

COMMUNITY EMPOWERMENT FOR THE SOCIETY AT BRINGSANG VILLAGE, GILI GENTING IN UTILIZING MANGROVE COFFEE (RHIZOPHORE STYLOSA) COMMODITIES

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Abstract: The potential of the mangrove forest ecosystem along Bringsang Village, Gili Genting District, Sumenep Regency's coast has not been optimally utilized. Therefore, this community engagement has a purpose to give training how to make mangrove coffee. This engagement was conducted at the Bringsang Village Hall on October 21, 2023, with 15 participants, including local residents and village officials. The *Rhizophora stylosa* mangrove species is one of the important commodities that can be presented as mangrove coffee. This community engagement activity aims to increase knowledge and train the community in making mangrove coffee. The method used is the practice of making mangrove coffee and interviewing the residents of Bringsang Village, Gili Genting. The result of the activity is a procedure for processing *Rhizophora stylosa* mangrove fruit into coffee powder. Mangrove coffee is priced at IDR 5,000 per pack. The community and village officials were very enthusiastic about the training in making Bringsang Village's signature mangrove coffee.

Keywords: *Rhizophora stylosa*, mangrove coffee, Gili Genting

Abstrak. Potensi ekosistem hutan mangrove di sepanjang pesisir Desa Bringsang, Kecamatan Gili Genting, Kabupaten Sumenep belum dimanfaatkan secara optimal. Oleh karena itu, pengabdian masyarakat ini bertujuan untuk memberikan pelatihan bagaimana cara membuat kopi yang berasal dari biji mangrove. Kegiatan ini dilaksanakan di Balai Desa Bringsang pada tanggal 21 Oktober 2023 dengan 15 peserta, termasuk warga setempat dan perangkat desa. Jenis mangrove *Rhizophora stylosa* merupakan salah satu komoditas penting yang dapat diolah menjadi kopi mangrove. Kegiatan pengabdian masyarakat ini bertujuan untuk meningkatkan pengetahuan dan melatih masyarakat untuk membuat kopi dengan bahan dasar biji mangrove. Metode yang digunakan adalah praktik dan wawancara; praktik pembuatan kopi mangrove dilanjutkan dengan wawancara dengan warga Desa Bringsang, Gili Genting. Hasil dari kegiatan ini adalah prosedur pengolahan buah mangrove *Rhizophora stylosa* menjadi bubuk kopi. Kopi mangrove ini dijual dengan harga Rp 5.000 per bungkus. Masyarakat dan perangkat desa sangat antusias mengikuti pelatihan pembuatan kopi mangrove khas Desa Bringsang ini.

Kata kunci: *Rhizophora stylosa*, kopi mangrove, Gili Genting

Introduction

Indonesia is a country rich in coastal ecosystems. One of the main ecosystems along the coast is the mangrove forest, also known as mangrove trees. According to Purnobasuki, mangroves are plants that grow on the coast and play a crucial ecological role in preventing coastal abrasion and erosion.¹ The mangrove ecosystem offers many benefits². Various products can be derived from mangroves, either directly or indirectly, including construction materials, firewood for household use, paper, medicine, and fisheries, among others³.

Mangroves are tropical trees that thrive in the tidal zone of seawater⁴. These mangrove forests are also widely found on the island of Madura. Remote sensing data conducted in Sumenep Regency, with its archipelagic region, shows that the area of mangroves with a density of fewer than 1000 trees per hectare reaches 4,587 hectares (37.9%)⁵. Mangroves with a density of 1000 to 1500 trees per hectare cover an area of 958.8 hectares (79%). The area with a density of more than 1500 trees per hectare covers 6,549.6 hectares (54.1%)⁶. These extensive mangrove forests are scattered across various sub-districts, including Gili Genting in Sumenep Regency.

One of the villages in Sumenep Regency with significant potential for marine ecosystems is Bringsang Village, located in Gili Genting District. According to an interview with Bringsang Village Head, Ahmad Muzzaki, the mangrove forest in Bringsang Village is quite extensive, but the residents have not yet been able to optimize its utilization. Although mangrove utilization has been ongoing for a long time, some community members still do not fully understand or utilize the mangrove forest⁷. The community mainly sees the mangrove forest as a barrier protecting the coastline from erosion, preventing sea waves from directly hitting the land⁸. One example of mangrove fruit utilization is processing mangrove fruit into coffee. The mangrove species that can be processed into coffee is *Rhizophora mangle*⁹. This type of mangrove is abundant along the coast of Bringsang Village and, when processed, will provide new opportunities for the residents of Bringsang Village¹⁰.

Based on the agreement between students, field supervisors of MBKM-KKNT UTM, and the local government in Bringsang Village in 2023, it was decided to conduct a community engagement activity (PKM) in the form of mangrove coffee-making training. The purpose of this PKM is to train the community on how to process and make coffee powder using mangrove

¹ Purnobasuki. 2005. Struktur dan status komunitas mangrove di ekosistem muara: ADLN - Perpustakaan Universitas Airlangga

² Fitriani, A. K. N., & Sunarto, S. (2015). Kajian Karakteristik Sedimen Di Muara Sungai Porong, Sidoarjo Terhadap Perkembangan Ekosistem Mangrove. *Jurnal Bumi Indonesia*, 5(2), 53–62.

³ Puspaningrum, D., et al. (2022). Pemanfaatan Buah Mangrove Untuk Peningkatan Perekonomian Masyarakat Dan Kelestarian Mangrove. *Insan Cita*, 4(1).

⁴ Saputra, Dika, K. 2020. Pengelolaan Habitat Berdasarkan Penilaian Sensitivitas Mangrove Di Pesisir Tulungagung, *Journal of Economic and Social of Fisheries and Marine*. 7(02): 258-267.

⁵ Latumahina, MB., Yona, AL dan Sangaji, M. 2018. Pengelolaan Mangrove Berdasarkan Tipe Substrat Di Perairan Negeri Ihamahu Pulau Saparua, *Jurnal TRITON*, Volume 14, Nomor 1, April, hal. 1-9 1.

⁶ Harahab, N. 2010. Penilaian ekonomi ekosistem hutan mangrove dan aplikasinya dalam perencanaan wilayah pesisir. Yogyakarta : Graha Ilmu

⁷ Sunarni. 2019. Zonasi Dan Struktur Komunitas Mangrove Di Pesisir Kabupaten Merauke, Fakultas Pertanian – Universitas Musamus, Merauke.

⁸ Sentoso, M. S., et al. (2021). Pemanfaatan Buah Mangrove menjadi Olahan Makanan/Minuman di Desa Jangkaran, Kulon Progo. *Jurnal Atma Inovasi (JAI)*, 1(1), 20–25.

⁹ Samo, Fauziyah dan Rahmat, D. 2014. Pertumbuhan Semai *Rhizophora Apiculata* Di Area Restorasi Mangrove Taman Nasional Sembilang Sumatera Selatan, *Maspari Journal*, 7(2):11-18 2015.

¹⁰ Alam, R.D., Muljo, B., Chatarina, 2005. Monitoring dan evaluasi Kawasan Hutan Mangrove di Daerah Pasir Putih Kabupaten Situbondo dengan Menggunakan Data Citra Satelit Multitemporal. *Geoid*, Vol. 1, No. 1. ITS. Surabaya.

seeds, which will later help the UMKM in Bringsang Village. Observations show that the residents of Bringsang Village, particularly those in the mangrove forest area, have not fully utilized the mangroves. Therefore, it is necessary to equip the community with knowledge and understanding about mangroves. so, they can recognize the benefits of mangroves and understand how to process them, thereby boosting the community's economy through the use of mangrove trees¹¹.

Method of Implementation.

The community engagement was conducted in Bringsang Village, Gili Genting District, Sumenep Regency. This engagement aimed to improve the local economy by innovating products using easily accessible raw materials. The method used included interviews (Q&A sessions) with local stakeholders to identify the potential resources in the village that could be developed. The information gathered was then subjected to a Filtering Information process, where relevant information was selected to ensure that it could be used effectively for the desired objectives.

For the production of mangrove coffee, the MBKM KKNT team conducted an observation of the mangrove forest to examine the mangrove propagules, which are the main raw material for making Mangrove Coffee. The results of the mangrove coffee product were presented through a training session involving selected community members. This training aimed to enable sustainable production of the product. To facilitate the training and community engagement activities, an approach similar to the one used by Hasan et al.¹² was employed:

1. Presentation on how to make mangrove coffee
2. Q&A session

The first step in making mangrove coffee is to collect mature *Rhizophora Stylosa* propagules. The next step involves separating the seeds and skins from the propagule heads. This is followed by removing the sap from the skins and seeds by soaking them in lime water for approximately 4 days, with the soaking water being replaced daily. After the soaking process, the seeds and skins are dried under direct sunlight until they are fully dried. Once dried, the seeds and mangrove propagules are roasted, with ginger added during the roasting process. The next step is grinding; the roasted seeds and skins are ground until fine. Mangrove coffee has a distinct astringent taste, which can be mellowed by adding full cream milk.

Results and Discussion

A. Observation

The MBKM KKNT UTM students conducted a one-month observation and approached the residents of Bringsang Village. This was done to understand the available commodities in Bringsang Village, their conditions, and where to obtain the raw materials for mangrove coffee. The observation also helped the students to get closer to the residents, understand their character, assess the local human resources, and evaluate the potential of the products to be

¹¹ Kariada, N. T., & Irsadi, A. (2014). Peranan mangrove sebagai biofilter pencemaran air wilayah tambak bandeng Tapak, Semarang (Role of mangrove as water pollution biofilter in milkfish pond, Tapak, Semarang). *Jurnal manusia dan lingkungan*, 21(2), 188-194.

¹² Hasan, W., Hatta, A.S., Winowoda, G.S.W., Mohammad, R.A.P., Pakaya, A.P.M., Fransiska, N., Nurindah, T., Yulinda, D., Zulkifli, P., Ryan, I., Rachelia, P. 2022. Pemanfaatan Buah Mangrove Menjadi Kopi Mangrove di Kecamatan Anggrek Kabupaten Gorontalo Utara. *Jurnal Pendidikan Masyarakat dan Pengabdian*. 2 (3).

developed. The utilization of *Rhizophora* sp. mangroves as coffee, a high-value product, has not been widely developed, and research on mangrove-based coffee is still very limited¹³.



Figure 1. Mangrove observation in Bringsang Village

Bringsang Village has a fairly extensive mangrove forest in two locations. The first location is in *Dhadap*, and the second is in *Bringsang*. The mangrove forest is dominated by the *Rhizophora stylosa* species. With the abundance of *Rhizophora stylosa* mangroves and the fruiting season coinciding, the raw materials needed for mangrove coffee production are more easily obtained.

B. Interview with the Head of Bringsang Village

On Tuesday, August 29, 2023, the MBKM KKNT students from Universitas Trunojoyo Madura in Bringsang Village, Gili Genting District, Sumenep Regency, East Java, conducted an interview with Mr. Ahmad Muzakki, the Head of Bringsang Village, after directly observing the village's commodities. This interview aimed to gain further information and obtain approval and support from the Village Head regarding the mangrove coffee-making training program. Mr. Zakki responded positively and enthusiastically to the training program and requested the involvement of the village officials in the process. However, Mr. Zakki suggested conducting a trial run before training the broader community.



Figure 2. Discussion with the Village Head and Village Officials

¹³ Abubakar, S., Kadir, M.A., Subur, R., Rina, Ariyati, H.F., Said, A.H., Nurhalis, W., Susanto, A.N., Salim, F.D., Muksin, D. 2023. Pemanfaatan Buah Mangrove *Rhizophora apiculata* sebagai Olahan Kopi Mangrove dalam Upaya Peningkatan Ekonomi Masyarakat di Desa Maitara Utara Kecamatan Tidore Utara. *Jurnal Pengabdian Magister Pendidikan IPA*. 6 (2): 368-377.

C. Collection of Mangrove Propagules (*Rhizophora stylosa*)

The next step taken by the MBKM KKNT UTM students in Bringsang Village was to collect *Rhizophora stylosa* mangrove propagules according to their needs. The collection of mangrove propagules was done during low tide, making it easier for the students to reach the entire mangrove forest area. However, the students only collected the mangrove propagules that were within their reach and did not venture deeper into the forest. This activity was assisted by Mr. Enggek, a staff member of Bringsang Village, and some local residents. The criteria for the collected mangrove propagules were those ready for planting—neither too young nor too old¹⁴. Only the propagule heads were collected, while the shoots were planted or embedded in the aquatic substrate, with the hope that they would grow into new individuals in the future.



Figure 3. Process of collecting mangrove propagules

D. Processing Mangrove Propagules into Mangrove Coffee

After collecting the mangrove propagules, the seeds and skins were separated. The skins were then cut into small pieces. The next step was soaking. During the soaking process, lime water was used to help remove the sap from the seeds and skins of the mangrove propagules. The seeds and skins were treated differently: the seeds were soaked for 3 nights, while the skins were soaked for 4 nights. The soaking lime water had to be replaced daily. This process slightly differs from the steps taken by Marita et al.¹⁵, where the mangrove fruit was split into two parts and soaked in lime water for 3x24 hours.

¹⁴ Firdaus, R., Fauzi, M.I, Asikin, N., Rendi, Risma, L., Rosnita, Y., Selmi, Siti, A., Wan, D.S., Zulfandi. 2023. Pelatihan Pembuatan Kopi Mangrove sebagai Kontribusi dalam Meningkatkan Ekonomi Masyarakat Desa Putri Puyu. Jurnal Pengabdian Al-Ikhlas Universitas Islam Kalimantan Muhammad Arsyad Al Banjary. 9 (1).

¹⁵ Marita, B., Sya'diyah, H., Lestari, H., Huriyah, A.A., Lilik, K.N., Pndhu, W.S., Rini, F., Septriadi, A., Setia, L.W., Yuliana. 2023. Pelatihan Pengolahan Buah Mangrove (*Rhizophora stylosa*) menjadi Kopi Herbal yang Kaya Khasiat untuk Menunjang Perekonomian Masyarakat Desa Sekotong Tengah. Prosiding Seminar Nasional Gelar Wicara.



Figure 4. Processing mangrove propagules

The soaked mangrove propagules were then dried until fully dried. During the drying process, the size of the seeds and skins shrank. Once dried, the seeds and mangrove skins were roasted with added ginger slices. After roasting, the mangrove coffee was left to cool for a while before being ground into a fine powder. To ensure the coffee powder was fine, it was then sifted. The ready-to-market mangrove coffee was packaged in attractive packaging. The packaging used was a standing pouch with a label to make it more appealing. Unlike Rahman et al.¹⁶, who used mangrove fruit as a coffee mix in a 1:2 ratio (500 g of mangrove fruit to 1 kg of coffee beans), the process also differed. Rahman et al. placed the washed mangrove fruit in a thermos containing 1 liter of clean water. Additionally, in the drying process, they dried the coffee beans for 5 hours on the first day, 4 hours on the second day, and 3 hours on the following day until they were completely dry.



Figure 5. Roasting process of mangrove coffee

Mangrove Coffee Making Training

The mangrove coffee-making training was conducted at the Bringsang Village Hall on October 21, 2023, with 15 participants, including local residents and village officials. The training began with an explanation of the characteristics of the main ingredient (mangrove coffee), the steps for making it, the product's benefits, the product's cost of production (HPP), and the marketing opportunities for mangrove coffee. The activity continued with the practice of making mangrove coffee, starting with roasting the mangrove coffee beans along with ginger slices. After roasting, the mangrove coffee beans were left to cool for 15 minutes, then ground and sifted.

¹⁶ Rahman, M.A., Yona, D., Hidayati, N., Syarifah, H.J.S., Iis, N.R. 2019. Program Doktor Mengabdikan Diversifikasi Produk Olahan Berbasis Mangrove di Desa Banyuurip Kecamatan Ujung Pangkah Kabupaten Gresik Jawa Timur. *Jurnal Pengabdian Masyarakat J-DINAMIKA*. 4 (2).

Once the mangrove coffee-making process was complete, the participants were invited to brew and taste the coffee.



Figure 6. Mangrove coffee-making training

The participants of the mangrove coffee-making training were very enthusiastic about the introduction of a new and unique product. Mangrove coffee is still very unfamiliar to the people of Bringsang Village. Moreover, the residents of Bringsang Village enjoy consuming coffee as a companion during their leisure time. Bringsang Village is also home to a tourist destination frequently visited by visitors from outside the island and even from abroad. Despite the large number of visitors to Pantai Sembilan, there are still no residents selling unique souvenirs from the village. Therefore, mangrove coffee has a great potential to be developed and sold, thereby improving the local economy. Mangrove coffee was marketed through a bazaar at IDR 5,000 per pack. The right strategy for marketing mangrove coffee is Weakness Opportunity (WO), which involves developing product processing technology to increase opportunities to market the product outside the village and enhancing capital to expand marketing opportunities ¹⁷.



Figure 7. Mangrove coffee product

The color of mangrove coffee is black with a slight brown tint, differing from the deep black color of the coffee produced by Sukma and Zahro¹⁸. Mangrove coffee has a distinctive coffee aroma and a fine texture, similar to regular coffee. The taste of the produced mangrove

¹⁷ Setyawati, N., Imran, Z., Yulianto, G. 2023. Potensi dan Manfaat Ekosistem Mangrove untuk Pengembangan Mata Pencaharian Alternatif Desa Karangsong. *Jurnal Ilmu dan Teknologi Kelautan Tropis*. 15 (1):31-48.

¹⁸ Sukma, R.N. dan Zahro, M. 2020. Effect Utilization Mangrove *Rhizophora* sp. Fruit Ekstrakt in Production of Coffee Powder in Perspective of water Content and Organoleptic test. *Jurnal Ilmu Perikanan dan Sumberdaya Perairan* 9 (1).

coffee still has a slight astringency, whereas the research by Nusatbah et al. resulted in mangrove coffee with a taste nearly identical to that of commercial coffee.

Conclusion

The mangrove coffee-making training was conducted at the Bringsang Village Hall on October 21, 2023, with 15 participants, including local residents and village officials. The main ingredient used for making coffee was the mangrove propagule fruit of the *Rhizophora stylosa* species, obtained from the Bringsang coastal entertainment park. The outcome of the activity was the procedure for processing the *Rhizophora stylosa* mangrove fruit into coffee powder. The mangrove coffee was priced at IDR 5,000 per pack. The community and village officials were very enthusiastic about the mangrove coffee-making training, which is a unique product of Bringsang Village, Gili Genting.

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