

Seaweed-Based Local Economic Development in Takalar District

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Abstract

This research was conducted in April 2022. The location of this research was Laikang Village, Mangarabombang District, Takalar Regency. This type of research is a survey. Survey research is a method of collecting data in the form of a questionnaire, which is then disseminated to respondents. Answers from respondents in survey research allow researchers to be able to conclude, as well as generalize a population that is represented by the respondent. Sampling was done by purposive sampling. The samples used in this study were 30 seaweed cultivators. Research data collection was carried out by conducting interviews and distributing questionnaires to respondents. Data analysis used in this research is descriptive qualitative and quantitative. Descriptive analysis is a kind of data research that helps in describing, demonstrating, or helping to summarize data points so that patterns can be developed that satisfy all data conditions. The process of cultivating seaweed is also relatively easy and does not require too much money, so the Takalar coastal community develops this commodity as their main livelihood. In its development, the community experiences obstacles in developing commodities so that the community and government need to implement strategies to overcome problems faced by coastal communities such as increasing the quantity and quality of grass, establishing partnerships with companies and financial institutions, processing seaweed to increase added value, strengthening institutions seaweed cultivators, provide assistance with seaweed cultivation facilities and infrastructure, and supervise coastal areas.

Keyword: seaweed, cultivation, development, livelihood

Introduction

Seaweed is a leading fishery commodity for Takalar Regency. Most of the people living on the coast do seaweed cultivation. Seaweed has strategic value and promising business opportunities to develop. The Ministry of Maritime Affairs and Fisheries (KKP) continues to strengthen the development of various cultivation commodities from upstream to downstream, including trade and marketing systems. One of the aquaculture commodities that is the focus of the Ministry of Maritime Affairs and Fisheries to continue to develop is seaweed. This step was taken to ensure that Indonesian seaweed is able to face various challenges that will develop in the future.

The use of seaweed in various industries is currently increasingly widespread. This makes the need for seaweed as a raw material to increase. Apart from that, the international market is also actively accepting seaweed from Indonesia, so that seaweed entrepreneurs have the opportunity to penetrate the international market. The process of cultivating seaweed is also relatively easy and does not require too much money. Seaweed consumers also come from all walks of life, this of course makes seaweed always sought after. In several industries, such as food, pharmaceutical, cosmetics and others, seaweed is also used as a raw material. In addition, seaweed can also be used as fertilizer and animal feed for fish. Seaweed in Indonesia with the most potential to be developed and its benefits are (1) *Eucheuma cottonii*: carrageenan producer; (2) *Gracilaria* spp: jelly producer;

(3). *Eucheuma spinosum*: carrageenan producer; (4) *Caulerpa* spp: anti-oxidants, anti-hypertension, preventing rheumatism, anti-microbial, anti-tumor, and increasing stamina (KKP, 2019).

Takalar Regency has a major contribution to South Sulawesi's seaweed production. In 2018, the production volume of *Cottonii* seaweed in Takalar Regency reached 316,780 tons while *Gracilaria* reached 43,008 tons. This amount of production is actually still not optimal when compared to the potential for seaweed in Takalar Regency. Taking this into account, seaweed production can be further optimized considering the market potential and prospects for seaweed products both domestically and for export are very wide open and are needed by several industries such as the pharmaceutical, food and other industries. Therefore, an in-depth study is needed regarding efforts to develop seaweed-based local economies in Takalar Regency.

Research Methods

This research was conducted in April 2022. The location of this research was Laikang Village, Mangarabombang District, Takalar Regency. The location was chosen purposively on the grounds that the location has great potential for seaweed and has a large number of fishing households (RTP). This type of research is a survey. Survey research is a method of collecting data in the form of a questionnaire, which is then disseminated to respondents. Answers from respondents in survey research allow researchers to be able to conclude, as well as generalize a population that is represented by the respondent. Sampling was done by purposive sampling. Purposive sampling is a sampling technique with certain considerations in Sugiyono. The reason for using this purposive sampling technique is because it is suitable for use in quantitative research, or studies that do not generalize (Sugiyono, 2016). The population in this study are people who have seaweed businesses. The population in this study was 300. The sample for this study was 10% of the research population. So the samples used in this study were 30 seaweed cultivators. Research data collection was carried out by conducting interviews and distributing questionnaires to respondents. In addition, data collection was also carried out through literature study. Literature study is a data collection technique for reviewing books, searching literature, notes, and reports related to research. This literature study process was also used to collect data. Later the author includes these data in scientific papers. The use of data in this scientific work also supports valid data sources. Data analysis used in this research is descriptive qualitative and quantitative. Descriptive analysis is a kind of data research that helps in describing, demonstrating, or helping to summarize data points so that patterns can be developed that satisfy all data conditions.

Results and Discussion

General Description of the Research Location

Takalar is one of the districts in South Sulawesi Province. The position of Takalar district is between 5°031' to 5°0381' South Latitude and between 199°0221' to 199°0391' East Longitude.

Takalar Regency is bordered by the following areas:

- To the north it is bordered by the city of Makassar and Gowa Regency
- To the south it is bordered by the Flores Sea
- West side is bordered by Makassar Strait
- In the east it is bordered by Jeneponto Regency and Gowa Regency

The total area of Takalar district is 566.51 Km². The Takalar Regency area consists of 9 (nine) sub-districts, namely Manggarabombang, Mappakasunggu, South Polombangkeng, North Polombangkeng, South Galesong, North Galesong, Pattalassang, Galesong, and Sanrobone. Part of the Takalar Regency area is a coastal area, which is 74 km long covering Mangarabombang District, Mappakasunggu District, Sandrobone District, South Galesong District, Galesong Kota District and North Galesong District.

Based on the RTRW of Takalar Regency for 2012-2032, there are several sub-districts designated for Aquaculture Areas:

Table 1. Aquaculture Designated Areas in Takalar Regency

Function	Subdistrict
Seaweed Commodity Seawater Fishery Cultivation	Located in several areas following districts: <ul style="list-style-type: none"> - Mangarabombang Subdistrict - Mappakasunggu Subdistrict - Sanrobone Subdistrict - South Galesong Subdistrict
Fish Processing Area	Fish Processing Area Fish Processing Area in : <ul style="list-style-type: none"> - Mappakasunggu Subdistrict - Sanrobone Subdistrict - Galesong Subdistrict - North Galesong Subdistrict - South Galesong Subdistrict - Mangarabombang Subdistrict

Source: RTRW Takalar Regency, 2012-2032

Seaweed production in Takalar Regency has fluctuated a lot in recent years, but tends to increase. Production of *Eucheuma cottonii* seaweed is the type of seaweed that is most widely cultivated by the community. The production of this type of seaweed is easy to cultivate and the harvesting process is relatively simple. Even so, the use of this type of seaweed in Indonesia is still not optimal so that the value it produces is relatively lower.

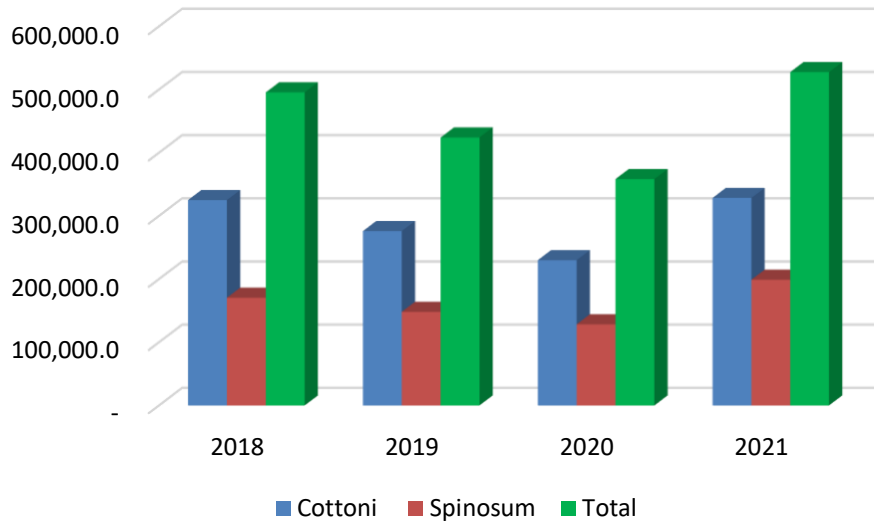


Figure 1. Production of Seaweed in Takalar Regency

The trend of seaweed production has decreased over the last two years, namely in 2019-2020. If you look more closely this year, Indonesia and even the world are experiencing the same thing, namely the Covid-19 pandemic. People are advised not to do activities outside the home so that seaweed production has decreased significantly. In 2021, Takalar Regency's seaweed production will reach 527,624.7 tons. Seaweed production has increased due to seaweed cultivators increasing the amount of seaweed spread along the coast.

Seaweed Cultivation Business Development

The development of seaweed cultivation business in Takalar Regency can be studied in two aspects, namely the internal environment and the external environment. In the internal environment, it can be seen from the internal environment of the seaweed business, the strength factors consist of seaweed being a superior commodity, available workforce, sufficient cultivator experience, easy marketing of dried seaweed, profitable seaweed business, and simple cultivation techniques. While the weaknesses in the seaweed business are decreased seaweed production, the quality of seaweed is not up to standard, the lack of interest of farmers in processing seaweed, limited market access, limited capital resources, and suboptimal institutional roles.

External environment, the factors that become opportunities in the grass business are government support and infrastructure assistance, water conditions suitable for seaweed cultivation, plans to develop a seaweed-based food industry in Takalar Regency, and developments in science and technology to support seaweed development. Threat factors for the seaweed business are the evaluation of carrageenan and agar products by the National Organic Standard Board, climate change and uncertain weather, pest and disease attacks, and fluctuating seaweed prices.

Efforts to develop the local community's economy by increasing seaweed production need to be carried out through several efforts, including, (1) Increasing the quantity and quality of grass; (2) Seaweed processing to increase added value; (3) Conducting partnerships with companies and financial institutions; (4) Strengthen seaweed cultivator institutions; (5) Providing assistance with seaweed cultivation facilities and infrastructure; (6) Efforts to develop the local community's economy by increasing seaweed production need to be carried out through several efforts, including, (1) Increasing the quantity and quality of grass; (2) Seaweed processing to increase added value; (3) Conducting partnerships with companies and financial institutions; (4) Strengthen seaweed cultivator institutions; (5) Providing assistance with seaweed cultivation facilities and infrastructure; (6) Monitoring of the coastal area.

Increasing the quantity and quality of seaweed

Efforts to increase the quantity and quality of seaweed need to be carried out by seaweed cultivators by using quality seaweed seeds, increasing the area of seaweed cultivation land, and preventing seaweed from being exposed to pests and diseases. First, the problem of sea weed seeds has always been a matter of concern to farmers. The seeds used so far are seaweed harvested which are then used as seed stocks for the next period. Of course this is not recommended because the seaweed seeds will not be maximized. Cultivation from seed roots is carried out as an effort to provide a solution to the availability of good quality seeds and is affordable for cultivators, so that cultivators do not buy seeds from cultivation and do not buy seeds from tissue culture results (Cokrowati, N., et al., 2019). From a technical point of view of cultivation, the business of providing seaweed seeds has the potential to be stimulated immediately, because technically the cultivation methods are easy, inexpensive, the harvesting period is short, harvesting and post-harvesting are simple and absorb a lot of manpower. With the presence of seaweed seedlings from tissue culture, the next step is to multiply seeds from tissue culture that can be carried out by business actors (Runtuboy, N., & Abadi, 2018)

Second, it is necessary to increase the area of land for seaweed cultivation. The Maritime Affairs and Fisheries Service needs to conduct a survey of the potential for grass cultivation land that has the potential to be developed in the Takalar Regency area. Of course by considering the suitability of land for grass cultivation and in accordance with the Spatial and Regional Layout Plan (RTRW) of Takalar Regency.

Third, prevention of pests and diseases that can attack grass needs to be done by cultivators. The lack of knowledge of farmers on how to technically prevent pests and diseases of seaweed called ice-ice (white spots). The main cause of the emergence of this disease is caused by low nutrient content in waters (waters are very clear), salt levels that are less than optimal (< 20 ppt; > 35 ppt), high water temperatures (> 33oC), very weak water currents, and generally occurs during the transition season to the peak of the dry season (Safni, I., 2019). Seaweed pest management is sometimes inappropriate so that the pests can spread and attack the entire production area, ice-

ice disease, weather, changes or decline in the quality of the cultivation environment, and low quality human resources (Wijayanto, T., et al., 2011). The first prevention that can be done is by cleaning the seaweed regularly. The method that is often carried out by farmers is by lifting a stretch of seaweed and then releasing it until the stretch falls and crashes to the surface of the sea water. This method is done so that the dirt and dust attached to the seaweed is released so that pests and diseases are expected not to attack the seaweed. Seaweed checks need to be carried out to ensure that the condition of the cultivated seaweed is in good condition.

Partnering with companies and financial institutions

The company has an important role in the seaweed business. Not only acting as a buyer, the company also needs to enter into plasma partnerships with several groups of seaweed cultivators. Companies need to provide literacy to seaweed farmers how quality seaweed can provide higher prices when compared to low quality. Several grades of seaweed quality have been determined by the company so that farmers need to know the quality grade of seaweed and how to meet the demand for the quality of the seaweed that the company wants.

Financial institutions are important for the sustainability of the fishing business. The problem of access to business capital for fisheries business actors has always been a complaint. The administration is complicated and the standards offered by banks and other formal financial institutions are too high. As a result, it is difficult for business actors, especially seaweed cultivators, to access capital. At the research location, the buyer is only one person, so the selling price can be adjusted according to the buyer's taste. Therefore, cultivators really need to build relationships with other business partners and other financial institutions so that there will be price competition between buyers and seaweed farmers who can easily obtain business capital assistance with low interest rents. This really helps farmers to get more profit from every business they do (Rompas, J. D. W., 2018). As a result of the difficulty in accessing formal institutions, cultivators usually seek access to capital through informal institutions. Formal institutions usually make it easier to borrow, but have certain requirements such as the sale of seaweed and the price is determined by the borrower. As a result of the absence of financial institutions, most fishermen are trapped by middlemen (collectors). There are very few economic institutions, where cooperatives seem to be in suspended animation due to the lack of knowledge and commitment of the managers (Nurwidodo, N., et al., 2017). Local governments need to encourage the entry of financial institutions into coastal areas or initiate or accelerate the birth of local financial institutions. This is very important and urgent, moreover to support efforts to develop the productive activities of coastal communities, an institution is needed that can help eliminate the space for middlemen or *ijon*, and at the same time can guarantee a price agreement that is mutually beneficial to both parties in the transaction (Nurwidodo, N., et al., 2017).

Seaweed processing to increase added value

Seaweed processing is one of the economic potentials utilized by coastal communities. Abundant and easy-to-obtain raw materials are a strength factor for the community. In some research results indicate that seaweed processing can provide added value. The policy strategy for the development of the *E. cottonii* seaweed processing industry to increase added value is to increase the productivity and quality of seaweed, gradually develop the semi-finished seaweed processing industry (ATC, SRC and RC) in the center of the seaweed production area, and develop the scale of the processing business. ready-to-consume seaweed from traditional scale to industrial scale. Currently, around 80% of Indonesian seaweed is only exported as raw material in the form of dried seaweed at a relatively low price, and only 20% is processed domestically. This causes the added value generated by seaweed products tends to be minimal. Even though seaweed is a commodity that is capable of producing quite high added value when it has gone through a processing process (Hikmah, H., 2015). Some research results show that the added value of processing seaweed into carrageenan flour is IDR 13,979/kg with a ratio of 44% and is classified as high added value because it is above 40% (Qalsum, U., et al., 2018).

Strengthen seaweed cultivator institutions

Institutions are a set of rules agreed upon by the actors of the interaction which can be in the form of a structural dimension and a cultural dimension. Institutions are more than just organizations, because institutions cover many aspects, namely in the form of agreed patterns of behavior, norms and conventions (Saptana, 2013). In fishing business institutions there are rules, rights/obligations of members, sanctions that start from habits that become culture and develop into code of conduct. Institutions in the agricultural/fisheries/livestock business system include sub-system institutions for facilities, business, processing, and marketing (Cahyono, 2012). Institutions that provide capital in the development of seaweed farming are collectors. Institutions that provide information are collectors and extension agencies, and institutions that provide input are collectors (Ramadan, R., & Yusria, W. O., 2018). Institutional rules for patterns of seaweed cultivation can be in the form of arrangements related to pricing, transaction time between actors, quantity agreed between actors, and quality of goods during transactions between actors (Mira, M., 2015). Institutional strengthening gives farmers a bargaining position to determine the price of seaweed. The pricing approach shows that the bargaining position of farmers tends to be weak or low due to several factors, namely limited capital, weak market access and limited information owned by farmers, causing prices to be determined by higher trading institutions (Puspitasari and Yunita, 2010).

Providing assistance with seaweed cultivation facilities and infrastructure

The Maritime Affairs and Fisheries Service (DKP) of Takalar Regency has distributed facilities and infrastructure assistance for seaweed cultivation activities. The results of the study show that

the government has provided facilities for seaweed farmers by providing the facilities and infrastructure needed by seaweed farmers, such as the provision of seaweed seeds, ropes, shelving boards, fiber boats, and warehouses. but the government must also further improve the facilities that will be provided to seaweed farmers so that all seaweed farmers feel cared for by the government and can feel the facilities provided by the government (Hamsah, H., 2019; Jauply, A., et al., 2022). Assistance with production facilities or equipment for seaweed management businesses from related agencies and no less important is helping them gain market share to sell seaweed processing products so that production continuity can run well (Damayanti, I.F., et al., 2021). Assistance provided to the community through groups formed and registered in DKP data. This assistance is very beneficial for the community. But on the other hand, this assistance is still limited and only for a certain period. The negative effect of this assistance is the community's dependence on government assistance. With the assistance that has been given, it is hoped that the community will be able to be independent and their cultivation business can continue in the following season.

The seed program that has been launched by the DKP for several years needs to be realized in order to meet the need for seeds which are usually an obstacle for the community. The quality and quantity of seedlings need to be provided by the community and government assistance is needed to facilitate nursery gardens. Problems with seeds usually occur during the transition of the season because farmers do not cultivate seaweed due to seasonal factors, so new seeds are needed to start a seaweed cultivation business.

Monitoring of coastal areas

Coastal areas are included in areas that are vulnerable to damage to coastal ecosystems. Therefore it is necessary to regulate the management of coastal and marine areas (Integrated coastal management). The regulation is intended as an effort to overcome conflicts in the utilization of resources in coastal and marine areas, and overlapping authorities and conflicts of interest between sectors. Utilization of coastal areas must comply with the local government's RTRW and ensure that all activities in the coastal area do not damage the environment. Therefore, supervision and control of coastal and marine areas is carried out in order to (Danial, 2012) (1) identify irregularities in the implementation of strategic plans, zoning plans, management plans, and the implications of these deviations for changes in the quality of coastal ecosystems; (2) Encouraging the utilization of coastal and marine resources in accordance with the plans for their supervision and management; (3) Imposing sanctions on violators, whether in the form of administrative sanctions such as cancellation of licenses or revocation of rights, civil sanctions such as imposition of fines or compensation; as well as criminal sanctions in the form of detention or confinement and (3) This legal basis regarding the Management of Coastal and Marine Areas is the basis for adjustments to the provisions contained in other laws and regulations.

Monitoring of the area is very important for the sustainability of the seaweed business in Takalar Regency. If there is environmental damage such as water pollution, it will have a negative impact on the seaweed cultivation business. Several locations in South Sulawesi have indicated environmental degradation. Coastal areas in the Selayar Islands Regency have experienced a decline in seaweed production due to several locations no longer supporting cultivation. One of the factors is the condition of the waters and the environment does not support the growth of seaweed. Good monitoring of coastal and marine areas will ensure that coastal areas are protected from environmental damage that endangers fishing activities. The role of the government and the community is very important to ensure that coastal areas are maintained so that the sustainability of fishing business activities continues and contributes to the local economy of coastal communities in Takalar Regency.

Conclusion

The process of cultivating seaweed is also relatively easy and does not require too much money, so the Takalar coastal community develops this commodity as their main livelihood. In its development, the community experiences obstacles in developing commodities so that the community and government need to implement strategies to overcome problems faced by coastal communities such as increasing the quantity and quality of grass, establishing partnerships with companies and financial institutions, processing seaweed to increase added value, strengthening institutions seaweed cultivators, provide assistance with seaweed cultivation facilities and infrastructure, and supervise coastal areas.

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