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Analysis of human resource management capabilities and models in seaweed production

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Abstract. The seaweed commodity is a cultivation commodity that is one of the leading sectors in 2022-2024, with a potential annual growth of 10.5% and revenues touching Rp734.4 trillion in 2030. Indonesia is also the second largest seaweed producer in the world, with the results of calculations of the Trade Intensity Index (TII) values in several countries being pretty high. However, the condition of seaweed cultivation and processing still has various obstacles and challenges, especially regarding the problem of low productivity of seaweed cultivation caused by low mastery of technology and low human resources. Therefore, this study explored the level of human resource management capabilities and management models in Sumenep, the second-best seaweed-producing area at the national level and number one in East Java. This research used qualitative research with descriptive methods through a case study approach. The results showed that the ability of human resources has partially fulfilled the qualifications but not maximized so that the planning of human resource improvement models that can be applied in the future is more focused on sustainable development programs, the use of technology, and price monitoring by the Government in stabilizing seaweed prices. Therefore, there will not be many people who change professions, and the target of seaweed production can be achieved.

1. Introduction

Seaweed is an essential commodity for the Indonesian economy—Director General of Aquaculture of the Ministry of Maritime Affairs and Fisheries TB. Haeru Rahayu said that seaweed cultivation could become one of the leading sectors in 2022-2024 [1][2]. This is because seaweed commodities have high economic value and a significant potential for seaweed cultivation development in Indonesia [3]. The seaweed industry globally is expected to record an annual growth of 10.5%, with revenues touching US\$48 billion, equivalent to Rp734.4 trillion, by 2030. Indonesia is the second largest seaweed producer in the world, producing 27.86% of the world's 35.8 million tons of seaweed production [4][5]. This condition is also supported by the fact that Indonesian seaweed is relatively competitive in international trade. The Trade Intensity Index (TII) value calculation of Indonesian seaweed products in several countries shows that Indonesian seaweed is highly competitive, especially in Spain.

One of the best seaweed-producing regions is Sumenep. Sumenep is the second-best seaweed-producing region at the national level and number one in East Java, so there is no mistake if seaweed from Sumenep is a favourite in the export market [6][7][8]. Among several seaweed-producing areas in Sumenep, Saronggi sub-district is the highest seaweed producer at 138,232 tons. Furthermore, the second position is Sapeken District, 156,906 tons, and the third with the most seaweed-producing area is Raas, with the acquisition of production of as much as 133,396 tons [2][9]. The success of seaweed production in Sumenep has penetrated international markets, such as China and Hong Kong. However, the condition of seaweed cultivation and processing in Sumenep still holds various obstacles and challenges, especially

regarding the problem of low productivity of seaweed cultivation. In 2023, the achievement of seaweed production in Sumenep also still did not reach the target of the Sumenep Fisheries Service (Diskan). The production generated is still less than 218,559 tons from the initial target. More clearly can be seen in Figure 1 [3][10].

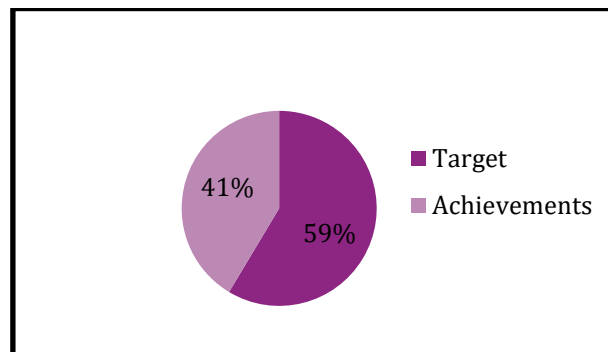


Figure 1. Seaweed production achievements in Sumenep in 2023
resource: Tropical Seaweed Innovation Network

Several studies on the management of seaweed potential showed that the existing human resources in the research location are still low, and there is a lack of mastery of technology and information in producing and marketing seaweed. This affects the inadequate ability to develop the potential of seaweed [10][11]. This is also supported by a statement from the Center for Budget Studies, Expertise Agency of the DPR RI Secretariat General stating that the low productivity of seaweed cultivation is due to low mastery of technology and low Human Resources (HR) [12].

Compared to other countries, dry seaweed productivity in Indonesia is only 1.14 tons/km. Indonesia's productivity is lower than that of the Solomon Islands, which can reach 4.55 tons/km. Meanwhile, Tanzania, India, and the Philippines reached 2.35 tons/km, 1.665 tons/km, and 1.61 tons/km, respectively [13][1]. So, there is no doubt the potential of seaweed in Indonesia, especially in Sumenep, as the belle of the seaweed export market has not been fully maximized. Meanwhile, creating a sustainable competitive advantage requires providing diverse knowledge resources and exploring new ways to meet needs. This is done by studying and analyzing the current situation, providing infrastructure, and building competent human resources to create added value.

Therefore, this research was conducted to analyze and examine more deeply the level of ability and human resource management model in stimulating and managing seaweed production so that the results of this research can later become scientific study material and strategic reference in planning to improve human resource capabilities and the appropriate human resource management model to create sustainable economic prosperity amid high levels of global competition, and as an effort to create a competitive advantage and provide added value to seaweed production in Madura.

2. Method

This research used qualitative research. Qualitative research seeks meaning about a phenomenon, event, or human life by being directly or indirectly involved [14]. This research employed a qualitative descriptive research method with a case study approach located in Sumenep Regency, specifically in Pagar Batu Village, Tanjung, Saronggi District, Sumenep, which is the village that produced the giant seaweed in Sumenep. The data collection method used was interviews with primary informants and supporting informants. The main informants in this

research were 2 heads of seaweed cultivation associations. The village head and the supporting informant came from the Sumenep Fisheries Service. In addition to interviews, researchers used direct observation methods by conducting direct reviews of the intended objects. The following data collection method was documentation to collect secondary data from various resources [15].

2.1 Stage of the research process

The research stage consisted of several stages, namely: (1) the first stage was the preliminary part, which served to find out the background of the problem and the phenomenon under study. Problem formulation is found in this stage. Researchers went to the field to conduct preliminary preliminary research and be supported by literature studies. Problem identification was found, and then the problem in the research was raised; (2) the second stage was the data collection stage. The data collection method used was interviews with primary and supporting informants. In addition to interviews, researchers used direct observation by directly reviewing the intended object. Furthermore, a literature study and document study were also used to complete the required data; (3) the third stage involved data analysis and data validity. Qualitative research employed data processing techniques that included analyzing transcripts, mapping patterns, and categorizing those patterns to identify the dynamics of the problem under study. The data validity technique was conducted by testing the validity of the data using a triangulation approach, which involved an examination technique that utilized external data sources for comparison. This aimed to verify or compare the data obtained previously; and (4) the fourth stage was to conclude the results of the data analysis and provide suggestions based on the research results.

3. Results and Discussion

This research analyzed the ability and model of human resource management to stimulate and manage the natural potential of the region in the form of seaweed to create sustainable economic welfare. Human resource capability is the individual, organizational/institutional, and system ability to carry out their functions or authority to achieve their goals effectively and efficiently [16]. 3 indicators measure the human resource capability construct: (1) Staff capacity is the standardization of staff capacity both in terms of quality and quantity; (2) tupoksi is a clear description of roles and functions for a staff supported by transparent systems and procedures; and (3) development is an effort to master and develop staff expertise, both formal and non-formal.

3.1 Staff capacity

The seaweed production process does not require specific skills/abilities, so informants do not provide a standardized educational background as a pre-requirement to join their group as a seaweed farmer. So far, the standardization is more about physical capacity, meaning that workers are only required to have the physical ability to do seaweed cultivation work and be willing to work. Regarding quality, informants prioritize the honesty of workers/seaweed cultivators, cultivating them honestly and not mixing seaweed products with materials that can destroy the quality of seaweed. *"There are no special abilities/skills; just do not cheat. Use salt or mama lemon so the quality drops."* *"No, there are no specific requirements. The important thing is that they want to work and are still strong."* *"As village officials, we do not limit people to cultivating seaweed, but we always caution them to be honest, not to mix it with any ingredients to maintain the quality of the seaweed here."*

3.2 *Tupoksi*

Seaweed cultivators in the seaweed cultivation village are divided into associations. The Village Head, as an informant, said that there are 11 seaweed cultivation groups. The group has been divided into roles; some become chairman, treasurer, secretary, and members. Furthermore, they all have clear responsibilities and role descriptions that are known to each member. The association has group cash and even groups whose cash management is already more structured in the cooperative. The procurement of cash in the association aims to aid workers in obtaining capital to support seaweed cultivation. Members of the association are not only required to pay cash contributions. Still, they must also attend monthly meetings each group holds and participate in training or other agreed-upon development activities.

3.3 *Development*

Development is needed to create a competitive advantage for seaweed farmers, increasing their competitiveness and stimulating the potential of seaweed, which is the superior potential of Madura as an archipelago, especially in Sumenep, the best seaweed producer nationally. Informants realized the importance of developing and providing training and assistance to increase seaweed and can open new business opportunities by making various processed seaweed products. Training and development efforts have been obtained from both local and provincial governments. However, informants assessed that training and assistance in making processed seaweed is still not optimal and has no sustainable impact. *“There is training on making jellies, dodol, and crackers from seaweed, often held for the wives/mothers of seaweed farmers. Nevertheless, we are not given the tools for some reason, so we only know about it.” “We once made crackers from seaweed and the like. Everything was finished. Nevertheless, it was not continued because the market did not exist, so the community did not dare to continue. So, it is useless for us to make it, but Madura has no market for snacks like this. It is lacking, so they prefer to sell the dried or wet seaweed, which gets more results and is sure to sell it.”*

In addition to training in seaweed processing, informants also said they had received financial assistance distributed to groups and assistance with seaweed planting equipment. The most productive groups also had the opportunity to conduct comparative studies and training directly at the provincial level. However, the majority of these training and development efforts are not sustainable. The community still uses traditional methods and tools in the seaweed cultivation process. This is because the equipment provided to the community is not in the form of technological tools that can be an alternative to increasing seaweed productivity but rather tools commonly used by the local community in cultivating seaweed.

Thus, some informants did not hope for any form of development as had been done before. They hope the Government will help stabilize the price of seaweed so that it becomes more stable and normal again because, in these last few years, the price of seaweed has decreased significantly from 20,000/kg to 2000/kg. This follows research conducted by Muhammad Syahrir, which found that the main obstacles seaweed farmers face are marketing and price stability [16]. This has a very impactful impact on the welfare of the community because, for this reason, there are also seaweed farmers who have changed professions and are migrating out of the region. So, indirectly, this is one of the factors that causes seaweed productivity to decrease and not meet regional targets.

The results of the human analysis of the above research provide an overview that can be a strategic reference in planning to improve the ability of human resources and the suitable human resource management model, namely *first*, providing training and assistance in sustainable seaweed processing not only in the manufacturing process but up to packaging and marketing. *Second*, training, mentoring, and procurement of technology-based tools can increase seaweed productivity, considering that so far, mentoring and procurement have only been

limited to simple tools commonly used by local communities in seaweed cultivation. Third, price monitoring for seaweed middlemen is done so that the price of seaweed can be stabilized and seaweed farmers can get a decent price.

Based on the planning of ability improvement and the suitable human resource management model, the economic welfare of the seaweed cultivator community in Sumenep is expected to be achieved again. There will be no more decline in seaweed production caused by seaweed cultivators who switch professions to other fields so that the target of seaweed production given by the district and province can be achieved. Furthermore, by increasing the ability of human resources, accompanied by the adaptation of technology and understanding of processing, marketing seaweed can quantitatively increase the productivity of seaweed and simultaneously improve its quality. This will eventually impact the achievement of production price stability and the creation of sustainable economic welfare from upstream to downstream.

4. Conclusions

Based on the results of the analysis of the level of human resource capability above, which is measured based on three indicators, namely staff capacity, Tupoksi, and Development, provide an overview of planning to improve human resource capabilities and HR management models in increasing seaweed productivity, namely: (1) Providing training and assistance in sustainable seaweed processing in manufacturing, packaging, and marketing; (2) Training, mentoring, and procuring technology-based tools are essential components for enhancing program participants' skills and capabilities; and (3) Maintaining the stability of seaweed selling prices through price monitoring to middlemen.

Based on the conclusions of the research results above and the limitations of the research, the suggestions given for further researchers are to increase the research scope so that more accurate and comprehensive data are obtained in measuring the level of ability and determining the model of human resource management of seaweed farmers so that the potential for the development of leading seaweed commodities in Indonesia can be maximized. In addition, further research can complement research from different scientific fields. If this research focused on human resource management, further research could be supplemented by agribusiness, biotechnology, industrial feasibility, marketing, and others.

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