

# The Stakeholder's Role in Education for Sustainable Development at Marine Protected Area - West Kalimantan

Pratita Budi Utami<sup>1\*</sup>, Indah Yuliastuti<sup>2</sup>, Sunardi<sup>2</sup>, Medha Pradipta Agung<sup>3</sup>,  
 Leny Dwihastuty<sup>4</sup>, Auliansyah<sup>5</sup>, Arif Rudianto<sup>6</sup>, Zulfian<sup>7</sup>, Nail Radhy Ilyas<sup>8</sup>,  
 Endang Triningsih<sup>9</sup>, Multazam<sup>10</sup>, Setra Kusumardana<sup>11</sup>, Hartono<sup>12</sup>, Freddy Surya Purnama<sup>13</sup>,  
 Apriansyah<sup>14</sup>, Arie Antasari Kushadiwijayanto<sup>14</sup>, Zan Zibar<sup>15</sup>, Adityo Raynaldo<sup>15</sup>, Triyono<sup>16</sup>,  
 Muhammad Yusuf<sup>17</sup>, Isharianto<sup>18</sup>, Dionisius Endy Vietsaman<sup>19</sup>, Lodri Khairul Nursalam<sup>20</sup>

<sup>1</sup>Aquatic Resource Management, Universitas Tanjungpura, Pontianak, Indonesia

<sup>2</sup>Dinas Pendidikan dan Kebudayaan Kabupaten Kubu Raya, Kubu Raya, Indonesia

<sup>3</sup>CV Putra Bahari, Pati, Indonesia

<sup>4</sup>Directorate of Ecosystem and Aquatic Biota Conservation, MMAF, Jakarta, Indonesia

<sup>5</sup>YEKHALI, Samarinda, Indonesia

<sup>6</sup>INHASA Diving Club, Pontianak, Indonesia

<sup>7</sup>Kelompok Masyarakat Wahana Bahari, Sambas, Indonesia

<sup>8</sup>Marine Biodiversity Conservation Kalimantan Barat, WWF Indonesia, Pontianak, Indonesia

<sup>9</sup>Directorate General of Marine and Fisheries Resources Surveillance, MMAF, Pontianak, Indonesia

<sup>10</sup>IKA (Ikatan Keluarga Alumni) UNDIP DPD Kalimantan Barat, Pontianak, Indonesia

<sup>11</sup>Yayasan WeBe Konservasi Ketapang, Ketapang, Indonesia

<sup>12</sup>Kelompok Sadar Wisata Cempedak Jaya, Ketapang, Indonesia

<sup>13</sup>Polsek Batu Ampar-Polres Kubu Raya, Kubu Raya, Indonesia

<sup>14</sup>Marine Science, Universitas Tanjungpura, Pontianak, Indonesia

<sup>15</sup>Marine Science, Universitas OSO, Pontianak, Indonesia

<sup>16</sup>Research Centre for Oceanography National Research and Innovation Agency, Jakarta, Indonesia

<sup>17</sup>Kepala Desa Lemukutan Island, Bengkayang, Indonesia

<sup>18</sup>Kepala Sekolah SDN 06 Lemukutan Island, Bengkayang, Indonesia

<sup>19</sup>DKP Provinsi Kalimantan Barat, Pontianak, Indonesia

<sup>20</sup>MIHMMASDA, Universitas Tanjungpura, Pontianak, Indonesia

Submitted: October 22<sup>nd</sup> 2024; Revised: March 07<sup>th</sup> 2025; Accepted: May 21<sup>st</sup> 2025

## Keywords:

Coastal school  
Conservation  
Elementary students  
Life under water  
Marine protected  
area

**Abstract** West Kalimantan Province has five Marine Protected Areas (MPAs), one of which is the Randayan MPA. It is located in Bengkayang Regency and was officially established in 2019 through Peraturan Daerah Provinsi Kalimantan Barat No. 1. One of the mandated activities was public education on conservation, which mostly targeted adults whose livelihoods depended on the extraction of natural resources. Concerning the conservation awareness gap for teenagers and children, our Program Kreativitas Mahasiswa (PKM) initiated the application of the concepts of Social Capital and Bandura's Social Learning Theory to facilitate this in the community. It was found that the involvement of multi stakeholders supports the well-rounded learning experience for the children and teenagers in enhancing their awareness about the conservation of marine ecosystem and the life of under water. Online guest lecture from Ministry of Marine Affairs and Fisheries as well as guided learning process by undergraduate students through their community service program are some of the influential initiatives.

## 1. INTRODUCTION

At the end of 2018, the Government of West Kalimantan initiated the establishment of a Marine Protected Area (MPA) in coordination with the Ministry of Marine Affairs and Fisheries (Kementerian Kelautan dan Perikanan). This

ISSN 2460-9447 (print), ISSN 2541-5883 (online)

\*Corresponding author: Pratita Budi Utami

Department of Aquatic Resource Management, Universitas Tanjungpura, Prof Hadari Nawawi St, Pontianak 78124, Indonesia

Email: pratitabu@untan.ac.id

Copyright ©2025 Jurnal Pengabdian kepada Masyarakat (Indonesian Journal of Community Engagement)  
This work is distributed under a Creative Commons Attribution-ShareAlike 4.0 International License

designation was officially confirmed in January 2019. The primary objective of this framework was to manage sections of open waters to ensure sustainability and biodiversity conservation. According to [Febriani & Hafsat \(2020\)](#), the increased fish stock in designated protected areas contributed to a 30% rise in the number of fishermen on Mapur Island, Bintan Regency. Similarly, [Nowakowski et al. \(2023\)](#) found that Highly Protected Areas (HPAs) with stringent fishing restrictions support significantly higher mean abundances of marine life and demonstrate stable or increasing trends in species populations, as compared to unprotected sites and general-use zones within MPAs. Moreover, communities located near MPAs—especially HPAs—reported elevated levels of income and food security, relative to communities farther from these areas. Furthermore, proximity to MPAs and ecologically rich reef systems was positively correlated with community well-being across various geographic locations. Additional literature supports these findings. Reports by [The Nature Conservancy \(2022\)](#), [Syukri et al. \(2023\)](#), and [Costello \(2024\)](#) collectively highlight three common themes: (1) economic benefits resulting from increased harvests, (2) higher participation in poverty alleviation programs among populations living near MPAs, and (3) ongoing challenges in healthcare accessibility within these regions.

The Randayan MPA was officially designated in 2019 under Peraturan Daerah Provinsi Kalimantan Barat No. 1, which outlined the Rencana Zonasi Wilayah Pesisir dan Pulau Kecil (Zoning Plan for Coastal Areas and Small Islands in West Kalimantan Province). In 2022, the status of Randayan Island was further affirmed through KEPMEN KP No. 90/2021 ([Kementerian Kelautan dan Perikanan, 2019](#)). These legal frameworks aimed to inform and involve local communities—such as fishermen, tourism practitioners, village governments, and other stakeholders—in sustainable marine resource management.

Observations of the ecological potential within the Randayan MPA have revealed valuable conservation assets. Notably, green sea turtle nesting sites have been identified on the northern beaches of Semesak and Selebar Islands. Giant clams (kima), which serve as both bioindicators of marine health and tourist attractions due to their aesthetic value, are also a focus of conservation. Since 2016, BPSPL Pontianak has prioritized clam rehabilitation and conservation, leading to the development of Taman Kima, a designated clam sanctuary on Lemukutan Island. Taman Kima serves as both a tourist destination and an educational site within the Randayan MPA ([Balai Pengelolaan Sumber Daya Pesisir dan Laut Pontianak, 2019](#); [Kementerian Lingkungan Hidup, 2019](#)).

Statistical data highlight the significance of fisheries in Bengkayang Regency, which contributed the largest share of fisheries production in 2019—amounting to 5,153.97 tonnes, or 61% of the regency's total output. Beyond capture fisheries, the Randayan MPA also possesses strong tourism potential. The coastal landscape of Bengkayang Regency includes numerous beaches, as well as popular snorkeling and diving sites ([Balai Pengelolaan Sumber](#)

[Daya Pesisir dan Laut Pontianak, 2019](#)).

Research conducted by [Sudarso \(2012\)](#) found that approximately 72% of Lemukutan Island's coral reefs were in good condition, while Randayan Island had about 69% coverage. The Randayan MPA is divided into three functional zones: the core zone, the limited-use zone, and other designated areas. This zoning system was developed based on ecological characteristics and socio-economic considerations, especially those relevant to the local coastal and island communities. Community and stakeholder input played a crucial role in zoning decisions. The core zone was established through an ecological assessment that considered the presence of (1) coral reef ecosystems, (2) seagrass beds, (3) mangrove forests, (4) coral reef fish diversity, (5) sea turtle nesting grounds, (6) giant clams, (7) marine mammals, and (8) traditional fishing areas ([Balai Pengelolaan Sumber Daya Pesisir dan Laut Pontianak, 2019](#)).

A community survey showed that 74% of respondents supported the designation of the area as a conservation zone. They believed that conservation would sustain environmental health and enhance fish populations, thereby increasing the income of fishermen. However, 26% of respondents opposed the conservation area, expressing concern that it would limit their fishing areas and reduce their harvests. This perception likely stems from a lack of understanding about the goals and benefits of marine conservation. As one of the five MPAs in West Kalimantan, the Randayan MPA plays a critical role in regional marine sustainability. The spread of misconceptions about conservation could become a significant issue if not addressed through education and engagement.

Conservation issues have increasingly become a regional concern, particularly in terms of ensuring biological protection, preserving ecosystems, and promoting sustainable resource management. Participatory management represents a transformative approach that adapts conservation frameworks to align with the actual conditions within protected areas ([Utami et al., 2023](#)). When applied effectively, this approach allows educational outreach programs on conservation to reach broader segments of coastal communities.

To date, most conservation-related educational activities have focused on adults whose livelihoods depend on natural resource extraction. These individuals are typically the primary participants invited to engage in such programs. However, this raises a critical question: What about teenagers and young adults? Are elementary school students—often classified simply as children—being overlooked in these initiatives? Has this vital awareness not been extended to them?

At the time of writing, conservation education specifically targeting school-aged children and youth within the five MPAs in West Kalimantan remains limited. If knowledge is to be transmitted, who will assume the role of educator?

While the previous section highlighted the ecological, social, and economic impacts of MPAs, it is essential to

question whether these impacts have extended to children and youth—especially since their very environment, their “home,” is now governed under an MPA framework. This critical responsibility has not yet been adequately addressed. This PKM initiative aimed to fill that gap.

West Kalimantan is home to five MPAs, spanning a considerable geographic area. However, the limited resources available at the university level make it challenging to address conservation needs across all five MPAs. Addressing this challenge in isolation is highly difficult and unsustainable.

Fratsea & Papadopoulos (2022) highlight the relevance of Social Capital, a concept introduced by Putnam (1993), in co-management frameworks. They describe trust-based management as a long-term, collaborative process aimed at resolving problems and achieving shared goals. Through such collaboration, various stakeholders can contribute complementary capacities.

Universities, with their abundant human resources, offer a strategic advantage in this regard. For instance, students enrolled in Aquatic Resource Management, Resources Conservation, and Fish Counseling and Communication courses are well-positioned to engage in conservation initiatives. Their academic training makes it appropriate for them to assume active roles in these efforts.

Among the five MPAs in West Kalimantan Province, the Randayan MPA—located closest to Kota Pontianak—was selected as the pilot site for this PKM initiative. The project, titled The Sekolah Pesisir Project, is grounded in the principles of Social Capital and designed as a collaborative, community-oriented model. This activity involves a broad network of stakeholders, each with specific interests and roles in coastal conservation along the West Kalimantan coastline.

### 1.1 Objective

This PKM aimed to develop a pedagogical framework to promote literacy in coastal environmental conservation among elementary school students and youth. Social Capital Theory served as the foundational ideology behind the Sekolah Pesisir initiative, particularly in the distribution of Buku Muatan Lokal (Buku Mulok) to elementary students along the western coastline of Borneo. At the pilot project site—Randayan MPA, located on Lemukutan Island—we applied Social Learning Theory as the basis for fisheries extension activities. A level-store system was used to structure the learning content according to the developmental stages of the students. The results of this initiative aligned closely with the objectives and methods outlined in the original PKM proposal. We hoped that this activity would help bridge the conservation literacy gap between adults and younger generations, thereby fostering a sense of environmental responsibility among youth.

## 2. METHOD

This PKM was implemented through collaborative efforts involving numerous grassroots NGOs, academic institutions, the private sector, and government agencies.

The activities were designed to operationalize Bandura’s Social Learning Theory alongside Putnam’s Social Capital Theory, providing a theoretical foundation for participatory education and community engagement. The program aimed to enhance conservation literacy among elementary school students and youth living within coastal communities situated in marine protected areas. By leveraging collaboration across sectors and emphasizing community-based education, the initiative sought to cultivate environmental awareness and stewardship among younger generations. This approach recognized that children and youth are integral members of conservation zones and must be equipped with the knowledge and values necessary to support long-term sustainability.

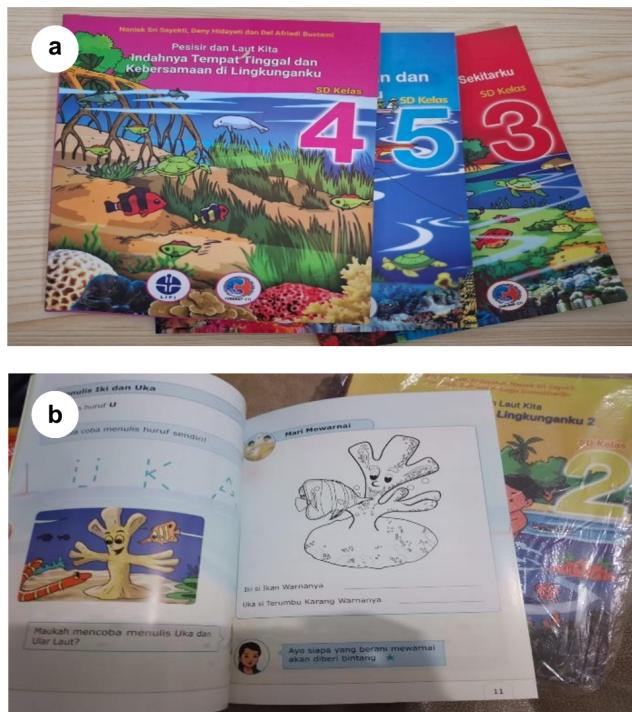
### 2.1 Preparation

We joined the Jejaring Konservasi Laut Kalbar forum in 2018. At the provincial level, this collaboration served as a platform to exchange information, coordinate work, and build shared understanding. The forum included academic institutions, grassroots organizations, local governments, village heads (*kepala desa*), the private sector, and others. All stakeholders in the forum shared an interest in MPAs and were located across the five MPA sites. At the end of each year, the forum typically reviewed completed programs for evaluation. One recurring finding was that youth were rarely involved in MPA-related activities. We investigated this further and found that in the Kubu Raya MPA, there had been a Sosialisasi Sampah Plastik program conducted by Yayasan Hutan Biru for elementary school teachers and students. In addition to this, they had also worked to integrate local coastal content from the Merdeka Belajar Kampus Merdeka (MBKM) program into student report cards (Rapor Siswa). Based on this information, we identified an opportunity to implement a similar program.

At the end of 2021, PRO BRIN informed us that a large number of books from their previous project for elementary students—9,000 copies, equivalent to 2.67 tonnes—were available at their Jakarta office. These books were part of the compulsory local content curriculum for elementary schools and were intended to introduce coastal and marine environments. Each book featured colorful illustrations and was available for every grade level from 1<sup>st</sup> to 6<sup>th</sup> grade (Figure 1). While the books were accessible to children in urban areas, they were difficult to obtain for students in remote or rural locations. We sought support from the private sector to transport the books from Jakarta to the Port of Pontianak. CV. Putra Bahari, based in Pati, Central Java, agreed to provide this assistance.

On the other hand, different stakeholders were responsible for raising awareness about conservation areas by developing and supporting the relevant theory. These included BPSPL Pontianak and the Directorate General of Marine Spatial Planning (Ditjen PRL) – Ministry of Marine Affairs and Fisheries. However, a challenge remained in delivering outreach materials from these entities to students (children) and youth. Therefore, we agreed that neither institution would act as an extension agent. As supervising

authorities, their role remained focused on conservation management at the local level. They were expected to share their knowledge with Marine Science and Fisheries (MSP) students on campus and fulfill their assigned duties. The MSP students would then redesign the materials using appropriate pedagogical tools. For this purpose, we used Module III by Alves et al. (2021) to summarize scientific content knowledge, applied the correlation model between conceptual bases and educational activities as described by Schio & Reis (2024), and followed the pedagogical tools framework for rural area education developed by Anjaneyulu (2018).



**Figure 1.** Buku Mulok Pesisir: (a) Book for 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup>; (b) Buku Mulok Pesisir for 1<sup>st</sup> grade

At this stage, we were uncertain about how to manage the books that had arrived in Pontianak. The fisheries extension activities conducted by our university students required only a limited number of books. Additional resources were needed to distribute the remaining books along the West Borneo shoreline. We held several discussions with members of the conservation forums. We contacted WWF Indonesia staff in the northern MPA location, OSO University as a representative for the Kayong Utara MPA, Yayasan WEBE in the Ketapang MPA, as well as Yayasan Hutan Biru and the Dinas Pendidikan in the Kubu Raya MPA. The effort was considered a social project without material compensation. As stated by Fratsea & Papadopoulos (2022), Social Capital could be realized when all stakeholders shared a common mission related to the MPA and engaged in co-management arrangements based on mutual trust. With that understanding, the stakeholders agreed to participate. The books arrived at Pontianak Port and were scheduled for distribution to MPA locations in Sambas Regency, Bengkayang Regency,

Kubu Raya Regency, Kayong Utara Regency, and Ketapang Regency. Attachment 1. presents the timeline for these preparations.

## 2.2 Analysis technique

Attachment 2 showed the implementation of this PKM. Two elements in Attachment 2 were essential to the activity: collaboration in a social project and the application of Bandura's Social Learning Theory. Stakeholder collaboration served as a foundation for trust-based management. We designed a Social Capital framework based on co-management principles in 2022. Since March 2022, we invited guest lecturers from the Ministry of Marine Affairs and Fisheries (MMAF), including Mrs. Lenny, Mr. Andrian, and Mr. Enjang. Their presentations provided Marine Science and Fisheries (MSP) students with additional perspectives on conservation theory, which the students later applied during their practicum activities in the Randayan MPA. The guest lecture sessions were conducted via the Zoom Meeting platform with 36 participants, as the program took place during the COVID-19 pandemic.

After receiving conservation theory instruction from Ditjen PRL, the MSP students carried out a small project to provide education and raise awareness about conservation. The target audience was elementary school students at SDN 06 Lemukutan Island. Working in small groups, the MSP students developed a participatory communication model as part of their assigned task. Each group was required to explain the methods they used to achieve the project goals during this second stage. The steps comprise the following.

- **Participatory planning:** Students prepared materials focusing on conservation-related biota and environmental topics.
- **Behavioral identification:** They observed that elementary students typically studied TPA (Tempat Pendidikan Al-Qur'an) in the afternoon, so they scheduled the program from 7:00 p.m. to 8:00 p.m.
- **Participation execution:** The participants were children between 6 and 13 years old. MSP students used animated images made from cardboard to help convey the information
- **Monitoring and evaluation:** All activities were recorded on video for monitoring purposes. Evaluation was conducted by asking participants to retell the story presented during the session.

In August 2022, this social capital initiative began collaborating on the distribution of Buku Mulok Pesisir for Grades 1 through 6. We moved 9,000 copies of the books from Jakarta to Kalimantan Barat. The books were distributed to elementary students along the west coast of Kalimantan Barat, from Sambas to Ketapang Regency. The name of this social project was Sekolah Pesisir. More than ten stakeholders participated in this effort, including: CV Putra Bahari – Pati, PRO BRIN (Badan Riset dan Inovasi Indonesia), Dinas Pendidikan

dan Kebudayaan Kabupaten Kubu Raya, POLSEK Batu Ampar, Kelompok Masyarakat Wahana Bahari, PSDKP (Pengawasan Sumber Daya Kelautan dan Perikanan) Pontianak, Ilmu Kelautan Universitas Tanjungpura, Ilmu Kelautan Universitas OSO, IKA (Ikatan Keluarga Alumni) UNDIP KALBAR, INHASA Diving Club, Yayasan WEBE Konservasi Ketapang, YEKHALI (Yayasan Ekonomi Keanekaragaman Hayati Laut Indonesia), Pangkalan TNI AL Ketapang, Dinas Ketahanan Pangan dan Perikanan Ketapang, Kelompok Masyarakat Pulau Cempedak, and HIMMASDA (Himpunan Mahasiswa Manajemen Sumberdaya Akuatik) Prodi MSP Universitas Tanjungpura. Books were distributed to the elementary school in Desa Lemukutan Island – Bengkayang Regency, to twelve schools in Kubu Raya Regency, and to four schools in Sambas Regency. In addition to elementary schools, distributions were also made to a Rumah Pintar in Ketapang and several Rumah Baca.

The expected result of this PKM social project is that we will educate coastal communities (children, teenagers, and young adults) on conservation ideas to protect the biotas and habitats around their homes. We also hope that stakeholders involved in conservation can take responsibility for the sustainability of the conservation concept in future generations.

### 3. RESULT AND DISCUSSION

This PKM collaborated with more than ten stakeholders and SD 06 Lemukutan Island. The results of the program aligned closely with the objectives and methods outlined in the proposal. Two key objectives were achieved: (1) all coastal books were successfully sent to five MPA locations, and (2) as a pilot site, students in the Randayan MPA received counseling activities conducted by MSP students (HIMMASDA). During the preliminary study, we held several discussions with stakeholders to assess their activities and identify areas of limited impact. The findings showed that certain coastal communities received minimal benefits from the MPA. Specifically, children in these communities were rarely included in conservation activities, which limited efforts to build conservation awareness from an early age.

Table 1 . PKM implementation method

| Problem  | Strategy   | Result  |
|--|--|---|
| A gap between plans and work programs implemented in MPA, especially those reaching students and youth in coastal communities.                             | We conducted counselling activities for youths and students at SD 06 Lemukutan Island. We only conducted this counselling at this location because of our limited resources.   | MSP students have successfully designed a draft of Extension Activities for students and youth. Students learn from Ditjen PRL while getting the extension activity draft while taking Penyuluhan dan Komunikasi Perikanan Subject. |
| PRO BRIN Jakarta had many Buku Mulok, which would be useless if the books were not distributed to coastal students. We faced very high distribution costs. | We have had a good and strong relationship with some colleagues for an extended period. Using Social Capital Theory to bind colleagues to this complicated activity, we bring this relationship into a more scientific scheme. | We received firm support that was beyond our expectations. We can distribute from Jakarta to five conservation areas in Kalimantan Barat.   |

gotong-royong and local wisdom in managing resources (Satriagasa et al., 2022). In a study by Juliana et al. (2023), it was reported that only 40% of adult participants effectively absorbed environmental content delivered through online media. In another study, Chasani et al. (2023) found that some private schools developed their teaching methods and content around environmental education. These schools integrated knowledge and skills related to the natural environment into their curriculum. Their school communities carried out activities such as focus group discussions, river biomonitoring training, and river care programs involving outdoor activities and waste cleanup. These activities were shown to be effective in motivating participants to take regular action in environmental care.



Figure 2 . MSP students in action

By applying the concept of Social Capital, we brought the spirit of gotong-royong into a more scientific context. We used all available resources to carry out this social project. The activity took place along the west coast of Kalimantan, which includes six regencies: Sambas, Bengkayang, Mempawah, Kubu Raya, Kayong Utara, and Ketapang.

Kementerian Pendidikan dan Kebudayaan (2019) reported that the Indeks Alibaca Nasional was 37.32, which classified Indonesia under the category of low literacy activity (*Aktivitas Literasi Rendah*). The report included index scores from all provinces. West Kalimantan scored 28.63, placing it below East Nusa Tenggara and close to West Papua. The index was based on four dimensions: proficiency, access, alternatives, and culture. We acknowledged that these four dimensions were difficult to address comprehensively. Therefore, we focused our efforts on the access dimension. Nationally, the Index Dimensi Akses scored 24, while West Kalimantan scored 14.88. This dimension included access indicators in schools—such as the percentage of school libraries in good condition—and access in the community, reflected by the number of public and community libraries. The low score in this dimension indicated a need for greater attention from various stakeholders to improve student access to literacy materials. This concern was one of the reasons why this PKM activity targeted children and youth as its primary beneficiaries.

PRO (Pusat Penelitian Oseanografi) BRIN conducted a project in the previous year, which produced the Buku

Mulok Pesisir for elementary and junior high school students. The book contained information on coastal protection, the introduction of marine and coastal biota, and guidelines on appropriate and inappropriate activities on the coast. This book had the potential to improve children's literacy and support conservation education at the elementary level. It was designed in full color and was visually appealing, especially for children in remote areas. Based on this, we decided to donate the books to students in West Kalimantan. With support from CV Putra Bahari under a CSR scheme, we transported the books from Jakarta. The official handover was conducted online and was attended by Mr. Udhi. In Sambas Regency, WWF Indonesia distributed 1,200 copies of Buku Mulok from Pontianak to Paloh District. We collaborated with POKMAS Wahana Bahari to conduct coastal educational activities, which included small games and book donations at SDN 11 Jeruju, SDN 21 Merbau, SDN 17 Ceremai, and SDN 2 Sebubus. In Mempawah Regency, we collaborated with the Marine Science Department of Universitas Tanjungpura to distribute 300 copies to SDN 06 Mempawah Hilir. The department also committed to supporting literacy development in remote areas.

In Kubu Raya Regency, we worked with the Dinas Pendidikan, POLSEK Batu Ampar, and Inhasa Diving Club to distribute books to two Rumah Baca in Sungai Kakap District and twelve elementary schools in Batu Ampar District. As part of the symbolic handover, the Dinas Pendidikan delivered books to SDN 21 and SDN 20 at the Kubu Raya Office. POLSEK Batu Ampar integrated the distribution with the Tatap Muka KAPOLRES Kubu Raya program. Bhabinkamtibmas personnel were assigned to distribute the books directly to the schools. In North Kayong, students and lecturers from the Marine Science Department of OSO University provided book donations to elementary students. According to OSO University staff, the students gave positive testimonials and frequently carried the books with them wherever they went.

In Ketapang, we donated the books to a Rumah Pintar managed by POKMAS Pulau Cempedak and the Lanal TNI AL. Additionally, Yayasan WeBe played a strategic role by arranging the transportation of books from Pontianak to Ketapang City. This initiative was part of a social network established by the Dinas Kelautan dan Perikanan (DKP) Provinsi Kalimantan Barat, where each stakeholder was encouraged to take on a more active role in conservation efforts. The focus extended beyond the protection of the environment and marine biota to also include support for local communities living within conservation areas.

### 3.3 Evaluation

We encountered a minor obstacle during the book distribution process, specifically the unpredictable duration of delivery. However, each stakeholder understood their responsibilities, and the issue was resolved without significant delay. The results of the counseling sessions showed that more than 60% of the participating children were able to retell the stories. The children also

demonstrated an understanding of the domino effects associated with damage to coral reef ecosystems or the consumption of sea turtles and their eggs. In addition, students achieved satisfactory scores on their tests. Many students were able to identify marine biota with protected status.

## 4. CONCLUSION

This social project aimed to educate coastal communities—particularly children and teenagers—on conservation concepts to help protect the biota and habitats surrounding their homes. Through Sekolah Pesisir, launched in November 2022, we hoped that stakeholders involved in conservation would take responsibility for sustaining these efforts and ensuring their continuity for future generations. Randayan MPA was selected as the pilot location due to resource limitations. Moving forward, collaboration and a clear shared vision will be necessary for expanding the program. The model implemented at Randayan MPA is intended to be replicated at other locations.

## ACKNOWLEDGMENT

The authors thank all individuals and organizations who volunteered and contributed to this social project. This project did not receive specific grants from public-sector or non-profit funding agencies. CV Putra Bahari, a long-standing fishing company based in Central Java, supported the project through its Corporate Social Responsibility (CSR) program.

## CONFLICT OF INTERESTS

The authors declare that they have no financial or personal relationships that may have influenced the content of this article.

## REFERENCES

Alves, T. M., Kokinou, E. Ekstom, M., Nikolaidis, A., Georgiou, G. C., and Miliou, A. (2021). Scientific, society and pedagogical approaches to tackle the impact of climate change on marine pollution. *Scientific Reports*, 11, 2927. <https://doi.org/10.1038/s41598-021-82421-y>

Anjaneyulu, C. H. (2018). A study on the effective pedagogical tools for management education. *International Journal and Creative Research Thoughts*, 6(4), 714-720.

BPSPL Pontianak. (2019). Rencana pengelolaan dan Zonasi (RPZ) Kawasan Konservasi Perairan Pesisir dan Pulau-pulau Kecil (KKP3K) Taman Pulau Kecil Pulau Randayan.

Chasani, Abdul. R., Siti, A., Hayinnatus, S., and Handasari, M. (2023). School community empowerment program for conservation of riparian vegetation around the Bedog River in Godean, Sleman. *Jurnal Pengabdian Kepada Masyarakat*, 9(1), 6-11. <http://doi.org/10.22146/jpkm.77924>

Costello, M. J. (2024). Evidence of economic benefits from marine protected areas. *Scientia Marine* 88(1). <https://doi.org/10.3989/scimar.05417.080>

Febriani, Z. & Hafsa, K. (2020). Dampak pengelolaan kawasan konservasi perairan terhadap hasil tangkapan nelayan Pulau Mapur Kabupaten Bintan. *Jurnal Manajemen Riset dan Teknologi*, 1(2).

Fratsea, L. M. & Papadopoulos, A. G. (2022). Fisheries co-management in the “age of the commons”: social capital, conflict, and social challenges in the Aegean Sea. *MDPI Journal Sustainability*, 14(21), 14578. <https://doi.org/10.3390/su142114578>

Juliana, M., Laily, H., & Ulya, Q. K. (2023). Education of covid-19 vaccination for pregnant woman. *Jurnal Pengabdian Kepada Masyarakat*, 9(2), 83-87. <http://doi.org/10.22146/jpkm.81494>

Kementerian Lingkungan Hidup. (2019). PERMEN LH Nomor P20 Tahun 2018 tentang Jenis Tumbuhan dan Satwa yang Dilindungi.

Kementerian Kelautan dan Perikanan. (2019). KEPMEN KP Nomor 90 Tahun 2021 tentang Kawasan Konservasi Pesisir dan Pulau-Pulau Kecil Pulau Randayan dan Perairan Sekitarnya di Provinsi Kalimantan Barat.

Kementerian Pendidikan dan Kebudayaan. (2019). Indeks Aktivitas Literasi Membaca 34 Provinsi. *Pusat Penelitian Kebijakan Pendidikan dan Kebudayaan*.

Nowakowski, A. J., Canty, S. W. J., Bennett, N. J., Cox, C. E., Valdivia, A., Deichmann, J. L., Akre, T. S., Bonilla-Anariba, S. E., Costedoat, S. & McField, M. (2023). Co-benefits of marine protected for nature and people. *Nature Sustainability*, 6, 1210–1218 <https://doi.org/10.1038/s41893-023-01150-4>

Putnam, Robert D. (1993). The prosperous community: Social capital and public life. *The American Prospect* 4(13).

Satriagasa, M. C., Ambar, K., Hatma, S., Faizal, N. F., & Uswatun, C. (2022). Community-based integrated water resource conservation on Mount Penaggungan in Pasuruan, Jawa Timur. *Jurnal Pengabdian Kepada Masyarakat*, 8(4), 224-231. <http://doi.org/10.22146/jpkm.56665>

Schio, C., & Reis, P. (2024). Design of a pedagogical model to foster ocean citizenship in basic education. *MDPI Journal Sustainability*, 16(3), 967. <https://doi.org/10.3390/su16030967>

Sudarso, J. (2012). *Strategi Pengembangan Ekowisata Terumbu Karang Di Pulau Lemukutan Dan Pulau Randayan, Kabupaten Bengkayang, Kalimantan Barat* [Thesis]. Universitas Terbuka.

Syukri, M., Mawardi, M. S., Amelia, L., Asyah, A. N., Iswara, M. A., Lecuyer, O., & Fourmann, E. (2024). Balancing conservation and community welfare: enhancing the management of marine protected areas in Indonesia. *AFD Research Papers*, 1-40.

The Nature Conservancy. (2022). *Sea change: Costs and benefits of marine protected areas*. The Nature

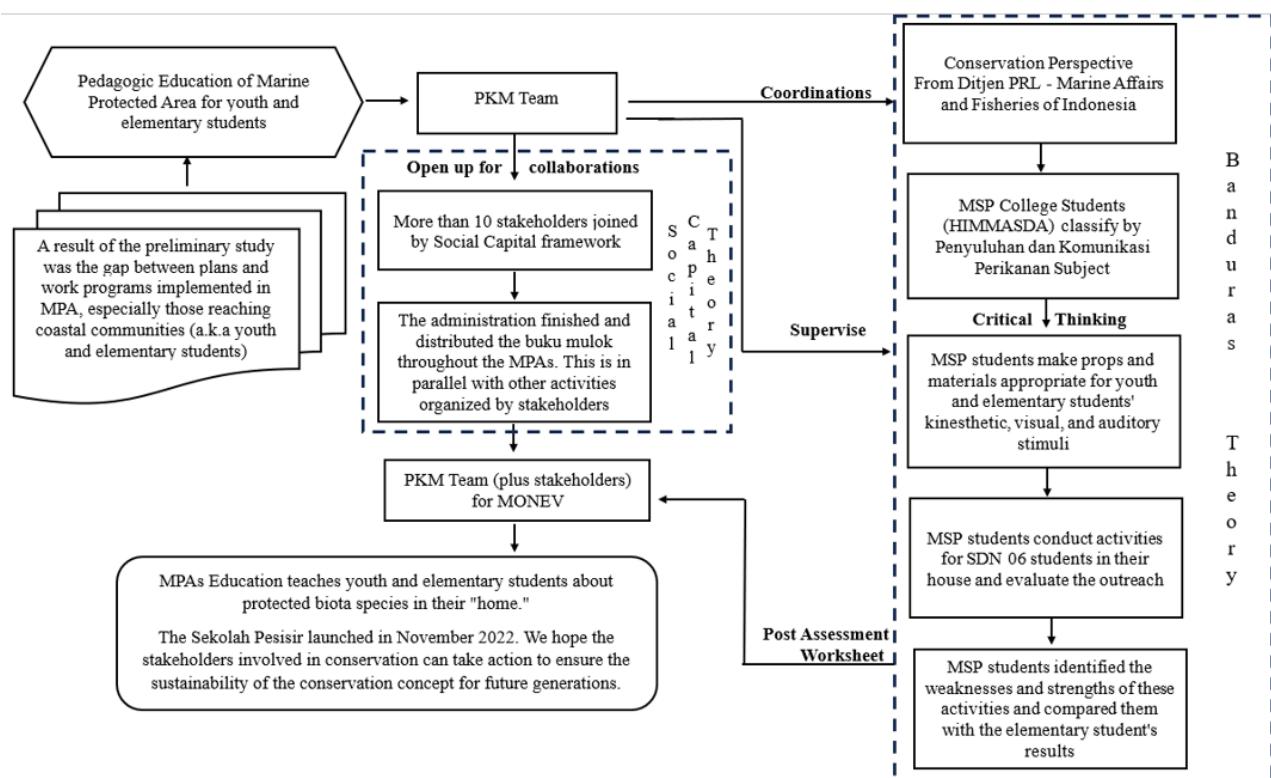
Conservancy

Utami, P. B., Dewi, D. A. N.N., & Vietsaman, D. E. (2023). Peran modal sosial pada manajemen kawasan konservasi perairan di Provinsi Kalimantan Barat. In *Pembangunan berkelanjutan di Indonesia dalam mewujudkan tujuan ekonomi inklusif*. LPPM Universitas Negeri Semarang, Semarang.

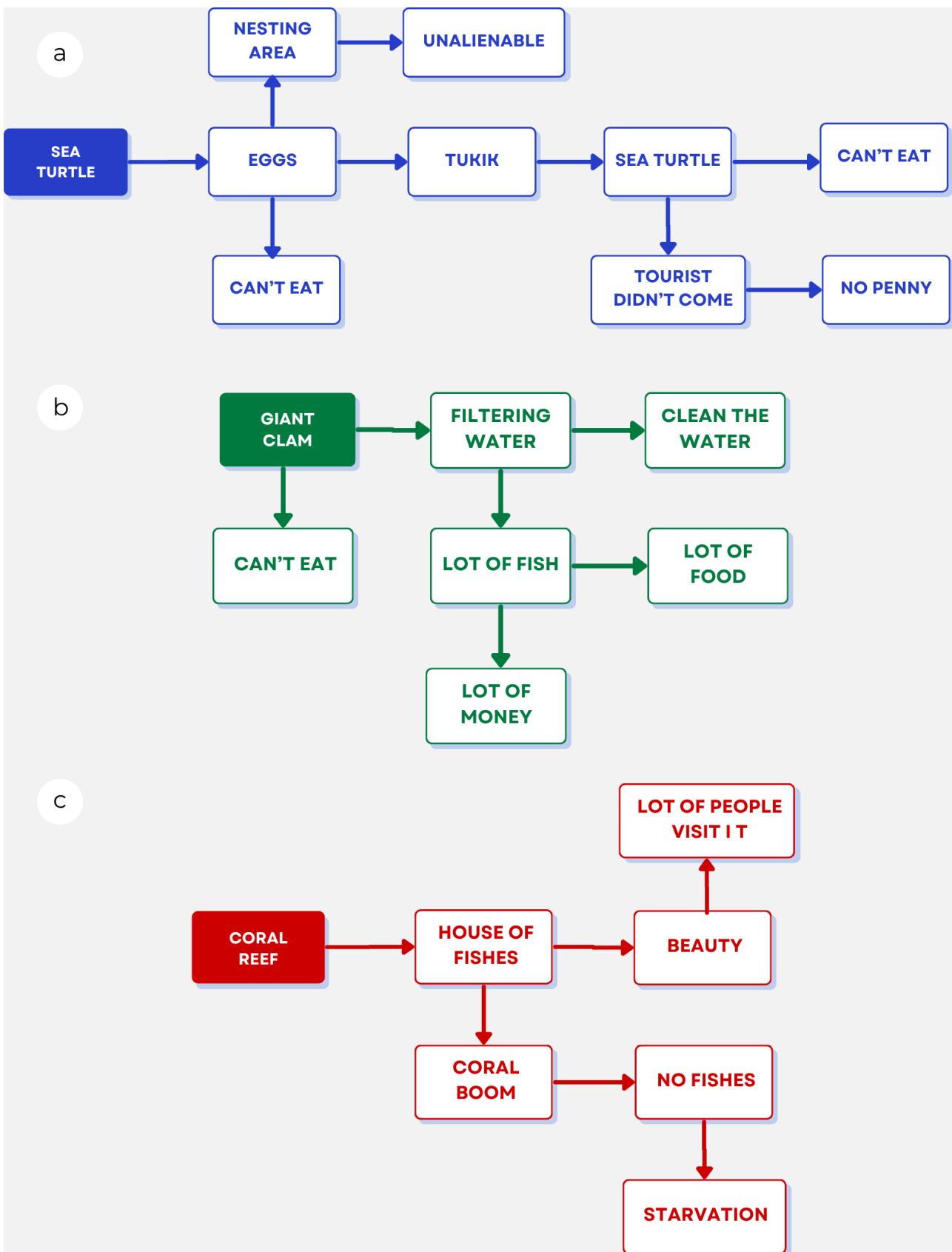
## ATTACHMENT

### Attachment 1. Schedule of PKM activities

| Activity  | Involved Stakeholders  |
|---|--|
| <b>March 2018 - 2020</b>  |  |
| 1. Coordination   | 1. DKP Provinsi Kalimantan Barat   |
| 2. A preliminary study will identify the gap between plans and work programs implemented in MPA, especially those reaching coastal communities. We will also deep-dive into which coastal communities received the lowest benefits from MPA. Then we can contribute to strengthening this.  | 2. Wahana Bahari<br>3. WWF Indonesia<br>4. BPSPL Pontianak<br>5. Yayasan Hutan Biru<br>6. Yayasan WEBE<br>7. Marine Science - OSO University   |
| <b>February - June 2021</b>   |  |
| Preparing a work plan design (Sekolah Pesisir : Edukasi Lingkungan Pesisir Sedini Mungkin, Bagi Siswa Siswi Sekolah Dasar di Pantai Barat Pulau Kalimantan)   | 1. Kepala Desa Pulau Lemukutan<br>2. MSP Students (HIMMASDA)<br>3. Yayasan YEKHALI   |
| <b>August 2021 - April 2023</b>   |  |
| PKM   | 1. PRO BRIN<br>2. Dinas Pendidikan Kubu Raya Regency<br>3. CV Putra Bahari Pati<br>4. Ditjen PRL - KKP<br>5. Kades Pulau Lemukutan<br>6. IKA UNDIP DPD Kalimantan Barat<br>7. INHASA DC<br>8. POLSEK Batu Ampar<br>9. Marine Science Tanjungpura University<br>10. Yayasan YEKHALI<br>11. Pangkalan TNI AL Ketapang<br>12. Dinas Ketahanan Pangan dan Perikanan Ketapang<br>13. POKMAS Pulau Cempedak - Ketapang<br>14. PSDKP Stasiun Pontianak<br>15. SDN 06 Desa Pulau Lemukutan<br>16. Bidang Ruang Laut - DKP Provinsi |
| 1. We finished the administration needs of these books from BRIN.<br>2. At the beginning of 2022, Ditjen PRL supported us by giving fisheries extension material. Our college students had another perspective; so far, they received theory from the lecturer's point of view, and now they have the perspective of someone who manages and is responsible for it.<br>3. November 2022 - February 2023, the books were shipped from Jakarta to five MPA in KALBAR. And we are still accepting contributions from any party. They are IKA UNDIP DPD KALBAR, INHASA Diving Club, POLSEK Batu Ampar - Kubu Raya, Ilmu Kelautan UNTAN, Yayasan YEKHALI, Pangkalan TNI AL Ketapang, Dinas Ketahanan Pangan dan Perikanan Ketapang, POKMAS Pulau Cempedak – Ketapang and PSDKP Stasiun Pontianak joined to contributing to this PKM Social Capital Project. This PKM got support from DKP Provinsi KALBAR.<br>4. Our college students officiated with coordinating with Kepala Desa, the SDN 06 Headmaster on Lemukutan Island, and PSDKP Pontianak. |  |
| <b>April 2023 and February 2024</b>   |  |
| PKM monitoring and evaluations.<br>The monitoring and evaluation of this PKM are divided into two steps:  | 1. PKM full team<br>2. SDN 06 Students<br>3. HIMMASDA (MSP students)<br>4. PRO BRIN  |
| 1. The first is the evaluation by SDN 06 students by MSP college students.<br>2. The second is the distribution of the mulok books for reporting to PRO BRIN Jakarta.   |  |



**Attachment 2.** The implementation stage



**Attachment 3.** The flow of the material for elementary students: (a) Biota or ecosystem of sea turtle; (b) Biota or ecosystem of giant clam (kima); (c) Biota or ecosystem of coral reef