with aquatourism**. The underlying rationale for this is the farm's proximity to Kalianda Resort, a beachfront tourist resort. PT. PBA went on to expand its business into Bengkunat in Pesisir Barat District where the company already owns 30 hectares of land on which 16 ponds measuring 3000 meters would be constructed. On the west coast of Sumatra, there is potential for higher stocking density due to an environmental carrying capacity that remains high. In the past, this could also be said for Lampung Bay. However, as new farms crop up and operate in total disregard of environmental sustainability, diseases emerge and pond productivity falls.

55 http://trobosaqua.com/detail-berita/2018/03/15/13/10024/peta-ekspansi-tambak-sumatera

Table 3. List of shrimp processing and feed companies in East Java

NO	NAME OF COMPANY	LCATION	COMMODITY
1	ALTER TRADE INDONESIA, PT	Jl. Raya Tebel, Sidoarjo, Jawa Timur	Frozen shrimp
2	BUMI MENARA INTERNUSA, PT	Jl. Pahlawan No. 1-3, Malang, Jawa Timur	Processed shrimp
3	BUMI MENARA INTERNUSA, PT	Jl. Margomulyo No. 4 E, Surabaya, Jawa Timur	Frozen shrimp/fish
4	CENTRAL PROTEINA PRIMA, PT	Jl. Dupak Rukun 81, Surabaya, Jawa Timur	Shrimp feed
5	GRAHA MAKMUR CIPTA PRATAMA, PT	Jl. Industri 29a, Sidoarjo, Jawa Timur	Frozen raw shrimp
6	INDOMANIS, PT	Jl. Kig Raya Barat No. 1, Gresik, Jawa Timur	Frozen shrimp
7	INDRA SURYA INDOPERKASA, PT	Jl. Margomulyo, Surabaya, Jawa Timur	Frozen shrimp
8	ISTANA CIPTA SEMBADA(SEJAHTERA), PT	Jl. Raya Labanasem, Banyuwangi, Jawa Timur	Frozen shrimp
9	KUDATAMA MAS CV	Jl. Kig Raya Selatan Kav E 2 3, Gresik, Jawa Timur	Frozen shrimp
10	MADSUMAYA SEAFOOD, PT	Jl. Kig Raya Selatan Kav C No. 15, Gresik, Jawa Timur	Frozen shrimp
11	MULTI PRAWN INDONESIA, PT	Desa Karangbong, Sidoarjo, Jawa Timur	Frozen shrimp
12	PANCA MITRA MULTI PERDANA, PT	Jl. Raya Banyuwangi Km. 10, Situbondo, Jawa Timur	Frozen shrimp
13	PERFECT INTERNATIONAL FOOD, PT	Dusun Stoplas, Desa Kedungrejo, Banyuwangi, Jawa Timur	Canned shrimp
14	SATU TIGA ENAM DELAPAN, PT	Jl. Raya Situbondo/yos Sudarso No. 72, Banyuwangi, Jawa Timur	Frozen shrimp
15	SEKAR BUMI/SEKAR MULIA, PT	Jl. Jenggolo II/17, Sidoarjo, Jawa Timu	Shrimp
16	SEKAR KATOKICHI, PT	Jl. Jenggolo II-17, Sidoarjo, Jawa Timur	Frozen shrimp
17	SURI TANI PEMUKA II(UNIT PAKANUDANG)	Jl. Raya Situbondo/ Gatot Subroto No. 100, Banyuwangi, Jawa Timur	Shrimp feed
18	SURI TANI PEMUKA, PT	Jl. Raya Manyar Km. 10,5, Gresik, Jawa Timur	Fish and shrimp feed
19	SURYA ALAM TUNGGAL, PT	Raya Situbondo Km. 17, Jl. Dobel Dg Di Sidoarjo, Banyuwangi, Jawa Timur	Frozen shrimp

Source: Ministry of Industry (2021)

As an export commodity in international trade, the whiteleg shrimp (Litopenaeus vannamei) and its cultivation has certain determinants that should be taken into account. To boost the export of frozen vannamei shrimp, more attention should be given to its quality, among others. Shrimp mishandling, contamination and physical damage can lower shrimp quality. A more diversified portfolio of value-added products (VAP) includes peeled and deveined (PD) shrimp, which are processed fresh shrimp involving several manufacturing steps, such as **washing, beheading, sorting, arranging, freezing, packing, and storage.** (Hafina & Sipahutar, 2021). Freezing shrimp is a fishery processing technique to preserve foods by inhibiting microbial growth, and slowing down chemical and enzymatic reactions so that the quality of frozen shrimp products meet national standards (SNI). In East Java and Lampung, several companies are focusing on frozen shrimp processing (see tables 3 and 4).

Table 4. List of shrimp processing and feed companies in Lampung

NO	NAME OF COMPANY	LOCATION	COMMODITY
1	CENTRAL PERTIWI BAHARI, PT	Tanjung Bintang, Lampung Selatan, Lampung	Shrimp feed
2	CENTRAL PERTIWI BAHARI, PT	Jl. Diwarna, Tulangbawang, Lampung	Frozen shrimp
3	CENTRAL PROTEIN PRIMA (PLANT I), PT	Bumi Dipasena, Tulangbawang, Lampung	Frozen shrimp
4	GOLD COIN, PT	Ir. Sutami Km. 15,9 Rt. 02/04, Lampung Selatan, Lampung	Shrimp feed
5	INDOKOM SAMUDRA PERSADA, PT	Jl. Ir Sutami Km. 13 Dusun Kemang, Lampung Selatan, Lampung	Vannamel shrimp
6	SENTRAL PERTIWI BAHARI, PT	Tanjung Bintang, Lampung Selatan, Lampung	Shrimp feed
7	SURI TANI PEMUKA, PT	Jl. Trans Sumatra Km. 28, Lampung Selatan, Lampung	Fish and shrimp feed
8	SURI TANI PEMUKA, PT	Jl. Muh. Salim No.24, Bandar Lampung, Lampung	Fish and shrimp feed

Source: Ministry of Industry (2021)

Concerning the role of businesses in the shrimp industry, Komnas HAM's SNP (Standard Norms and Regulations) No. 7, specifically points 426 to 433, outlines the fundamental principle of the obligation of companies or business entities to respect human rights, prevent human rights violations that they may be complicit in, and provide a redress mechanism in case of human rights violations resulting from business activities. This is in accordance with the Guiding Principles on Business and Human Rights: Implementing the "Protect, Respect and Remedy" Framework that the UN Human Rights Council had approved in 2011. Specifically on coastal areas, Komnas HAM sets out a list of corporate responsibilities:

1. The business/corporate responsibility to respect human rights, **requires corporations/ business actors to avoid causing or contributing** to adverse human rights impacts arising from their own activities, and address such impacts when they occur, and to seek to prevent or address adverse human rights impacts that are directly linked to their operations, products or services by their business relationships, even if they have not contributed to those impacts.[56]
   This however is far from reality. Take for example the Bratasena and Dipasena aquaculture hubs, where upon the termination of cooperation, the environmental burden was left to the farmers to bear.
2. The business/corporate responsibility to respect human rights applies to all enterprises regardless of their size, sector, operational context, ownership and structure. Nevertheless, the scale and complexity of the ways in which enterprises fulfill that responsibility may vary according to these factors, and with the severity of the enterprise's human rights violations.[57]
3. The business/corporate responsibility to respect human rights through the appropriate policies, to carry out human rights due diligence to identify, prevent, mitigate, and account for how they deal with their adverse human rights and environmental impacts,

56 Komnas HAM SNP No. 7 point 427
57 Point 428

and to provide remediation for any adverse human rights harms that may occur.[58]
Environmental management also involves ecolabel certification. However, ecolabelling does not address the human rights dimension in any way. According to previous studies, human rights violations continue to be a serious issue in the fisheries industry. It is indeed appalling that the government has failed to monitor human rights violations that occur in aquaculture processing companies. According to the Ministry of Labor and the local labor office, government supervision is focused more on the manufacturing industry.

4. The business/corporate responsibility to respect human rights and protect the environment through good business practices that do not neglect land, nor clear land where forest cover is high or clear hazardous land for aquaculture, and to designate land for conservation and business cooperation with the local community.[59]
   Based on interviews with expert sources, it was found that aquaculture farms would only be productive for no more than 4-5 years after land clearance, whereupon production would start to fall, and the farms abandoned.
5. The business/corporate responsibility to provide remediation where they identify that they have caused or contributed to an adverse human rights impact.[60]
   In the aquaculture business, the immense environmental burden resulting from farming operations is in fact shouldered by the farmers. Corporations have washed their hands of their responsibility towards such adverse impacts, even when they are ones making a fortune. For example, feed or fry producers in relation to environmental management and responsibility are limited only to where they operate. This needs further investigation to determine the extent to which this responsibility has been met.
6. The business/corporate responsibility to comply with the laws and policies established by the State to create an enabling environment that will make sure they respect human rights. For example, more clearly defined laws and policies on matters such as access to land, including the right to ownership or right of use, to protect both rights-holders and business enterprises.[61]
7. The business/corporate responsibility to provide transparent and truthful information regarding licensing documents, business operations, and their impacts to the community.[62]

58 Point 429
59 angka 430
60 Point 431
61 Point 432
62 Point 433

Cooperation Scheme Unfavorable to Farmers

Existing corporation-farmer partnership schemes can be grouped into three categories. *First*, a **binding** commitment, where farmers have an obligation—or in many cases a binding agreement—to buy feed, facilities and infrastructure, and to sell their harvests only to a single company/partner. This arrangement is prone to exploitation, making it near impossible for many farmers to pull themselves out of their debt trap. *Second*, a **semi-binding** commitment, where farmers have the freedom to sell to buyers they consider the most profitable. However, farmers are still bound by certain obligations, such as feed purchases from a single company. *Third*, a **non-binding commitment**, where the producers or farmers are not bound in any way to the agreement or conditions entered into with the other parties.

Based on the experience of respondents, workers in intensive farms are usually paid higher than the Provincial Minimum Wage (UMP), plus bonuses. In the shrimp sector, buyers would proactively approach farmers, often making a down payment that would bind both the buyer and seller for the harvest yields. Say for example a 20-ton harvest at the current price of Rp80,000 per kilo that would amount to Rp4 billion, from which the farmer/seller can borrow Rp1-2 billion in advance. "*When it comes to selling shrimp, it is not the farmer but the buyer—who is actually a supplier or middleman—who would make the first move*".[63]

Suppliers can earn a profit in different ways. As an illustration, they can buy from farmers at Rp80,000 per kilogram, before selling to a factory for the price of Rp82,000 per kilogram. They can profit from two avenues. *First*, from sorting the shrimp by size. When buying from farmers, every 1 kg of shrimp varies in size and bought at a single price. When selling to factories, they will sort the shrimp by size and offer a range of prices, such as for 80 shrimps/kg or 30 shrimps/kg. Manufacturers or exporters who own factories buy on a daily basis within a certain price range. Some will pay a higher price for shrimp size 30, or even for size 50. *Second*, from weight gain as shrimp are transported from the pond to the factory, which usually takes 1-2 days, and stored in a cooler/ice. Factories normally would not buy directly from farmers due to the distance, and this is the case in many areas.

Regarding the cooperation scheme in intensive shrimp farming, we can learn valuable lessons from the Bratasena situation. The company-farmer conflict has had a detrimental impact on the livelihoods of Bratasena farmers. It has also led to declining shrimp production and export volume. The termination of partnership resulted in an agreed debt relief for all farmers that came up to Rp1.3 trillion. The company at which point did not completely disappear from the aquaculture chain, but has turned into a supplier of shrimp fry and feed. Farmers were also free to decide on whether to use the company's harvesting services or not. As a result, production fell and the company's cold storage was not in full operation. Bratasena shrimp exports, which accounted for 76% of Lampung's total fisheries export in 2013 plunged to only 30% in 2013 (Rachmawati et al., 2021).

63 Interview with MAI

Ecolabel Certification Excludes Human Rights Standards

Ecolabel certification not only serves as a tool that can be used to support environmental conservation, but also to improve the quality of cultured shrimp products and to build consumer confidence in international trade (Pramoda and Putri, 2017). In other words, ecolabelling helps promote sustainable fisheries around the world. An example of the ecolabelling of farm-raised shrimp products is the use of ASC (Aquaculture Stewardship Council) certification. An ASC certificate is not mandatory for national exporters, but it has several advantages, including the promotion of good and ecofriendly aquaculture practices, guaranteed healthy and safe shrimp products, and environmental protection from wastes and hazardous chemicals. The drawback on the other hand is that the certification process is costly and time-consuming.

In East Java, certification is seen as an instrument that provides added value, especially for the US and European markets. Meanwhile, the Japanese market places more emphasis on a long-standing relationship based on mutual trust. "*They do their own inspection and crosscheck. Sometimes certification can be too complex for smallholders. They need our assistance. That is why we start with making improvements. Ecolabeling is buyer-oriented and takes a different approach. For example the ASC certification requires a minimum productivity of 30%. It's difficult. An average of 30% is considered good. The majority is now at 20%. ASC therefore is not relevant to small-scale farms. It's a heavy burden. It's more suitable for intensive farms (200-300 shrimp per m2). The environmental impact is much greater. So it would not be fair if it is applied to traditional farms. The key indicator of certification is environmental impact*".[64]

The certification scheme depends on market demand. Certain certifications are specifically related to the market of a particular country or region.[65] For example, the WWF-initiated ASC scheme (ecolabelling) in the European market, and the NSF in the U.S. The problem, however, is that these certification mechanisms leave out the human rights dimension. Certification undergoes an audit process, yet it also depends on who the retailer is. Retail chains like Walmart, for example, require certain types of certification. The government cannot revoke or impose sanctions. Entering the U.S. market requires certification that is highly selective in terms of food quality and safety.

Indonesia's Fish Quarantine Agency is considered one of the world's best. This is evidenced by the fact that Indonesian seafood products dominate the U.S. market, and ranked second in Japan (after India). In Europe however, Indonesia is considered a weak player, ranking below the top 10. The European market follows European Union regulations that levy high import duties on middle-income countries, and none on developing countries. This has delivered a heavy blow to the competitiveness of Indonesian products. This shows how the European market is dictated more by tariffs, instead of product quality.

64 Interview PT. ATINA

65 Certification in barcode form that can be scanned to display the country of origin.

"The FPA system in Japan and America is stricter than in Europe. Sometimes Europe plays 'nasty'. For example, accusing Indonesian shrimp of containing chloramphenicol (a type of chemical compound) that is higher than the FPB. But it is actually more about competition. They want to protect the domestic market because they have their own shrimp products. Upon further investigation, chloramphenicol was also detected in European shrimp that were caught through a capture-based process. So scientifically, all biota contain chloramphenicol. Indonesia filed an objection with the WTO, of which the decision was in favor of us."[66]

Meanwhile, ecolabelling has yet to address the issue of gender justice and human rights protection. Certification in general focuses on food safety, the environment, and good production techniques, and do not sufficiently take labor rights into account. We need to acknowledge that the social dimension or human rights indicators in certification are still a new concept, with different levels of comprehensiveness. Some certification schemes pay little attention to the labor dimension, and none to gender equality. *"But I heard that it's being discussed by their advisory team. But no news as to when it will be released. Europe is the strictest. If you look at export data, exports to Europe is less than 100%, while to the U.S. it's almost 70%, and Japan 16-18%. Obstacles to certification. The European market is harder to please when it comes to certification. In the U.S., there are markets that are concerned about certification, while others don't even require certification (building trust and traceability)."*[67]

Feedback from businesses

A problem facing Indonesia's shrimp industry today is the **shortage of raw materials (low production)**. This is indicated by the average machinery utilization rate of only 65%. Raw materials are therefore undersupplied by an average of 35%. The raw materials are costly as quantity supplied is less than the quantity demanded by the market. In addition, the licensing procedure also creates a barrier. Despite the many cases and inspections over the last two years, not a single one has been brought to court, all of which were eventually discontinued in an underhanded manner. *"This has caused many farmers to falter. Either they continue operating or not, it doesn't make any difference. It's not easy. We propose that this issue be discussed until the Coordinating Ministry for Maritime and Investment Affairs forms a Working Group to simplify the regulation from 22 to 3 licensing items."* [68]

66 Interview with MAI
67 Interview with PT. A
68 Interview with PT. A

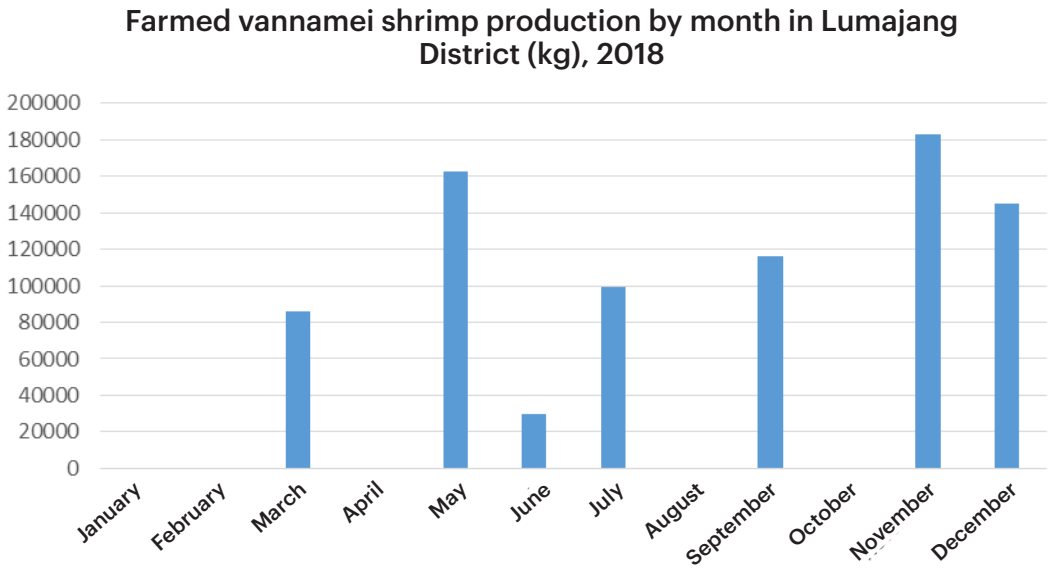


Figure 18. Vannamei shrimp production in Lumajang District in a year (2019, in kg)

Overlapping regulations. There is a certification scheme specifically on building fitness. However, applying for a building fitness certificate is costly as you need to retain a certified consultant. The consultancy fee can cost up to Rp200 million. As certification is mandatory, both for small and large-scale cold storage warehouses, it is important to streamline the licensing procedures.

Taxation is another barrier to business. Shrimp is a strategic commodity that has caught the attention of tax authorities. Shrimp were initially exempted from VAT. There is now talk of subjecting shrimp to VAT, which most certainly contradicts the President's agenda of increasing foreign exchange earnings from shrimp. The Minister has announced an increase of 250%. Meanwhile, the price of raw materials has continued to inch up, which in turn has impacted on the farmer's purchasing power. Shrimp price at the farmer level may eventually be corrected.

Slow government response. Businesses in general do not expect much from the government, when in fact there is plenty that requires government intervention, such as with regard to infrastructure and water drainage to ensure good water quality for healthy shrimp growth. Meanwhile, how small and large rivers fare is dependent on government regulation. In Sulawesi for example, due to limited authority, the local government was unable to effectively deal with problems at arose in an estuary, unless the central government intervenes. As a consequence, in the last three years, local government response has been extremely slow without any form of communication. Siltation in water systems in fact significantly affects water quality and salinity.

Mafia exploitation. Feed companies normally provide technical assistance directly to farmers to help them run successful operations, which will mean more feed consumption. However, a large number of members under the feed manufacturers' association in Lampung have refused to do so due to the involvement of many "mafias" who would lower feed quality by reducing protein content. In the end, farmers will lose out as feed quality is far from what they expect.

Government Human Rights Mechanism for Businesses

Legal and Human Rights Instruments in Aquaculture

The State has the duty to protect, promote, uphold and fulfil human rights. This is asserted in Article 28i clause (4) of the Constitution. Furthermore, clause (5) stipulates that in order to ensure that human rights are upheld and protected in accordance with the principles of a democratic rule of law, the implementation of human rights is guaranteed, regulated, and set forth in applicable laws and regulations. It is reaffirmed in international conventions on human rights, both at the international and regional levels. Article 1 clause (1) of the International Covenant on Economic, Social and Cultural Rights (ICESCR) emphasizes the obligation of State parties to take the necessary steps, individually and through international assistance and cooperation, especially economic and technical, to the maximum of their available resources, with a view to progressively achieving the full realization of rights, including by undertaking legislative measures. The State must guarantee the exercising of the right to land and natural resources without discrimination of any kind.

From the colonial era to the New Order regime, even up to President Habibie's administration, maritime issues were always under the purview of a Directorate General at the Ministry of Agriculture. Fisheries were simply a "complementary" sector that was not a government policy priority. It was only in 1999 that the then President Abdurrahman Wahid established the Ministry of Marine Affairs and Fisheries (MMAF). From then onwards, the policy direction was refocused with a much broader scope. In line with the sustainable development agenda, the Government's focus in the marine and fisheries sector extends to a number of important issues. First, harmonizing economic growth with welfare. Second, social equity, by aiming for a bigger economic pie to be enjoyed by every person and not just by a selected few. Third, prioritizing the environmental dimension or environmental sustainability in marine resources and fisheries management.

If economic growth is left without a clear and measurable policy direction, it can never be enjoyed by ordinary people such as farmers, tenant farmers, and so on. Article 33 of the Constitution in fact explicitly states that the earth, water and natural resources contained therein are under State control to be used, to the greatest extent possible, for the prosperity

of the people. This article is in line with Law No. 5/1960, specifically Article 1 clause (1), Article 2, and Article 3, which stipulate that the entire territory of Indonesia is a unified entity of land and water (earth, water, and airspace, including the natural resources found therein) that God Almighty has endowed, which constitutes national wealth to be utilized to the fullest extent possible for the prosperity, welfare, and independence of the people.

For the economy to grow and prosperity to be enjoyed by all in a sustainable manner, well-formulated regulations are imperative in order to guarantee the protection and enjoyment of human rights and environmental sustainability. However, existing legislation on fisheries is still insufficient, particularly given its divergence from the government's plan to boost shrimp production. In the capture fisheries and aquaculture subsectors, many aspects have been left out of in both national and local regulations. The aquaculture industry is far less regulated compared to capture fisheries.

Aquaculture-related regulations refer to at least three laws: namely Law No. 45/2009 on Amendments to Law No. 31/2004 on Fisheries, Law No. 1/2014 on Amendments to Law No. 27/2007 on Management of Coastal Areas and Small Islands, and Law No. 7/2016 on the Protection and Empowerment of Fishers, Fish Farmers and Salt Farmers. Other relevant laws include the Environmental Law to ensure environmental sustainability in the aquaculture business, in addition to the Spatial Planning Law and other sectoral laws, such as Law No. 41/1999 on forest areas and UU No. 31/2007 on the protection of coastal areas, which imposes a ban on activities that destroy mangroves.

Meanwhile, the only legal reference for the protection of aquaculture workers is Labor Law No. 13/2003, which is more general in nature. There are no specific laws or more technical ministerial regulations that address the issue of the protection of workers in the aquaculture sector. Regarding the protection of aquaculture farmers, in addition to invoking Human Rights Law No. 39/1999, the issue is also sufficiently provided in Law No. 7/2016, which sets out a government protection mechanism for aquaculture farmers that offers assistance to provide certainty of business for shrimp farmers or producers, through empowerment programs, insurance, and others. Alas, the law has yet to be effectively implemented.[69]

Overall, there are at least 28 pieces of legislation relating to aquaculture, including laws, government regulations and ministerial regulations, as provided in Table 5 below.

69 Interview with MAI respondent

Table 5. Legislation on Business and Human Rights Relating to Fisheries and Aquaculture

NO	LAW (UU)/GOVERNMENT REGULATION (PP)/ MINISTERIAL REGULATION (PERMEN)	CONCERNING
1	UU No. 7/2016	Protection and Empowerment of Fishers, Fish Farmers, and Salt Farmers
2	UU 1/2014	Amendments to Law No. 27/2007 on the Management of Coastal Areas and Small Islands
3	UU 45/2009	Amendments to Law No. 31/2004 on Fisheries
4	UU 11/2020	Job Creation*
5	PP 27/2021	Marine Resources and Fisheries
6	PP No. 28/2017	Fish Farming
7	MMAF Permen No. 19/2021	Restocking and Capture of Farmed-Raised Fish
8	MMAF Permen No. 6/PERMEN KP/2020	Fish Welfare in Fish Farming
9	MMAF Permen No. PER.18/ MEN/2016	Guaranteed Protection against Risks for Fishers, Fish Farmers and Salt Farmers
10	MMAF Permen No. PER.23/ MEN/2016	Planning and Management of Coastal Areas and Small Islands
11	MMAF Permen No. PER.35/ MEN/2016	Good Hatchery Practices
12	MMAF Permen No. 75/PERMEN-KP/2016	General Guide on Raising Tiger Prawn (Peneus Monodon) and Whiteleg Shrimp (Litopenaeus Vannamei)
13	MMAF Permen No. 15/PERMEN-KP/2014	General Guide on Monitoring, Evaluation and Reporting of Fish Farming Development Zones (Minapolitan)
14	MMAF Permen No. 24/PERMEN-KP/2014	Good Fish Medicine Production Practices
15	MMAF Permen No. PER.49/ MEN/2014	Fish Farming Business
16	MMAF Permen No. PER.04/ MEN/2013	Amendments to MMAF Regulation No. Per. 04-KP/2012 on Fish Medicine
17	MMAF Permen No. PER.04/ MEN/2012	Fish Medicine
18	MMAF Permen No. 18/PERMEN-KP/2012	Guidelines on the Formulation of a Masterplan for Minapolitan
19	MMAF Permen No. 12/PERMEN-KP/2010	Minapolitan Fish Farming Development Zone
20	MMAF Permen No. PER.15/ MEN/2011	Quality Control and Safety of Fisheries Products Entering the Territory of the Republic of Indonesia
21	MMAF Permen No. PER.16/ MEN/2011	Risk Analysis of Fish and Fisheries Importation
22	MMAF Permen No. PER.02/ MEN/2010	Fish Feed Procurement and Distribution
23	MMAF Permen No. PER.05/ MEN/2009	Business Scale of Fish Farming
24	MMAF Permen No. PER.29/ MEN/2008	Entry Requirements for Carrier Media of Live Fish

NO	LAW (UU)/GOVERNMENT REGULATION (PP)/ MINISTERIAL REGULATION (PERMEN)	CONCERNING
25	MMAF Permen No. PER.02/ MEN/2007	Residual Monitoring of Drugs, Chemicals, Biologicals and Contaminants in Fish Farming
26	MMAF Permen No. PER.14/ MEN/2007	Critical Situations that are Harmful or Potentially Harmful to Fish Stock, Fish Species or Farming Areas
27	MMAF Permen No. PER.15/ MEN/2005	Capture Fishing and/or Aquaculture in Indonesian Fisheries Management Zones for Non-Commercial Purposes
28	MMAF Permen No. 39/PERMEN-KP/2005	Residual Control of Fish Drugs, Chemicals and Contaminants in Farming Fish for Consumption

**In accordance with MK Decision No. 91/PUU-XVIII/2020, the Job Creation Law should be improved within 2 years*

The existing three laws and their accompanying regulations do provide protection for the business actors or enterprises in the shrimp sector, both from the technical, spatial, and socio-economic perspectives. For example, the Law on Coastal Areas and Small Islands provides certainty for aquaculture business in designated zones (RZWP3K). Zonation aims to ensure the designation of protected areas in every national and local development region (province and district/city) (minimum 30 percent based on the Spatial Planning Law), which includes therein protection of the aquaculture industry. Measures have also been introduced to protect shrimp farms from pollution through the AMDAL requirement that should be met before construction to ensure that farm-induced environmental impacts are properly managed.

Field findings however reveal myriad problems in the aquaculture business that have been mishandled. These problems are inextricably linked to weak regulations and their poor implementation. These policies will be further analyzed from 3 key aspects: human rights, the environment, and protection of vulnerable groups.

Negligible Protection for Vulnerable Groups

This study has identified at least three vulnerable groups: aquaculture farmers, women, and crew members working on trawlers. Aquaculture farmers are included in the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas, specifically under Article 17, **which states that every peasant and person living in rural areas has the right to land, individually and/or collectively. *In addition, they have the right to access, use and manage land and water bodies, coastal seas, fisheries, pastures and forests therein in a sustainable manner, to an adequate standard of living, to have a place to live in security, peace, dignity, and to develop their cultures***.

At the national level, there is Law No. 39/1999 on Human Rights. Each of these groups has different sets of challenges and needs, and the existing regulatory framework does not adequately provide protection nor ensure the realization of their rights. Laws and regulations need to be effectively implemented in order to make a difference. **In terms of norms, the term aquaculture is defined in such a way that it excludes traditional and independent farmers,** as was the case in Dipasena and Bratasena.

Government failure to optimally fulfill the mandate set forth in Law No. 7/2016

Of the three laws directly related to coastal areas (Law No. 45/2009, Law No. 27/2007, and Law No. 7/2016) only Law No. 7/2016 on the Protection and Empowerment of Fishers, Fish Farmers, and Salt Farmers specifically provides a protection scheme for aquaculture farmers. The other laws, such as on the Management of Coastal Areas and Small Islands, pay little attention to fish farming, only mentioning fish farmers twice in the entire document. First, fish farmers are included in a general provision as a key stakeholder. The law defines key stakeholders as users of Coastal and Small Island Resources who have direct interest in optimizing the utilization of Coastal and Small Island Resources, and they include traditional fishers, modern fishers, fish farmers, tourism entrepreneurs, fisheries entrepreneurs, and the community.
Second, fish farmers are again mentioned in the explanatory note to Article 26A clause (4) point b regarding the licensing required for foreign direct investment in small islands and the surrounding waters that must guarantee public access, with approval from the Minister. In the explanatory note, public access is defined as the provision of access for fishers and fish farmers in fisheries activities, including access to drinking or clean water.

Nonetheless, Law No. 7/2016 sufficiently provides protection for aquaculture farmers. Pursuant to the said law, both the Central and Local Government, under their respective purview, have the obligation to provide protection to and empower fish farmers. Such protection shall be assured through the following strategies: a) provision of fisheries infrastructure; b) easy access to fisheries facilities; c) provide certainty to business; d) risk guarantees in capture fisheries and culture fisheries; e) elimination of high-cost economic practices; f) imports controls of fisheries commodities; g) security and safety guarantees; and h) facilitation and legal assistance. Fisheries infrastructure in this context includes infrastructure for capture fisheries, culture fisheries, as well as processing and marketing.

Table 6. The strategy for the provision of fisheries infrastructure

Capture fisheries infrastructure	Culture fisheries infrastructure	Processing and marketing infrastructure
a. Filling station for fuel and other energy sources for fishers; b. Fishery port integrated with the fish auction market; c. Road network within and to the port; d. River flow and estuaries; e. Electricity and telecommunications network, and clean water; and f. Refrigerator and/or freezer storage.	a. Land and water; b. Filling station for fuel and other energy sources for fish farmers; c. Irrigation canals; d. Production roads; e. Electricity and telecommunications network; f. Waste treatment facility; and g. Refrigerator and/or freezer storage.	a. Fish processing plant; b. Fish market; c. Distribution roads; and d. Waste treatment facility.

The protection strategy is to ensure fish farmers have easy access to fisheries facilities provided by the Central and Local Governments in accordance with their respective purview. This at the very least should include guaranteed availability and price control of fisheries facilities. Fisheries facilities include facilities for capture fisheries, culture fisheries, as well as processing and marketing.

Table 7. Fisheries facilities

Capture fisheries facilities	Culture fisheries facilities	Processing and marketing facilities
a. Fishing vessels that are seaworthy and fit for fishing and fish storage; b. Fishing equipment and supplies; c. Fuel and other energy sources; and d. Clean water and ice	a. Broodstock, seeds and fingerlings; b. Feed; c. Fish medicine; d. Geoisolator; e. Clean water; f. Fish health laboratory; g. Fertilizer; h. Harvester; i. Live fish carrier; j. Fuel and other energy sources; k. Water pump; l. Waterwheel; and m. Floating net cage.	a. Live fish holding facility; b. Fish handling equipment; c. Fish processing equipment; d. Cold chain equipment; e. Fisheries product marketing equipment; f. Refrigerated conveyance; g. Ice and/or salt; and h. Product packaging and/or packaging machine.

In addition, the Central and Local Governments, within their respective purview, may provide subsidies for fuel or other energy sources, broodstock, seeds, fingerlings, fish feed, and fish medicine to small-scale fish farmers. The subsidies should be provided at appropriate levels, accurately targeted, timely, with the right quality and amount.

To ensure certainty in business, Law No. 7/2016 mandates the Central and Local Governments, within their respective purview, to undertake the following measures. *First*, create enabling conditions for fish prices that are favorable to farmers. This can be achieved by having a fish marketing system in place; provide a guaranteed market for fish through the auction market and warehouse receipts; establish fish market supporting facilities; develop a fish market price information system at the national and international levels; and establish a cold chain system. *Second*, ensure environmental quality control of aquatic environments, coastal waters, and oceanic waters. *Third*, ensure quality control of the processing environment. *Fourth*, make sure that fish farming partnerships are formalized through a written agreement.

In order to ensure business certainty, the Central Government shall prepare a national marine spatial plan for capture fisheries and aquaculture, while the Local Government draws up a zoning plan, including detailed zonation for coastal areas and small islands for capture fisheries and aquaculture; and/or the Central and Local Governments in accordance with their respective powers shall formulate a local spatial plan for fish farming, processing and marketing. The plan must be made in conformity with the applicable laws and regulations. *It should also be guided by other pertinent laws and regulations, such as the Law on Management of Coastal Areas and Small Islands or the Law on the Environment*. In addition, the government has the obligation to provide livelihood space and access to small-scale fishers, traditional fishers, small-scale fish farmers, and small-scale salt farmers. To ensure certainty of the fish farming business, the Central Government appoints an agency or institution to take charge of fisheries commodities. The agency or institution shall carry out the following functions: a) ensures fish supply; b) supports a fish logistics system; and c) ensures fish prices that are favorable to fish farmers.

Law No. 6/2017 also emphasizes the importance of risk guarantees for fish farming as part of the protection strategy. The risks in fish farming include, *first*, the loss or damage of fish farming facilities; *second*, work-related accidents or fatalities among fish farmers; and *third*, other types of risks governed by a Ministerial Regulation. Other risks are further explained and regulated in MMAF Regulation No. 18/PERMEN-KP/2016 on *Guaranteed Protection against Risks to Fishers, Fish Farmers, and Salt Farmers*.

In general, there are two other types of risk: a ban on the culture of certain fish species and/or on the entry and or exit of certain types of fish. These risks can arise from natural disasters, fish disease outbreaks, climate change impacts and/or pollution. Protection against the first and third types of risk is provided through Fisheries Insurance. Meanwhile, protection against

the second type of risk is provided through fisheries insurance for occupational accidents or life insurance to cover fatalities in accordance with existing legislation.

The risks are further regulated in the MMAF Regulation No. 18/PERMEN-KP/2016 on Guaranteed Protection against Risks for Fishers, Fish Farmers, and Salt Farmers. The regulation covers guaranteed risk protection, fisheries insurance and life insurance coverage; criteria for the recipients of premium assistance for fisheries insurance or life insurance; and implementation of Fisheries Insurance and Life Insurance.

Apart from protection, Law No. 72/2016 also establishes the Central and Local Governments' obligation to empower fish farmers through education and training, extension services and mentoring, business partnerships, easy access to knowledge, technology and information, and institutional strengthening.

Narrow definition of small-scale fish farmers and a regulatory void on traditional farmers

A fundamental regulatory issue concerns the definition of aquaculture farmers. The problem should not be taken lightly as it may lead to missed opportunities for farmers to secure their rights. This research posits that aquaculture farmers should be categorized into traditional farmers, farmers, and women farmers. Unfortunately, at the normative level of protection and empowerment, most of the available programs only focus on small-scale fish farmers.

In fact, the relevant Laws and Ministerial Regulations narrowly defines small-scale fish farmers as farmers who engage in fish farming to meet their daily needs. Unlike the definition for fishers that includes a specific category for traditional fishers, the law does not recognize the term traditional aquaculture farmers in the aquaculture sector. Under Law No. 7/2016 and the Fisheries Law, a fish farmer is defined as any person whose livelihood depends on the culture of freshwater fish, brackish water fish and saltwater fish. Aquaculture farmers are then divided into 3 (three) categories: small-scale fish farmers, aquaculture tenants, and aquaculture owner-operators.

Table 8. Categories of fish farming

Aquaculture Farmer	Definition by Law
Fish farmer (shrimp)	Any person whose livelihood depends on the culture of freshwater fish, brackish water fish and saltwater fish.
Small-scale fish farmer (shrimp)	A farmer who engage in fish farming to meet his or her daily needs.
Aquaculture tenant	A fish farmer who contributes his or her labor to fish farming
Aquaculture owner-operator	A fish farmer who holds the right or permit to land and actively engages in fish farming activities.
Traditional aquaculture farmer	None/unknown

These definitions and classification will have implications on the data collection of fish farmers as well as on the fulfillment of their rights. An example is the MMAF Regulation No. 39/PERMEN-KP/2017 on the Marine and Fisheries Business Card (KUSUKA card), which is a unique identity card for marine and fisheries business actors. Business actors can either be an individual or a corporation, and includes: a. Fishers consisting of small-scale fishers, traditional fishers, fisheries workers, and fisheries owners; **b. Fish farmers consisting of small-scale fish farmers, aquaculture tenants, and aquaculture owner-operators**; c. Salt farmers consisting of small-scale salt farmers, tenant salt farmers, and salt farm owner-operators; d. Fish processors; e. Fisheries marketers; and f. Transport operators for the shipment of marine and fisheries products. The card confirms the professional identity of marine and fisheries business actors, from which a database is created to facilitate their protection and empowerment; provide access to services and mentoring support; and as a means for monitoring and evaluating the implementation of the Ministry's programs. In terms of the substance of the law, the issue lies in a rather narrow definition that excludes traditional farmers.

Given the definition above, the question is which category do Dipasena and Bratasena shrimp farmers fall into? The definition of fish farmers already includes traditional farmers. However, the above protection and empowerment programs are primarily targeted at small-scale fish farmers who automatically do not include traditional farmers. **This definition does not represent the reality on the ground as almost every fish farmer relies on aquaculture as a source of livelihood.** Unless the definition extends to fish farmers who depend on aquaculture as their livelihoods to meet daily needs but with little capital. **The question is, if that is the case, why should there be a distinction between fish farmers and small-scale fish farmers?**

According to the MMAF, government protection for traditional aquaculture farmers is assured through the development of a spatial plan (RTRW), an insurance program, and land certification for fish farmers (in cooperation with ATR BPN).[70] However, companies and farmers lamented on existing regulations and permits that they considered too many, which have instead hampered operations, including for the farmers. In addition, the permits are general in nature, applying to all types of aquaculture farmers, be they traditional farmers, or farmers with small or large capital. The list of required permits and licenses include:

1. Groundwater Withdrawal Permit
2. Generator Operation Permit/Generator Ownership Report
3. Certificate of Operational Worthiness for Generators
4. Certificate of Competency of Generator Operators)
5. Fuel Storage Permit
6. Building Permit
7. Trade License
8. Workers Insurance (BPJS-Employment)

70 FGD findings with government ministries/agencies

9. Health Insurance (BPJS-Health)
10. Mandatory Manpower Report
11. Business Identification Number
12. Company Registration Certificate
13. Fisheries Business License/Indo GAP
14. Land Use Permit
15. Advice Planning
16. Seawater Utilization Permit other than Energy
17. Subsea Pipeline and Cable Installation Permit
18. Hazardous and Toxic Waste Storage Permit
19. Waste Water Disposal Permit
20. Statement of Ability to Manage and Monitor the Environment

However, aquaculture farmers have mentioned that the only thing needed to get a new farm started is seed capital (based on the situation in Dipasena and Bratasena). "*As long as they have the money, then they can buy/rent ponds without all the permit hassle*".[71] The government is in the middle of paring down the number of permits to only 3 (three). **Such simplification does not necessarily solve other problems, especially if it means omitting permits associated with environmental impacts. If the regulatory simplification disregards the environmental factor and the potential adverse impacts, it will pose a grave threat. Hence, the importance of taking into account other important aspects when streamlining permit requirements, and not be preoccupied solely on the ease of doing business**.

The limitations of the definition in Law No. 7/2016 as described above is not altogether apparent as the law itself has yet to been implemented. As such, the repercussions are still unnoticeable at the implementation level. No groups appear to be excluded as a result of the definition provided in the law that has yet to be enforced. In Vietnam, which is Indonesia's competitor in shrimp exports, the government strongly **encourages the formation of community-led social and economic institutions such as cooperatives in a bid to place farmers and corporations on equal footing**. This has allowed the local community to determine market price.

Vietnam has greatly benefited from its large fisheries industry, despite lower production levels compared to Indonesia, partly due to its **human rights-oriented policies**. Vietnam and Thailand are making every effort to **add value to their products**. Moreover, **Vietnam has helped empower farmers to become the price maker**. Meanwhile, Indonesia is still exporting raw materials. **Vietnam has a master plan specifically designed for the fisheries sector that extends from the grassroots to the international level**, as part of its response to the 2050 food crisis and its desire to become a major player in the fisheries industries. In contrast, **the Government of Indonesia plays a negligible role in supporting local**

71 Interview with FORSIL

businesses, and rigidly follows market mechanisms. Furthermore, the labor problem for women workers in East Java in 2017-2018 has not been resolved to date, which gets in the way of Indonesia's plans to become the world's leading shrimp producer.

Weak Aquaculture Regulations for the Protection of Women Workers

As with capture fisheries, women's role in aquaculture is never a black-and-white issue. There is still lack of recognition and protection for women as aquaculturists, when they put in the extra work along the aquaculture value chain. From an early age, women aquaculture farmers have been taught to tend to the ponds and treat sick shrimp. They and their spouses (for those who have one) would look after the ponds around the clock.[72] The rights of women workers are enunciated in Article 11 of the Convention on the Elimination of All Forms of Discrimination against Women:

1. The right to work is a human right.
2. The right to the same employment opportunities, including the application of the same criteria for selection in matters of employment.
3. The right to free choice of profession and occupation, the right to promotion, job security and all benefits and work facilities, and the right to receive vocational training and retraining, including apprenticeships.
4. The right to equal remuneration, including benefits, and to equal treatment in respect to work of equal value, and equality of treatment in the evaluation of the quality of work.
5. The right to social security, particularly in cases of retirement, unemployment, sickness, invalidity, old age, and other incapacity to work, and the right to paid leave.
6. The right to protection of occupational health and safety, including the safeguarding of the function of reproduction.

Bearing in mind the women's rights above, implementation on the ground should be closely monitored, including in the aquaculture industry. **The CEDAW also underscores the importance of the protection of women's rights**. CEDAW calls upon countries that have ratified the Convention to adopt principles and provisions designed to eliminate inequality, subordination, and discrimination on the grounds of sex, which are harmful to women not only in the civil, political, economic, social and cultural sectors, but also in the public and private spheres, in addition to policy and regulatory measures. CEDAW sets out 3 (three) foundational principles: substantive equality, non-discrimination, and State obligation. The principle of State obligation covers the following:[73]

1. To guarantee women's rights through laws and policies, and guarantee the outcomes;
2. To ensure the practical realization of rights through special temporary actions or measures, and to create enabling conditions that promote women's access to opportunities that will allow them to equally and fairly enjoy the benefits arising from the said opportunities.
3. To not only guarantee but also realize women's rights.

72 Interview with PPNI

73 Achi Sudiarti Luhulima. "Hak Perempuan Dalam Konstitusi". In Perempuan dan Hukum Menuju Hukum yang Berperspektif Kesetaraan dan Keadilan. p.89. Yayasan Obor Indonesia, 2006.

4. To provide guarantee, both de jure and de facto.
5. To not only be responsible and regulate the public sector, but also ensure implementation against the actions taken by private individuals or organizations in the private realm (family) and business sector.

Specifically on coastal issues, Komnas HAM in the Human Rights Standard Norm No. 7 Point 232 asserts that the State is obliged to ensure that overall fisheries, coastal and marine development plans take into account the presence of women in order to strengthen their protection and affirmation in pursuit of prosperity.

Regrettably, no policy is currently in place on women in aquaculture. The only reference to women in this context is made in Law No. 7/2016. The Law obligates the Central and Local Governments to empower fish farmers and **pay heed to women's involvement and role** in the household. However, the norm is limited to empowerment, and does not include protection. Protection in fact should cover in detail the rights, such as the right to be recognized as a farmer and the right to insurance coverage. A weak point in the norm can be detected from its impact on the ground. Women in aquaculture continue to struggle in earning recognition as farmers, not only in their relationship with the State but also with society amidst a deep-rooted patriarchal culture.

The ILO Convention 109 that sets forth the guarantee of safety and security for women in employment needs to be broadened to include the aquaculture sector. **The convention also contains an article on the elimination of child labor that will help prevent children from being exploited**. Meanwhile, Article 5 provides women protection from harassment and violence. This is important in order to make sure that such issues are not overlooked in the aquaculture sector. **The expectation is for aquaculture enterprises to have SOPs on the prevention of sexual violence against women**. They are also expected to introduce rules to **eliminate discrimination in employment** so that women are afforded the opportunity to occupy strategic positions in the aquaculture sector.

Weak Regulations and Implementation for Labor Protection

There are no specific regulations on the protection of workers—in processing jobs or maritime work—in the aquaculture sector. The existing legislation has instead created confusion. Law No. 7/2016 does little to regulate worker protection, and the same can be said of other laws. The only legal instruments that attempts to address this issue are Law No. 13/2003 on Labor and **Law No. 1/1970 on Occupational Safety**. By virtue of both laws, the Ministry of Labor is obligated to create a safe, comfortable and productive workplace with **zero accidents and work-related diseases**. The Ministry of Labor (ML) is also responsible for ensuring the protection of workers, inspecting production equipment, and guaranteeing safe production processes. The work unit in charge of Work Assessment Test focuses on each stage of work

(pre-implementation, implementation, post-implementation). The Directorate General of Labor Inspection and Occupational Safety and Health (OSH) has often received requests from large companies to issue a certificate stating that their business operations have been conducted in compliance with labor and OHS norms, including from a large aquaculture company in Lampung.

As part of the complaint mechanism, in the event of a work-related accident, the ML has appointed labor inspectors working under the Provincial Government or Ministry to perform monthly inspections of all enterprises, in addition to making them understand about labor and OSH standards. The Ministry of Labor has also issued **Regulation No. 5/2018 on Occupational Safety and Health**. Inspections are not conducted only on employees, but also the work environment in accordance with the said Ministerial Regulation. This is carried out by the company's hygiene and hazardous substances unit.

Currently, the ML is developing a **cost-benefit analysis instrument to weigh the pros and cons of implementing an OSH program** and has been tested in ASEAN countries, which should be completed by this year. The instrument should not only be developed for the construction sector, but also the aquaculture industry. **Security and safety assurance for aquaculture workers needs to be considered** given the high rate of occupational diseases in the aquaculture sector. The ML will work with BPJS Employment for the implementation of the program. **There is still the need to further improve the OSH scheme for the aquaculture sector. The ML has proposed that OSH be recognized as a fundamental right for workers at the ASEAN level. OSH in various sectors including aquaculture will continue to be an area of focus of the Ministry of Labor**.

In the last 3 years, the ML and MMAF under the Coordinating Ministry for Maritime Affairs and Investment have established a joint inspection team to keep track of the extent to which labor and OSH standards are met. One of the issues concerns the signing of employment agreements, a requirement that many mining companies in Indonesia have failed to satisfy. **The ML also helps oversee the application of labor norms, not only in the aquaculture sector**. In enforcing the Labor Law, the ML has **inspectors working under the Provincial Government** to uphold labor standards. Meanwhile, **national-level inspectors** focus only on monitoring and technical guidance. **Support and assistance are in fact needed at the district/city level in regard to employment relationships**. Apart from human resource issues, labor problems at the local level are not considered fundamental, and therefore often are not appropriately addressed.

East Java's Provincial Labor and Transmigration Office for example, had dealt with a labor case involving PT. Sekar Mulia. Post-harvest women workers at the time were considered unskilled labor and were paid below minimum wage. The case ended with a joint agreement on the payment of social benefits, but wages are still lower than the minimum standard. **The Local**

Labor Office can only intervene in the event of grievances against normative violations. To date, the East Java Labor Office has **not received any complaints against normative violations in the shrimp farming sector**. In an employment relationship, a key aspect is the **availability of social security benefits** for workers. **Regarding the aquaculture sector, there is the need to delve deeper into the pattern or dynamics** of contractual employment relationships and collective agreements related to profit-sharing, and others.

Currently, there are no policies dedicated to the protection of workers in the aquaculture sector or the processing industry. Both the **ML and Provincial Labor Office have admitted to not giving priority to the aquaculture sector**. In regard to inspection and OSH, the Ministry prioritizes other sectors such as manufacturing and construction. Nevertheless, the ML had previously facilitated medical check-ups and provided personal protective equipment for fishers. Meanwhile, OSH education and training was mainly in response to the rise in fire incidents on board vessels due to lack of safety awareness concerning the proper handling of flammable substances. Such programs however are limited only to fishers, while fish farmers are persistently left out.

The disregard of workers' rights, including the right to a workplace free of health hazards in the aquaculture sector, poses a serious threat to workers, especially women. In the future, the ML should pay more attention to OSH in the aquaculture business. The Ministry has now established a UPTP unit in each region to conduct an annual assessment of the work environment. In the aquaculture business for example, the cold storage system will be assessed to monitor the risk of frostbite due to exposure to extreme cold, and other health harms arising from the use of chemicals. Beginning this year, the Ministry has been directly monitoring tuberculosis control measures in the workplace. Findings from this study can inform further actions for better monitoring and implementation of OSH in the aquaculture sector.

Lack of Environmental Protection

In managing natural resources, including in coastal areas, the State must focus its attention to the environmental aspects. This is in line with the commitment to sustainable development enunciated in international, regional and national human rights instruments. Article 9 of the ASEAN Human Rights Declaration emphasizes the need "to promote sustainable development to **ensure the protection of the environment** within the region, sustainable natural resources, the preservation of cultural heritage, and the highest possible quality of living. The commitment to a sustainable coastal environment is in line with the SDGs, especially Goals 12 and 14. Goal 12 refers to "sustainable consumption and production" by reducing pollution, promoting sustainable business practices, increasing public awareness of responsible consumption. Goal 14 is about "life below water" and protecting these resources by eliminating destructive and illegal fishing, and preserving fisheries resources.

The government also has yet to have regulations on land clearance for shrimp farming. This is a cause of grave concern as the government claims that there are over two million hectares of land ready to be converted into shrimp farms. This puts coastal areas at more serious risk. Kiara had enquired the government about the data, who was unable to support such claims. Companies are given leeway to clear land and evict people, and lay claim over coastal areas, made possible by the Job Creation Law.

Many shrimp companies incentivize farmers to clear mangrove forests with the promise of electric power supply, road repairs, and others. However, once the shrimp farms are up and running, the waves tend to get higher from year to year, fishers will have to go further out to sea, and tidal waves become all too common. Shrimp farms are projected to further expand at an unprecedented level. The two-million-hectare land planned for shrimp farming poses a threat to coastal ecosystems.[74] This is made worse by the ongoing waste problem. Wastes produced from different sources are dumped into the ocean, causing extraordinary levels of pollution. This is indicated by foamy, foul-smelling water. "*The company should take responsibility. Ammonia levels are very high in trash fish caught during fishing operations. It can make you faint or even die.*"[75] All kinds of materials that move through waterways will eventually end up in shrimp farms as they are located in low-lying areas. In view of this, the MMAF and Local Government should make every effort to manage these negative impacts (externalities), especially arising from the industrial and agricultural sectors, households, urban areas and others.

Given today's technological advances, the conversion of land into shrimp farms need not cause damage to mangrove forests as a sustainable BIOKRIT and HDPE system is already in place. In the past, natural ponds were only possible in coastal areas with clay loam texture soil, where the ponds can be made watertight. However, since 1990, almost all sustainable ponds use concrete and HDPE as there would be no organic waste and can be completely drained at harvest time. In short, pond development from the late 1990s to present has been on sandy soils. Nowadays, a more desirable location for aquaculture ponds is the southern coast of Java thanks to its marine ecosystems. This means that the Indian Ocean has much better water quality than the Java Sea, where the currents are relatively calm, so there is no need to worry about the impact of pond development on mangroves.

Article 35 of Law No. 27/2007 establishes that in respect to the use of coastal areas and small islands, it is prohibited, either through direct or indirect involvement, to:

a. mine coral reefs that causes damage to coral reef ecosystems;
b. extract coral reefs in conservation areas;
c. use explosives, toxic substances, and/or other materials that cause damage to the coral reef ecosystem;
d. use equipment, procedures, and other methods that cause damage to the coral reef ecosystem;

74 Interview with Kiara
75 Interview with Kiara

e. use procedures and methods that cause damage to the mangrove ecosystems, and are unsuitable with the characteristics of coastal areas and small islands;
f. convert mangrove ecosystems in aquaculture development areas that do not take into account the sustainability of the ecological functions of coastal areas and small islands;
g. cut down mangrove trees in conservation areas for industrial, residential, and/or other purposes;
h. use procedures and methods that destroy seagrass beds;
i. mine sand in areas that can technically, ecologically, socially, and/or culturally cause damage to and/or pollute the environment and/or harm the surrounding community;
j. mine oil and gas in areas that can technically, ecologically, socially, and/or culturally cause damage to and/or pollute the environment and/or harm the surrounding community;
k. mine minerals in areas that can technically, ecologically, socially, and/or culturally cause damage to and/or pollute the environment and/or harm the surrounding community; and
l. conduct physical development that causes damage to the environment and/or harm the surrounding community.

Violation of Article 73 (1) shall be punishable by imprisonment for a minimum of 2 (two) years and a maximum of 10 (ten) years and a minimum fine of Rp2,000,000,000 (two billion rupiah) and a maximum of Rp10,000,000,000 (ten billion rupiah) if a person by intention:
a. mines coral reefs, extracts coral reefs in conservation areas, uses explosives and toxic substances, and/or other methods that cause damage to the coral reef ecosystem as set forth in Article 35 points a, b, c, and d;
b. uses procedures and methods that cause damage to the mangrove ecosystem, converts mangrove ecosystems, and cuts down mangrove trees for industrial, residential and/or other purposes as set forth in Article 35 points e, f, and g;

Komnas HAM through the SNP (Standard Norm and Regulation) No. 7 on the right to land and natural resources, also explicitly outlines State obligations in coastal areas and small islands. The SNP provides reference for public officials to ensure that regulations, policies, and actions abide by human rights principles and norms, and serves as guidelines for individuals and communities to understand human rights violations in order to ensure that their human rights are protected, and to promote State accountability. It also guides non-state actors (business, non-governmental organizations, community organizations) to understand human rights and their obligation to respect these rights and to not cause or contribute to human rights violations. Numbers 219 to 234 of the SNP set out in detail the following State obligations in coastal management:
1. The State has the obligation to not grant business license to industrial, housing development, commercial and industrial, tourism, aquaculture, plantation, reclamation, and mining activities that may change and harm the natural landscape and damage the environment in coastal areas and small islands, and to control land allocation in the upstream area for extractive industries in order to prevent environmental damage

to coastal areas and small islands. *In the aquaculture sector, mining permits have been issued to allow operations in aquaculture farming areas, and intensive aquaculture permits in traditional farming areas. In Lampung, for example, before a zoning regulation was in place, sand mining was allowed.*

2. he State is obliged to prevent the occurrence of tidal waves or seawater intrusion, abrasion and coastal erosion that may cause the loss of land and housing of coastal communities, and to prevent seawater abrasion into the ground, which may trigger a water crisis and decrease the quality of other life forms for the local/coastal community.

The Directorate General of Inland Waterways and Mangrove Rehabilitation (RPDM) is primarily responsible for forest rehabilitation and reclamation, including the mangrove ecosystems, in accordance with Government Regulation No. 26/2020. In 2021, the Directorate General unveiled a mangrove map developed jointly with the Coordinating Ministry of Maritime and Investment Affairs, BIG, BAPPENAS, and several other relevant institutions. Currently, **total mangrove area with high-medium-low density in Indonesia spans across 3.3 million hectares**. The potential of one of the mangrove typologies is manifested in productive or unproductive ponds. **Land-based aquaculture farms currently stretch across 600 thousand hectares**, both inside and outside forest areas. This shows that the data are consistent with the data on shrimp production in Indonesia as reported by INFID.

However, certain inter-ministerial policies have proven to be counterproductive. **On the one hand, the Ministry of Environment and Forestry (MEF) is currently working alongside BRG to rehabilitate critical forests, one of which is a 600-ha critical mangrove area** located inside and outside mangrove forests due to labor-intensive activities. The lands were once private-owned aquaculture farms that were eventually abandoned following a decline in production for 2 years. **Under the charge of the Coordinating Ministry of Maritime and Investment Affairs, the MEF is currently overseeing a national action plan for the rehabilitation and restoration of mangrove ecosystems. The MEF has taken the initiative to draft an implementing regulation to Law No. 32/2009 and Law No. 41/1999 on Forestry, which relates to the protection and utilization of mangrove ecosystems**, including therein discussion on the use of aquaculture ponds in mangrove ecosystems. **The MEF also worked in concert with the MMAF to prepare a General Plan for Forest and Land Rehabilitation,** which covers pond and non-pond areas, damaged ecosystems, open spaces, and several typologies of emergent landforms. This is driven by pond activities that are predominantly carried out by coastal communities.[76]

Under the MEF's regulation, aquaculture refers to farms that adopt the silvofishery or ditch pond system as an adaptation strategy. An example of good practice is the traditionally managed ponds in Brebes, which have improved since 2012 when local farmers underwent training on pond optimization. Notable outcomes of the training program include increased

76 FGD findings (MEF)

pond and fish production, mangrove ecotourism, and transcontinental bird migration into the area. In addition, silvofishery is considered more environmentally sustainable. However, the initiative goes against the MMAF's goal of producing higher and faster yields, as it would mean diminished land capacity, only to be abandoned within the next 2-3 years.

The environmental responsibility of aquaculture companies to ensure sustainable mangrove management has thus far been carried out through CSR initiatives. Pelindo, Pertamina, the Indonesian Forest Entrepreneurs Association, the Indonesian Forestry Entrepreneurs Federation, and several state-owned enterprises are the only companies that have so far carried out CSR activities under the MEF supervision. However, none was aimed at the aquaculture sector.

Weak Government Regulation on the Aquaculture Business

Sustainable development is not the sole responsibility of the State, but should also involve non-state actors, especially the business sector. In this context, enterprises must ensure that their business practices do not infringe on the human rights of others and are sustainable. The UN Guiding Principles on Business and Human Rights (UNGPs) **outline a three-pillar approach to address the link between business and human rights:** 1) the State duty to protect human rights from violations by companies; 2) the corporate responsibility to respect human rights; and 3) enterprises should provide a grievance mechanism to address violations and ensure remediation. The commitment to sustainable development is also embodied in the SDGs, a global agenda adopted by governments and translated into national and local action plans.

Indonesia currently has no national certification scheme, and as such the government has no obligation to protect and empower shrimp farmers. The government does not have direct control over existing certification schemes and neither is the government obliged to audit them, leaving these certification systems unsupervised. If an enterprise were to violate certification requirements, the government is powerless to impose sanctions. At best the government can resort to an auditing of the schemes.

If a national certification scheme is in place, the government can ensure the inclusion of the key dimensions of human rights, gender justice, and environmental protection. This will strengthen the implementation of Law No. 7/2016, specifically on the protection and empowerment of fish farmers. The existing **MMAF Regulation No. 15/2015** focuses more on capture fisheries. It was however poorly implemented given the context in which it came about that was mainly market-oriented.[77] It was prior to 2015, when European countries banned Thai fisheries imports that allegedly involved slave labor. The MMAF capitalized on the opportunity by establishing a fisheries human rights certification mechanism, but **without any monitoring and evaluation as the purpose was merely for market penetration with**

77 Findings from FGD (Kiara)

an average market response. The government has not paid serious attention to the aquaculture sector with no specific policies on the protection of aquaculture, and GAP (good aquaculture practices) certification falls only under the ambit of the Directorate General of Fisheries and Aquaculture.

The Government in fact already has a GAP mechanism in place since 2017, and the MMAF also has its own certification scheme. However, the GAP certification is not recognized in foreign markets, merely serving as an attachment, without the power to influence prices. According to farmers, the MMAF certification scheme brings no benefit. In Dipasena, certification has simply become a data collection process without further on-site inspection and monitoring of the harvesting process. In addition, the GAP scheme is overly technical, specifically relating to water flow direction, water outlets, and feed ration. Meanwhile, the environment is not seen as a natural landscape at risk of being affected by the encroachment of shrimp farms.

Based on input from stakeholders, the Government plans to revise the GAP scheme into INDOGAP (Indonesian Good Aquaculture Practices) to follow in the footsteps of other countries in Southeast Asia. Vietnam, for example, has established its own Vietnam Good Aquaculture Practices. Thailand and other countries where aquaculture is an important industry, have pushed for their own certification schemes. Further regulation of the aquaculture sector should learn from previous experiences to avoid introducing market-oriented policies.

The Ministry of Law and Human Rights (MLHR) already has a voluntary self-assessment mechanism (PRISMA) in place, which is therefore not legally binding. PRISMA is an application to help companies self-assess the risk of human rights violations caused by their business activities. PRISMA was jointly initiated, designed, and developed by the MLHR's Directorate General of Human Rights and civil society in consultation with the private sector. The application aims to make it easier for enterprises, both large and small, in all lines of business, to perform self-assessments by identifying the potential impacts or risks, developing follow-up plans based on the assessment results, tracking the implementation of the plan of action, and communicating the processes to the public.

PRISMA uses 13 indicators to help enterprises conduct human rights due diligence related to their business practices. The indicators are:

1. Company profile
2. Human rights policies
3. Human rights impacts of the company
4. Complaint mechanism on human rights violations
5. Supply chain
6. Labor (This needs to be monitored especially when child labor is involved as the Labor Law has provisions that specifically address child labor)
7. Workers' condition

8. Trade union
9. Work environment
10. Agrarian and indigenous peoples
11. Privacy
12. Discrimination
13. Social responsibility and the environment where the company operates

In addition, PRISMA also sets out 7 (seven) criteria for human rights compliance in the fisheries sector:

1. Occupational Safety and Health (OSH)
2. Recruitment system
3. Labor system
4. Responsibility towards community development
5. Workers' safety
6. Environment
7. Land acquisition

Urgency of Local Government Support in the Aquaculture Sector

The **Lampung Provincial Government** plans to build a shrimp processing and cold storage facility in East Rawajitu, Tulangbawang to absorb local farmers' shrimp production.[78] This was announced by Lampung Governor, Arinal Djunaidi, during a P3UW meeting on Thursday, February 18, 2021. The cold storage facility is a priority program of the Lampung Provincial Government. It will help ensure shrimp freshness, which will mean more stable shrimp price. The provincial government also pushed PLN (state-owned power company) to urgently resolve complaints on frequent outages, which are one of the major challenges facing thousands of shrimp farmers in Dipasena. In addition, P3UW also urged the Provincial Government to look into the immediate handing over of PT. CPP's land-use-permit to the Government. This will allow the Ministry of Public Works and Housing to revitalize water infrastructure that will facilitate the operations of Dipasena farmers.

Apart from the Lampung Provincial Government, the **Indonesian Fisheries Public Corporation (Perum Perindo)** is equally committed to shrimp quality assurance in Bratasena. To this end, Perum Perindo works closely with the Fish Quarantine, Quality Control and Product Safety Agency (BKIPM) to protect fisheries resources from quarantine pests and diseases of fish.[79] The quality of fisheries products will therefore be guaranteed prior to reaching consumers. Perum Perindo oversees a 2,500-hectare shrimp farming area in Bratasena. It provides support and assistance to 800 partner farmers, of whom 219 farmers are certified. One farmer in particular manages a half-hectare farm. The main shrimp species farmed in the area are the tiger prawn and whiteleg shrimp. Perum Perindo is primarily responsible for

78 https://m.lampost.co/berita-pabrik-pengolahan-udang-di-tulangbawang-jadi-prioritas-gubernur.html
79 https://bumn.go.id/post/perum-perindo-jaga-mutu-udang-di-lampung

revitalization activities, and helps Lampung farmers increase their income. The production potential of several partner farmers is around 2,400 kg per year or 800 kg for three rounds of harvest in a year.

The Local Government's show of support and responsiveness as explained above are paramount, especially to assist shrimp farmers grow their businesses, while finding a way out for those hampered by problems related to facility and infrastructure. It is also important for the Local Government to develop a roadmap for its coastal areas and aquaculture farms in dealing with climate change impacts, including sea-level rise, through long-term mitigation measures. This will provide aquaculture farmers viable alternatives in case of natural disasters or worsening climate change impacts that pose a threat to their main source of livelihood. For regions where shrimp estates are being developed, the Local Government should learn from the blunders and missteps made in Dipasena and Bratasena to prevent social conflicts and human rights abuses from recurring in the future.

CONCLUSION

Government plans to boost shrimp production and exports by 250% through revitalization and opening up new shrimp farms (including the conversion of traditional ponds into improved-traditional and semi-intensive ponds) should be carefully weighed against the potential social and ecological impacts, especially in coastal areas. This includes the government's (MMAF) initiative to build shrimp estates where pilot plant testing has not been conducted to identify how such projects would impact on the environment and the farming community.

The past mistakes (1993-1998) made in the shrimp estate development projects in Dipasena (the largest in Southeast Asia at the time) and Bratasena in Lampung Province should serve as an invaluable lesson. Land clearance on a massive scale for intensive farming with the expectation of optimal productivity turned out to be short-lived, despite being in sites suitable for aquaculture. This manner of intensive aquaculture management has shown a track record of failures, marked by human rights violations, social conflicts, and environmental degradation.

Shrimp farmers or producers in each aquaculture system face a different set of problems. Traditional farming uses natural feed with high dependence on nature. It becomes even more challenging when natural conditions change due to multiple factors. In response to this, traditional farmers are increasingly aware of the need to "adapt to technology", which unfortunately is understood differently from what the government has in mind. Traditional farmers see the importance of eco-friendly technology as long as it does not change the basic structural system of traditional farming that has thus far proven to be sustainable. In contrast, the government is seeking to promote such changes, including the use of supplementary artificial feed, and moving away from the traditional method to semi-intensive farming or the government's newly coined term, "improved-traditional farming".

Among the drawbacks of intensive farming are the heavy reliance on feed, large amounts of capital and high-cost, not to mention the significant environmental burden that individual farmers will not be able to shoulder alone. There has been no meaningful effort from the government and the shrimp supply chain to address the environmental burden caused by intensive shrimp farming in Indonesia.

From a regulatory lens, Indonesia has yet to introduce a specific policy for shrimp farming. The protection of aquaculture farmers currently relies on Law No. 7/2016 on the Protection and Empowerment of Fishers, Fish Farmers and Salt Farmers, which includes a government protection scheme to ensure certainty of business, empowerment, insurance and others. Implementation on the ground however tells a different story. In fact, business uncertainties

or threats also come from government programs and policies, both under the MMAF, such as the granting of permits for intensive mining located adjacent to traditional farms, and under other ministries that issue sand mining permits in the upstream section of rivers, which compromise the supply of quality water as a critical resource in shrimp farming.

In addition, the government has not set any ground rules specifically for the aquaculture sector that can ensure a win-win business relationship for all stakeholders in the aquaculture value chain, especially for farmers, where everyone involved in aquaculture should share environmental responsibilities.

Due to lack of specific, clear-cut regulations, the aquaculture industry sees a future where everything will hinge on the certification scheme, which in itself is contingent on the market mechanism without comprehensively taking into account the human rights dimension. Certification places emphasis on the technical aspects of aquaculture, overlooking the protection of producers (farmers), women workers, and crew members. Furthermore, certification oversight remains weak. In fact, the MMAF's GAP certification scheme is even considered unhelpful to farmers as it does not provide price certainty, nor is it recognized in international markets.

Indonesia should learn from Vietnam and Thailand. Despite lower levels of production compared to Indonesia, Vietnam takes a human rights-approach to its fisheries policy. Vietnam and Thailand are one step ahead by empowering the community into becoming the price maker, and introducing a masterplan dedicated to the fisheries sector from the grassroots to the international level, while bearing in mind the 2050 food crisis and Vietnam's ambition of becoming a leading player in the fisheries industry. In contrast, the Government of Indonesia provides little support to local aquaculture farmers, and is unduly dictated by market mechanisms.

RECOMMENDATIONS

Based on the findings, the following recommendations are put forward:

a. The government needs to regulate the aquaculture sector for certainty to business, especially shrimp farming, in a holistic manner, while at the same time remaining consistent with the principles of human rights and environmental sustainability. In view of this:
    1. The government (MMAF) should more wholeheartedly be committed to implementing Law No. 7/2016 on the Protection and Empowerment of Fishers, Fish Farmers and Salt Farmers, especially in providing a protection scheme for certainty to business, empowerment, insurance coverage and others.
    2. The government, through the MMAF and the Coordinating Ministry for Maritime and Investment Affairs, needs to redefine small-scale fish farmers—currently measured simply from whether they operate for commercial purposes or not without any further elaboration—as it can mean the exclusion of traditional farmers or farmers with little capital whose livelihoods depend on aquaculture. The government should also reclassify shrimp farms in Indonesia in order to provide appropriate support according to the needs of each shrimp farming community.
    3. Given the double burden that they bear, women in aquaculture sector should be protected and empowered economically as natural variability can create uncertainty in shrimp yields. Economic empowerment can help ensure the economic sustainability of women and farmers' households in coastal areas that are vulnerable to natural disasters and climate change impacts. The government should also improve access to education for women in aquaculture amidst a deep-seated traditional mindset that often brush aside the importance of education.
    4. The need for government intervention to ensure a healthy partnership between business actors in the shrimp supply chain. A new, more adaptive and equitable partnership model is urgently needed so as not to repeat the mistakes made in the previous "nucleus estate-smallholder" scheme that had instead led to exploitation and social conflicts. Other forms of government intervention may include infrastructure (rivers, roads, markets, etc.) and facility (technology, training, credit/capital, etc.) development and maintenance, either directly or indirectly, which can help promote welfare and sustainable outcomes for shrimp farmers and their farms in Indonesia.
    5. Enact regulations to protect coastal ecosystems from environmental degradation that are more specifically caused by aquaculture activities by acknowledging the climate crisis as a policy challenge that needs to be factored in to make sure that government actions are not rendered futile.
    6. Ensure inter-ministerial collaboration, including the Ministry of Environment and

Forestry, considering the Government's commitment to rehabilitate 600 hectares of mangrove land that contradicts its plans to boost shrimp exports.

7. Develop a formula or indicator for sustainable shrimp farming. Nature-dependent traditional farms should not be viewed from an economic lens where they are seen as "unproductive" and "inefficient". They involve long-standing good practices passed on for generations within the local community that deserve preservation, such as environmental sustainability, social cohesion, local knowledge/wisdom. A pilot project of a certain scale should be considered to ascertain the sustainability, technological capability, and environmental impact of a large-scale shrimp estate before going ahead with such projects. Paradigmatically, the government needs to frame aquaculture development in the context of food sovereignty, instead of focusing only on food security. Food sovereignty involves a more comprehensive set of dimensions: pro-producers, ecosystem conservation, and multistakeholder engagement at the local level (stronger sense of ownership).
8. The MMAF needs to develop a national aquaculture business certification scheme, which will lead to government oversight to ensure compliance, including the imposition of sanctions for violations, and not to be left entirely to market mechanisms, such as the case for certification schemes introduced by the business sector. In line with this, government plans to develop GAP certification into IndoGAP should view the environment as a complex natural landscape, and embed human rights, including the protection of women, into the process. The certification scheme and the regulations that come with it should not focus on the politics, but rather to facilitate fairer relations for all stakeholders in the aquaculture (shrimp) value chain. Only then can each stakeholder operationalize the principles and responsibilities socially, economically, and environmentally.
9. In developing the national certification scheme, the government should engage with civil society in the monitoring or assessment of compliance in the aquaculture industry.

b. The business sector should incorporate environmental and human rights aspects into its certification schemes that tend to be partial, and generally overlook human rights violations, including with regard to ecolabelling schemes that focus only on the environment.
c. Civil society needs to help raise public awareness on avoiding the consumption of shrimp produced by irresponsible businesses linked to environmental and human rights violations.

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