



Strengthening the Existence of Pesona Bahari Coastal Community Through Lobster Cultivation in the Pandemic Era

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Abstract: The pandemic that ravaged Indonesia caused restrictions on social interaction policy was reduced people's productivity, particularly the micro-economic components and tourism enterprises in coastal areas. An alternative solution was needed to maintain the existence of the coastal community. The participatory research methods were used to find an ideal form of a solution including CBPR and ABCD. The CBPR method was used for community outreach and acculturation. Meanwhile, the ABCD method was used in the process of optimizing community assets. The process of Pesona Bahari community acculturation yields favorable effects in marine cultivation. Asset inventories by the community show that GWD Beach had huge potential to be a lobster farm. Moreover, the community conducts its business process for lobster cultivation operations by involving all internal and external stakeholders. Pesona Bahari community shows a process of enthusiasm and sustained engagement in order to bring social transformation.

Introduction

People's welfare due to restrictions on mass and digitization activities had become a national problem. Coastal communities which rely on tourism activities were sunk and almost bankrupt during the pandemic. According to Suryana¹, East Java's visitors

¹ Yulifah Suryana, *Statistik Pariwisata Provinsi Jawa Timur* (Surabaya: Badan Pusat Statistik Jawa Timur, 2019).

suddenly decreased drastically since 2018 and worsened in 2020. Tourism activities on the coast were forced to stop, resulting in thousands of jobless people suddenly being unpaid.

Most of the coastal population were urban with daily income and depend on managing fish resources as their main livelihood. The Large-Scale Social Restrictions Policy (PSBB) impacts the closure of tourist activities and traditional markets, which were the core of the community's economic wheel. Changes in coastal communities that were used to doing physical activities into digital activities in a short time show ineffective results². Digitalization activities were still a challenge, especially for coastal communities, requiring more counselling time than urban communities³.

As a portrait of the condition of the East Java coastal community, the Pesona Bahari community of Grand Watu Dodol Beach (GWD) Banyuwangi was chosen as the research locus. Pesona Bahari community was a creative community that was always open, innovating and growing. Institutionally, the Pesona Bahari community already had several divisions like Tourism Awareness Groups (Pokdarwis), Community Supervisor Groups (Pokmaswas), and Fish Cultivator Groups (Pokdakan). Pokmaswas consist of significant community elements by appointing a group of "local leaders" who serve as supervisors and guarantee that community activities get off the track that had been determined⁴. Meanwhile, Pokdarwis focus on managing and developing tourist attractions based on the results of deliberations by group members⁵. The Pesona Bahari community also formed a Pokdakan whose members were cultivators and fishery resource managers⁶.

Interestingly, Pokmaswas provide firm boundaries in the fish farming sector so that Pokdakan members were more focused without compromising GWD beach aesthetics and conservation. Pokmaswas plays an essential role in sustainable environmental protection and maintaining the quality of GWD Beach. Pokmaswas also maintain proper communication between tourism managers, fish farmers, and local governments with the society to escalate tourism activities.

² Fredrik Christhio Mustapa, Lisbet Situmorang, and Ratna Purba, "Dampak Pandemi Covid-19 Tahun 2020 Bagi Kehidupan Sosial Ekonomi Masyarakat Nelayan Di Kecamatan Talisayan Kabupaten Berau," *Sosiatri-Sosiologi* 10, no. 3 (2022), <https://www.sridianti.com/sejarah/kehidupan-sosial-ekonomi-masyarakat-banten.html>.

³ Asep Hamzah and Sutrawan Nurdin, "Strategi Adaptasi Nelayan Selama Pandemi Covid-19 Di Pelabuhan Perikanan Nusantara Karangantu," *Jurnal Akuatika Indonesia* 6, no. 1 (2021): 25–30.

⁴ Rani Saputri and Henni Muchtar, "Peran Pokmaswas Laskar Pemuda Peduli Lingkungan Dalam Pengelolaan Wilayah Pesisir Pantai Di Ampiang Parak Pesisir Selatan," *Journal of Civic Education* 2, no. 5 (2019): 324–335.

⁵ M. Mu'adz Zamah Syari and Muhamad Wildan Fawa'id, "Peran Kelompok Sadar Wisata Dalam Pengembangan Kampung Buah Di Desa Ngetos Kec. Ngetos Perspektif Ekonomi Islam," *Journal of Islamic Tourism, Halal Food, Islamic Traveling, and Creative Economy* 2, no. 1 (2022): 27–44.

⁶ Yusuf Enril Fathurrohman, "Model Kerjasama Kelompok Pembudidaya Ikan (Pokdakan) Pada Pemasaran Agribisnis Ikan Gurami Di Kabupaten Banyumas," *Jurnal Sosial Ekonomi dan Kebijakan Pertanian* 5, no. 2 (2016): 30–36, <http://dx.doi.org/10.21107/agriekonomika.v7i1.2513%0AABSTRACT>.

The three divisions of the Pesona Bahari community worked so well in harmony till the pandemic came. It changed Significantly due to the pandemic, which forced most of the group members to seek a new income outside their duties. The leader of the Banyuwangi Pokdarwis Association regretted the changes that had occurred in the tourism community but found no better solution to hold those global issues⁷. The void in tourism management occurred thru the pandemic, which threatened the sustainability of tourism programs, especially in Banyuwangi.

Seeing the condition of coastal communities that require extra attention, the Provincial Government of East Java was trying to support the National Economic Recovery (PEN) program, especially the development of the Jatim Agro Program. It focuses on increasing agricultural, plantation, and fishery commodities from the superior products of the people⁸. Fisheries commodities have high potential through various products with export quality in demand, such as grouper, tuna, different crabs, and lobsters. As a high-value commodity, lobster had the best potential to be developed and hold the revenue of the coastal communities⁹.

East Java's lobster production reached 1,633 tons in 2019¹⁰. Lobster productivity had consistently decreased since 2016 until now. Lobster cultivation was needed to conserve it from the over-exploitation of the lobster demands. In addition, the lobster potential in Indonesia was a high-value marine commodity with relatively high demand. Six types of lobsters have been recorded all along Indonesia's seawater, including spiny lobster (*Panulirus homarus*), batik lobster (*Panulirus longipes* and *Panulirus femoristriga*), rock lobster (*Panulirus penicillatus*), pearl lobster (*Panulirus ornatus*), and bamboo lobster (*Panulirus versicolor*)¹¹. Optimizing the potential of lobsters was carried out through aquaculture innovations that adapt to coastal topography conditions with the wisdom of local communities to run it¹². Community cultivation activities can be used as an alternative income during the PSBB policy.

The productive potential of lobsters in Banyuwangi opens up opportunities for growing aquaculture activities for coastal communities. The Banyuwangi Fisheries

⁷ Abdul Azis, "Interview of GWD Community Adaptation in Pandemic Era" (Banyuwangi, 2022).

⁸ kilasjatim, "Fokus Pembangunan Pemprov Jatim Pada Musrenbang RKPD 2022," *Kilasjatim.Com*, last modified 2022, accessed March 12, 2022, <https://kilasjatim.com/ini-fokus-pembangunan-pemprov-jatim-pada-musrenbang-rkpd-2022/>.

⁹ Donna NP Butarbutar, Lelo Sintani, and Luluk Tri Harinie, "Peningkatan Kesejahteraan Ekonomi Masyarakat Pesisir Melalui Pemberdayaan Perempuan," *Journal of Environment and Management* 1, no. 1 (2020): 31–39.

¹⁰ Slamet Soebjakto, *Kebijakan Pengembangan Budidaya Lobster Di Indonesia* (Jakarta, 2020), <https://kkp.go.id/an-component/media/upload-gambar-pendukung/DitJaskel/publikasi-materi-2/pengelolaan-sumberdaya-lobster/1>. KEBIJAKAN PENGEMBANGAN BUDIDAYA LOBSTER INDONESIA - DIRJEN PERIKANAN BUDIDAYA.pdf.

¹¹ World Wide Funded of Nature Indonesia, *Seri Panduan Perikanan Skala Kecil Perikanan Lobster Laut Panduan Penangkapan Dan Penanganan, WWF-Indonesia*, 1st ed. (Jakarta: WWF - Indonesia, 2015).

¹² G. Syda Rao et al., "Cage Culture of the Spiny Lobster *Panulirus Homarus* (Linnaeus) at Vizhinjam, Trivandrum along the South-West Coast of India," *Indian Journal of Fisheries* 57, no. 1 (2010): 23–29.

Training and Counseling Center (BP3) helps and assist the Pesona Bahari community by socializing the lobster cultivation system using floating net cages and bottom cages¹³. The community welcomed the socialization of BP3 in 2019, but it needs some innovation to be an easy system so it could be a sustainable activity for the people¹⁴.

By the complex problems, coastal community empowerment must be based on participatory principles of sustainability which the role of all elements of society was the key to reaching success, especially in lobster cultivation activities. The combination of academics, stakeholders, and the community was a form of participatory institutional strength that significantly impacts the sustainability of lobster cultivation activities, which was slowly increasing people's welfare amid a pandemic.

Method

Observation of the initial conditions of the Pesona Bahari communities became the basis for determining the follow-up of community participation research to be carried out. The Pesona Bahari community had shown great enthusiasm in welcoming lobster cultivation as an alternative earning during the pandemic. The hype of community participation provides positive enthusiasm in community empowerment steps towards optimizing the abundant lobster assets in their areas. Empowerment of the Pesona Bahari community was carried out by combining asset optimization (ABCD) and community participation (CBPR) methods. Both methods were considered according to the needs of research in the field, were flexible and dynamic and complete each other to help the community find appropriate patterns.

The CBPR method identified the potential and objective conditions that develop in the community¹⁵. The process of acculturation of the lobster cultivation system, which was relatively new for society, requires a unique and gradual touch.

1. The CBPR approach was carried out by acculturating information with an artistic approach that blends with the Pesona Bahari community. The acculturation process of cultivation activities was one of the efforts to empower the community amid the pandemic, which closed most of the job opportunities for the Pesona Bahari communities. Utilization of popular media such as motivational videos and illustrations related to technical assistance from cultivation to the preservation and packaging of fresh biological products was used as a model for a sustainable community-based industry.
2. The positive results of acculturation towards community enthusiasm, then a mapping

¹³ Ahmad Soebijakto, "Interview of BP3's Role in Coastal Community Empowerment" (Banyuwangi, 2022).

¹⁴ Azis, "Interview of GWD Community Adaptation in Pandemic Era."

¹⁵ Budd Hall and Rajesh Tandon, "Community Based Participatory Research and Sustainable Development Goals," *Canadian Commission for UNESCO's IdeaLab*, no. December (2017).

of the assets and potential of GWD Beach was carried out. Mapping the potential of GWD Beach begins with a transect of the Beach. The transect was used to assist the community in making an inventory of natural potential and designing further development. It was found that there was excellent potential for a well-designed stretch of coast from south to north in one main tourist beach plan with a variety of potential uses such as camping grounds, family zones, photogenic areas, food courts, and conservation in the GWD Beach.

Furthermore, the assets of the community were optimized through the ABCD method. This approach was carried out by identifying assets based on local knowledge developed in the community¹⁶. The preparation of working procedures together with stakeholders and the community was carried out after this stage.

First, Discovery was carried out by exploring local knowledge and wisdom that develops in the community regarding the potential for lobsters on the Banyuwangi Coast. The process of inventorying knowledge in communities was carried out with several local leaders and stakeholders in a joint forum. The informal, focused group discussion (FGD) approach was chosen because the dynamics of community discussions were easier to occur (Figure 1). This discussion method provides much more factual information in looking at the existing local knowledge as a whole. At this stage, stakeholders and academics were expected to be able to blend (bonding) with the community and refrain from making unilateral justifications for the process and production of existing local knowledge to encourage the process of inventorying the intellectual property of the local community. In general, this process does not only obtain local knowledge that comes from existing scientific facts; the existing local knowledge products were often obtained from community experience, which was shared by the relevant community.



Figure 1. Informal FGD with stakeholders and the community

Second, The Dream stage was carried out after an inventory of local knowledge was obtained from the relevant communities. At this stage, the researchers invited the

¹⁶ John L. McKnight and Cormac Russell, *The Four Essential Elements of an Asset-Based Community Development Process (What Is Distinctive about an Asset-Based Community Development Process?)*, 2018.

public to "flashback" the glory days of the abundant lobsters on the Banyuwangi Coast (Figure 2). which people can get lobster at a relatively low price compared to today. In addition, researchers also provide an overview of the success of lobster farming which provides benefits not only economically but also provides ecologically benefits.



Figure 2. Exploration of the dreams of the triumph of the Pesona Bahari community

Third, start the Design stage in the FGD, which every element of society, stakeholders and academics can plan concrete steps to be taken (Figure 3). Planning work steps were the core of the sustainability of program implementation that will be carried out together. In the process, incorporating the art approach into CBPR gives a different colour. Interestingly each member expressed his views clearly in a limited informal forum. Every view from the community was the primary data vital to further processing by the community. Planning action steps for lobster cultivation will reflect the diversity of perspectives between communities that form a single unit by mutual agreement. The views of stakeholders and academics were external views that cannot be forced on society to create maximum community participation.



Figure 3. The activity design process by the Pesona Bahari community, together with local leaders, stakeholders, and academics

Fourth, the stages of Defining and Destiny or affirmation of shared goals will be

initiated by the community in formal FGD forums held by groups (Figure 4). Determining a common final goal forms the basis of community strength in the key to the sustainability of lobster farming. Furthermore, the results of an understanding of shared goals were agreed upon and included in the Pokdakan Pesona Bahari agenda, which processes more concretely existing daily activities, such as scheduling pickets for cultivation activities, night guards, and managing existing assets.



Figure 4. FGD with the Pesona Bahari community, local leaders, stakeholders, and academics

Result and Discussion

Acculturation Approach

The global pandemic was the starting point for changes in the socio-economic construction of coastal communities that were coercive and require adaptive steps in a short time. The art approach illustrates community-based activities by adopting success stories of empowered business activities utilising marine fishery's biological resources.

The lobster cultivation activity program in several regions in Indonesia was one of the positive activities with a shared vision and mission in diverse coastal communities. For example, the results of sea lobster cultivation activities in Bali and Lampung show high-income turnover¹⁷. Seeing the great potential of marine lobsters in Banyuwangi, the Pesona Bahari community was trying to hook BP3 Banyuwangi to educate and assist in cultivating sea lobster enlargement using essential cage media.

The lobster growing cultivation program was an outstanding effort at GWD Banyuwangi Beach with a landscape area arrangement that focuses on tourism development and the conservation of marine biological resources (Figure 5). The Chairperson of Pokdarwis Pesona Bahari conveyed the importance of public awareness

¹⁷ Soebijakto, "Interview of BP3's Role in Coastal Community Empowerment."

of the sustainability of underwater life at GWD Beach as a long-term attraction asset that must be preserved. The underwater conservation zone of GWD Beach was an area of agreement between community managers and relevant stakeholders in limiting sea use activities on the north side of GWD Beach¹⁸. The Pesona Bahari community demonstrates how important it was for local and regional governments, including the Tourism Office and the Village Government, to communicate with the community to sustain the marine tourism industry's synergy and foster peace and mutual trust.



Figure 5. GWD Beach utilization zone transect

Empowerment Based on Asset Potential Development

Discovery :

1. Human and Social Resources Assets

Social assets, in this case, were viewed from the social organization that exists in the community. The GWD Banyuwangi Beach community had several associations, including:

- Pesona Bahari Business Group (KUB)
- Pesona Bahari Tourism Awareness Group (Pokdarwis)
- Pesona Bahari Fisheries Supervisory Community Group (Pokmaswas)
- Pesona Bahari Fish Farmer Group (Pokdakan)

Pesona Bahari's social assets/associations were the community's ability to cooperate, social networks, social solidarity and harmony. This social asset was shown by the emergence of local leaders in GWD Tourism, encouraging community participation in managing GWD Tourism so it can develop.

In social networking, Pokdarwis Pesona Bahari involves the people of Bangsring

¹⁸ Azis, "Interview of GWD Community Adaptation in Pandemic Era."

Village and community groups to form associations such as Pokmaswas and Pokdakan to empower the surrounding community and make it easier for Pokdarwis to develop their tourism. The four organizations were relatively active. This was demonstrated by the findings of the community focus group, in which all associations assist and support one another.

Table 1. The institutional community of GWD Beach

No	Association	Leader	Member (People)	Enthusiasm
1	Pokmaswas Pesona Bahari	Abd. Azis	20	😊 Active
2	Pokdarwis Pesona Bahari	Abd. Azis	16	😊 Active
3	KUB Pesona Bahari	Abd. Azis	20	😊 Active
4	Pokdakan Pesona Bahari	Ach. Mustofa	14	😊 Active

Table 1 above shows that the GWD Beach community had a centralized local leader. Which was the local leader trusted to be the chairperson of 3 community associations, namely Mr. Abdul Azis. In addition, the skills possessed by local leaders and Pokdarwis themselves have bridged the collaboration between Pokdarwis and various institutions and institutions that can make a positive contribution to the development of GWD Beach tourism, such as collaboration with the Ministry of Tourism and Creative Economy, Fisheries and Marine Services, as well as the University.

2. Physical Assets

As the primary capital for implementing development in Bangsring Village, natural resources were necessary to achieve a well-planned village development program. Natural resources in Bangsring Village can be seen in the following table.

Table 1. Physical assets of Bangsring Village, Banyuwangi

No	Description of natural resources	Volume	Unit
1	Area of use	31. 620,5	Ha/m ²
2	Dryland	416.709	Ha/m ²
3	Wetland	0	Ha/m ²
4	Plantation area	125	Ha/m ²
5	Public facility	69.8	Ha/m ²
6	Forest area	4500	Ha/m ²

Source: Bangsring village profile, 2022

Dryland and public facilities in Bangsring Village tend to be comprehensive, and access from the main road/national road was near Banyuwangi-Situbondo street. This position makes it easier for visitors to visit/travel to GWD Beach. Besides public facilities

and access roads to beach locations, GWD was close to other tourist destinations such as Tabuhan Island and Menjangan Island in Bali. The distance between Tabuhan Island and Grand Watu Dodol was only 8.3 km, while the distance from GWD to Menjangan Island was 10 km. Fishers use this strategic location to make tour packages from GWD to the two islands.

3. Natural Resources Assets

Banyuwangi has abundant natural resource assets. This asset was because the waters in the area were still awake. Based on the focus group discussion results with the Pesona Bahari communities, they said that there was varied natural resources abundance in North Banyuwangi waters (Table 3). Among them were lobster, squid, ornamental fish and consumption fish such as smallhead hairtail, rabbitfish, and snapper. The following was a table of types of marine products, their abundance and conditions around Banyuwangi waters.

Table 2. Natural resources of GWD Beach

Marine Products	Abundance	Description (Condition)
Coral reefs	😊 Overflow	Outstanding and high biodiversity, it could create a coral garden
Consumption fishes	😐 Neutral	The abundance of fish depend on the season and fish migration
Lobsters	😊 Overflow	Abundant lobster seeds were only challenging to obtain during the transitional season, especially in March, April, August, and September.
Coral / Ornamental fishes	😊 Overflow	Abundant, the reef fishes at GWD Beach were varied and beautiful.
Squids	😐 Neutral	The abundance of squid depends on the season. Usually found in August-December.

Dream

Natural conditions such as weather, seasons, currents and sea wave height affect fishermen's income from fishing. Based on research conducted with the community, data was obtained that fishermen on the north coast of Banyuwangi use several fishing gears, including fishing gear, shooting, gill nets and circle nets. The fish commodities caught were types of consumption fish, such as squid, rabbit fish, tuna, anchovies, trout and snapper. The average income of fishermen on the north coast of Banyuwangi in the east season was Rp. 189,000/day, with an average catch of 17kg/day. In the western season, fishermen's income and number of catches tend to be more erratic. Seasonal variability causes the income of fishing households to be classified as vulnerable. Fishermen sell

their seafood to collectors at an average of IDR 15,000/kg.

After seeing the abundance of natural resource assets, namely lobsters in Banyuwangi waters, the fishing community's perception towards the application of sea lobster cultivation was excellent. The community agrees that lobsters were abundant in their waters and have high economic value. The lobster enlargement business requires good water quality. All respondents agreed and even strongly agreed that the northern coastal waters of Banyuwangi have good water quality for lobster cultivation.

With global climate change causing the community's income to become erratic, coupled with the results of the asset identification meeting, the people of Bangsring village, especially those on GWD Beach, agreed to dream of a stable income that would not only be obtained from fishing in the sea or from tourism but also with lobster cultivation.

Design

1. Preparation for cultivation enlargement of lobsters

Planning for sea lobster cultivation activities can be assessed after a study of the suitability parameters of the quality of the aquatic environment had been carried out. Various methods of sea lobster cultivation can be applied, depending on the environmental conditions of the waters that will be used as research locations, such as using floating cages, bottom cages, surface ponds, to quarantine tanks¹⁹. The success of cultivation activities was also more focused on treatment and evaluation by cultivators.

Lobster cultivation was a new thing among people who need to become more familiar with cultivation to preserve premium lobster commodities. After obtaining a study of the parameters of the aquatic environment, selecting the location for cultivation was carried out according to the suitability analysis for the marine lobster commodity. Determining the cultivation location was the starting point for cultivation activities. Some important parameters for adjusting the quality of lobster products include being far from river intrusions and other groundwater sources, stable ocean currents but protected from big waves, not polluted and indicated by industrial pollutants, flat and sandy water bottom, and at a depth of 5 to 10 meters with sufficient sunlight intensity.

Predetermined cultivation locations were the basis for considering the suitability of the cage model to be used as well as community agreements. Water quality and the type of bottom substrate can affect the potential for disease spread and the success of aquaculture activities. Generally, the cages used were floating cages and bottom cages.

2. Construction of cages

¹⁹ Akhmad Mustafa, "BUDIDAYA LOBSTER (Panulirus Sp.) DI VIETNAM DAN APLIKASINYA DI INDONESIA," *Media Akuakultur* 8, no. 2 (2013): 73.

Aquatic animal commodity cultivation media, particularly marine, had special specifications that were slightly different from other commodity cultivation media. Marine commodity cultivation media must have high resistance to salt content which results in corrosion as well as being strong and flexible against the impact of waves and ocean currents²⁰.

Several cultivation media were widely used in Indonesia, including pond media, coastal ponds and cages. Aquaculture ponds were suitable for use in pelagic fish and shrimp commodities on the sea coast which can survive warm temperatures and do not interact much with aquatic substrates (Figure 6). However, pond media requires quite high maintenance and operational costs. This was because ponds with seawater require extra effort in adjusting the needs of seawater that was left in the pond²¹.

The cages applied around the GWD Coastal Waters were the Basic Cage type. Basic cages have various advantages, including being permanent, not shifting due to currents and waves, relatively cheaper manufacturing costs, not disturbing shipping lanes and sea transportation, not being affected by garbage floating in the sea, and being safer from fishing theft²². Cages were made with dimensions of 3 meters wide by 1.5 meters high. Basic cages require maintenance and feeding of cultivated commodities which were relatively more complex. This complexity was due to the placement of sinking cages, so feeding activities and cage monitoring were carried out by diving.



Figure 6. Basic cage construction by the community

Define and Destiny

²⁰ Zealandia Sarah N.F. et al., "Marine Environmental Suitability Mapping for Lobster Sea-Cage Culture in East Lombok Using Remote Sensing Data and GIS Approaches," *Aquacultura Indonesiana* 17, no. 2 (2017): 60.

²¹ Gia Asasa Ghassani and Andriana Monica Sahidu, "Teknik Pemeliharaan Induk Ikan Kerapu Sunu (*Plectroponus Leopardus*) Pada Bak Beton Di Balai Besar Penelitian Dan Pengembangan Budidaya Laut Gondol-Bali," *Journal of Marine and Coastal Science* 7, no. 3 (2018): 103–110.

²² Emmanuel Alfredo Vázquez Olivares, *Design of a Cage Culture System for Farming in Mexico, Training*, 2003.

The bottom cages made by the community were then submerged in waters with a depth of 5 to 15 meters. GWD beach conditions have a muddy sand bottom substrate. This structure requires the selection of steel reinforcement material for the proper cages. The community agrees that the 8-10 mm size was a good choice in sandy substrate conditions with little silt. In order to keep the iron frame last longer, anti-rust coating and 1-3 days of drying were required to reduce the risk of corrosion due to rust oxidation, as shown in Figure 7. As a culture container, cages can use nylon PE nets which were water resistant.



Figure 7. The frame of bottom cages for lobster cultivation

After submerging the bottom cage, feeding was carried out daily (Figure 8). Lobsters prefer this natural feed. Besides that, natural food for fresh fish and shellfish provides good nutrition to support the growth and development of lobsters. The high protein content in fresh fish supports the growth and fattening of lobsters, while the silica content in shells accelerates the hardening of the lobster carapace after the moulting phase.



Figure 8. Feeding and lobster cultivation process

The cultivated lobsters were pearl lobsters and sand lobsters. To guarantee

lobster survival, it was vital to preserving lobsters' quality and health by performing routine maintenance on cages at the bottom of the seas over 100 days. Checking the condition of the cages, repairing damaged nets, cleaning up leftover feed, and cleaning from attached algae were done every day. The condition of the moulting lobsters was counted and recorded every day by collecting the remaining carapace left in the cages. It does not rule out the possibility of quarantine on lobsters indicated to be sick and dead to be immediately separated from the main cages. The quarantine process was done to suppress disease transmission to other lobsters, which results in mass death.

After 100 days of lobster rearing, sampling was carried out on the condition of the existing lobsters. Raised lobsters were measured for length, width and weight to determine the feasibility and quality of lobsters that follow applicable regulations²³. Harvested lobsters must meet the minimum market feasibility size (165 grams) with complete legs and antennae, do not lay eggs on female lobsters, were not undersized, and were still responsive to stimulation.

Conclusion

Empowering the GWD Beach community gave positive results with the implementation of community-based lobster farming activities. The Pesona Bahari community fully manages lobster farming activities at GWD Beach. Activity planning, treatment processes, and lobster marketing have become more dynamic with the rapid development of society. The CBPR and ABCD approach processes reveal cultivation patterns with solid local wisdom, such as mixing vitamins in lobster feed, the right time to feed, to a safe harvest time so that the social transformation that occurs in the Pesona Bahari community was more sustainable and becomes a forum for attracting community participation in community economic activities.

References

- Azis, Abdul. "Interview of GWD Community Adaptation in Pandemic Era," 2022.
- Butarbutar, Donna NP, Lelo Sintani, and Luluk Tri Harinie. "Peningkatan Kesejahteraan Ekonomi Masyarakat Pesisir Melalui Pemberdayaan Perempuan." *Journal of Environment and Management* 1, no. 1 (2020): 31–39.
- Fathurrohman, Yusuf Enril. "Model Kerjasama Kelompok Pembudidaya Ikan (Pokdakan) Pada Pemasaran Agribisnis Ikan Gurami Di Kabupaten Banyumas." *Jurnal Sosial Ekonomi dan Kebijakan Pertanian* 5, no. 2 (2016): 30–36.
<http://dx.doi.org/10.21107/agriekonomika.v7i1.2513%0AABSTRACT>.
- Ghassani, Gia Asasa, and Andriana Monica Sahidu. "Teknik Pemeliharaan Induk Ikan

²³ Kementerian Kelautan dan Perikanan Republik Indonesia, *PerMen Kelautan Dan Perikanan RI Nomor 17 Tahun 2021, Peraturan Menteri Kelautan Dan Perikanan Republik Indonesia* (Indonesia, 2021).

- Kerapu Sunu (*Plectroponus Leopardus*) Pada Bak Beton Di Balai Besar Penelitian Dan Pengembangan Budidaya Laut Gondol-Bali." *Journal of Marine and Coastal Science* 7, no. 3 (2018): 103–110.
- Hall, Budd, and Rajesh Tandon. "Community Based Participatory Research and Sustainable Development Goals." *Canadian Commission for UNESCO's IdeaLab*, no. December (2017).
- Hamzah, Asep, and Sutrawan Nurdin. "Strategi Adaptasi Nelayan Selama Pandemi Covid-19 Di Pelabuhan Perikanan Nusantara Karangantu." *Jurnal Akuatika Indonesia* 6, no. 1 (2021): 25–30.
- Kemeterian Kelautan dan Perikanan Republik Indonesia. *PerMen Kelautan Dan Perikanan RI Nomor 17 Tahun 2021. Peraturan Menteri Kelautan Dan Perikanan Republik Indonesia*. Indonesia, 2021.
- kilasjatim. "Fokus Pembangunan Pemprov Jatim Pada Musrenbang RKPD 2022." *Kilasjatim.Com*. Last modified 2022. Accessed March 12, 2022. <https://kilasjatim.com/ini-fokus-pembangunan-pemprov-jatim-pada-musrenbang-rkpd-2022/>.
- McKnight, John L., and Cormac Russell. *The Four Essential Elements of an Asset-Based Community Development Process (What Is Distinctive about an Asset-Based Community Development Process?)*, 2018.
- Mustafa, Akhmad. "Budidaya Lobster (*Panulirus* Sp.) Di Vietnam Dan Aplikasinya Di Indonesia." *Media Akuakultur* 8, no. 2 (2013): 73.
- Mustapa, Fredrik Christhio, Lisbet Situmorang, and Ratna Purba. "Dampak Pandemi Covid-19 Tahun 2020 Bagi Kehidupan Sosial Ekonomi Masyarakat Nelayan Di Kecamatan Talisayan Kabupaten Berau." *Sosiatri-Sosiologi* 10, no. 3 (2022). <https://www.sridianti.com/sejarah/kehidupan-sosial-ekonomi-masyarakat-banten.html>.
- Olivares, Emmanuel Alfredo Vázquez. *Design of a Cage Culture System for Farming in Mexico. Training*, 2003.
- Rao, G. Syda, Rani Mary George, M. K. Anil, K. N. Saleela, S. Jasmine, H. Jose Kingsly, and G. Hanumanta Rao. "Cage Culture of the Spiny Lobster *Panulirus Homarus* (Linnaeus) at Vizhinjam, Trivandrum along the South-West Coast of India." *Indian Journal of Fisheries* 57, no. 1 (2010): 23–29.
- Saputri, Rani, and Henni Muchtar. "Peran Pokmaswas Laskar Pemuda Peduli Lingkungan Dalam Pengelolaan Wilayah Pesisir Pantai Di Ampiang Parak Pesisir Selatan." *Journal of Civic Education* 2, no. 5 (2019): 324–335.
- Sarah N.F., Zealandia, Anggia Rivani, Bety Puspitasari, Firdian Ikhwanasyah, Fonna Maulidyah, Meridian Oktavian, Ridho Dwi D, Sufiyana Eka P, and Wirastuti Widyatmanti. "Marine Environmental Suitability Mapping for Lobster Sea-Cage Culture in East Lombok Using Remote Sensing Data and GIS Approaches." *Aquacultura Indonesiana* 17, no. 2 (2017): 60.
- Soebijakto, Ahmad. "Interview of BP3's Role in Coastal Community Empowerment," 2022.
- Soebijakto, Slamet. *Kebijakan Pengembangan Budidaya Lobster Di Indonesia*. Jakarta,

2020. <https://kkp.go.id/an-component/media/upload-gambar-pendukung/Ditjaskel/publikasi-materi-2/pengelolaan-sumberdaya-lobster/1>.
KEBIJAKAN PENGEMBANGAN BUDIDAYA LOBSTER INDONESIA - DIRJEN PERIKANAN BUDIDAYA.pdf.

Suryana, Yulifah. *Statistik Pariwisata Provinsi Jawa Timur*. Surabaya: Badan Pusat Statistik Jawa Timur, 2019.

Syari, M. Mu'adz Zamah, and Muhamad Wildan Fawa'id. "Peran Kelompok Sadar Wisata Dalam Pengembangan Kampung Buah Di Desa Ngetos Kec. Ngetos Perspektif Ekonomi Islam." *Journal of Islamic Tourism, Halal Food, Islamic Traveling, and Creative Economy* 2, no. 1 (2022): 27–44.

World Wide Funded of Nature Indonesia. *Seri Panduan Perikanan Skala Kecil Perikanan Lobster Laut Panduan Penangkapan Dan Penanganan*. WWF-Indonesia. 1st ed. Jakarta: WWF - Indonesia, 2015.