

Empowerment of Gulf Communities Tomini In Improving Blue Economy Through Soft skills Technopreneurship in the Subdistrict North Leato, Gorontalo

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Abstract

Purpose: This research discusses the processing of skipjack tuna into frozen food in the form of rolls for UKM (Small and Medium Enterprises) groups in the North Leato sub-district, Gorontalo City. The study aims to improve the understanding of UKM groups regarding skipjack tuna processing to enhance the blue economy through technopreneurship soft skills training.

Method: The process of making skipjack tuna rolls began with coordination with the UKM group members. This was followed by a socialization session about community empowerment in producing long-lasting fish products. After the socialization, training was conducted on processing skipjack tuna and utilizing fish waste as organic fertilizer. This was done to assess the participants' understanding of processing skipjack tuna into rolls. A Focus Group Discussion (FGD) was then held with the community and the North Leato government to discuss marketing techniques and product processing.

Practical Application: The results offer practical benefits for the SME groups in the North Leato sub-district by increasing their understanding of skipjack tuna processing training, which can help improve their income and ensure sustainability in producing skipjack tuna rolls.

Conclusion: Empowering the community around Tomini Bay, especially in the North Leato sub-district, is a strategic step in enhancing the blue economy through the development of technopreneurship soft skills. Through training and interpersonal skill development, the community can become better prepared to manage marine resources sustainably and foster creative innovation in technology-based businesses.

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Introduction

Indonesia is an archipelagic country with the second longest coastline in the world and an abundance of marine resources (Apriyani et al., 2023; Maulana et al., 2024; Widodo et al., 2023). If managed optimally and sustainably, these marine resources have the potential to become a key pillar of national economic development, particularly through the blue economy approach (Olcavia et al., 2022; Ujianti et al., 2024). According to (Darajati, 2025; Khoiriyah, 2024) the blue economy is an economic development concept that emphasizes the sustainable utilization of marine resources, where economic growth does not come at the expense of marine ecosystem health.

Tomini Bay is one of the maritime regions rich in marine biodiversity, offering significant potential in capture fisheries, aquaculture, and marine-based creative industries. However, despite this great potential, many coastal areas around Tomini Bay, including North Leato Sub-district, still face several challenges such as low added value of marine products, limited community skills, lack of access to technology, and underdeveloped marketing systems.

Most of the residents in North Leato depend on the fisheries sector for their livelihoods. However, fluctuations in fish prices, competition between regions, and limited capabilities in processing and marketing fish products lead to unstable incomes (Kour et al., 2020). Furthermore, unmanaged fish waste can cause environmental problems, such as pollution and foul odors (Kau et al., 2024).

Given these conditions, a community empowerment program is needed—one that not only focuses on increasing fish catches but also emphasizes innovative and sustainable approaches to processing, marketing, and waste management. Training in soft skills for technopreneurship, along with fish processing into value-added products such as frozen skipjack tuna roulades, is one strategy believed to be effective in addressing these challenges (Abdullah et al., 2021; Ahmad et al., 2021; Helmizuryani et al., 2022).

The blue economy improvement program in the Bay of Tomini region is a crucial step in enhancing and utilizing sustainable marine resources. Through this program, the Bay of Tomini region can develop the economic potential of its coastal areas, such as fisheries, marine agriculture, and other marine-based creative industries. In addition, this program can strengthen local food security by utilizing the sea's potential as a sustainable food source.

By involving various stakeholders, including local fishermen and communities, this program can create inclusive and sustainable economic opportunities for all residents. Efforts to protect and rehabilitate marine ecosystems also need to be prioritized in order to ensure the sustainability of marine resources for future generations. Thus, the program to enhance the blue economy in the Bay of Tomini is not only capable of improving the local community's economic welfare but also reinforces environmental resilience and social strength in coastal areas.

Gorontalo Province is one of the maritime regions located along the Bay of Tomini. North Leato Sub-district, in particular, has a population of 2,639 people, consisting of 1,245 men and 1,394 women, spread across 3 RWs. The main livelihood of the community in North Leato is fishing, as it is located directly on the coastline of the Bay of Tomini, giving the population direct access to the sea.

Based on an interview with the Head of North Leato Ward, Mrs. Radi Botutihe, S.Ip, the number of fishermen in the sub-district is around 100, indicating a significant potential in the local fisheries sector. Further, an interview with a local fisherman, Mr. Leno Muhamad, revealed that the most commonly caught fish in the sub-district include skipjack tuna, mackerel, and marlin.

According to data from the Gorontalo City Maritime Affairs and Fisheries Service in 2023, the total fish catch production in Gorontalo City reached 11,234 tons. North Leato, as one of the main fishing centers in the city, contributed about 10% of that total, which is approximately 1,500 tons per year. This underscores the important role of the fisheries

sector in North Leato. Skipjack tuna is the most caught species, with an annual catch reaching up to 100 tons. Unlike other types of fish that are seasonal, skipjack tuna is available year-round, making it one of the primary catches for North Leato fishermen.

However, this high volume of skipjack tuna also results in significant waste. If not managed properly, this waste can produce unpleasant odors and pollute the surrounding environment. Although fish production in North Leato is quite high, low sales can lead to losses for fishermen due to unsold inventory. This negatively impacts their economy.

Challenges in increasing fish prices in North Leato include competition with neighboring areas, such as Talumolo Ward, where skipjack tuna is sold at a lower price—IDR 35,000 per kilogram compared to IDR 40,000 in North Leato. This creates pricing pressure in the local market. Additionally, the community lacks knowledge on how to process fish into long-lasting products. With effective marketing, however, this challenge could be turned into an opportunity to create more valuable and appealing products for consumers.

North Leato's abundant marine resources can be utilized to boost the local economy. For example, skipjack tuna can be processed into various appealing products like frozen roulades. The waste, which is usually discarded and can emit toxic gases such as hydrogen sulfide (H_2S), can instead be processed into organic fertilizer. This fertilizer can then be sold locally, adding economic value and helping maintain a clean environment.

Given these issues, it is essential to implement fish processing initiatives that add economic value and extend product shelf life. However, the community faces limitations in knowledge and skills regarding fish processing. For instance, few people know how to process skipjack tuna into frozen food products that can be stored and marketed through platforms like e-commerce.

Therefore, it is important to provide training and education for the community on proper fish processing techniques. With sufficient knowledge and skills, the community can produce high-value fish products with longer shelf lives. This will create new opportunities for fishermen and small entrepreneurs to market their products more broadly, both locally and online, thereby increasing their income and overall welfare.

Method

This community service activity, focused on processing skipjack tuna into frozen roulade, was carried out from July to September 2024 in North Leato Ward, Dumbo Raya District, Gorontalo City, Gorontalo Province. The target participants of this activity were a group of 20 fisherwomen from the North Leato sub-district.

The tools used included gas stoves, knives, frying pans, baking trays, spoons, packaging machines, pans, chopping boards, spatulas, scales, mixing bowls, vacuum machines for skipjack tuna, spring onions, celery, carrots, eggs, garlic, pepper powder, broth powder, salt, sesame oil, wheat flour, and baking powder.

Stages of Implementation:

1. Coordination with the UKM (Small and Medium Enterprise) group.
2. Socialization on community empowerment efforts in producing long-lasting fish products.
3. Focus Group Discussion (FGD) with the community and North Leato ward government on marketing techniques and product processing.
4. Training and workshops on marketing techniques and product processing for the target audience.
5. Business development training for the community.
6. Training on processing skipjack tuna and fish waste into organic fertilizer.
7. Product marketing and promotion of skipjack tuna rolls through technopreneurship.

Based on the stages above, the processing of skipjack tuna rolls began with coordination with the UKM group members. This was followed by a socialization session on community empowerment to produce long-lasting fish products. After the socialization,

training was conducted on processing skipjack tuna and utilizing the fish waste as organic fertilizer. This was done to assess the participants' understanding of processing skipjack tuna into roulade.

Afterward, a Focus Group Discussion was held with the community and the North Leato ward government to discuss marketing techniques and product development. Skipjack Tuna Roulade Recipe are skipjack tuna: 1 kg, carrots: 3 pieces, spring roll wrappers: as needed, spring onions: 3 stalks, onion (bombay): 1 piece, garlic: 6 cloves, pepper powder: 2 sachets, broth powder: 2 sachets, salt: 1 tablespoon, msg: 1 tablespoon (optional), egg white: 1 egg, sesame oil: 2 tablespoons, celery: as needed, and wheat flour: $\frac{1}{2}$ kg.

This formulation was used during the training session to teach the participants how to create a nutritious and marketable skipjack tuna-based frozen food product.

Result

Skipjack tuna is an excellent source of animal protein, playing an important role in growth, tissue repair, and maintaining overall body function. Approximately 20–25% of the weight of skipjack tuna consists of protein. It also contains omega-3 fatty acids (DHA and EPA), which are beneficial for heart and brain health. Omega-3s help reduce inflammation, lower the risk of heart disease, and support brain development, especially in children.

Skipjack tuna is essential for bone health and the immune system. It is a natural source of vitamin D and contributes to the production of red blood cells and the maintenance of nerve health. The selenium content functions as an antioxidant that protects body cells from damage. Skipjack tuna also contains phosphorus, which is important for healthy bones and teeth, and is involved in energy production. Additionally, it provides zinc, which plays a role in immune function and wound healing (Yulianti, 2018).

Moreover, skipjack tuna is relatively low in calories, making it suitable for various diet programs. Although it contains fat, most of it is healthy fat that provides health benefits. Skipjack tuna also contains essential amino acids needed by the body for various biological functions, including the formation of new proteins (Widyastuti et al., 2023).

Procedure for Processing Skipjack Tuna Roulade:

1. Wash the skipjack tuna meat thoroughly and drain.
2. Finely grate the carrots. Chop the spring onions, Bombay onion, and garlic.
3. Blend the skipjack tuna using a food processor until smooth.
4. Add eggs, flour, sesame oil, salt, MSG (optional), and pepper to the fish mixture. Stir until all ingredients are well combined.
5. Add the grated carrots, chopped spring onions, Bombay onion, and garlic into the mixture. Stir until evenly mixed.
6. Place the fish dough into a roulade mold. Alternatively, take a banana leaf sheet, place the dough on top, flatten it, then roll the banana leaf tightly to prevent leaks.
7. Tie both ends securely using raffia string or seal them with small sticks.
8. Prepare a steamer with boiling water, then steam the rolls for 15–25 minutes until fully cooked. Remove from the steamer and let them cool slightly.
9. Slice the roll into pieces about 1–1.5 cm thick.
10. Pack approximately 12 pieces into a plastic bag. Seal the bag securely.
11. Freeze the packaged skipjack tuna roulade in a freezer at a temperature of -40°C .

This processing method extends the shelf life of skipjack tuna and adds value to the product, making it more appealing and suitable for commercial distribution.

Figure 1. Skipjack Tuna Roulade Cooking Process



Discussion

Community empowerment in Tomini Bay, especially in Leato Utara Village, Gorontalo, is a strategic step to improve the blue economy through the development of soft skills and technopreneurship. The blue economy focuses on the sustainable use of marine resources, which can provide economic benefits while preserving the environment.

The blue economy is an approach that integrates economic growth with environmental sustainability (Khoiriyah, 2024). In Tomini Bay, the potential of abundant marine resources—such as fisheries, marine tourism, and marine cultivation—can be utilized to improve community welfare. However, to achieve this, it is necessary to increase community capacity through education and training.

Increasing the blue economy through skipjack tuna processing can be done with several strategies that focus on sustainability and efficiency. Increasing the blue economy through technopreneur soft skills training will be very helpful in improving the skills of SME groups (Hasanuddin et al., 2023). Soft skills in technopreneurship include a series of non-technical skills that are very important for individuals who want to succeed in technology-based entrepreneurship. These skills include interpersonal, intrapersonal, and communication skills needed to manage a business and interact with various stakeholders (Septiana & Nurkhin, 2019).

Skipjack tuna roll is one of Indonesia's specialty dishes that combines the deliciousness of skipjack tuna with a simple cooking technique, producing a rich flavor. Skipjack tuna, known for its dense and aromatic meat, is very suitable for processing into rolls (Pundoko & Onibala, 2014). This dish is not only tasty but also rich in nutrients, making it an ideal choice for both daily meals and special occasions.

Skipjack tuna roulade is a dish made from skipjack tuna meat processed into a dough, then shaped and rolled, usually wrapped in banana leaves before cooking. This dish typically combines spices and vegetables to enhance flavor and texture. Once cooked, skipjack tuna roulade has a savory taste and is rich in nutrients, making it an attractive option as a side dish or main course.

Empowerment of the Tomini Bay community, especially in North Leato Village, has great potential in increasing the blue economy through the development of technopreneurship soft skills. Through this approach, the community can be trained to manage marine resources sustainably, create technology-based businesses, and enhance the interpersonal skills needed in the business world.

Strengthening soft skills such as communication, leadership, and teamwork will help people build better networks, convey ideas effectively, and collaborate on development projects. In addition, innovation and creativity in processing marine products can increase added value, which in turn contributes to local economic well-being.

By integrating technopreneurship soft skills into empowerment programs,

communities will not only be able to create new business opportunities but also contribute to the sustainability of marine ecosystems. This empowerment is expected to generate a sustainable positive impact, improve the quality of life in the community, and maintain the sustainability of natural resources in Tomini Bay.

Conclusion

Making skipjack tuna roll is a process that is not only enjoyable but also provides a nutritious and delicious meal. By using fresh ingredients and following the correct steps, skipjack tuna roll can become a healthy alternative dish, rich in protein, and containing omega-3 fatty acids and vitamins. This dish is also flexible and can be customized to each person's taste, both in terms of spices and additional ingredients.

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