



## The Impact of Covid 19 on Seaweed Smallholder Farmers in Nusa Tenggara Barat, Indonesia

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### ABSTRACT

The COVID-19 pandemic has impacted the seaweed industry and business. The export-import trade is the most severely impacted sector, mainly the raw material export of seaweed. The purpose of this study was to determine how smallholder farmers in West Nusa Tenggara, Indonesia, can survive under adverse conditions and maintain their businesses during a pandemic. The research was conducted through a combination of field surveys and in-depth interviews with respondents. Interviews were performed using a variety of instruments, including questionnaires and cameras. According to the study's findings, smallholder farmers are impacted by a decline in prices and demand. Smallholder farmers in West Nusa Tenggara, Indonesia, are attempting to adapt or adjust their operations to maintain profitability. Seaweed farmers make significant savings and cut their spending in the event of a pandemic. What is intriguing is that respondents did not reduce their spending on food. Instead, they prioritize reducing tertiary needs. Additionally, the same holder farmer borrows from collectors, borrows from the bank, and works side jobs. Thus, seaweed farmers are relatively unaffected by this pandemic and recover more quickly than other types of fishery businesses.

**Keywords:** Covid 19, seaweed, smallholder farmer, Nusa Tenggara Barat

### ABSTRAK

Pandemi covid-19 berdampak pada usaha dan industri rumput laut. Perdagangan ekspor impor merupakan sektor yang paling terkena dampak paling berat terutama ekspor rumput laut dalam bentuk raw material. Penelitian ini bertujuan untuk melihat bagaimana petani kecil di Nusa Tenggara Barat, Indonesia mampu bertahan disaat kondisi kritis, dan mempunyai solusi terhadap usaha yang mereka jalankan selama Pandemi ini. Penelitian dilakukan dengan metode survei lapangan, dan wawancara langsung dengan responden. Wawancara dilakukan dengan menggunakan alat bantu berupa kuesioner dan kamera. Berdasarkan hasil penelitian diketahui bahwa petani kecil terdampak karena terjadi penurunan harga dan permintaan. Petani kecil di Nusa Tenggara Barat, Indonesia berusaha melakukan adaptasi atau penyesuaian agar usahanya tetap dapat berjalan. Dalam menghadapi pandemi para petani rumput laut melakukan banyak penghematan dan mengurangi belanja mereka. Namun yang sangat menarik, bahwa para responden tidak mengurangi porsi belanja untuk kebutuhan pangan. Mereka memilih kebutuhan tersier untuk dikurangi. Solusi lain yang ditempuh oleh petani kecil yaitu meminjam kepada pengepul, meminjam ke bank, dan melakukan pekerjaan sampingan. Pada masa pandemi ini, dampak yang dialami pembudidaya rumput laut relatif ringan dan relatif cepat pulih daripada jenis usaha perikanan lainnya

**Kata kunci:** Covid 19, rumput laut, petani swadaya, Nusa Tenggara Barat

## 1. Introduction

Seaweed farming has exploded in popularity across coastal Indonesia over the last two decades. Although numerous seaweed species are cultivated commercially, only seven of these species account for more than 95% of the global value of aquatic plants (FAO, 2020). Four of these are premium food products primarily grown in China, Korea, and Japan. The remaining three – *Gracilaria*, *Eucheuma*, and *Kappaphycus* species are used to make carrageenan and agar, both of which are hydrocolloids used as gelling agents in a variety of applications. Indonesia produces 66% of the world's supply of these hydrocolloid seaweeds, and the industry has overgrown them since 2000. Hydrocolloid seaweeds are significantly less valuable than edible seaweeds.

Indonesian seaweed production is primarily carried out by low-income smallholder farmers, primarily in Eastern Indonesia, who can work around seasonal and tidal changes and have few other sources of income. Seaweed farming is a significant source of revenue for more than 267,000 rural households in Indonesia (Presidential Decree 33-2019, p.17), with annual profits of approximately US\$2000 (Presidential Decree 33-2019, p.16). Seaweed farming is frequently perceived as a more lucrative endeavor than more established industries such as copra, cocoa, and other marine industries (Arsyad et

al., 2014). Additionally, various other benefits associated with seaweed farming have been documented, including an improved ability for farmers to manage their income and save for large purchases. These benefits are in addition to a variety of other environmental and social changes associated with the industry and varying benefits to different members of the community and household (Figure 1) (A. Langford et al., 2021).

Recognizing the growing importance of seaweed in coastal livelihoods, the Indonesian government has made industry development a national priority, as evidenced most recently by Presidential Decree 33-2019 (*Peraturan Presiden Republik Indonesia Nomor 33 Tahun 2019 tentang Peta Panduan Pengembangan Industri Rumput Laut Nasional Tahun 2018–2021*), which establishes a road map for the seaweed industry's development from 2018 to 2021. The decree outlines opportunities for increased seaweed production and, rather than exporting early-stage products, to develop processing capacity for food, animal feed, fertilizers, cosmetics, and bioethanol in Indonesia. While efforts to improve production are focused on growth rates and quality, the industry faces various challenges, including high transportation and logistics costs and a lack of infrastructure development (Presidential Decree 33-2019 p. 30). Despite its importance to the national economy and as a strategy for poverty reduction, seaweed production patterns



**Figure 1.** Women smallholder farmers activity

are poorly understood, limiting farmers, traders, and processors' ability to coordinate and the efficacy of policy interventions. As a result, more informed data are required to understand better farming patterns in rural Indonesia (Z. Langford et al., 2020).

During the early stages of the COVID-19 pandemic (Quarter I), seaweed exports as raw materials were particularly hard hit. A lockdown policy implemented by the Indonesian government and many trading partners has had a significant impact on the seaweed export sector. As a result, seaweed export volume decreased by 7.77 % in the first semester, while value declined by 6.17 % (Wardono et al., 2020). This is one of the arguments that the pandemic's impact will be felt by exporters of dried seaweed (raw material). On the one hand, the utility of Indonesian seaweed processing plants has been reduced to 50%, partly because they do not receive an adequate supply of raw materials, even though the raw material requirements of processing plants should not be more minor.

On the other hand, product mobility is hampered due to the pandemic, resulting in seaweed production not being as optimally absorbed by the market as before the pandemic. Additionally, this condition has a significant impact on smallholder farmers in West Nusa Tenggara Province. The purpose of this study is to demonstrate how smallholder farmers can survive in adverse conditions and find solutions to the businesses they have previously operated.

## 2. Material and methods

The research was conducted in the West Nusa Tenggara Province villages of Serewe, Ebangah, and Gerupuk. This study took place between 16 and 21 July 2021. There were 58 respondents in this study, ranging in age from 11 to 60 years (Table 1).

Field surveys and direct interviews with respondents were used to collect primary data. Interviews were conducted using a variety of instruments, including questionnaires and cameras. Discussions are advantageous for obtaining primary (first-hand) data. Primary data collection via a questionnaire has several advantages, including the fact that the list of questions can be carefully written, allows for the involvement of a large number of people, and allows for interaction between researchers and respondents. The data analysis was descriptive, using tables and graphs (Prasetia et al., 2020).

## 3. Results and Discussion

### 3.1. Individual characteristics

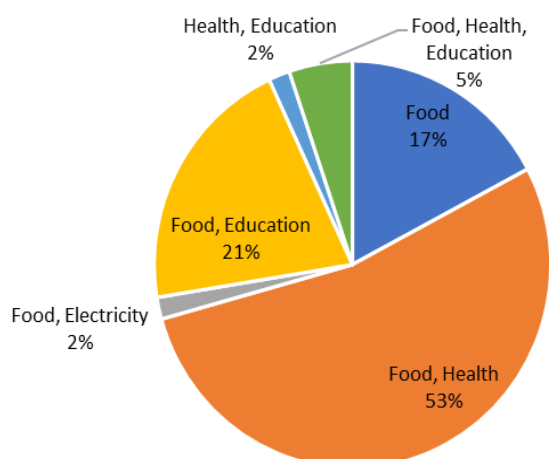
The age group of respondents in this study was 21-30 years (39.7%). At the same time, the youngest are between the ages of 51 and 60 years (3.4%). Male respondents outnumber female respondents when Gender is considered.

### 3.2. Socio-demographic characteristics

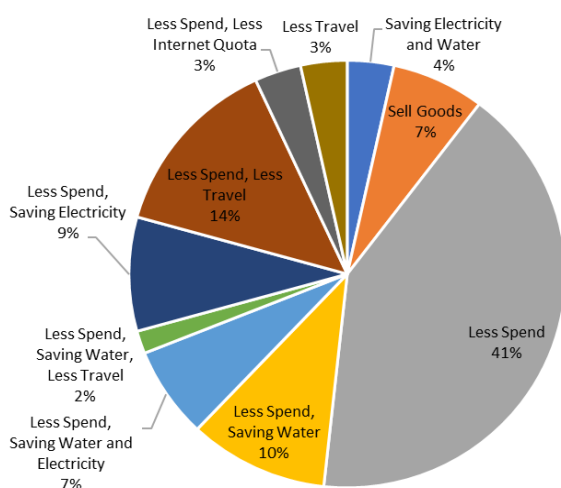
In this study, 28.6 % of respondents in this study did not have a side business. Respondents without side business are more committed to their seaweed business. The price of seaweed at the cultivator level is already quite high (more than Rp. 20,000), providing a strong incentive for smallholder farmers to survive, even after it dropped to Rp. 13,000-16,000 during the covid-19 pandemic. Additionally, they argue that because seaweed cultivation requires relatively little investment capital and has a short harvest period, as well as a low risk of failure, it can provide income, food security, and employment during the COVID-19 pandemic. Quite large, approximately 5-7 percent per year as a benchmark for how good seaweed cultivation is. According to the study's findings, seaweed cultivation has numerous advantages to

**Table 1.** Distribution of Respondents based on Side Business

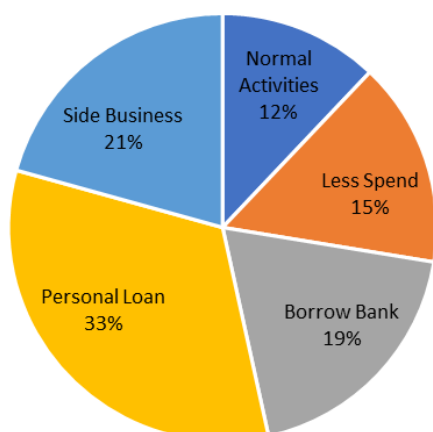
Side Business	Males		Females		Total	
	n	%	n	%	n	%
Labor	2	8.7	3	15.8	5	11.9
Commerce	0	0.0	4	21.1	4	9.5
Cowherd	7	30.4	0	0.0	7	16.7
Tie seaweed	0	0.0	4	21.1	4	9.5
Fishermen catch	13	56.5	11	57.9	24	57.1
Parking officers	1	4.3	0	0.0	1	2.4
Tutor	1	4.3	0	0.0	1	2.4
None	8	34.8	4	21.1	12	28.6
Total	23	100	19	100	42	100



**Figure 2.** Priority economic requirements of the respondent



**Figure 3.** Priority reducing tertiary needs of the respondent



**Figure 4.** Respondents' pandemic response strategies

overfishing and fish farming. It thus can serve as a 'shifting model' for fishing and aquaculture businesses that have been impacted by the COVID-19 pandemic and are recovering slowly (Hidayat & Safitri, 2019; Larson et al., 2021; Nuryartono et al., 2021; Valderrama D, Cai J, 2014).

Additionally, the study discovered that many respondents worked as fishing fishermen on the side (57.1%). For generations, this side job as a fishing fisherman has been performed. Furthermore, the community inherited these abilities from their parents.

Seaweed cultivators are relatively unaffected by this pandemic and recover more quickly than other fishery businesses (catching, fish farming, Micro, Small, and Medium Enterprises). Seaweed cultivation can provide both food security and income. The majority of respondents identified food as the primary need that every family must meet. As many as 53% of respondents identified food and health as their immediate economic needs. According to respondents, the lowest priority financial need is a combination of health and education, food, and electricity (Figure 2). Even if such data were available, profit estimates alone would not provide a comprehensive picture of seaweed farming's social and economic benefits: additional information on how money is spent is required. Increased income does not always equate to socioeconomic benefits and improved well-being (Larson et al., 2021).

Seaweed farmers make significant savings and cut their spending in the event of a pandemic. As many as 41% of respondents reported reducing their share of the expenditure to survive. What is intriguing is that respondents did not reduce their spending on food. They prioritize reducing tertiary needs (Figure 3).

Along with saving for economic needs (15%), respondents' personal loan from collectors (33%) and banks (19%) and worked side jobs (21%). Thus, around 12% of respondents are going about their everyday lives and are unaffected by the pandemic (Figure 4). Creditors, both collectors, and banks continue to have faith in smallholder farmers because they see tremendous potential in the seaweed cultivation business. However, additional research on this subject is highly beneficial to elucidating field phenomena.

#### 4. Conclusions

Smallholder farmers in West Nusa Tenggara, Indonesia, are attempting to adapt or adjust their operations to maintain profitability.

The COVID-19 pandemic has accelerated efforts to meet the primary needs of independent farmer families, requiring them to forego non-food spending and conserve electricity and water in the household. Another option is to obtain bank loans or to borrow from collectors to reduce expenses.

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