



Mangrove Forest Preservation for Environmental Sustainability and Community Welfare Improvement in Suwung Kauh Village Denpasar : An International Community Service Program

IGM Yogiswara Winatha^{1*}, Cokorda Gede Swetasoma², I Ketut Satria Wiradharma Sumertajaya³, Kadek Ary Purnama Dewi⁴, Tjokorda Gede Agung Wijaya Kesuma Suryawan⁵

^{1*,2,3,4}Law Departement, Faculty of Law,

⁵Management Department, Faculty of Business and Economics,
Universitas Ngurah Rai

*Corresponding Author. Email: yogiswara.winatha@unr.ac.id

Abstract: This community service program aims to improve the preservation of mangrove forests by replanting mangrove seedlings to replace old damaged trees and expand the mangrove ecosystems. In addition, coastal cleaning activities were also carried out to reduce plastic waste that pollutes mangrove forest areas in Suwung Kauh Village, South Denpasar. By using a Participatory Action Research (PAR) approach method oriented towards community empowerment, the implementation of community service was carried out by a team of the Faculty of Law and the Faculty of Economics and Business, Ngurah Rai University, in collaboration with Canberra University and KUB Simbar Segara. The evaluation was carried out by the managing team through direct interaction between the interviewer and the respondent using interview and observation techniques for the achievement values of the results of the implementation of community service activities and was analyzed descriptively. The results of the service program succeeded in reducing plastic waste around the area and increasing the area of mangrove areas by planting new seedlings.

Article History:

Received: 14-06-2023
Reviewed: 15-07-2023
Accepted: 24-07-2023
Published: 19-08-2023

Key Words:

Mangrove; Preservation;
Enviromental
Sustainability; Plastic
Waste; Community
Welfare.

How to Cite: Yogiswara Winatha, I., Swetasoma, C., Sumertajaya, I., Dewi, K., & Suryawan, T. (2023). Mangrove Forest Preservation for Environmental Sustainability and Community Welfare Improvement in Suwung Kauh Village Denpasar : An International Community Service Program. *Jurnal Pengabdian UNDIKMA*, 4(3), 491-498. doi:<https://doi.org/10.33394/jpu.v4i3.8532>



<https://doi.org/10.33394/jpu.v4i3.8532>

This is an open-access article under the [CC-BY-SA License](https://creativecommons.org/licenses/by-sa/4.0/).



Introduction

Mangrove forests are coastal forest ecosystems consisting of groups of trees that can live in a high-salt environment (Redi et al., 2019). The uniqueness of this ecosystem is seen from its vegetation on tropical coastlines consisting of several types of mangrove trees that can grow and develop in tidal areas on muddy beaches (Baskara Andika et al., 2019). Physically, mangrove forests function as a barrier to wave currents and sea breezes to minimize the impact of coastal area abrasion. Mangrove forests are also home to various marine organisms and are a vital source of organic matter in the aquatic environment (Baskara Andika et al., 2019). In addition, the free carbon that mangrove forests can absorb is three times more than terrestrial forests (Kresnasari et al., 2022). From an economic aspect, mangrove forests can be utilized as a tourist attraction; various processed foods such as dodol, syrup, and chips made from mangrove fruit or leaves can increase community income, so the existence of mangrove forests is necessary for the environment and socio-economic community (Kresnasari et al., 2022).



Bali Province is one of the mangrove forest distribution areas in Indonesia, which is spread over three locations with a total area of 2177.5 Ha; where one of the distribution areas is in Benoa Bay, and Tahura with an area of 1374 Ha covering the Denpasar City area of 641 Ha and Badung Regency 753.5 Ha (Adinegoro et al., 2023). Of the total mangrove forest area in Bali, 19 hectares fall into the sparse density category, while 263 hectares fall into the plantable mangrove habitat (Yastika et al., 2023). With such a large potential land area, sustainable conservation efforts are needed by all relevant parties.

Mangrove ecosystem conservation is a complex endeavor, requiring an accommodating nature towards all parties around and outside the area, both government and society (Sugiyanti, 2020). In line with these efforts, the Bali Provincial Government has issued Governor Regulation Number 24 of 2020 concerning the Protection of Lakes, Springs, Rivers, and the Sea, which regulates the roles and obligations of each party, from Regional Government Apparatus to Traditional Villages and business elements to maintain and preserve the coastal marine ecosystem.

As a form of real contribution to preserving the coastal environment, the Community Service Team consisting of lecturers from the Faculty of Law and the Faculty of Economics and Business, Ngurah Rai University, Denpasar, in collaboration with Canberra University, conducted International Community Service activities in the form of cleaning mangrove forest areas from plastic waste and planting mangrove seedlings with the Simbar Segara Joint Business Group (KUB) in the Bali Coastal area, precisely in Suwung Kauh Village, South Denpasar. Considering the results of initial observations and interviews with the local community, this community service is essential because plastic waste in the mangrove forest area in Suwung Village, Denpasar, remains one of the main problems. Besides that, much potential land still needs to be planted with new mangrove seedlings. With the existing problems, this community service activity is carried out to rejuvenate and increase the area of the mangrove area in Suwung Kauh Village, Denpasar, and to help reduce the presence of plastic waste in the area to support the implementation of sustainable development programs.

Method

This international Community Service Program was implemented using a Participatory Action Research (PAR) approach where the service team works with partners to fulfil the elements of empowerment (Yuwanda et al., 2023). This approach saw the community as the main agent of change. Lecturers/students carried out the program as parties facilitating the process (Rizal et al., 2022). As a facilitator, implementing the program involved an international collaboration between Ngurah Rai University and Canberra University, together with KUB Simbar Segara. The steps for this community service program were carried out through several steps, which include:

a) Preparation

The preparation stage began with coordination conducted by the University team with the KUB Simbar as the mangrove forest management group in Suwung Kawuh Village. The meeting discussed things that were needed and how the program would be carried out in implementing Community Service activities to preserve the mangrove forest ecosystem in Suwung Kauh Village, South Denpasar. Then, it was agreed that the activity would be held on June 21, 2023, with the theme "Save Mangroves to Protect Our Island".



b) Implementation Program

This community service program was divided into three sessions: Focus Group Discussion, environmental cleaning activities from plastic waste, and planting mangrove seedlings in the last session.

c) Evaluation Stage

Using interview and observation techniques for the achievement values of the results of the implementation of community service activities, the evaluation was carried out by the managing team through direct interaction between the interviewer and the respondent so that more direct answers were obtained accurately and the results were analyzed descriptively to see the level of program achievements and to determine things that still need to be done for further activities (Junaidi et al., 2022).

Result and Discussion

Mangrove forests are generally tropical coastal vegetation communities dominated by several tree species that can grow and develop in muddy coastal tidal areas. The difference with other forests is the presence of specific flora and fauna, with high species diversity (Pakedai & Raya, 2014). One crucial aspect of managing mangrove forest resources is to increase the role of the community. The role of the community can be traced from the results of the study of socio-economic conditions, the use of local wisdom, the protection of traditional and environmentally friendly technology, and increasing community compliance with laws and regulations and local community values, which are environmentally sound. It can be concluded that the existence of mangrove forest ecosystems is highly dependent on community responses, both in the form of perceptions and participation in groups and individually for each community member (Pakedai & Raya, 2014).

In line with the purpose of the sustainable development program or better known as the Sustainable Development Goals (SDGs), which consists of three main pillars that are integrated, namely economic, social and environmental, community service in Suwung Kauh Village, Denpasar applies the principle of partnership to achieve goals (Ferawati, 2018). It was implemented by the agreement signed between Canberra University and Ngurah Rai University, which was related to the joint activities of Community Service. In addition, its implementation collaborates with KUB Simbar Segara, a community group managing the Mangrove Forest in Suwung Kauh Village, South Denpasar.

The implementation of this community service not only aims to conserve mangrove forests in Suwung Kauh Village, Denpasar Bali, but also to increase the active role of the community in maintaining and utilizing the potential of mangrove forests for socio-economic life. In collaboration with Canberra University, this activity also aims to raise awareness of the international community and introduce the existing local potential, especially related to the mangrove forest ecosystem in Bali and its utilization by local communities for food and economic security. This goal is in line with the 17 (seventeen) goals of the sustainable development program, where the preservation of mangrove forest ecosystems is a form of handling climate change and is beneficial for marine ecosystems (Irhamisyah, 2019).



Figure 1. Focus Group Discussion

In its implementation, the community service activity on mangrove forest conservation began with a Focus Group Discussion between the KUB Simbar Segara community group and academics and students from Ngurah Rai University and Canberra University. The discussion was about the benefits of mangrove forests' existence for the environment and society and the steps needed to preserve them. Mangrove forests are the last defense that protects land-based environments from abrasion, sea storms, tsunami waves, strong winds and seawater intrusion. Mangrove forests are believed to reduce marine damage due to various impacts of damage from land, such as pollution and sedimentation. So that through this community service activity, it is expected that public awareness, both from academics, students, and local communities, can be further improved (Basthomi et al., 2022).



Figure 2. Product Presentation

Furthermore, the Focus Group Discussion session was followed by presentations on processed mangrove fruit products that local community groups can utilize to improve the economy. The processed products include drinks from mangrove fruit and pastries from mangrove fruit. Mangrove processing skills into food is also a form of community skills in improving food security which was also included in the goals of sustainable development programs, namely ending hunger, achieving food security and improving community nutrition (Hapsari & Rudiarto, 2017).



Figure 3. Handover of Mementos and Mangrove Seedlings



The Focus Group Discussion ended with the handover of mementos and mangrove seedlings from the Faculty of Law, Faculty of Economics and Business, Ngurah Rai University and Canberra University symbolically to the KUB Simbar Segara community group.



Figure 4. Coastal Cleanup

The service activity continued with a coastal cleanup by students and the University Team with the KUB Simbar Segara community group that aims to reduce plastic waste around the mangrove forest. Existing waste piles are one of the results of human habits that can cause problems in the environment directly. The presence of waste in the naked eye caused a reduction in the beauty and beauty of the mangrove forest area. Ecologically, waste has a huge negative impact on the sustainability of the ecosystem in the mangrove forest area (Turker et al., 2021). In addition to cleaning up plastic waste in the mangrove forest area, this activity also aims to raise awareness about the adverse effects of plastic waste on the environment and life. Thus, it is hoped that all program participants and the communities involved can be motivated to better manage plastic waste, especially in the environment where they live (Ali et al., 2023).

The team was divided into several groups equipped with cleaning equipment. Each team then went to the locations targeted for clean-up activities to collect garbage, especially plastic waste. The collected garbage was then put together in a predetermined location to be taken to the final disposal site (TPA).



Figure 5. Departure To the Mangrove Planting Site

The last session in the program's implementation was carried out by planting mangrove seedlings together by all participants and the KUB Simbar Segara community group on land included in the potential land for planting. This activity aims to replace the old mangrove plants that have been damaged or died, as well as to help increase the area of mangrove forests in Suwung Kauh Village, South Denpasar.



Figure 6. Mangroves Planting

After the entire stage of community service activities was completed, the implementation team conducted field observations and interviews with community groups and other participants. The results of field observations showed that the community service activity had succeeded in increasing the area of mangrove forests by planting 200 new tree seedlings. With an estimated planting distance of 1 meter x 1 meter between the seeds, it is estimated that this activity has succeeded in increasing the mangrove area in Suwung Kauh village, Denpasar, to an area of 200 square meters. In addition, based on the results of interviews, local community groups appreciate this community service activity and hope that activities like this can be carried out sustainably, considering that the potential land that can still be planted is still very large.

The student participants from each University also gave a positive response. They said that these community service activities for the preservation of mangroves provided positive behavior for students and especially the community to always maintain the preservation of nature and existing natural ecosystems, in addition to increasing student and community awareness regarding the dangers of plastic waste which is increasingly being used in households and its surroundings. Hopefully, this activity can foster a high sense of awareness at the student and community level regarding the importance of planting mangroves and disposing and sorting waste from the family, school, and community environment.

Based on the results of the evaluation, training is also needed to improve the local community's economy to improve the expertise in processing food products that utilize mangroves as the main ingredient and materials related to product marketing strategies. So, besides being beneficial to the environment, mangroves can also be utilized optimally to improve the local community's economy.

Conclusion

Based on the results of Community Service conducted in Suwung Kauh Village, South Denpasar, it can be concluded that there are still many potential lands that can be planted with mangroves. The existence of mangrove forests, in addition to having a positive impact on the environment, some parts of mangrove trees can also be utilized by the community to be processed into food and drinks. It must continue to be developed to support the economic growth of communities around the mangrove forest area. The objectives of implementing community service activities have generally been achieved by replanting mangrove seedlings to replace damaged old trees and on new land. Beach cleaning activities have successfully reduced plastic waste around the mangrove forest area in Suwung Kauh Village, South Denpasar.



Recommendation

Based on the condition of the mangrove forest area in Suwung Kauh Village, it needs special attention from the local government, primarily through the periodic planting of mangrove seedlings, considering there is still a lot of potential mangrove planting. Academics and governments must collaborate to find the right solution in managing and processing plastic waste in mangrove forest areas, in view of the existing waste that comes not only from the environment around the forest but also that is carried by ocean currents. In improving the community's economy, further training is needed from related government agencies, community organizations, and academics to improve mangrove processing skills and the ability to market these processed products. In protecting the environment, local community awareness is also needed so sustainable development programs can be carried out correctly with the fulfilment of the aspects mentioned above.

References

- Adinegoro, R. D. S., Putra, I. D. N. N., & Putra, I. N. G. (2023). Pemetaan Perubahan Luasan Mangrove Menggunakan Citra Sentinel-2A Pasca Kematian Massal Mangrove di Denpasar-Bali. *Journal of Marine and Aquatic Sciences*, 8(1), 66. <https://doi.org/10.24843/jmas.2022.v08.i01.p08>
- Ali, M. M., Yusuf, R., & Darise, R. I. (2023). Sosialisasi Pemanfaatan Sampah Dan Penanaman Pohon Mangrove Desa Laulalang Kabupaten Tolitoli. *Lamahu: Jurnal Pengabdian Masyarakat Terintegrasi*, 2(1), 37–43. <https://doi.org/10.34312/ljpm.v2i1.17928>
- Baskara Andika, I. B. M., Kusmana, C., & Nurjaya, I. W. (2019). Dampak Pembangunan Jalan Tol Bali Mandara Terhadap Ekosistem Mangrove di Teluk Benoa Bali. *Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan (Journal of Natural Resources and Environmental Management)*, 9(3), 641–657. <https://doi.org/10.29244/jpsl.9.3.641-657>
- Basthomi, H. F., Suhara, E., Muhaimin, M., & Ilyas, Y. (2022). Potensi Wisata Melalui Budi Daya Tanaman Mangrove di Pulau Untung Jawa (Pada Kegiatan PKM UIJ). *Jurnal Pemberdayaan Komunitas MH Thamrin*, 4(1), 107–118. <https://doi.org/10.37012/jpkmht.v4i1.765>
- Ferawati, R. (2018). Sustainable Development Goals di Indonesia: Pengukuran dan Agenda Mewujudkannya Dalam Perspektif Ekonomi Islam. *Kontekstualita*, 33(02), 143–167. <https://doi.org/10.30631/kontekstualita.v35i02.512>
- Hapsari, N. I., & Rudiarto, I. (2017). Faktor-Faktor yang Mempengaruhi Kerawanan dan Ketahanan Pangan dan Implikasi Kebijakannya di Kabupaten Rembang. *Jurnal Wilayah Dan Lingkungan*, 5(2), 125. <https://doi.org/10.14710/jwl.5.2.125-140>
- Irhamy, F. (2019). Sustainable Development Goals (SDGs) dan Dampaknya Bagi Ketahanan Nasional Dampaknya Bagi Ketahanan Nasional. *Jurnal Kajian LEMHANNAS RI*, 38, 45–54.
- Junaidi, J., Surahmi, M., & Romli, D. (2022). Penyuluhan Hukum Analisis Sosial sebagai Strategi Perubahan Sosial di Masa Penerimaan Anggota Baru (MAPABA) Pergerakan Mahasiswa Islam Indonesia (PMII) Sumatera Selatan. *Jurnal Pengabdian UNDIKMA*, 3(3), 531. <https://doi.org/10.33394/jpu.v3i3.5628>
- Kresnasari, D., Mustikasari, D., & Handoko, B. (2022). Konservasi Mangrove Berbasis Pendekatan Ekosistem Sebagai Penunjang Pengembangan Ilmu Pengetahuan Di Segara Anakan, Cilacap. *SELAPARANG: Jurnal Pengabdian Masyarakat*



- Berkemajuan*, 6(4), 1857. <https://doi.org/10.31764/jpmb.v6i4.11714>
- Pakedai, K. T., & Raya, K. K. (2014). Arahan Kebijakan Pengelolaan Hutan Mangrove: Kasus Pesisir Kecamatan Teluk Pakedai, Kabupaten Kuburaya, Provinsi Kalimantan Barat. *Jurnal Geografi*, 83–94.
- Redi, A., Sitabuana, T. H., Hanifati, F. I., Nabila, P., & Arsyad, K. (2019). URGENSI PEMBENTUKAN PERATURAN DAERAH PROVINSI BALI MANGROVE BERLANDASKAN KEARIFAN LOKAL Pengelolaan Kawasan Ekosistem Esensial , Antung Deddy Radiansyah pada komunikasi publik Bali . Mangrove di Provinsi Bali sebagian besar tumbuh di dalam kawasan hutan ., *JUurnal Muara Ilmu Sosial, Humaniora Dan Seni*, 3(1), 32–42.
- Rizal, S., Aksara, B., & Tangan, K. (2022). *Pendampingan Dan Pelatihan Keterampilan Tangan Pengentasan Buta Aksara Upaya Memaksimalkan Potensi Masyarakat Desa*. 1(2), 146–163.
- Sugiyanti, Y. (2020). Pelestarian Ekosistem Mangrove Di Taman Hutan Raya (Tahura) Ngurah Rai, Desa Suwung, Denpasar, Bali. *Jurnal Green Growth Dan Manajemen Lingkungan*, 9(1), 26–33. <https://doi.org/10.21009/jgg.091.04>
- Suyadi. (2009). KONDISI HUTAN MANGROVE DITELUK AMBON: PROSPEK DAN TANTANGAN1 [The Condition of Mangrove Forest in Ambon Bay: Prospect and Challenges]. *Jurnal Ilmu-Ilmu Hayati - LIPI*, 9(5), 481–490.
- Turker, S. B., Widyastuti, N. K., Putra, P. S. E., Suyasa, N. L. C. P. S., & Artana, I. N. R. (2021). Penanganan Limbah Plastik Pada Hutan Bakau Di Kawasan Dam Estuari Denpasar Selatan. *Prosiding Konferensi Nasional Pengabdian Kepada Masyarakat Dan Corporate Social Responsibility (PKM-CSR)*, 4, 563–569. <https://doi.org/10.37695/pkmsr.v4i0.1440>
- Yastika, P. E., Vipriyanti, N. U., Doan, T. T., Pascasarjana, P., Mahasaraswati, U., & Sensing, R. (2023). *Analisis Spatio-Temporal Perubahan Tutupan Vegetasi Mangrove di Taman Hutan Raya Ngurah Rai Berbasis Citra Landsat 7 ETM + dan Landsat 8 OLI*. 4(2), 82–92.
- Yuwanda, T., Fadhlan, A., Bundo, M., & Crefioza, O. (2023). Strategi Marketing dalam Optimalisasi Minat Pengunjung Website caribakatmu.com dengan Pendekatan Technology Acceptance Model. *Jurnal Pengabdian UNDIKMA*, 4(1), 184. <https://doi.org/10.33394/jpu.v4i1.7014>