

# Analysis of Human Resources Quality in Seaweed Production Development in Sumenep

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## ABSTRACT

*This research highlights the need for an integrated approach to enhance human resource quality for the sustainable development of seaweed production in Sumenep Regency. By focusing on Pagar Batu Village, Saronggi District, a significant seaweed-producing area, this study aims to support community welfare, particularly for coastal communities. Using a descriptive qualitative method with a case study approach, the research explores the dynamics of local seaweed cultivation, focusing on conditions as they naturally occur. Data collection involved observations, interviews, and documentation to capture a comprehensive view of seaweed production. Findings reveal both supporting factors, such as cooperative teamwork and adequate equipment, and obstacles like unpredictable weather, poor water quality, and fluctuating prices. Training programs organized by local authorities show potential in increasing technical knowledge, though outreach is still limited. This research underscores the importance of capacity building and technical training to address these challenges, fostering sustainable productivity and economic growth in Sumenep's seaweed sector.*

**Keywords:** Human Resources, Production Development, Seaweed, Sumenep

## ABSTRAK

*Penelitian ini menyoroti perlunya pendekatan terpadu untuk meningkatkan kualitas sumber daya manusia demi pembangunan berkelanjutan produksi rumput laut di Kabupaten Sumenep. Dengan berfokus pada Desa Pagar Batu, Kecamatan Saronggi, yang merupakan daerah penghasil rumput laut yang signifikan, penelitian ini bertujuan untuk mendukung kesejahteraan masyarakat, khususnya masyarakat pesisir. Dengan menggunakan metode kualitatif deskriptif dengan pendekatan studi kasus, penelitian ini mengeksplorasi dinamika budidaya rumput laut lokal, dengan fokus pada kondisi yang terjadi secara alami. Pengumpulan data melibatkan observasi, wawancara, dan dokumentasi untuk menangkap pandangan komprehensif tentang produksi rumput laut. Temuan penelitian mengungkapkan faktor pendukung, seperti kerja sama tim yang kooperatif dan peralatan yang memadai, dan kendala seperti cuaca yang tidak dapat diprediksi, kualitas air yang buruk, dan harga yang berfluktuasi. Program pelatihan yang diselenggarakan oleh pemerintah daerah menunjukkan potensi dalam meningkatkan pengetahuannya teknis, meskipun jangkauannya masih terbatas. Penelitian ini menggarisbawahi pentingnya pengembangan*

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## INTRODUCTION

Seaweed production in Indonesia has become an interesting sector in recent years. Seaweed is a marine biological resource that can be produced in an environmentally friendly and sustainable manner. Seaweed can be processed into both food and non-food ingredients (Nakhate & Meer, 2021). In Indonesia, the seaweed sector not only contributes to the economy but also provides opportunities for improving the welfare of the community, especially coastal communities. Indonesia is one of the largest seaweed producers in Asia, after China (Nilsson et al., 2022). In 2015, Indonesia contributed around 38% of global production with a total of 11.269 million tons. Meanwhile, China contributed 47% or equivalent to 13.925 million tons (Pamungkas et al., 2023). In 2019, Indonesia's seaweed production reached 9.962 million tons, making Indonesia the largest producer after China which managed to produce 20.296 million tons (Cai et al., 2021).

Along with the increasing global demand for seaweed products, the development of the sector in Indonesia, especially in Sumenep Regency, is getting higher. Sumenep is located at the tip of Madura Island and has great potential for seaweed production due to the geographical and climatic conditions that support the growth of this plant. Sumenep is the second best seaweed producing area nationally and number one in East Java Province. The potential area of seaweed cultivation in Sumenep is approximately 243,254 hectares, the existing area is 59,424 hectares, with 4,093 seaweed farmers. Meanwhile, the cultivation production is 686,657.08 tons and the cultivation production value is 3,433,285,405 in 2023 (DKP East Java, 2023). Of several areas in Sumenep Regency, Saronggi District is one of the locations that has quite extensive land resources and coastal conditions that are suitable for seaweed cultivation. So that this potential can be utilized to increase seaweed production in the area.

However, to utilize this potential optimally, effective management is needed, especially in terms of Human Resources (HR). Skilled and influential HR are very important to manage seaweed cultivation properly. Obstacles in seaweed cultivation include the low quality of HR in coastal areas that act as seaweed farmers, this causes the quality of seaweed produced to be less than satisfactory (Abdullah, 2011). If explored further, it seems that the problem in developing farmer resources is still related to their low level of knowledge and skills. This situation will greatly hinder the process of adoption and innovation of technology in farming in the future. The skills possessed by farmers are still relatively traditional, with the use of non-mechanical production tools. This phenomenon can be an encouragement for farmers and the government to realize the importance of improving the quality of existing human resources, so that they can increase the quantity and quality of seaweed production (Fatmawati & Wahyudi, 2015).

In addition, improving the quality of human resources in seaweed cultivation is also directly related to community welfare. Communities involved in seaweed cultivation can earn better incomes, which in turn can improve their quality of life. If farmers feel more prosperous, they will be more motivated to implement better cultivation practices, thus creating a sustainable positive cycle for this sector. Given the large potential of seaweed in Sumenep Regency and its significant role in the regional economy, efforts are needed to improve the quality of human resources in developing seaweed production. The quality of human resources can be interpreted as the ability of farmers and related stakeholders to manage and develop seaweed production efficiently and innovatively, by optimally utilizing available knowledge, skills, and resources.

According to Priyono & Darma (2016) in their book entitled Human Resource Management, improving the quality of human resources is needed to increase work productivity, which can ultimately help achieve welfare. The development of human

resource quality is carried out so that organizational management becomes more effective and efficient. Thus, the higher the quality of human resources, the greater the potential for the organization to increase its productivity and competitiveness. In the research of Putra et al. (2023), with good quality human resources, companies will find it easier to carry out various things, one of which is increasing work productivity, especially the production sector. The quality of human resources is not just a supporting factor, but is the core of the success of production development that focuses on increasing the productivity and competitiveness of the company.

Therefore, a comprehensive and integrated approach is needed to improve the quality of human resources for the development of seaweed production in Sumenep Regency. It is hoped that the results of this study can be used as scientific study material and can contribute to the development of a sustainable seaweed sector and improve the welfare of the community, especially coastal communities. In addition, it is hoped that the implementation of the findings of this study can create synergy between increasing human resource capacity and sustainable productivity, thereby encouraging more inclusive and sustainable economic growth in the area.

## **LITERATURE REVIEW**

Quality can mean the level of good or bad of something (level) or can be interpreted as a degree or level (skill, skill, and so on) and quality. According to Panambunan et al. (2019), quality is a measure of how far various requirements, specifications, and expectations have been met. According to Setiawan & Safitri (2019), quality is a measure used to assess that a good or service has met the value according to expectations. In other words, goods or services are considered quality if they are able to function or provide benefits as desired. Based on the definition above, quality can be concluded as a measure that reflects the extent to which something meets the standards or expectations set.

Human resources are an important element in an organization or company, in addition to other factors such as operational activities and capital. Therefore, human resource management needs to be carried out optimally to increase the effectiveness and efficiency of the organization. This management is one of the important functions in a company known as human resource management. According to Virtadaniati & Anggarani (2024), human resources are an important element in an organization, which includes all individuals involved in carrying out various activities. The definition of human resources according to Panambunan et al. (2019) is workers or employees in an organization who have an important role in achieving success. Meanwhile, according to Dimuru (2024), Human Resources (HR) are adaptive and transformative potential, which is able to manage itself and optimize all natural resources in order to achieve welfare in a sustainable balance.

The quality of Human Resources (HR) is a very important aspect in an organization because it plays a direct role in business success (Yulianto et al., 2023). According to Winedar & Wibowo (2019), the quality of HR is not only seen from their ability to carry out tasks well, but also from their ability to develop and support the personal growth of their colleagues. In addition, Puryana (2021) added that the quality of HR is a combination of physical abilities, such as health, and non-physical abilities, such as work skills, thinking, mental abilities, and other skills that enable someone to be creative and contribute to the organization. HR is considered qualified when they are able to carry out the authority and responsibilities given to them well (Putra et al., 2023). Thus, the existence of quality HR is a vital element for an organization, because business success is highly dependent on individuals who have intelligence, talent, and are physically healthy. According to Atika (2021), there are several main indicators for assessing the quality of human resources, including intellectual quality which includes knowledge and skills, level of education, understanding of the field of work, relevant special abilities, high work enthusiasm, and planning and organizing abilities.

Seaweed cultivation management is one of the strategies implemented by the government to increase production and community income (Sujarwo & Fitriyanny,

2016). The government tries to support the community in developing seaweed businesses by providing the necessary facilities and infrastructure, such as pond construction, seed provision, and technical training (Wardhani et al., 2021). Seaweed cultivation not only brings economic benefits to the community but also has a positive impact on the environment (Nurwidodo et al., 2018). In addition, seaweed cultivation also opens up opportunities to develop environmentally friendly seaweed-based products that have the potential to become superior regional products (Madasari & Wibowo, 2018). With effective management, seaweed production can be increased, thereby increasing the economic value and contribution of the fisheries sector (Putri et al., 2018).

## **METHODS**

This research was conducted in Pagar Batu Village, Saronggi District, Sumenep Regency, which is one of the largest seaweed producing areas in Sumenep. The method used is descriptive qualitative research with a case study approach, aiming to describe the phenomenon systematically and accurately. Qualitative research focuses on describing phenomena, both those that occur naturally and those that are the result of human engineering, and prioritizes the quality and relationships between activities (Nurhawani & Nurhawani, 2019). This descriptive research does not involve variable manipulation, but only describes conditions according to reality (Azizah, 2023). Data were collected through three main techniques: observation, interviews, and documentation. Observations were carried out by directly observing activities at the research location (Harahap et al., 2024). Interviews were conducted in depth to obtain primary data, while secondary data were obtained from related agencies (Sufiyanto & Hefni, 2021). Documentation as a complementary method includes relevant photos, news, and reports (Sembiring et al., 2018). Data analysis uses descriptive qualitative techniques, including data collection, reduction, presentation, and drawing conclusions (Kase et al., 2023). The first stage is collecting field data through observation, interviews, and documentation. The reduction stage aims to simplify the data obtained by summarizing and filtering information according to the focus of the research. Data presentation helps researchers understand the situation and continue the analysis. The final step is drawing conclusions and verification to ensure the accuracy of data interpretation. If there are errors, corrections are made in the field to obtain more accurate answers.

## **RESULTS**

Based on the results of interviews with several seaweed farmers in Sumenep, it was found that the knowledge and technical skills of each member of the seaweed association play a significant role in the quality of human resources in developing seaweed production in Sumenep. The level of formal education of the farmers varies (elementary school, junior high school, MTs), but education is not considered a major factor influencing performance. However, experience and technical skills are very important for successful production. Each member of the association has mastered various seaweed cultivation techniques, including tying seaweed ropes and dealing with diseases. These skills are obtained from years of work in this field. The Sumenep Fisheries Service provides training that is useful for improving the technical knowledge of association members. However, this training is considered less effective because only the head of the association is involved in this training and then conveys the information obtained in the training to the association members without being directly involved in the research.

In terms of ability, members of the seaweed association showed good mastery of all technical aspects of seaweed cultivation. Farmers also have sufficient ability to complete tasks related to seaweed cultivation. Farmers have mastered all cultivation processes, from preparation to planting and harvesting. Farmers can still work together and effectively even in situations with low prices or difficult technical problems. The work spirit shown by members of the association shows high motivation. Seaweed farmers do not complain and remain optimistic even though there are obstacles, such as diseases or weather that damages seaweed. This is influenced by the sense of solidarity of the farmers

and their responsibility for their work, which helps seaweed farmers survive in difficult conditions. To maintain positive spirits, farmers are grateful for their achievements with a thanksgiving or celebration.

The seaweed association has good planning in overcoming technical obstacles and determining harvest times in a structured manner. The main obstacle in seaweed production is the weather factor which is difficult to predict and often affects the harvest. However, with careful planning, the members of the association are still able to carry out their duties with high spirits and maintain solidarity among fellow farmers, even though natural conditions often pose challenges. The solidarity that is built among them helps strengthen resilience in facing production obstacles caused by changes in the weather. To maintain production quality and performance, the association regularly holds semi-monthly meetings. Every ½ month, members gather in the forum to assess the results of the work over the past two weeks and discuss solutions to various problems faced. Through evaluation and problem solving together, they can provide support to each other and find ways to overcome existing obstacles collectively. These regular meetings not only strengthen cooperation between farmers, but also ensure the sustainability and stability of better seaweed production amidst the challenges of unpredictable weather.

Based on the results of interviews with several seaweed farmers in Sumenep, it shows that solid cooperation between associations, the availability of fairly complete tools, and training provided by the Sumenep Fisheries Service are some of the factors that support the growth of seaweed production. However, the training provided by the Sumenep Fisheries Service in Banyuwangi only involved group leaders who were present and then shared the knowledge and information they had obtained with other members. Although only the association leaders were involved, this training was considered to enrich the technical knowledge of seaweed farmers. However, there are significant inhibiting factors, especially unpredictable weather, white disease in seaweed, and disturbances from predatory fish that can destroy seaweed. Extreme weather, especially in the summer, is also a challenge that requires strict supervision.

## **DISCUSSION**

Human resource quality can be defined as the level of skills, knowledge, and abilities possessed by individuals or groups to carry out the tasks required to achieve organizational goals. The quality of human resources is determined by attitudes, education or level of knowledge, experience or maturity and values they possess, not just physical strength or skills (Sari & Amri, 2018). The quality of human resources is very important for organizations because high-quality human resources can increase productivity, efficiency, innovation, and adaptability to change.

The development of seaweed production in Sumenep is greatly influenced by the quality of Human Resources (HR) of its farmers, especially in terms of knowledge and skills. According to Pangkey & Pombengi (2024), knowledge is the result of a person's understanding obtained through perception and interaction of the five senses with their environment. Seaweed farmers in Sumenep already have a deep understanding of seaweed cultivation, including water conditions and effective cultivation techniques, based on their experiences and observations in the field. This is supported by the statement of the head of the farmer group who emphasized that his members have mastered the knowledge and technical skills that enable them to work more effectively (Interview, September 24, 2024). In addition to knowledge, skills are also an important component that determines the quality of HR. In line with Nidayawati's theory (2022), skills are acquired through direct practice, not formal training. The skills of Sumenep farmers are obtained from direct involvement in the cultivation process, from planting to harvesting, which results in effectiveness in increasing productivity. Although their skills are adequate, improving the quality of HR is still needed, especially through continuous training to face the challenges of future production and technological adaptation in the seaweed industry. This improvement is expected to help farmers optimize production and

contribute to the development of the seaweed industry in Sumenep, strengthening their position in the growing seaweed market.

Education is divided into two types, namely general education and vocational education. General education aims to provide participants with general knowledge, organized inside and outside schools by the government or the private sector. Vocational education focuses on preparing participants to work according to their field of expertise. Both types of education play a role in improving the quality of human resources. Based on an interview with Mr. Dadak Firdaus, Chairperson of the Cahaya Bahari Association, formal education is not considered to affect the performance of his group, which consists of members with elementary, junior high, and MTS education. On the contrary, technical mastery and practical skills, such as disease management and seaweed maintenance, are more dominant in the success of their production. From this interview, the researcher concluded that practical experience is more important than formal education in improving the skills and productivity of seaweed farmers. In Sumenep, the quality of human resources in seaweed production is further improved through technical skills and direct work experience than formal education. This supports the view of Susianita & Riani (2024), where practical skills are more relevant to direct work. Thus, vocational education is considered more effective in equipping farmers with practical skills, enabling them to face production challenges more readily and efficiently.

Skills are expertise acquired through hands-on practice, and a deep understanding of a job requires practical skills from field experience (Nidyawati, 2022). In the context of seaweed cultivation, these skills help farmers identify and solve problems, especially for those who have been practicing for a longer time. According to him, without experience, farmers would not understand how cultivation works effectively (Interview, September 24, 2024). The results of this interview show that farmers in Sumenep understand their jobs well, have the necessary abilities and skills, and develop seaweed cultivation techniques independently. They demonstrate high integrity and commitment in achieving optimal production results. Their skills and knowledge, gained from years of experience, support the argument that farmers not only understand their field but also excel in cultivation-related tasks. With in-depth skills, farmers can face various challenges and achieve the best results in seaweed production. This condition shows that the quality of human resources in Sumenep is influenced by in-depth understanding generated through practice and direct experience in the field, making farmers increasingly ready to develop the seaweed industry in their area.

Ability is one of the important indicators in assessing the quality of Human Resources (HR), including for seaweed farmers in Sumenep. Ability is defined as the capacity to perform tasks that require endurance, skill, and strength. Based on interviews, members of the seaweed association in Sumenep, especially the Cahaya Bahari group led by Mr. Dadak Firdaus, have mastered all technical aspects of cultivation, from preparation, planting, to harvesting. They are able to face challenges, such as technical constraints and market price fluctuations, while remaining compact and effective, demonstrating the resilience and stability of their technical abilities (Interview, September 24, 2024). However, there are areas that still need to be understood in more depth, especially related to techniques for dealing with diseases that attack seaweed and strategies for maintaining production quality amidst market changes. Mr. Dadak Firdaus stated that farmers need to understand technical methods to eliminate and prevent diseases in seaweed, as well as handle price fluctuations, which affect production success (Interview, September 24, 2024). This high technical ability reflects the quality of strong HR and is one of the determining factors for the success of seaweed cultivation in Sumenep. Ongoing training programs will be an important investment to help farmers update their skills, so they can remain competitive and productive in the industry. Thus, the skills acquired and honed continuously through training and field experience will further strengthen their position in facing production challenges and supporting the development of the seaweed industry in Sumenep.

Work enthusiasm is an important factor that influences the productivity of seaweed farmers in Sumenep. According to Syihab et al. (2020), work enthusiasm is a condition within a person that drives them to work faster and better, and improve their work results in an organization. High enthusiasm in seaweed farmers makes them more motivated to learn and apply more efficient cultivation techniques. Based on an interview with the head of the Cahaya Bahari group, Mr. Dadak Firdaus, it was revealed that despite challenges such as seaweed damage, work enthusiasm was maintained through thanksgiving activities and gratitude. This helps farmers not to be too burdened by existing problems (Interview, September 24, 2024). Mrs. Megawati, a member of the group, also stated that their work enthusiasm is very high because seaweed cultivation is their main source of income. She said that even though the work is tiring, the enthusiasm to continue working is high in order to support her family's daily needs. This statement shows that work enthusiasm encourages farmers to commit to seaweed cultivation tasks, from preparation to harvest. Strong work spirit makes farmers more enthusiastic and efficient, even when facing obstacles such as price fluctuations and unpredictable weather. In addition, work spirit also strengthens cooperation between group members. Thus, work spirit not only improves the quality of the harvest but also creates a positive and productive work environment. This shows that developing work spirit is one effective way to improve the quality of Human Resources (HR) in developing seaweed production in Sumenep.

Planning ability is an important component in an effective organizing process. In an interview with Mr. Dadak Firdaus, the head of the Cahaya Bahari association, it was stated that the planning carried out had been effective even though commodity prices fluctuated. Every half a month, the association holds a meeting involving all members to share the problems faced (Interview, September 24, 2024). The results of the interview showed that the Sumenep seaweed association had made good preparations in determining the harvest time and overcoming technical problems. The farmers worked with high enthusiasm and solidarity even though unpredictable weather often hampered production. They applied flexible and responsive planning methods to challenges. Routine meetings every half a month were held to evaluate performance and solve problems. Thus, good planning ability in organizing can build quality and productive human resources in seaweed cultivation in Sumenep. The quality of human resources in the development of seaweed production in Sumenep Regency is influenced by knowledge, skills, work enthusiasm, and planning ability. Continuous training involving all members of the association is very important to increase productivity and quality of cultivation results.

The development of seaweed production in Sumenep is influenced by various supporting and inhibiting factors. According to an interview with Mr. Abd Rahman, chairman of the Sumber Bahari association, the main supporting factor in seaweed production is the availability of complete tools, such as ropes, slingshots, and boats to check seaweed at sea. In addition, solid cooperation between group members also contributes positively to the success of this business (Interview, September 24, 2024). On the other hand, there are several inhibiting factors faced in the development of seaweed production. Mr. Dadak Firdaus, chairman of the Cahaya Bahari association, said that unpredictable weather is one of the main obstacles. In addition, dirty water quality, destructive fish attacks, and diseases that attack seaweed are also problems. He also highlighted the fluctuation in seaweed prices which also affect farmers' income. The conclusion of the interview shows that the main supporting factors in the development of seaweed production in Sumenep are the availability of adequate tools and solid cooperation between members of the farmer group. This finding is in line with Rompas (2018), which discusses the strategy for developing seaweed cultivation businesses on Nain Island, North Minahasa Regency. Rompas (2018) emphasized the importance of paying attention to community interest in cultivation businesses, simple technology, and affordable costs as key elements in increasing seaweed production.

The training held by the Sumenep Fisheries Service in Banyuwangi, although only attended by the group leader, has the potential to increase the technical knowledge of

seaweed farmers. The group leader is responsible for disseminating the information obtained to other members, although this method is still limited in reach. This training is very important in improving technical skills, which in turn can support increased seaweed production. Research by Rifa'i & Kirihio (2020) also shows that training and socialization activities can improve farmers' knowledge and skills, enabling them to increase the quantity and quality of seaweed production, as well as techniques for planting and processing it into processed products. However, there are several significant inhibiting factors in seaweed cultivation, such as unpredictable weather, especially extreme weather in summer, interference from predatory fish, low selling prices, and white disease that attacks plants. Teniwut & Kabalmay (2017) in their research entitled Empirical Study of Seaweed Cultivation Business Evaluation in Southeast Maluku Regency, noted a decline in seaweed cultivation activities between 2012 and 2014, which was caused by pests and diseases, low-quality seeds, and low selling prices. This condition not only reduces production results, but also increases the workload and requires more intensive handling. Therefore, improving the quality of human resources, especially in terms of mitigation and adaptation skills to environmental challenges, is crucial to ensure the sustainability and increase of seaweed production in Sumenep.

## CONCLUSION

Research shows that the quality of Human Resources (HR) plays a crucial role in the success of seaweed cultivation. Several factors that influence the quality of HR in seaweed production in Sumenep include knowledge, skills, education, work enthusiasm, understanding of the field of work, and planning skills. Farmers in Sumenep generally have good technical knowledge of seaweed cultivation, which is obtained from practical experience in the field. Although the formal educational background of farmers varies, mastery of technical skills is more dominant. Continuous training involving all seaweed farmers is essential to optimize their ability to face various production challenges and in implementing new technologies. In addition, support for the development of seaweed production in Sumenep also depends on the availability of adequate equipment and good cooperation between members of the farmer group. However, there are several inhibiting factors that need to be overcome, such as extreme weather, diseases that attack seaweed, and price instability. By improving the quality of HR through continuous training and strengthening technical skills, it is hoped that the productivity and sustainability of the seaweed industry in Sumenep can continue to increase. This is important to ensure that farmers are able to compete and adapt to ever-changing market conditions so that this industry can develop sustainably.

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