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Community Training in Seaweed-Based Soft Candy Production: A Blue Economy Initiative in Lontar Village, Indonesia

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ABSTRACT

Lontar Village has a fairly good blue economy potential because some of its residents are seaweed farmers with a total land use of 149 ha. The seaweed farmer group only sells dried seaweed at a fairly low price, so it has not been able to provide significant economic improvement. In addition, many mothers in this village are migrant workers abroad. The large number of migrant workers from mothers has the potential to disrupt the development of the children they leave behind. Therefore, training is needed to be able to become independent entrepreneurs, so as to reduce their interest in becoming migrant workers abroad. The purpose of this activity is to train the people of Lontar Village to be able to process soft candy from seaweed. The methods of this activity are education, demonstrations, and direct practice of making soft candy. The target participants in this activity are 15 people from the seaweed farmer group and 20 members of the Family Welfare Movement. The parameters for the success of this training are (1) the community understands the material provided, (2) there are soft candy products that have a minimum preference score of 7, (3) there is a soft candy product packaging design. The training results showed that the majority of participants understood the material, as evidenced by the increase in the number of participants scoring 8, from none to 25 participants. Participants successfully produced soft candy with a 7-8 (like-very like) rating. The soft candy products now have attractive packaging designs.

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INTRODUCTION

The blue economy is an economic development concept that utilizes the sea and marine resources. Essentially, the blue economy concept is the application of a green economy in marine areas. Economic development that utilizes marine resources has a significant opportunity to improve community welfare and increase employment opportunities (Supriyadi et al. 2022). One coastal village with potential for blue economy development is Lontar Village, Tirtayasa District, Serang Regency, Banten. This village covers an area of 556.5 hectares and borders directly on the Java Sea. Most of the Lontar Village community is known to be a seaweed farmer, with the number of farmers currently reaching hundreds, with a total utilization of seaweed cultivation land reaching 149 hectares. Seaweed cultivation yields in Lontar Village reached 13,750 tons in 2022 (Munandar et al. 2019). The type of seaweed widely cultivated by the Lontar Village community is Kapapycus alvarezii. This seaweed is high in dietary fiber (25%) and also contains protein (9.76%), vitamins, and minerals (Matanjun et al. 2009). It is also rich in active compounds such as phenolic compounds, natural pigments, sulfated polysaccharides, and halogenated compounds (Rizkaprilisa 2023).

The seaweed farming group in Lontar Village has so far focused solely on cultivating and selling dried seaweed. These activities have not yet generated significant economic growth, as most of the seaweed is sold to middlemen at fluctuating prices, averaging below IDR 9,000/kg. Efforts to diversify seaweed production through value-added product diversification are needed. This initiative is expected to provide community knowledge in seaweed processing, thus providing economic opportunities for seaweed farming groups in Lontar Village.

Lontar Village is also known for its high migrant worker population. According to the Lontar Village Government, the number of migrant workers reaches thousands, the majority of whom are women. The high level of public interest in becoming migrant workers is due to the lack of job opportunities, lack of entrepreneurial skills, and the desire to earn a higher income abroad. Upon closer examination, the large number of mothers working as migrant workers can negatively impact the children they leave behind, such as suboptimal child development, psychological problems, and even academic achievement issues (Widyarto and Rifauddin 2021). Therefore, it is necessary to guide the mothers of Lontar Village in utilizing their village's potential to process seaweed into value-added products, thereby creating an independent and sustainable entrepreneurial community. This activity is expected to reduce the interest of mothers in becoming migrant workers abroad.

Increasing the added value of seaweed can be achieved by processing it into soft candy. Soft candy is a semi-moist product with a long shelf life and is easy to produce on a home scale. Selecting products with a long shelf life can potentially serve as souvenirs from Lontar Village, given the large number of tourists from outside the region who frequently vacation at the beach or visit religious sites in Banten. The purpose of this activity is to provide new skills to the people of Lontar Village in processing seaweed into soft candy.

METHOD

This training will be held in Lontar Village, Tirtayasa District, Serang Regency, Banten, during July 2025. The training is targeted to be attended by 35 people, consisting of 15 members of the seaweed farming group and 20 members of the Family Welfare Movement.

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Implementation Stage

The training of seaweed-based soft candy production was conducted in a series of activities, consisting of (1) preparation, (2) training implementation, and (3) evaluation.

Preparation

- The first stage was coordination with the Lontar Village Government, Seaweed Farmers Group, and members of the Family Welfare Movement to gain community support and participation in the training.
- The second stage was to prepare the training materials to be delivered. The literature was sourced from various journal articles, websites, and books. The materials were presented in MS. PowerPoint and a leaflet. The content of materials about the nutrition and benefits of seaweed, soft candy production, and product packaging.
- The third stage was the preparation of tools and materials used in the training. Tools used included a pan, blender, stove, stirring spoon, baking pan, digital scale, plastic packaging, tray, and sealer. The required materials are presented in Table 1.

TABLE 1. Soft candy composition

No	Material	Volume
1	Seaweed (*Kappaphycus alvarezii)*	20 g
2	Water	200 mL
3	Agar-agar powder	7 g
4	Sugar	200 g
5	Fruit flavour	20 g
6	Citric acid	2 g

Training Activity

The training was conducted over three days, July 9, 10, and 12, 2025. Each day had a different schedule and objectives. The training activities are presented in Table 2.

TABLE 2. Soft candy production training activities and objectives

Day, Date	Schedule	Activity Objectives
Wednesday, July 9th 2025	- Opening by the Village Head and Community Service Team Leader - Pre-test: consisting of 10 questions regarding the benefits and nutrition of seaweed, seaweed processing techniques, and packaging knowledge - Presentation on the benefits and nutrition of seaweed, seaweed processing techniques, and packaging - Demonstration of soft candy	The objectives of the first days activities were: - To determine participants' initial understanding of the training material - To provide education and information regarding the nutrition and benefits of seaweed - To provide an overview of how to produce and

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Day, Date	Schedule	Activity Objectives
	production - Question and answer - Closing	package soft candy products
Thursday, July 10th 2025	- Opening by the community service team - Soft candy production practice: 1. Grinding seaweed using a blender 2. Boiling water with added sugar and agar-agar powder in a saucepan, then stirring until completely dissolved 3. Mixing seaweed, flavoring, and citric acid in a saucepan, then stirring until homogeneous 4. Cook for 5 minutes 5. Pouring into a baking pan while hot with a thickness of 0.5 cm 6. Letting stand at room temperature for 10 minutes 7. Rolling the candy dough 8. Slicing thinly 9. Drying - Q&A - Closing	The aim of the activities on the second day was to improve the participants' skills in making soft candy.
Saturday, July 12th, 2025	- Opening by the community service team - Assistance in creating packaging designs - Q&A - Post-test - Closing	The objectives of the third day's activities were: - To assist participants in creating packaging designs - To determine the level of understanding after the training.

Evaluation

Evaluations were conducted on the participants and the products. Participants were evaluated on the third day of the training to determine their level of understanding. Participants were given the same 10 questions as the pre-test, and a score of 8 correct answers was used to determine their understanding of the material.

Further evaluations were conducted on the soft candy products. This aimed to determine participants' success in making the soft candy. The product evaluation used a hedonic test in

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accordance with SNI 01-2346-2011 (BSN 2011). A panel of 30 people, consisting of 3 lecturers and 27 students, assessed the level of preference. The assessment was conducted in the Aquatic Product Processing Technology Laboratory, Faculty of Agriculture. Assessment attributes included preference for appearance, odor, taste, and texture. The preference scale ranges from 1-9, namely (1) Dislike extremely, (2) Dislike, (3) Dislike, (4) Dislike somewhat, (5) Neutral, (6) Dislike somewhat, (7) Like, (8) Like very much, and 9) Like extremely.

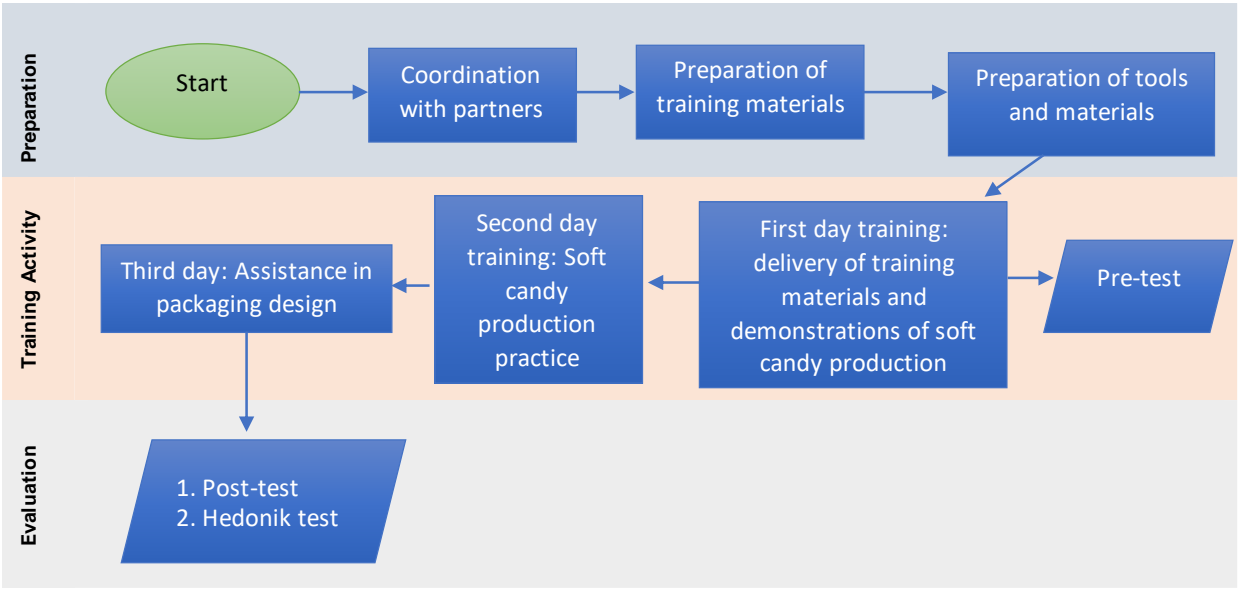

FIGURE 1. Flowchart of training activity

RESULT AND DISCUSSION

Preparation

The training activities began with coordination with the Seaweed Farmers Group, members of the Family Welfare Movement, and the Lontar Village Government. This coordination aimed to ensure that all parties involved were working in the same direction and that the activities ran effectively. Thorough coordination increased community participation, fostering a sense of ownership and commitment to the program. Coordination was also key to ensuring the success of the training activities and supporting the achievement of community empowerment goals. Documentation of the coordination activities is presented in Figure 2.

FIGURE 2. Coordination activity

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Training materials were prepared to support the program's success. The materials presented included information on the nutrition and benefits of seaweed (Kappaphicus alvarezii), seaweed processing, and packaging techniques. Developing media for delivering the information was considered crucial, as it significantly enhanced participants' understanding. Therefore, the community service team prepared MS. PowerPoint slides and leaflets as a means of delivering the information (Figure 2). Furthermore, the community service team prepared pre-test and post-test questions to evaluate participants' understanding during the training. The list of questions is presented in Figure 3.

(a) (b)

FIGURE 3. Presentation media: (a) Ms. PowerPoint slides and (b) leaflet

Nama :
Kelompok : Pembudidaya Rumput Laut / PKK (Lingkari Jawaban Anda)

Jawablah pertanyaan dengan menyilang jawaban yang benar!

1 Nama rumput laut yang digunakan dalam pengolahan?
a. *Gracillaria* sp b. *Kappaphicus alvarezii* c. *Sargassum sp*

2 Kandungan zat non gizi rumput laut yang bermanfaat bagi tubuh?
a. Serat pangan b. Protein c. Mineral

3 Apakah manfaat kandungan zat non gizi yang ada pada rumput laut?
a. Membantu memelihara kesehatan pencernaan b. Mencukupi kebutuhan protein tubuh
c. Membantu mencukupi kebutuhan kalsium tubuh

4 Bagaimanakah proses pembuatan permen lunak?
a. Rumput laut kering, dihaluskan, ditambah susu, dijemur
b. Rumput laut kering, direndam, dihaluskan, ditambah bahan lain, direbus, dicetak, dikeringkan
c. Rumput laut kering, direndam, dihaluskan, ditambah bahan lain, dicetak, dikeringkan

5 Kenapa permen perlu dikeringkan
a. agar awet b. Agar tidak dimakan semut c. Untuk menjaga kebersihan

6 Berapa suhu pengeringan yang dapat digunakan untuk mengeringkan permen lunak
a. 100-120 ^{0}C b. 0-5^{0} C c. 40-50^{0}C

7 Fungsi utama kemasan pada permen lunak, kecuali..
a. Agar terhindar dari kotoran b. Agar tidak meleleh c. Memberikan daya tarik konsumen

8 Fungsi penambahan agar pada permen lunak
a. Meningkatkan tekstur b. Memberikan rasa manis c. Menjauhkan dari gangguan serangga

9 Hal yang harus tercantum pada kemasan, kecuali
a. Merek b. Komposisi c. Cara pembuatan produk

10 Desain kemasan yang baik adalah...
a. Hurufnya jelas dan proporsional b. Tidak boleh transparan c. Huruf harus berwarna hitam

FIGURE 4. List of questions for participant evaluation

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Training Activity

The first day of the soft candy training was attended by seaweed farmers, the Family Welfare Movement, and the village government. The purpose of the first day's activities was to educate the community about seaweed nutrition, processing methods, and product packaging. The first day's activities began with a pre-test to determine the participants' level of knowledge regarding the material to be presented. The results of the pre-test are presented in Table 3. The result shows that the level of understanding of the participants was still low, as all participants scored below 8. Based on our criteria, the community is considered to understand the material to be presented if they can answer at least 8 questions correctly.

TABLE 3. Pre-test result

Respondent	Score
18 people	4
12 people	5
5 people	6

After answering the pre-test questions, the community was educated about the nutrition and benefits of seaweed, as well as how to process and package soft candy products. The community enthusiastically participated in each stage of the activity, from theoretical explanations to demonstrations of soft candy production (Figure 4). This activity is a crucial step in developing innovative seaweed-based products with high economic value, as previously, the community only sold dried seaweed. This activity is expected to open new business opportunities, thereby increasing the role of the blue economy for the community. The blue economy is all activities that utilize the sea or marine resources for sustainable economic development (Henggu et al. 2024).

FIGURE 5. Presenting how to produce soft candy

Processing seaweed into soft candy can increase the product's selling value. This is based on a simple capital cost analysis of soft candy production (Table 4). The capital cost for a single jar of soft candy on a home scale is Rp 13.113, compared to a similar product on the marketplace for Rp 24.000 per jar. This suggests that processing can significantly increase the selling price, thereby generating greater profits for the community.

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TABLE 4. Analysis of soft candy manufacturing costs

No	Materials	Volume	Price (Rp)	Cost of capital (Rp)
1	Seaweed	20 g	9.000/Kg	180
2	Water	200 mL	5.000/19 L	53
3	Agar-agar powder	7 g	5.500/7 g	5.500
4	Sugar	200 g	17.000/1 Kg	3.400
5	Fruit flavour	20 g	50.000/1 Kg	940
6	Citric acid	2 g	20.000/1 Kg	40
7	Jar and sticker	1 set	3.000/set	3.000
		Total		Rp. 13.113

The second day of the training focused on practicing soft candy production. The training aimed to improve participants' skills in making soft candy. Figure 6 shows the Lontar Village community practicing the process of making soft candy from seaweed, guided by the community service team. This activity began with the preparation of the raw materials, namely, seaweed that had been cleaned and ground. After that, sugar was dissolved with agar in boiling water. The seaweed was added to the boiling water along with flavoring and citric acid, then stirred until homogeneous. The liquid mixture was then poured onto a baking sheet and left at room temperature to harden. After that, the candy was rolled into rolls and dried in the sun until dry. The candy-making process is considered quite easy and can be implemented as a home business. Soft candy has a low water content, so it is called a semi-wet product (Ahmad and Mujdalipah 2017). This product has a long shelf life, making it suitable as a typical Banten souvenir.

(a) (b)

FIGURE 6. Day two training: (a) production of soft candy, (b) soft candy

The training activity on the third day was a practical activity of packaging soft candy and assisting in the creation of packaging designs. In this activity, the community service team provided examples of how to package soft candy products using primary plastic packaging and secondary packaging in the form of plastic jars (Figure 7a). According to Larasati et al. (2023), packaging plays a primary role in protecting the product to ensure its safety, durability, and quality during distribution and storage. Furthermore, packaging also functions as a communication medium with consumers through listed information, such as composition, nutritional value, and expiration date. The community service team also assisted in creating packaging designs (Figure 7b). The results of the packaging design for soft candy products are presented in Figure 8. According to Larasati et al. (2023), an attractive packaging design will attract and build consumer confidence in choosing our products.

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(a)

(b)

FIGURE 7. (a) Practice packaging soft candy and (b) assisting in the creation of packaging designs

FIGURE 8. Soft candy product packaging

Evaluation

Post-tests are an important part of training evaluation, measuring participants' understanding and skills after completing the entire training program. Through post-tests, the community service team can determine the extent to which the material presented has been absorbed and assess the effectiveness of the learning methods used. Furthermore, post-tests also help identify aspects that participants still lack understanding, which can be used as material for improvement in subsequent training activities. The post-test results are presented in Table 5. The post-test results from this activity were quite positive, as there was an increase in the number of participants scoring above 8, amounting to 33 people.

TABLE 5. Post-test result

Responden	Score
28 people	8
5 people	9
2 people	6

Besides evaluating participants' understanding, evaluating the products they have created is also very important. Product evaluation can also be a parameter for participants' success in making soft candy. The resulting soft candies were tested using a hedonic test to assess the panelists' level of preference. The hedonic test can be used as a measuring tool for manufacturers before marketing their products (Azwa and Rosmiati 2025). The soft candies were tested at the Aquatic Products Technology Laboratory, Faculty of Agriculture, Sultan Ageng Tirtayasa University. The panelists consisted of 30 people, consisting of 3 lecturers and 27 students. The product testing was conducted on campus

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because the panelists were trained in assessing product preference. The test results are presented in Figure 9.

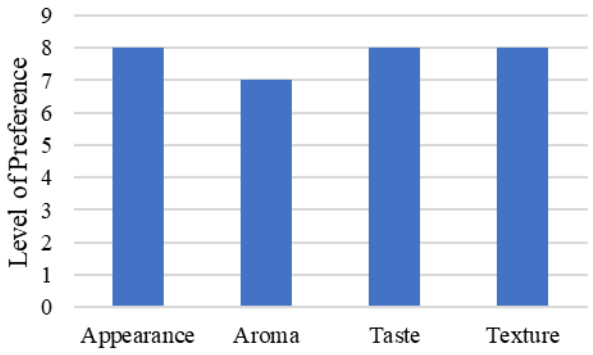

FIGURE 9. Hedonic test of soft candy

The test results showed that the panelists gave a score of 8 (very much like) for the appearance of the soft candy. For the smell value, it got a score of 7 (like) because the product has a less strong smell. The taste of the soft candy has a score of 8 (very much like). The taste of the soft candy is specifically sweet orange and slightly sour due to the addition of citric acid. The value for texture is 8 (very much like), the candy from seaweed has a hard texture on the outside and soft on the inside. Overall, the soft candy product has a score of 7-8, which means this candy is liked very much, so it has the potential to be sold to the market as a snack option. These results also indicate that the community has succeeded in processing seaweed into soft candy, which is one of the parameters of success in community service activities.

CONCLUSION

The training activity in Lontar Village successfully improved participants' knowledge and skills in processing seaweed into soft candy, as evidenced by an increase in the number of respondents scoring above 8, from zero to 33 participants. Participants also successfully produced soft candy, achieving a 7-8 (like-very like) rating. The soft candy products now feature attractive packaging designs.

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REFERENCES

Ahmad, D., & Mujdalipah, S. (2017). Karakteristik organoleptik permen jelly ubi akibat pengaruh jenis bahan pembentuk gel. Edufortech, 2(1), 52-58.

Azwa, Y., & Rosmiati, M. (2025). Uji Hedonik Masker Peel Off yang Beredar Di Kota Bandung. Journal of Pharmacy Student (JPhaS), 3(1), 9-17.

https://doi.org/10.35568/abdimas.v8i4.7154

[BSN] Badan Standardisasi Nasional. 2011. Petunjuk pengujian organoleptik dan atau sensori pada produk perikanan SNI 2346-2011. Jakarta. Badan Standardisasi Nasional. 20 hlm.

Henggu, K. U., Katonguretang, E. U., Nggaba, M. E., Radjah, Y. G., Mehakati, I. U. T., & Nasution, N. A. (2024). Pelatihan Pembuatan Stik Rumput Laut Kappaphycus alvarezii Dalam Rangka Mendukung Implementasi Ekonomi Biru Di Kelompok Masyarakat Pesisir Di Desa Kaliuda. Jurnal Abdi Insani, 11(1), 965-973.

Larasati, D., Lutfianti, F. A., Melinda, S., Sadiyyah, K., Fitriani, D. A. N., & Yulianti, F. (2023). Strategi Inovasi Kemasan (Packaging) untuk Meningkatkan Pemasaran Produk Olahan Madu. Jurnal Ilmiah Pengabdian dan Inovasi, 2(2), 301-308.

Munandar, A., Surilayani, D., Haryati, S., Sumantri, M. H., Aditia, R. P., & Pratama, G. 2019. Characterization of flour of two seaweeds (Gracilaria spp. and Kappaphycus alvarezii) for reducing consumption of wheat flour in Indonesia. In IOP Conference Series: Earth and Environmental Science. 383(1): p. 012009.Rizkaprilisa W. (2023). Pemanfaatan Rumput Laut sebagai Pangan Fungsiomal: Systematic Review: Indonesia. Science Technology and Management Journal, 3(2): 28-33.

Gumilar, I., Heryadi, H. D., Suryana, A. A. H., & Nurhayati, A. 2024. Analisis strategi pengembangan kampung perikanan budidaya rumput laut di desa lontar kabupaten serang. Jurnal Perikanan Tropis. 11(1): 38-53.

Rizkaprilisa W. (2023). Pemanfaatan Rumput Laut sebagai Pangan Fungsiomal: Systematic Review: Indonesia. Science Technology and Management Journal, 3(2): 28-33.

Widyarto, W. G., & Rifauddin, M. 2021. Problematika anak pekerja migran di Tulungagung dalam perspektif bimbingan dan konseling. Jurnal Kajian Bimbingan dan Konseling. 5(3): 9-15.

https://doi.org/10.35568/abdimas.v8i4.7154