Darwin Initiative Main: Annual Report

To be completed with reference to the "Project Reporting Information Note":
(https://www.darwininitiative.org.uk/resources/information-notes/)

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes

Submission Deadline: 30th April 2024

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Darwin Initiative Project Information

Project reference	29-029
Project title	Nature Climate Solution to Protect Mangrove Biodiversity and Improve Livelihood
Country/ies	Indonesia
Lead Partner	Yayasan Konservasi Alam Nusantara (YKAN)
Project partner(s)	– Faculty of Biological Sciences, University of Leeds – Faculty of Fisheries and Marine Science, Mulawarman University
Darwin Initiative grant value	GBP 599,365
Start/end dates of project	1 July 2022 – 31 March 2025
Reporting period	Apr 2023 – Mar 2024 Annual Report 2
Project Leader name	Mariski [redacted]
Project website/blog/social media	https://www.ykan.or.id/en/program/oceans-program/blue-economy/secure/
Report author(s) and date	Mariski [redacted]

1. Project summary

Indonesia has the largest mangrove ecosystem in the world with an area of 3.9 million hectares (23% of the world's mangroves), which can store up to 1/3 of all carbon stored in the world's coastal ecosystems. This mangrove forest is one of the most carbon-rich forests as it can absorb 3 to 5 times more carbon than terrestrial forests. Unfortunately, Indonesia's mangrove forests are disappearing faster than tropical rainforests and coral reefs with rates of approximately 5,000-10,000 ha per year. The major cause of mangrove loss in Indonesia is conversion of land for shrimp ponds. Berau Regency in East Kalimantan has 86,043 ha of mangrove ecosystem, the biggest in East Kalimantan Province. However, in 2019 alone 13% or 11,237 ha mangroves were converted to shrimp ponds. If the pond area continues to expand, it will have a severe impact, not only to the ecosystem but also for the coastal communities.

Unsustainable aquaculture practices (converting mangroves into shrimp ponds to increase productivity) support 30% of the population but threaten 54,000 ha of mangrove ecosystems in Berau Regency, East Kalimantan. Through community engagement, capacity building and establishment of land-use plans, the project aims to protect 15,000 ha of mangroves, and provide a novel community-based model to increase shrimp productivity while restoring up to 80% of shrimp ponds back to mangroves in 5,000 ha. Healthier mangrove ecosystems and comparable, and preferably higher, harvest of shrimps, lives, and biodiversity in the coasts of Berau Regency can enjoy increased resilience, higher income, and better living conditions.

The expected outcomes are increased biodiversity and governance of vulnerable mangroves, and improved livelihoods in 3 villages namely Pegat Batumbuk, Suaran, and Tabalar Muara.

2. Project stakeholders/ partners

YKAN apply SIGAP in this project in our assessment of women's groups, aquaculture groups, and village-owned enterprises (description of SIGAP provided in previous report). We also use the SIGAP approach in assisting preparation of village mid-term development plans, home industry food licensing, stakeholder engagement, and capacity strengthening of project beneficiaries.

The project facilitates local application of participatory planning and action approaches including community-led mangrove protection, enhance collaboration and shared learning among stakeholders. We work closely with the communities on-the-ground where assistance is provided on a regular and even daily basis by our village facilitators to carry out aquaculture and restoration activities.

YKAN already has a long established relationship with the governments of East Kalimantan Province and Berau District. They are actively involved in our project not only from a helicopter view for overall monitoring and endorsements, but aslo supplying information and technical know-how alongside YKAN. The below table gives an overview of our government partners and their role in the project. We've ensured we have a central contact point in each agency/department, to ensure efficient exchange of information. Many of these not only attend meetings, but also provide knowledge and technical inputs into the project (mentor and resource person).

Table 1. Project Stakeholders and Their Roles

Government Partner	Role in Project
Ministry of Marine Affairs and Fisheries	Mentor and resource person of Secure and Ecosystem Approach of Aquaculture (EAA) development
National Research and Innovation Agency	Research, collecting data, resource person for SECURE and EAA development
Marine and Fisheries Agency of East Kalimantan	Mentor and resource person of SECURE and EAA
Research, planning and development Agency of East Kalimantan	Update database from SDG's activities in SECURE project
Environmental Agency of East Kalimantan	Resource person of SECURE and part of EAA working group
Fisheries Agency of Berau District	Mentor and SECURE field supervisor, and EAA working group
Community and Village Empowerment Agency of Berau District	Mentor and resource person of Village Government capacity building, BUMKamp (village-owned enterprises) improvement, and EAA working group
Environment and sanitary agency of Berau District	Mentor and resource person of SECURE, and EAA working group

For works on biodiversity and spatial planning, YKAN collaborated with University of Mulawarman and University of Leeds. YKAN's national and field teams are working closely with the two organization for design of activities, organization of field works, and regularly hold meetings to discuss and update on direction and progress of the works on biodiversity analysis, water sampling, and spatial prioritization. The works are basically final and will be packaged for advocacy works.

This year, we are adding a new partnership with the Ministry of Marine and Fisheries' Center for Brackish Water Aquaculture in Jepara. Memorandum of Understanding with the Center was signed in December 2023 as a way to strengthen windu shrimp cultivation on SECURE ponds as well as to strategically align SECURE program with government practices and government's supply chain.

3. Project progress

3.1 Progress in carrying out project Activities

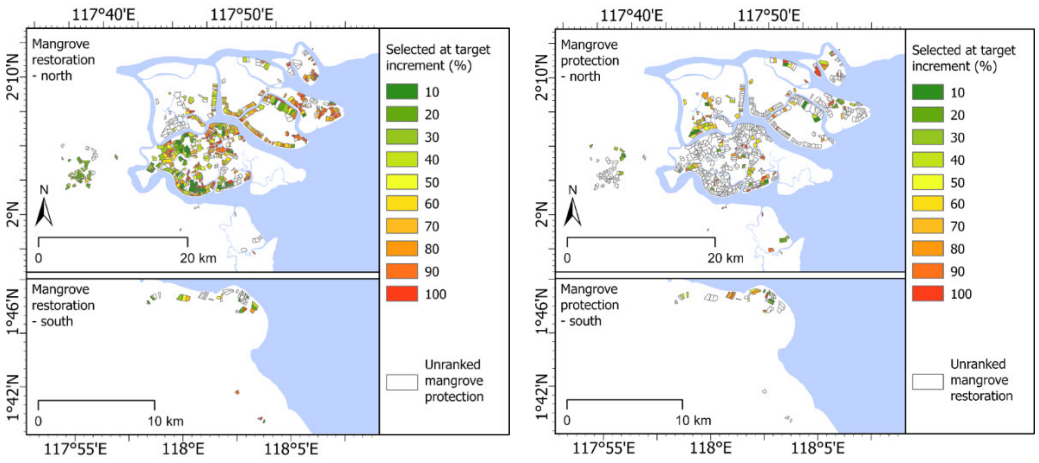
Toward **Output 1,** aiming to develop management plans for the protection of mangrove ecosystems and their biodiversity, YKAN's SIGAP coordinators have effectively promoted community-based mangrove management, leading to the development of draft village development plans and granting community rights to manage mangrove areas for ecotourism, as highlighted in Annual Report 1. We continue to advocate for extended mangrove protection in villages such as Pegat Batumbuk. The village encompasses 28,764.56 hectares of Production Forest, of which 22,153.82 hectares were proposed to the Ministry of Environment and Forestry (MoEF) for designation as a Village Forest under the social forestry scheme. The Ministry approved 11,180 hectares as Village Forest, empowering the community with rights to sustainably manage and utilize the forest to support their livelihood while preserving its ecological functions.

In collaboration with village stakeholders and the Village Forest Management Institution (Lembaga Pengelola Hutan Desa/LPHD), YKAN is committed to the sustainable management of the remaining forests not included in the scheme. In June 2023, we initiated a Working Group for Mangrove Ecosystem Regulation in Pegat Batumbuk, which was officially recognized on World Mangrove Day, July 26, 2023, through Village Regulation No. 5 Year 2023. This regulation, which covers 25,000 ha, guides the management, protection, and restoration of mangrove ecosystems at the village level, incorporating local spatial statuses and traditional wisdom.

Through the work of our university partners, we will inform village government on their spatial planning and considerations for mangrove protection and restoration. The works of University of Leeds produced spatial prioritization that addresses the underlying mangrove threat: land use change for aquaculture ponds. To effectively prioritize spatial planning for the SECURE pond initiative, we agreed to use three critical criteria: restoration and protection potential of mangroves, profitability of shrimp production, and the cost of establishing a SECURE pond. These criteria led to the quantification and analysis of 718 productive non-SECURE ponds leading to prioritization of ponds based on mangrove cover potential, proximity to the village for economic efficiency, and associated costs related to location and structural needs.

The analysis showed that 551 ponds with less than 60% existing mangrove cover will be prioritized for mangrove restoration to reach minimum 60% coverage (indicated with dark green in Picture 1 left), while 167 ponds already exceeding this threshold will be designated for protection (indicated with dark green in Picture 1 right). Ponds ideal for restoration or protection were strategically selected to maximize ecological and economic benefits, with higher priority given to larger ponds further from riverbanks and closer to villages, minimizing operational costs and enhancing profitability. This targeted strategy ensures effective resource allocation, enhances mangrove conservation efforts, and optimizes shrimp farming operations. These results will be consulted during YKAN's spatial planning workshop with village government and local stakeholders and further proposed to be incorporated in the village spatial planning documents alongside other thematic spatial planning processes.

Picture 1. Spatial Prioritization for Mangrove Restoration (left) and Mangrove Protection (right)



Meanwhile, the works of University of Mulawarman are useful for enhancing biodiversity through environmental monitoring. In this work, we utilized different tools and methods to assess environmental parameters, with traditional approaches generally preferred over advanced automatic equipment due to their reliability in producing consistent results. For instance, dissolved oxygen (DO) measurements using Winkler titration and WQC instruments showed nearly identical values, while JALA automatic checkers presented significantly different results. Overall, environmental parameters remained stable over time and space, with temperature averaging 28°C, ranging from 26.5°C to 32°C. Salinity varied across quarters due to seasonal changes in sea water access, with a notable decrease in Quarter 1 and normalization (26 ppm) by Quarter 3. DO content fluctuated from 3.8 to 8.46 ppm, occasionally exceeding the standard maximum of 7.5 ppm, requiring careful monitoring to maintain optimal levels for shrimp health. pH levels across all stations remained within the ideal range of 7.5 to 8.5, crucial for preventing disruptions in shrimp metabolism and increasing disease resistance.

Using eDNA sampling methods to monitor aquatic and associated terrestrial biodiversity, University of Mulawarman collected samples in October 2023 (T1 with T0 collected in January 2023), only at Pegat Batumbuk village due to delays in pond construction at the other two planned villages (Suaran and Tabalar Muara). Although samples can still be collected in two other villages, they will not provide a meaningful comparison due to differing lengths of exposure to aquaculture activities. During T1, 24 samples were collected, predominantly identifying eukaryotes from the Pseudomonadota and Bacillariophyta phyla. The Bacillariophyta, or diatoms, are crucial as primary producers, converting carbon dioxide into biomass and producing oxygen through photosynthesis, indicating a healthy ecosystem.

Comparative analysis between the pond and secondary mangrove samples showed significant differences in bacterial composition, with secondary mangrove samples dominated by Actinomycetota and Bacillota, bacteria crucial for bioremediation and nutrient cycling. The annual comparison between T0 and T1 samples noted a rise in Bacillariophyta in water samples and sediment, although there was a decrease in Ascomycota and disappearance of Euglenozoa, suggesting environmental changes due to aquaculture activities. The current biodiversity focus is primarily on bacterial diversity, but university partners are expanding the scope to include lower taxa such as mollusks and chordates using new bioinformatic tools, aiming to enhance management and conservation efforts.

Under this output, we also aim to build capacities of local governments and stakeholder, preceded with a capacity needs assessment conducted from May to June 2023. The assessment was done using an adoption of Restoration Opportunity Assessment Method (ROAM) and had identified that Berau stakeholders possessed a keen awareness and commitment to mangrove ecosystem conservation and optimistic considering most of the areas are previously occupied by mangroves, giving potential for natural regeneration. It also highlighted the direct economic benefits of mangrove ecosystems, though improvements are necessary in areas such as legal certainty for community management, strengthening of village-level regulations, budget allocation, community capacity building, and cross-party coordination for mangrove-based livelihood activities.

The result of this capacity assessment was translated into technical assistance for village governments and community mangrove management groups. YKAN has enhanced the capacity of village stakeholders through on-the-job training focused on the development of Village Regulations on the Management, Protection, and Restoration of the Mangrove Ecosystem. This training involved a diverse group of participants, including village governance representatives, youth leaders, and women, supported by YKAN facilitators to aid in the formal drafting stages and the delineation of mangrove management zones.

A workshop for the development of mangrove management and protection plans was held from November 28 to December 1, 2023, in three villages: Pegat Batumbuk, Suaran, and Tabalar Muara. Attended by 28 community representatives (16 men and 6 women) and accompanied by YKAN staff, the workshop produced draft plans for managing a total of 27,500 hectares of mangrove area, which have been appended to this report as MOV.

YKAN also facilitated the integration of mangrove management, protection, and restoration into the Long-Term Development Plans of Teluk Semanting Village, Karangan Village, and Tabalar

Muara Village. This integration establishes a foundation for including mangrove management programs and budgets in the villages' Annual Development Work Plans.

At the community level, YKAN supported the Village Management Institutions—LPHD Samaturu from Pegat Batumbuk Village and Tabalar Muara Lestari from Tabalar Muara Village—in formulating their Strategic Plans for 2024 – 2029. These plans are based on gap analysis, SWOT, and community aspirations and are supplemented as MOV in this report. However, it was noted that community mangrove management groups face challenges in securing sustainable funding and in engaging with the private sector and donor institutions. To address these challenges, YKAN recommended routine coordination between mangrove managers and government agencies, strengthening human resource capacities, developing economic sectors as income stream for the management institutions, advocating for activity budgeting with governmental bodies, and encouraging active community participation.

This effort will be complemented by mangrove surveillance training organized for LPHD Samaturu in Pegat Batumbuk Village (enacted through MoEF's Decree), Tabalar Muara Lestari group (enacted by Village Head), and a management group in Suaran Village (pending formal endorsement). In the first year, YKAN provided training that resulted in a Standard Operating Procedure (SOP) for surveillance and practical fieldwork. The next batch of training, scheduled for the third year, is planned to cover topics such as survey procedures, equipment use and maintenance, data collection analysis, data format creation, data visualization, and activity evaluation plans.

Output 2 is aimed toward mangrove restoration and biodiversity improvement plan and the demonstration of SECURE model. In Year 1, YKAN finalized the assessment for the Ecological Approach to Aquaculture (EAA) and consulted the findings with relevant agencies in Berau Regency. This year, we leveraged those findings in our advocacy for the designation of EAA areas in Berau Regency. Among the three core villages, Tabalar Muara is less suitable due to its location within the Coastal and Small Islands Conservation Area of the Derawan Islands and Surrounding Waters Zone. Pegat Batumbuk, with its predominantly Production Forest area, and Suaran Village, largely classified under Other Land Use with regency-level authorization, are recommended for EAA, with a combined potential of 12,054.93 hectares.

YKAN has maintained coordination with the Berau Fisheries Agency and consulted with the Directorate General of Cultivation of the Ministry of Maritime Affairs and Fisheries to address challenges in developing tiger prawn EAA, such as securing regional government commitment, ensuring human resource readiness, and managing budget and implementation strategies. We have encouraged the inclusion of EAA in the sustainable development of the tiger prawn industry in Berau Regency, with a pilot area of 850 hectares designated in Suaran Village. This initiative will facilitate the development of an EAA action plan to be incorporated into programs for relevant Regional Apparatus Organizations (OPD).

In this second year, the total number of SECURE ponds has reached 10, distributed across three villages: two in Tabalar Muara, six in Pegat Batumbuk, and two in Suaran. These ponds, spanning a total of 120 hectares, have been redesigned to include 19.07 hectares for cultivation, 52.76 hectares for mangrove restoration, and 50.56 hectares as protected intact mangrove areas.

Nine of the ten ponds are now operational, engaging in varying cycles of restoration and cultivation. One pond in Suaran is pending operational status as it undergoes embankment reconstruction and repairs to pond sluice gates.

Picture 2. Distribution of Darwin-supported SECURE Ponds

Pond Name	Total Area	Aquaculture Area	Mangrove Restoration Area	Mangrove Protection Area
Abdul Rahman	18,00 ha	3,00 ha	15,00 ha	11,00 ha
Herdin	42,00 ha	1,44 ha	0,00 ha	40,56 ha
Steven Tanjung Bingkar	4,00 ha	2,00 ha	2,00 ha	0,00 ha
Suprianto Tanjung Bingkar	9,00 ha	2,00 ha	7,00 ha	0,00 ha
Ichsan Tanjung Bingkar	14,00 ha	2,80 ha	11,20 ha	0,00 ha
Suaib	10,00 ha	1,55 ha	8,00 ha	0,00 ha
SECURE Model-2	10,00 ha	2,00 ha	8,00 ha	0,00 ha
Suderajat	12,00 ha	3,00 ha	9,00 ha	0,00 ha
SECURE Model-1	7,00 ha	1,74 ha	5,26 ha	0,00 ha
Angge	3,00 ha	0,54 ha	0,00 ha	1,00 ha
Total	129,00 ha	20,07 ha	65,46 ha	52,56 ha

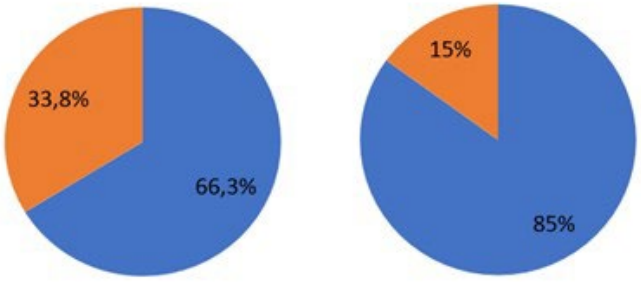
To support the cultivation process, YKAN has provided shrimp, milkfish, and mangrove crab seeds, along with essential materials such as organic fertilizer and probiotics, and standard cultivation operational equipment like harvesting tools. YKAN facilitators, stationed in each village along with external experts from the tiger prawn industry, guide the farmers through the cultivation process.

Additionally, YKAN has partnered with the Ministry of Marine and Fisheries' Center for Brackish Water Aquaculture in Jepara (BBPAP Jepara) to further assist farmers with the cultivation process across several pond models. Collaboratively with BBPAP Jepara, we are developing a SECURE pond cultivation guide based on the learnings from the current cultivation cycle.

To enhance farmers' expertise in sustainable aquaculture, we organized a Field School for both SECURE and non-SECURE farmers. This year, one term of the Field School has been completed in three villages, attended by 48, 55, and 69 farmers from Pegat Batumbuk, Tabalar Muara, and Suaran, respectively. The Field School offers a 15-syllabus joint learning program covering a wide range of topics from ecosystem mapping to business planning and technical aquaculture practices. Notably, the Field School has significantly improved harvest yields in Pegat Batumbuk and Suaran Villages, with one cycle of tiger prawn cultivation yielding approximately 150 kg per pond.

Moreover, YKAN organized a Training of Trainers (TOT) for 20 facilitators from the villages of Tabalar Muara, Pegat Batumbuk, and Suaran, employing an active adult participatory learning method. Pre-test and post-test assessments show an 18.7% increase in knowledge among participants.

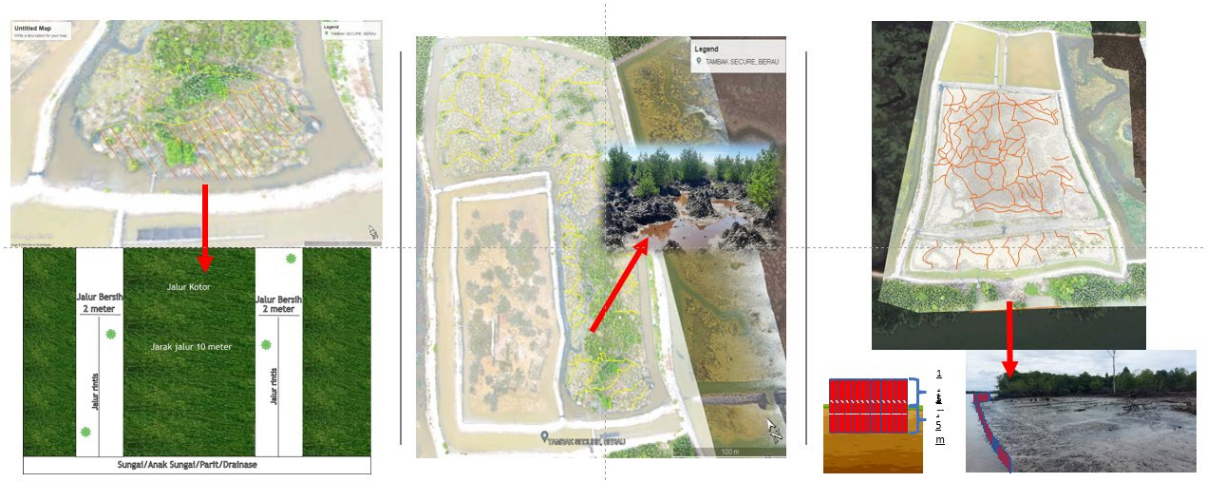
Diagram 1. Result of Pre-test (left) and Post-test (right) on Field School knowledge test



We have also improved pond design in the 120-hectare SECURE area by allocating zones for natural mangrove restoration and hydrological enhancements, supported by periodic maintenance of waterways and strategic mangrove seed dispersal. These modifications aim to optimize environmental conditions and increase sediment accumulation through innovative approaches such as double-fence bamboo barriers along riverbanks prone to abrasion.

In addition to these technical advancements, the program conducted Community-Based Ecological Mangrove Restoration (CBEMR) training for 25 mangrove activists across four villages. This collaborative effort enhances our collective restoration strategies and fosters a community-led approach to environmental stewardship.

Picture 3. Designs of mangrove restoration to allow for natural mangrove regeneration



Finally, a second vegetation analysis conducted in February 2024 across 12 stations, utilizing a permanent transect already deployed in the first visit for comparable results. In first year's vegetation analysis, we found eight true mangrove plants and nine mangrove associates. This year, 20 species found, consisting of 12 true mangrove species, 3 associated mangrove species, and 5 understory plant species with Nypa fruticans as the dominant species attributed to brackish zone at the transition between coastal and terrestrial ecosystems.

The analysis reaffirmed the robust growth and increased biomass of the mangrove ecosystems, with an average potential carbon storage of 32.04 tons per hectare. The first draft of the pre-feasibility study for a carbon project has been developed, with the final report anticipated by May 2024.

Understanding that conservation will not succeed without improving the welfare and livelihood of people living within the mangrove ecosystem, under **Output 3**, we work to maintain and improve the incomes of people in our 3 demonstration villages and those working in mangrove-based livelihoods. A socio-economic survey was conducted in March 2024 for the three core villages. Compared to the baseline from Year 1, there has been a 12% increase in income for aquaculture farmers and an average 40% increase for women's groups. Some aquaculture farmers reported that they feel encouraged by the SECURE program, prompting them to activate their idle ponds for cultivation. Meanwhile, the notable rise in average women's groups' income is due to additional members joining in who did not have any income stream into having additional income.

With continuous improvements to aquaculture practices and YKAN's efforts to enhance market appreciation for SECURE shrimps, we anticipate further income growth for shrimp farmers in the coming years.

YKAN is also dedicated to advancing women's micro-businesses by diversifying products, enhancing organizational and operational efficiency, and expanding market access through various channels. To support these initiatives, YKAN has provided tools and equipment, with each women's group committing to set aside IDR 2,000 per package sold for equipment maintenance and group savings.

Assisted by YKAN, women's groups have developed 10 products, with 9 receiving a Home Industry License and 8 obtaining Halal certification. *Amplang* and crackers, popular in East Kalimantan, are the signature products, enjoying stable demand as they are favored in Indonesian cuisine either as meal accompaniments or snacks.

Table 2. List of Micro Business Certifications

No	Product	Group Name	Home Industry License	HALAL	Certification date
1	Cracker (brand: Ceria)	Ceria	V	V	27 Dec 2022
2	*Amplang* (brand: Ceria)	Ceria	V	V	27 Dec 2022
3	Crackers (brand: ASA)	Tenggiri 2	V	V	27 Dec 2022
4	*Amplang* (brand: ASA)	Tenggiri 2	V	V	27 Dec 2022
5	Cracker (brand: Heeem)	Tenggiri 1	V	V	27 Dec 2022
6	Cracker (brand: Bandeng Laut 1)	Bandeng Laut 1	V	V	27 Dec 2022
7	Cracker (brand: Puri)	Bandeng Laut 1	V	V	27 Dec 2022
8	Fish floss	Kerjasama Jaya	V	V	11 May 2023
9	Fish crackers	kerjasama Jaya	V		
10	Shrimp head broth	Kerjasama Jaya			(new product)

To increase market reach, YKAN facilitated the participation of these groups in several events, including the launch of Teluk Semanting Eco Tourism on May 1, 2023, a Product Expo in Medan on May 16, 2023, the Berau Village-Owned Enterprise Expo on June 16, 2023, Expos in Jakarta and Surabaya on June 23 and September 1, 2023, respectively, a YKAN event on September 6, 2023, and the Sabah International Convention from September 22-24, 2023. Groups such as Kelompok Kerjasama Jaya, Kelompok Tenggiri, and Kelompok Ceria participated in these events.

For the Kerjasama Jaya Group, additional support included training in product development, marketing, and financial management, as well as assistance in setting up a group bank account to facilitate digital transactions and online marketing. We also helped develop a partnership with RUMAH BUMN Pertamina in Berau to prepare the group for the digital economy ecosystem through coaching and capacity development.

The Village Owned Enterprises (BUMK) are yet to fully optimize their capacity to support women's group businesses. BUMK's mandate is to foster economic activities aligned with local customs and culture and government programs aimed at community economic development.

We began by conducting a gap analysis and organizing a visioning workshop for BUMK Tabalar Muara and BUMK Bakauta Teluk Semanting. It was noted that these entities, like most other BUMKs, need to reorganize and revitalize their operations by developing and updating their statutes and bylaws, building an organizational structure with a long-term vision, and establishing good governance, particularly in management and financial systems.

To further build long-term capacity, YKAN facilitated a study visit for the Teluk Semanting Mangrove Ecotourism Team to Yayasan Bhakti Sendang Biru, which manages Clungup Mangrove Conservation, an environmentally based tourism area covering 893 ha in Tambakrejo Village, Malang, East Java. From this visit, the team gained insights into tourist guiding, conservation activities, and operational and financial management.

Moreover, YKAN is developing an internship program for representatives from the women's groups who produce non-timber mangrove derivative products. This on-the-job training will focus

on food processing business management. We are currently developing the curriculum and searching for suitable companies to host the internship.

3.2 Progress towards project Outputs

Output 1: Management plans for the protection of 15,000ha of mangrove ecosystems and their biodiversity are developed, approved, and implemented through strengthened village governance capacity

In the two years to the project, YKAN's technical assistance and support have successfully established mangrove ecosystem governance and plans for Teluk Semanting Eco Tourism at 748.89 hectares and Pegat Batumbuk Village Regulation covering 25,000 hectares, totalling to 25.749 hectares. Through capacity strengthening as described in Section 3.1 above, the project supported three drafts of village mangrove management plans summing up to 27,500 hectares and two community-based mangrove management plans covering a total of 12,680 hectares.

The work of universities lays a foundation toward a strategic approach to managing mangrove ecosystems and enhancing biodiversity through precise environmental monitoring, targeted spatial prioritization, and integration of socio-economic factors important to motivate conservation actions. Reliable monitoring methods ensure consistent assessment of vital ecological parameters, enabling responsive mangrove management. The prioritization framework, by focusing on areas with significant restoration potential and existing mangrove cover, ensures targeted conservation efforts, aligning economic incentives with ecological benefits to promote sustainable aquaculture practices. If implemented effectively, this not only secures the ecological health of mangrove habitats but also bolsters local economies, creating a supportive community framework essential for the long-term sustainability of mangrove conservation efforts.

Output 2: 10-year mangrove restoration and biodiversity improvement plan developed and approved for 5,000 ha of shrimp ponds and, a 100 ha SECURE model demonstration site (within the 5,000ha area) is established by the end of the project

Ecosystem Approach to Aquaculture (EAA) analysis recommended a total area potential for EAA designation of 12,054.93 hectares located in Pegat Batumbuk and Suaran Villages. Considering that land status in Suaran Village is Other Land Use, which falls under the jurisdiction of the regency government, we are advocating to the Region's Head Office to include the 850 hectares area in Suaran in the development of sustainable tiger prawn area as pilot EAA.

Total SECURE ponds spans a total of 120 hectares in the three villages composed of 19.07 hectares cultivation area, 52.76 hectares mangrove restoration area, and 50.56 hectares protected intact mangrove areas. Cultivation has begun with varying cycles in 9 ponds provisioned with technical assistance, external experts, and pond materials. Within these ponds, designs of mangrove restoration plots have been improved to allow for natural regeneration as described in Section 3.1.

Output 3: At the completion of the project (2025) the income of people working in shrimp aquaculture, mangrove ecotourism, and mangrove-based household industries in the 3 target villages is increased by 15% (compared to baseline)

The second socio-economic survey conducted showed an increase of 12% in household income for aquaculture families and an average 40% increase for women's groups, compared to the Year 1 baseline. This resulted from continuous assistance and capacity development provided by YKAN and from increased shrimp production in non-SECURE ponds as detailed in Section 3.1.

3.3 Progress towards the project Outcome

The second year of the project provides confidence toward achievement of project's intended outcome. For the 15,000 hectares mangrove management and conservation plan (indicator 0.1), to date YKAN has managed to establish a total of 25,748.89 hectares at village level (details in Section 3.1.). We are currently continuing to advocate for adoption of 850 hectares in Suaran Village as EAA-managed area and are managing a total of 120 hectares SECURE ponds that already implements EAA principles.

In the second-year analysis, we found many growths of saplings and trees with higher rate of growth for trees than that of saplings. Overall, the average value of mangrove height has increased at all observation stations. However, there was some decrease in the average mangrove diameter at several stations due to dead trees, especially saplings. Baseline study on the richness of mangrove flora and fauna has been completed at the beginning of the project and will be compared with assessment by end of the project (indicator 0.3).

Positive results are also shown in the livelihood of village communities living within the mangrove ecosystem with increased average income of 12% for aquaculture farmers and improved non-timber mangrove-based businesses of the women's groups that translated into an average increase of 40% additional income for them (indicator 0.4).

3.4 Monitoring of assumptions

Assumption 1: No negative effects from forest fires or natural disasters including pandemic in site locations / There is no drastic change of the ecosystems due to man-made or natural disasters such as forest fire, storm, or tsunami that affect wide scale habitat the aquatic biota and key species.

Comments: Thus far no natural or pandemic events occurred except for occasional bad weather and high tides that hampers in-field work. We are constantly monitoring the weather and adapt a flexible working approach particularly for working on the project sites works where the tide and weather can change by the hour.

Assumption 2: Continued support of Government policies for mangrove conservation following Provincial government elections scheduled during this project's timeframe. An active communication with the government in charge is needed to ensure the new government will have a consistent policy with the previous administration

Comments: Political and policy changes may occur post the Elections in February 2024 and new cabinet that will be appointed in October 2024. However, Indonesia will still be mandated to fulfill its NDC commitments. Additionally, each region has a conservation mandate and targets from the central government (NDC and regional FOLU Net Sink) which will allow the project objectives to be pursued despite any leadership changes. This may potentially delay some works, especially reflecting on regulatory changes in the past that can occur promptly. Project will use the time to follow any changes and remain close relations with its government partners.

Assumption 3: Continued community commitment and engagement

Comments: YKAN/TNC has a long standing and strong presence in East Kalimantan and have gained the trust from both the regional government as well as the communities. In this project we also engage facilitators from the local communities that support building strong relationships and engagement with the community. It has also already become clear that these facilitators become local champions and thus continue promoting and advocating our cause as evident from expansion of SECURE ponds and strong livelihood programs.

Assumption 4: The government successfully provided a clear regulation and mechanisms on carbon financing for both domestic and international markets. To anticipate the slow legislation process, this project will also seek potential of voluntary carbon market.

Comment: Albeit regulations on carbon trading has been established, implementation is still very minimalistic. A particular concern for the Ministry of Forestry and Environment is the development of sound methodology. Current international standards have not been adopted by the government. In East Kalimantan, current Result-Based Payment (RBP) program from the World Bank will soon cease. YKAN has started conversation and workshop of post RBP with East Kalimantan Provincial Government to introduce community-based carbon project ideas.

Assumption 5: At least 70% of community members reliant on shrimp aquaculture and mangrove-based industries for income are able to attend training courses.

Comment: Total participants attended Field School is 172 people from three villages with varying attendance on each of the session, depending on farmer's activity.

Assumption 6: The economic situation, especially shrimp global demand, not disrupted by disasters such as pandemic or regional conflicts. To anticipate and minimise the impact on community's income, the project should invest also on market and product diversification.

Comment: The project is also promoting and supporting alternative mangrove-based livelihoods through value added products such as milkfish crackers, milkfish floss, and ecotourism to diversify income sources. At the moment, we are looking for partners who have experience in similar shrimp aquaculture business to link us to new potential markets for SECURE shrimp.

3.5 Impact: achievement of positive impact on biodiversity and poverty reduction

Project Intended Impact: Biodiversity threats halted, poverty reduced and long-term climate changed impacts mitigated in mangrove ecosystems in Berau Regency, East Kalimantan, Indonesia

Reflecting on YKAN's experience and results of mangrove conservation and restoration implemented in our Jakarta site—a 5-year project—that has seen evidence of improved mangrove diversity and improved fauna species, we believe the project in East Kalimantan will also yield the same results, given sufficient time for these changes to happen.

Employing Ecological Mangrove Restoration approach, we're not just planting trees but restoring the ecosystems to enable natural mangrove regeneration by mimicking natural processes crucial for a healthy mangrove ecosystem. This approach is designed to empower local communities to both restore and sustainably manage their mangroves beyond the project timeframe. Communities learn the value of their mangroves and how to steward them responsibly, addressing the underlying issues that lead to mangrove degradation and we have witnessed this internalization in our assisted communities.

Noting that around 83% of mangrove loss in Indonesia is due to aquaculture expansion, YKAN developed mangrove restoration and shrimp carbon aquaculture programme (SECURE). The project primarily seeks to improve shrimp aquaculture practices that are not environmentally friendly by increasing productivity that corresponds to increased income. We also support income diversification by supporting women groups with value added products from fish harvest. Feedback from the women groups showed that they gained extra income that helps support their families, albeit not yet at scale.

SECURE model also reconverts portions of the existing shrimp ponds back to mangrove and protects intact mangroves from potential land clearing, leading to restored mangrove ecosystems as vital habitats for countless species, reduced carbon emissions (each hectare of mangrove forest can store 3 to 5 times more carbon than terrestrial forests), reduce risks as intact mangroves can decrease wave energy by up to 75%, protecting coastal communities from storm surges, and improve surrounding estuary and waters from mangrove's root systems that acts as natural water filtration from pollutants. Results from two years of the project show positive conclusions to support these premises.

4. Project support to the Conventions, Treaties or Agreements

Ecosystem-based approaches utilized in this project have resulted in mangrove protection, management, and restoration plans as well as actions as detailed in Section 3. These climate mitigation and adaptation actions through improved mangrove management can support global and national obligations such as sustainable use of natural resources & halting & reversing decline of nature by 2030 as laid out in the Post-2020 Global Biodiversity Framework; Indonesia's NDC; Paris Agreement; and the SDG 13, 14 and 15 targets. Specifically, the project directly tackles SDG14 targets through mangrove restoration and improved aquaculture practices (Target 14.2), assisting communities to sustainably manage and conserve coastal areas (Target 14.5), and increases economic benefits through capacity building of environmentally friendly aquaculture, mangrove ecotourism and non-timber household industries (Target 14.7).

Improvement in mangrove habitat links to the protection of migratory water birds under the Convention of the Conservation of Migratory Species of Wild Animals as result of the project works can support Ramsar targets 3,9,12 and 13 as well as Indonesia's commitment to the Convention on Biological Diversity (CBD) presented in the Indonesian Biodiversity Strategy and Action Plan (IBSAP).

Economic and social incentives for local communities to support conservation agenda is embedded in the project through community engagement and awareness, including women and women groups of whom are very active in shrimp aquaculture post-harvest activities, to empower them to protect and restore mangroves and to develop alternative sustainable livelihoods. Our works with village women groups and community-led ecotourism explained in Section 3 above supports SDG 1 and 5. SDG Targets 1.4, 1.5 and 5a are also supported by promoting equitable businesses and integrating women's involvement in mangrove management decisions.

5. Project support for multidimensional poverty reduction

In Berau, over 5% of the population live in extreme poverty relying heavily on shrimp aquaculture for their subsistence with few other alternative livelihoods available to them. In the second year of the project, as detailed in Section 3 above, we are seeing an increased of income in aquaculture farmers and women groups. With continuous improvements to aquaculture practices and YKAN's efforts to enhance market appreciation for SECURE shrimps, we anticipate further income growth for shrimp farmers. YKAN is also dedicated to advancing women's micro-businesses by diversifying products, enhancing organizational and operational efficiency, and expanding market access through various channels.

YKAN also supports the aspiring Teluk Semanting Eco Tourism with trainings and facilitating networks as well as potential funding to enhance and sustain their business. The success of Teluk Semanting Eco Tourism will have a snowball effect to the village, particularly women groups with their micro business and catering services as well as the youth involved in the Eco Tourism.

6. Gender Equality and Social Inclusion (GESI)

Please quantify the proportion of women on the Project Board[1].	75% 6 out of 8 YKAN's Board members for this project are women
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women[2].	100% Our partners, University of Mulawarman and University of Leeds teams, are both headed by women.

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project	

[1] A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

[2] Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

	addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	X
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

While we're working with the men on their SECURE ponds, on another hand, we are focusing on empowering women by training them to produce and market non-timber mangrove-based products, such as crackers, milkfish floss and *amplang*. These initiatives not only open new income stream for them and their family, but also foster a sense of independence among the women.

Women are particularly active in the post-harvest activities including shrimp fry and feed collection, and storage and processing. Despite women's significant contribution to shrimp farming, Indonesian gender norms view women's primary role as domestic caregivers, so are typically only hired as casual workers creating barriers to their engagement to decision making in this industry.

Our gender responsive alternative livelihood programme exclusively targets women groups in the three villages through provision of development of 10 non-timber mangrove-based products. To date, the programme has been well received by the women groups and we hope to see more good news throughout the project especially with the increased additional income and stronger association created from the business (evidence provided in MOV and details explained in Section 3).

7. Monitoring and evaluation

In mid-2023, YKAN refreshed the Theory of Change for each of its division, following The Nature Conservancy's guidance who is YKAN's key partner. The SECURE program with its mangrove conservation falls under the Coastal Resilience Strategy and the livelihood improvement falls under the Blue Economy Strategy. The updated Theory of Change lays a foundation toward long-term YKAN's 2030 goals beyond project results.

On a regular basis, YKAN has an overall dashboard that keeps track of each indicator and the overall project progress. This dashboard is linked to staff KPI and performance. Additionally, we have set up communication and reporting lines to allow timely and more accurate updates from the pond level to project outcomes. These came in the form of: (1) Monthly monitoring for internal purpose; (2) Adaptive management, regular meetings and additional when needed to respond dynamics in the field, including evaluating and capturing project successes and learnings; (3) Data collection and on-site monitoring; (4) Project dashboard updating; and (5) YKAN's Senior Manager Team (SMT) and Indonesia Leadership Team (ILT) reviews and reports. With our partner, University of Mulawarman, we organized briefing sessions both on programmatic and admin-finance aspects. The same will be done with University of Leeds. Both partners are monitoring progress within their scope of work and submit progress reports to YKAN accordingly to the timetable that has been set and jointly agreed. We also have a WhatsApp Group dedicated for fluid communication (WhatsApp is a big communication tool in Indonesia, used even as formal platform by government). Thus far these methods work fine for us.

We are monitoring our progress against these indicators described in Section 3 of this report:

Biodiversity	
Mangrove hectare	To monitor areas restored back to mangrove (linked to benefits of mangroves)
Mangrove density	To monitor healthiness, survival rate, and success of restoration (linked to benefits of mangroves)
eDNA test results	To trace species, avifauna, and other animals that depend on mangrove ecosystem
Soil carbon	To measure and monitor climate change mitigation and carbon sequestration in our projects as evidence for conservation actions. In future, we hope to valuate this and prepare a feasibility study for potential carbon credits.
GHG emission	
Livelihood	
Shrimp harvest (productivity)	To develop appropriate aquaculture production model and practices and evidence for improved livelihood as measured by harvest per hectare
Social economic data	To monitor and check impacts of the project to community welfare. This database has just started to be collected and will be collected yearly to see if the project contributes to community welfare

8. Lessons learnt

Having local facilitators embedded in the villages proves to be very helpful in building relationship and commitments. Most importantly, it creates trust between village government and the community and YKAN. The project implementation means reaching out and engaging with each individual shrimp farmer/pond owner (they don't have one central representative organisation). Our SIGAP process has been a great guiding process for this as it provides constant and regular coordination, updates, and relationship with pond owners, including negotiation for them to join in agreement to implement SECURE. Nonetheless, decision to join SECURE depends also on cultivation timetable of individual ponds so although farmers wanted to join SECURE, they may refrain until their aquaculture cycle is completed.

During project implementation, we found that pond design, particularly for mangrove restoration plots, needed to be improved while at the same time does not disturb the neighboring aquaculture plot. We conducted ground and aerial survey to determine the most suitable restoration method that improves hydrology and nurture mangrove growth. We expect this improvement will further expedite the success of mangrove restoration.

A number of challenges occurred in cultivation ponds such as water gate repair needs, leaks in pond embankments, and attack of devil grass. Continuous monitoring and prompt deployment of teams to the ponds are organized, however, it is difficult for teams to stay at the pond house for long period of time considering there is no electricity and limited clean water. We have put up solar panels on the pond house albeit with limited power supply.

There has also been delays in recruitment of expert from University of Leeds resulting in some activities being pushed back. A change request has been submitted to revise Leeds' second year budget. Fortunately, there is an effective collaboration between Leeds and YKAN teams, owing to similar interests and passion particularly on spatial delineation and exchange of ideas.

University of Mulawarman faced setbacks due to challenges in analysing biodiversity data collected in the first sampling. University of Mulawarman, in collaboration with a researcher from IPB University, is addressing these issues. Nevertheless, the data's overall quality remains commendable. It's not uncommon to encounter technical hiccups in environmental DNA data analysis, especially during the project's initial phases and lab setup. As the project progresses, challenges related to lab techniques and bioinformatics analysis will be resolved.

9. Actions taken in response to previous reviews (if applicable)

29-029 Feedback to Annual Report 1 Review

Review Comment 1: *It has been noted that the partnerships with the two universities were delayed due to legal and administrative processes. It would be helpful to understand what caused these extensive delays and whether this is expected to have any impact on the overall performance of the project – particularly the submission of the management plans under Output 1. Given that the partnership with the University of Leeds was not agreed until March 2023, it would be helpful if the project could comment on when the management plans (15,000 ha) are expected to be submitted to the Regency Government and how this delay is expected to impact overall performance of the project.*

Response:
Delays of subaward agreement to university partners were caused by a number of factors, including:

- Sabbatical leave of our main partner contact (Leeds University) just after kick-off meeting in August.
- Longer internal administrative process at the University of Mulawarman by adding another agreement (an MoU) required by the university initial basis prior to granting process.
- Late onboarding of YKAN staff that is responsible for this work. The post was advertised in October 2021 with unsuccessful results. The post was only filled in October 2022.
- Many review points to go through in different departments to provide information, draft the agreement, reviews, and legal endorsement took over 1 month each time (applies to YKAN, Leeds University, and University of Mulawarman). Extra delay observed during long holiday break in December and January.

Action:
The project had anticipated the spatial planning work that leads to initial draft of management plan to be completed by end of Year 1. The works with University of Mulawarman was on target and on time except for the biodiversity analysis due to lengthy import complications of reagent for lab processing. While works with University of Leeds was expected to start in May 2023, however due to unavailability of schedules, the works did not pick up until June 2023. It is anticipated that the draft spatial planning would be made available for local stakeholders' discussions by February/March 2024. Note: By the time this report is written, the draft spatial planning has been developed but public consultation was delayed due to conflicting schedules with village government and unfavorable weather (high tides).

YKAN is well positioned to support the Government of Berau with its longstanding presence in the regent and close relationship with the government. Albeit delays in the development of management plans, YKAN continues consultation with government partners to prepare for such mangrove plans agenda. We believe the delay will not affect the overall project objectives.

Review Comment 2: *It seems that the project has confused Section 14 Safeguarding with a request for information about Health and Safety policies and procedures. Please can you comment on whether the information provided is in relation to the organisation's safeguarding protocol, and if not, provide an updated response to Section 14.*

Response:
Below is the updated Section 14 of Annual Report on Safeguarding.

Has your Safeguarding Policy been updated in the past 12 months?	Yes/~~No~~
Have any concerns been investigated in the past 12 months	~~Yes~~/No
Does your project have a Safeguarding focal point?	Yes/~~No~~ Environmental & Social Management System Focal Point: Laksmi [redacted]

	Gender Focal Point: Hilda [redacted] Safety & Security Focal Point: Rizya [redacted] Ethics Focal Point: Kurniawan [redacted]
Has the focal point attended any formal training in the last 12 months?	Yes/~~No~~
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 32 Planned: 58

Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.

- No major safeguarding challenges observed during project implementation.
- Lessons learnt from working with women groups: Our gender responsive livelihood programme within the project explicitly targets women and/or women's groups, without which, the women would not have additional income nor other significant economic activities. The project strengthens women association as testified them during a monitoring visit. Although not yet in scale, they have seen increases in their income and were very proud to say that they have extra income to provide for the family and even to treat their husbands. To us, the empowerment they felt is an alleviation beyond mere poverty measures.

Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.

- YKAN recently organized training for gender programming for all YKAN staff.
- Currently, the Environmental & Social Management System Guidelines of YKAN are being reviewed by external expert to be updated to ensure it is still relevant. Once final, YKAN plans to organize training to staff on the updated Environmental & Social Management System.

10. Risk Management

We are monitoring risks with most updated risk mitigations compiled as below table:

Risk	Likelihood	Impact	Mitigation
Pond owners reluctant to join the program	Medium	High	▪ YKAN Berau team has close ties with communities including having village facilitators for close communications with pond owners ▪ Tailored agreements with each pond owners based on mutual interests ▪ Continue looking and assessing potential ponds and strengthen relationships with villagers ▪ Invite pond owners to participate in the field school
Natural hazards such as high tides, unfavorable weather, or government restrictions	Medium	High	▪ Implement agile and adaptive management approaches ▪ Monitor weather and schedule activities accordingly to minimize effects
Production failures due to various reasons	Medium	High	▪ YKAN's research on productivity function remains strong ▪ Engage experts such as from BBPBAP Jepara in brackish aquaculture ▪ Develop guidelines on the management and implementation of SECURE ▪ Conduct research on seeds, fertilizers, water quality and other environmental factors contributing to harvests (incl. treatments)
Changes in Berau/East Kalimantan development priorities	Low	High	▪ Involve local governments closely ▪ Assist local government in developing policies/regulations on mangrove-aquaculture
Uncertainty of government regulations on carbon	High	Low	▪ Keep project updated with regulations, methodologies, and verification methods adopted by GoI ▪ As the project is only building its carbon case/proof and not aiming for carbon trading, this has less impact politically or reputationally with MoEF

Of the risks mentioned in above table, we initially had 13 farmers expressed interest to join our program (total 103 hectares) and this year we can confirm 10 farmers of which their ponds have

been redesigned and reconstructed (total 120 hectares). Decision to join SECURE depends on cultivation timetable of individual ponds so although farmers wanted to join SECURE, they may refrain until their aquaculture cycle is completed.

We experience high tides in the first quarter in 2024 with new reports of boat accidents. YKAN team consistently monitor tide changes and always prioritize safety despite demanding work timetable. It proved useful to have local facilitators in each of the village.

Updated risk framework attached.

10. Sustainability and legacy

SECURE program is gaining interest from a number of organizations. SECURE model with its application on traditional ponds garnered interests as the areas where these traditional ponds are notorious for mangrove loss and prone to the impacts of climate change. YKAN has been invited to share its SECURE method and approach on national platform at Ministry's event as well as small group discussion with fellow NGOs even with private sectors such as Jawa Power, Temasek Foundation, Earth Security, and Asia Community Foundation.

As one of the very few organizations promoting EAA, YKAN has been added as one of the developers for Program Outlines and Teaching Materials for EAA training in Indonesia. This will also be an exit strategy of the program upon uptake of EAA by District Government and by Farmer Groups at the village level.

Our mangrove restoration method has also served as a learning material by private sector such as HSBC and Chevron that potentially inspire them to adopt ecological mangrove restoration as opposed to mere planting activities in their CSR or other environmental programs.

11. Darwin Initiative identity

Our project transparently communicates Darwin's support to our government counterparts (Berau Regency Office, Berau Fisheries Agency, East Kalimantan Marine and Fisheries Agency, and East Kalimantan Environmental Agency) and stakeholders we work with. We include partners' logos (such as the Darwin Initiative) in our backdrops during events, mention partners' support in our remarks to allow our stakeholders to identify Darwin and other donors we work with.

A Learning and Communications Officer has been hired to ensure the identity of Darwin will be embedded in our activities such as placement of Darwin's logo, to produce press releases, and other communication activities/materials. SECURE page under YKAN's website has also mentioned Darwin as one of its partners.

Additionally, the project facilitated courtesy meeting of DEFRA's International Biodiversity and Climate Director with Head of Berau Regency on 22 July 2023. Some coverage of the meeting is listed below:

- https://suaraberau.com/kerja-sama-bupati-berau-dan-pemerintah-inggris-upaya-menjaga-hutan-dan-melestarikan-mangrove-kabupaten-berau/?amp=1
- https://busam.id/bupati-berau-dapat-kunjungan-tim-defra-dan-ykan-jakarta-dan-berau/
- https://mediakaltim.com/komitmen-lindungi-ekosistem-mangrove-di-pesisir-berau/
- https://lensaku.id/2023/07/23/kementrian-lingkungan-hidup-inggris-apresiasi-pemkab-berau-dalam-menjaga-lingkungan-hidup/
- https://nomorsatuutara.com/apresiasi-komitmen-pemkab-berau/
- https://benuanta.co.id/index.php/2023/07/24/bupati-berau-terima-kunjungan-tamu-tim-defra-uk-dan-ykan/117356/17/04/14/
- https://www.instagram.com/p/Cu_5BCdrSuW/?igshid=MzRlODBiNWFIZA==
- https://www.instagram.com/p/Cu_IxNGJott/
- https://www.instagram.com/p/Cu_IxNGJott/?img_index=3

12. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	~~Yes~~/No
Have any concerns been reported in the past 12 months	~~Yes~~/No
Does your project have a Safeguarding focal point?	Yes/~~No~~ Environmental & Social Management System Focal Point: Yudi [redacted] Gender Focal Point: Hilda [redacted] Safety & Security Focal Point: Rizya [redacted] Ethics Focal Point: Kurniawan [redacted]
Has the focal point attended any formal training in the last 12 months?	Yes/~~No~~ 1. Gender Training: 2. Safety and Emergency Aid: 3. Mandatory annual Ethics & Compliance course:
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 30% [15/year] Planned: 30% [15/year]

Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.

No major safeguarding challenges observed during project implementation.

Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.

YKAN has annual ethics and compliance training. In addition, we also have periodical gender session, workplace and culture session, as well as sharing sessions from the field for cross learning about safeguard and working with communities.

Please describe any community sensitisation that has taken place over the past 12 months; include topics covered and number of participants.

1. On June 20, 2023, YKAN facilitated the formation of a Working Group for village mangrove protection, management, and restoration attended by 20 participants (8 women and 12 men). This triggered a sense of ownership and leadership that they can be the drivers to safeguard mangroves in their village. The Group voluntarily created a WhatsApp Group and actively engaged in updates and progress.
2. One of the capacity needs assessed for mangrove management human resources that was conducted in May to June 2023 explored the motivation of key actors to safeguard mangrove. The participants provided reflections on how mangrove ecosystem can prevent land abrasion close to their homes and the economic benefits they can gain from restoration activities.
3. Training of Trainers for Field School implemented on July 21-24, 2023, participated by 20 people conducted with engaging and fun methods proved to increase their know-how about mangrove protection and restoration and further increase their confidence to support farmers during Filed School implementation.
4. From November 28, 2023 to December 1, 2023, representatives from the three villages (16 men and 6 women) participated in a workshop to develop mangrove management and protection plans. We observed their active participation as expression of ownership and understanding of the importance of mangroves to their lives.
5. The list of exhibition and expo for women groups' products listed in Section 3 notably increased their confidence and aspiration to seriously pursue this business, especially since

they have enjoyed additional income and a sense of independence personally and as a group with other women.
Have there been any concerns around Health, Safety and Security of your project over the past year? If yes, please outline how this was resolved. One of YKAN's critical attention is on safety considering our project sites are mainly on remote and challenging areas. During one of the field works, a team member was stuck on a boat due to engine failure during high tide. Our communication tree was executed, and staff was picked up and transported to safer island before returning to base island. When needed, YKAN can send a rescue boat or even helicopter depending on the situation.

13. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2023 – 31 March 2024)

Project spend (indicative) since last Annual Report	2023/24 Grant (£)	2023/24 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	[redacted]			
Consultancy costs				Underspent in the consultancy derived from project team managed to negotiate better price for bundled works.
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL	**215,689.35**	**208,200.05**		

Table 2: Project mobilised or matched funding during the reporting period (1 April 2023 – 31 March 2024)

	Secured to date	Expected by end of project	Sources
Matched funding leveraged by the partners to deliver the project (£)	[redacted]		Philanthropy and private sector
Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)	-		

11. Other comments on progress not covered elsewhere

YKAN remains alert that we need still need to validate the SECURE approach and ensure that this prototyping approach can be successful. The match funding sources supports continuous learning and research on cultivation methods and addressing field challenges, improving pond digital database, as well as measuring GHG emissions including the purchase of Lidar, high resolution drone and camera. This will feed into the feedback loop to check our assumptions, improve the SECURE model where necessary, and build evidence on project achievements and lessons learned.

12. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes.

I agree for the Biodiversity Challenge Funds to edit and use the following for various promotional purposes (please leave this line in to indicate your agreement to use any material you provide here).

File Type (Image / Video / Graphic)	File Name or File Location	Caption including description, country and credit	Social media accounts and websites to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
				Yes / No
				Yes / No
				Yes / No
				Yes / No
				Yes / No

Annex 1: Report of progress and achievements against logframe for Financial Year 2023-2024

Project summary	SMART Indicators	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
Impact Biodiversity threats halted, poverty reduced and long-term climate change impacts mitigated in mangrove ecosystems in Berau Regency, East Kalimantan, Indonesia		SECURE model divides existing ponds into aquaculture and mangrove restoration areas. On the aquaculture area, we work to improve shrimp aquaculture practices that are not environmentally friendly by increasing productivity that corresponds to increased income. The restoration area is done by reconverting portions of the ponds back into mangrove and protect surrounding intact mangroves. Thanks to the restoration and protection of mangroves, the coastal areas will be more resilient against the negative impacts of climate change and natural disasters. The restored mangroves will continue to absorb CO2 and store them in the soils, and the roots will trap and filter pollutants thus improving the surrounding waters. Results from two year implementation of the project show positive conclusions to support these premises.	[redacted]
Outcome Biodiversity threats prevented from protection of 15,000ha intact mangrove forests and improved biodiversity and community income from management plans for 5,000ha of shrimp ponds in Berau Regency, East Kalimantan	0.1 By 2025, community based mangrove management plan for conservation (15,000ha) developed and implemented by village communities and Regency government, and endorsed by national Ministry of Environment & Forestry 0.2 By 2025, The Regency Government Approved the Village Governments Plan to implement an Ecosystems Approach to Aquaculture (EAA) improvement plan covering 5,000 ha	The second year of the project provides confidence toward achievement of project's intended outcome. To date, YKAN has managed to establish a total of 27,248.89 ha at village level mangement plans. We are currently continuing to advocate for adoption of 850 ha in Suaran Village as pilot EAA area and are managing a total of 120 ha SECURE ponds that already implements EAA principles.	Continue assisting the villages with their mangrove protection, management, and restoration plans as well as employing the spatial SECURE prioritization that has been developed in collaboration with University of Leeds. Continue advocating for EAA pilot in Berau Regency and promoting EAA as a way to create knowledge of Berau Regency to uptake EAA in their region.

	of shrimp ponds (including a 100ha SECURE model demonstration site) to increase overall shrimp yield whilst reducing total pond size area. 0.3 mangrove flora and fauna (e.g. mammals, water birds, aquatic biota) are stabilized in the 15,000ha protected areas and increased by at least 10% in the mosaic of restored mangroves in the 5,000ha shrimp pond/mangrove area compared to baseline study of 2022. 0.4 By 2025, the average household income of people dependent on mangrove-related livelihoods across the 3 target villages will have been increased by 15% compared to baseline study of 2022.	Against Year 1 baseline, this year we see increased in overall income of 12% for aquaculture farmers and 40% increase in additional income of the women's groups from their non-timber mangrove-based businesses.	Finalize product certifications to 2 products that has not been certified out of the 10 products, assits women groups to expand sales and market to further generate additional income for them.
Output 1. Management plans for the protection of 15,000ha of mangrove ecosystems and their biodiversity are developed, approved, and implemented through strengthened village governance capacity	1.1 By the end of the project's first year consultations with local communities in the 3 target villages attended by 60 village leaders and community representatives are completed, and management plans for the protected mangroves are submitted by the heads of the villages to the Regency Government for Approval and to the MOEF for an endorsement. 1.2 By the end of the project, the richness of mangrove tree species, mangrove-associated aquatic species, and key threatened species (e.g. Proboscis monkeys-EN, Chinese egrets-VU, Lesser adjutant stork-VU) for this target mangrove area in Berau are stabilized compared to validated baseline study. 1.3 By the end of the project, the village governments have capacity to develop policies, standards, and	In the two years to the project, YKAN's technical assistance and support have successfully established mangrove ecosystem governance and plans for Teluk Semanting Eco Tourism at 748.89 hectares and Pegat Batumbuk Village Regulation covering 25,000 hectares, totalling to 25.749 hectares. Through capacity strengthening as described in Section 3.1 above, the project supported three drafts of village mangrove management plans summing up to 27,500 hectares and two community-based mangrove management plans covering a total of 12,680 hectares. In this reporting period, we have supported the development mangrove working group in Pegat Batumbuk Village that resulted in the issuance of Village Regulation No. 5 Year 2023 on mangrove protection, management and restoration. We have also assisted the integration of mangrove management, protection and restoration into the Long-Term Development Plans of Teluk Semanting Village, Karangan Village, and Tabalar Muara Village. At community level, YKAN supported community mangrove management groups namely Village Management Institution (LPHD) Samaturu from Pegat Batumbuk Village and Tabalar Muara Lestari from Tabalar Muara Village to formulate their 2024 – 2029 Strategic Plans.	

	have a management team in place to succesfully implement the management plan for 15,000 ha of village protected mangrove forest.		
Activity 1.1 Consultations with local communities in the 3 target villages attended by 60 village leaders and community representatives are completed, and management plans for the protected mangroves are submitted by the Village Heads to the Regency Government for an approval through a Regent Decree and to the MOEF for an endorsement		YKAN is collaborating with village stakeholders and the Village Forest Management Institution (Lembaga Pengelola Hutan Desa/LPHD), initiated a Working Group for Mangrove Ecosystem Regulation in Pegat Batumbuk, which was officially recognized on World Mangrove Day, July 26, 2023, through Village Regulation No. 5 Year 2023. This regulation, which covers 25,000 ha, guides the management, protection, and restoration of mangrove ecosystems at the village level, incorporating local spatial statuses and traditional wisdom. Through the work of our university partners, we will inform village government on their spatial planning and considerations for mangrove protection and restoration. The analysis showed that 551 ponds with less than 60% existing mangrove cover will be prioritized for mangrove restoration to reach 60% coverage, while 167 ponds already exceeding this threshold will be designated for protection. Ponds ideal for restoration or protection were strategically selected to maximize ecological and economic benefits, with higher priority given to larger ponds further from riverbanks and closer to villages, minimizing operational costs and enhancing profitability. This targeted strategy ensures effective resource allocation, enhances mangrove conservation efforts and optimizes shrimp farming operations.	Village and public consultation on Village Spatial Planning to inform and advice the strategic demarcation for mangrove restoration or protection.

Activity 1.2 The richness of mangrove tree species, mangrove-associated aquatic species, and key threatened species (e.g. proboscis monkeys-EN, chinese egrets-VU, adjutant stork-VU) for this target mangrove area in Berau are stabilized compared to validated baseline study.	Using eDNA sampling methods to monitor aquatic and associated terrestrial biodiversity, University of Mulawarman collected 24 samples in October 2023 (T1 with T0 collected in January 2023), only at Pegat Batumbuk village due to delays in pond construction at the other two planned villages (Suaran and Tabalar Muara). The year-to-year comparison will be useful for enhancing biodiversity through environmental monitoring.	Conduct periodical physical-chemical characteristics of the water measurements and another eDNA sampling by collaborating university.
Activity 1.3 Village governments have capacity to develop policies, standards, and a management team to implement the management plan for 15,000 ha of village protected mangrove forest	Under this output, we also aim to build capacities of local governments and stakeholder, preceded with a capacity needs assessment conducted from May to June 2023. The result of this capacity assessment was translated into technical assistance for village governments and community mangrove management groups. YKAN has enhanced the capacity of village stakeholders in Pegat Batumbuk, Suaran, and Tabalar Muara, through on-the-job training focused on the development of Village Regulations on the Management, Protection, and Restoration of the Mangrove Ecosystem. YKAN also build capacities for the integration of mangrove management, protection, and restoration into the Long-Term Development Plans of Teluk Semanting Village, Karangan Village, and Tabalar Muara Village. At the community level, YKAN supported the Village Management Institutions—LPHD Samaturu from Pegat Batumbuk Village and Tabalar Muara Lestari from Tabalar Muara Village—in formulating their Strategic Plans for 2024 – 2029. This effort will be	Provide technical assistance and support to village governments and community mangrove management to uptake and formalize mangrove management, protection, and restoration plans.

		complemented by mangrove surveillance training organized for LPHD Samaturu in Pegat Batumbuk Village, Tabalar Muara Lestari group, and a management group in Suaran Village.	
Output 2. 10-year mangrove restoration and biodiversity improvement plan developed and approved for 5,000 ha of shrimp ponds and, a 100 ha SECURE model demonstration site (within the 5,000ha area) is established by the end of the project.	2.1 By the end of the project's second year, village authorities have developed and approved spatial and management plans for the 5,000 ha shrimp ponds using FAO's Ecosystems Approach to Aquaculture (EAA) that takes into consideration the 15,000 ha protected mangroves and village area 2.2 By the end of the project, ~80% of the 100ha SECURE model demonstration site is restored back to mangroves using hydrological or hybrid engineering restoration approaches 2.3 By the end of the project, ~20% of the 100ha SECURE model demonstration site is being managed as shrimp ponds with improved aquaculture practices, which will increase overall shrimp yield by 30% 2.4 By the end of the project, a business case for carbon finance for mangrove restoration and protection is developed and used as business proposal for carbon finance project. 2.5 By the end of the project, village authorities have the knowledge to co-manage carbon financing for the project area.	Ecosystem Approach to Aquaculture (EAA) analysis recommended a total area potential for EAA designation of 12,054.93 hectares located in Pegat Batumbuk and Suaran Villages. Considering that land status in Suaran Village is Other Land Use, which falls under the jurisdiction of the regency government, we are advocating to the Region's Head Office to include the 850 hectares area in Suaran in the development of sustainable tiger prawn area as pilot EAA. Total SECURE ponds spans a total of 120 hectares in the three villages composed of 19.07 hectares cultivation area, 52.76 hectares mangrove restoration area, and 50.56 hectares protected intact mangrove areas. Cultivation has begun with varying cycles in 9 ponds provisioned with technical assistance, external experts, and pond materials. Within these ponds, designs of mangrove restoration plots have been improved to allow for natural regeneration as described in Section 3.1. YKAN is currently conducting pre-feasibility study with first draft of the study for has been developed and final report anticipated by May 2024. We have also started communication with East Kalimantan Province Government for possible innovative financing post the Result-Based Payment the government is currently implementing.	
Activity 2.1. Village authorities develop and approve spatial and management plans for the 5,000 ha shrimp ponds using FAO's Ecosystems Approach to		In Year 1, YKAN finalized the assessment for the Ecological Approach to Aquaculture (EAA) and consulted the	Advocacy for EAA in Suaran Village as pilot to be included the sustainable

Aquaculture (EAA) that takes into consideration the 15,000 ha protected mangroves and village areas	findings with relevant agencies in Berau Regency. This year, we leveraged those findings in our advocacy for the designation of EAA areas in Berau Regency. Among the three core villages, Pegat Batumbuk, with its predominantly Production Forest area, and Suaran Village, largely classified under Other Land Use with regency-level authorization, are recommended for EAA, with a combined potential of 12,054.93 hectares. YKAN has maintained coordination with the Berau Fisheries Agency and consulted with the Directorate General of Cultivation of the Ministry of Maritime Affairs and Fisheries and are advocating for the inclusion of EAA in the sustainable development of the tiger prawn industry in Berau Regency, with a pilot area of 850 hectares in Suaran Village.	development of the tiger prawn industry in Berau Regency. Assessment of the initial status for EAA management designation, consultative meetings, development of action plan including forming of working group.
Activity 2.2. ~80% of the 100ha SECURE model demonstration site is restored back to mangroves using hydrological or hybrid engineering restoration approaches.	In this second year, the total number of confirmed SECURE ponds in the Darwin-supported program is 10 ponds, distributed across three villages: two in Tabalar Muara, six in Pegat Batumbuk, and two in Suaran. These ponds, spanning a total of 120 hectares, have been redesigned to include 19.07 hectares for cultivation, 52.76 hectares for mangrove restoration, and 50.56 hectares as protected intact mangrove areas. We have also improved pond design in SECURE area by allocating zones for natural mangrove restoration and hydrological enhancements, supported by periodic maintenance of waterways and strategic mangrove seed dispersal. These modifications aim to optimize	Finalize construction at 1 of the Suaran Village. Implement CBEMR and monitor restoration works, progress, and results.

	environmental conditions and increase sediment accumulation through innovative approaches such as double-fence bamboo barriers along riverbanks prone to abrasion. Mangrove restoration will be carried out using Community-Based Ecological Mangrove Restoration (CBEMR) approach.	
Activity 2.3 ~20% of the 100ha SECURE model demonstration site is being managed as shrimp ponds with improved aquaculture practices, which will increase overall shrimp yield by 30%.	Nine of the ten ponds are now operational, engaging in varying cycles of restoration and cultivation. One pond in Suaran is pending operational status as it undergoes embankment reconstruction and repairs to pond sluice gates. To support the cultivation process, YKAN has provided shrimp, milkfish, and mangrove crab seeds, along with essential materials such as organic fertilizer and probiotics, and standard cultivation operational equipment like harvesting tools. YKAN facilitators, stationed in each village along with external experts from the tiger prawn industry, guide the farmers through the cultivation process.	Continue provision of materials and technical expertise for community, implementation of aquaculture field school. Monitor, tabulate, and analyze shrimp pond yields and productivity.
Activity 2.4 A business case for carbon finance for mangrove restoration and protection is developed and used as business proposal for carbon finance project.	A second vegetation analysis conducted in February 2024 across 12 stations, utilizing a permanent transect already deployed in the first visit for comparable results. The analysis reaffirmed the robust growth and increased biomass of the mangrove ecosystems, with an average potential carbon storage of 32.04 tons per hectare. The first draft of the pre-feasibility study for a carbon project has been developed, with the final report anticipated by May 2024.	Conduct third vegetation analysis and calculate biomass. Finalize carbon project pre-feasibility study.

Activity 2.5 Village authorities have the knowledge and capacity to manage carbon financing for the project area		YKAN has initiated communication with East Kalimantan Province Government for possible innovative financing options post the Result-Based Payment the government is currently implementing.	Follow up with East Kalimantan Province Government on financing options or incentives for conservation. Conduct regency and village level capacity event on carbon financing or other financing options.
Output 3. At the completion of the project (2025) the income of people working in shrimp aquaculture, mangrove ecotourism, and mangrove-based household industries in the 3 target villages is increased by 15% (compared to baseline).	3.1 By the end of the project's first year, 100 selected households (400 persons, with at least 50% women) are trained in new practices in environmentally-friendly shrimp aquaculture, mangrove ecotourism, and non-timber mangrove-based household industry development. 3.2 By the end of the project, products produced by workers with mangrove-based livelihoods in at least two aquaculture ponds will meet the requirements for national and globally recognized certifications, (.e., Aquaculture Stewardship Council (ASC), Halal, and Indonesia Good Manufacturing Practices (GMP) improving the product value and quantity, with a broader access to markets.	The second socio-economic survey conducted showed an increase in overall household income by 12% in average for aquaculture families and an average 40% increase for women's groups, compared to the Year 1 baseline. This resulted from continuous assistance and capacity development provided by YKAN to a total of 106 women and 32 male participants. Out of the number of people reporting increase of income, 48.8% are women. Assisted by YKAN, women's groups have developed 10 products, with 9 receiving a Home Industry License and 8 obtaining Halal certification.	
Activity 3.1 100 selected households (400 persons, with at least 50% women) are trained in new practices in environmentally-friendly shrimp aquaculture, mangrove ecotourism, and non-timber mangrove-based household industry development.		YKAN works to maintain and improve the incomes of people in our 3 demonstration villages and those working in mangrove-based livelihoods, totalling to 138 beneficiaries. A socio-economic survey was conducted in March 2024 for the three core villages. Compared to the baseline from Year 1, there has been an average 12% increase in overall income of aquaculture farmers and an average 40% increase for women's groups. Out of the number of people reporting increase of income, 48.8% are women.	Conduct Year 3 socio-economic survey and analyse the trend. Potentially, we may need to calculate real income to factor in determinants beyond project's control. Continue support the the 5 women's group, potentially by supporting further market access and cooperation with other entities or offtakers.

	A special dedication is to advance five women's micro-businesses by diversifying products, enhancing organizational and operational efficiency, and expanding market access through various channels. The groups are: Kelompok Kerjasama Jaya, Kelompok Tenggiri 1, Kelompok Tenggiri 2, Kelompok Bandeng Laut 1, and Kelompok Ceria. Additional supported provided to Kerjasama Jaya Group, including training in product development, marketing, and financial management, as well as assistance in setting up a group bank account to facilitate digital transactions and online marketing. The Village Owned Enterprises (BUMK) are yet to fully optimize their capacity to support women's group businesses. We began by conducting a gap analysis and organizing a visioning workshop for BUMK Tabalar Muara and BUMK Bakauta Teluk Semanting. It was noted that these entities, like most other BUMKs, need to reorganize and revitalize their operations by developing and updating their statutes and bylaws, building an organizational structure with a long-term vision, and establishing good governance, particularly in management and financial systems.	
Activity 3.2 Products produced by workers with mangrove-based livelihoods in at least two aquaculture ponds will meet the requirements for national and globally recognized certifications, (i.e., Aquaculture Stewardship Council (ASC), Halal, and Indonesia Good Manufacturing Practices (GMP) improving the product value and quantity, with a broader access to markets	To enhance production of the women's groups. YKAN provided tools and equipment, with each women's group committing to set aside IDR 2,000 per package sold for equipment maintenance and group savings. Assisted by YKAN, women's groups have developed 10 products, with 9	Implementation of internship or apprenticeship program for representatives from the women's groups who produce non-timber mangrove derivative products. This on-the-job training will focus on food processing business management.

	receiving a Home Industry License and 8 obtaining Halal certification. To increase market reach, YKAN facilitated the participation of these groups in several events, including the launch of Teluk Semanting Eco Tourism on May 1, 2023, a Product Expo in Medan on May 16, 2023, the Berau Village-Owned Enterprise Expo on June 16, 2023, Expos in Jakarta and Surabaya on June 23 and September 1, 2023, respectively, a YKAN event on September 6, 2023, and the Sabah International Convention from September 22-24, 2023. We also helped develop a partnership with RUMAH BUMN Pertamina in Berau to prepare the group for the digital economy ecosystem through coaching and capacity development.	Support Kelompok Kerjasama Jaya to obtain Home Industry License and Halal certification for their products.

Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed)

Project Summary	Measurable Indicators	Means of Verification	Important Assumptions
Impact: Biodiversity threats halted, poverty reduced and long-term climate changed impacts mitigated in mangrove ecosystems in Berau Regency, East Kalimantan, Indonesia			
Outcome: Biodiversity threats prevented from protection of 15,000ha intact mangrove forests and improved biodiversity and community income from management plans for 5,000ha of shrimp ponds in Berau Regency, East Kalimantan	0.1 By 2025, community based mangrove management plan for conservation (15,000ha) developed and implemented by village communities and Regency government, and endorsed by national Ministry of Environment & Forestry	0.1.1 Spatial plan agreement signed by Berau Regency Government. 0.1.2 Endorsement letter from Ministry of Environment & Forestry received. 0.1.3 Village government decision letter delivered on the establishment of Community Surveillance unit and certificate of training completion of by the Government Fisheries Agency.	1. No negative effects from forest fires or natural disasters including pandemic in site locations. 2. Continued support of Government policies for mangrove conservation following Provincial government elections scheduled during this project's timeframe. An active comunication with the government in charge is needed to ensure the new government will have a consistent policy with the previous administration. 3. Continued community commitment and engagement.
	0.2 By 2025, The Regency Government Approved the Village Governments Plan to implement an Ecosystems Approach to Aquaculture (EAA) improvement plan covering 5,000 ha of shrimp ponds (including a 100ha SECURE model demonstration site) to increase overall shrimp yield whilst reducing total pond size area.	0.2.1 Management Plan for Ecosystem Aproach to Aquaculture (EAA) signed by Berau Regency Government. 0.2.2 Report on the SECURE Model Pond comprised of information on each shrimp pond characteristics, land ownership status, aquaculture improvement plans, and conservation agreement with the community group to manage the SECURE Model Pond	
	0.3 By 2025, the richness of mangrove flora and fauna (e.g. mammals, water birds, aquatic biota) are stabilized in the 15,000ha protected areas and increased by at least 10% in the mosaic of restored mangroves in the 5,000ha shrimp pond/mangrove area compared to baseline study of 2022.	0.3 Annual biodiversity status reports comprise of species count, population, distribution, threats, and recommendation, shared to Indonesia's Biodiversity Strategy and Action Plan (IBSAP) team to be included in the IBSAP development process.	
	0.4 By 2025, the average household income of people dependent on mangrove-related livelihoods across the 3 target villages will have been increased by 15%	0.4 Number of poor households from Indonesia's Statistical Agency (BPS) data combined with household interviews (collected	

	compared to baseline study of 2022.	before and after project intervention).	
Outputs: **1**. Management plans for the protection of 15,000ha of mangrove ecosystems and their biodiversity are developed, approved, and implemented through strengthened village governance capacity	1.1 By the end of the project's first year consultations with local communities in the 3 target villages attended by 60 village leaders and community representatives are completed, and management plans for the protected mangroves are submitted by the heads of the villages to the Regency Government for Approval and to the MOEF for an endorsement. *Interim target: not relevant.*	1.1.1 Workshop Report comprise of minutes of consultation workshops conducted within the 3 target villages, list of attendees, are documented and include boundary map of the 15,000 ha protected area which available for public view in the village offices. 1.1.2 Villages management plans for the protection of 15,000 ha of mangroves, proposed by village government, approved by Regency Government with The MOEF's endorsement.	1. Consistent government policy to protect the mangroves following Provincial government elections scheduled during this project's timeframe. An active comunication with the government in charge is needed to ensure the consistent policy to support better protection of mangrove through aquaculture improvement. 2. There is no drastic change of the ecosystems due to man-made or natural disasters such as forest fire, storm, or tsunami that affect wide scale habitat the aquatic biota and key species.
	1.2 By the end of the project, the richness of mangrove tree species, mangrove-associated aquatic species, and key threatened species (e.g. Proboscis monkeys-EN, Chinese egrets-VU, Lesser adjutant stork-VU) for this target mangrove area in Berau are stabilized compared to validated baseline study. *Interim target: By the end of Project's first year, baseline study is available*.	1.2 Mangrove species biodiversity project report including the use of environmental DNA to check aquatic and associated terrestrial biodiversity, and validation of baseline measures from existing studies for threatened and indicator mangrove species is produced and submitted for peer-reviewed journal for publication by the end of the project.	
	1.3 By the end of the project, the village governments have capacity to develop policies, standards, and have a management team in place to succesfully implement the management plan for 15,000 ha of village protected mangrove forest. *Interim target, by the end of Project's second year, the Community Surveillanve Unit is established.*	1.3 The village government issued mangrove protection standard operating procedures, and established Community Surveillance Unit for mangroves for protection comprised of 30 mangrove rangers.	

2. 10-year mangrove restoration and biodiversity improvement plan developed and approved for 5,000 ha of shrimp ponds and, a 100 ha SECURE model demonstration site (within the 5,000ha area) is established by the end of the project.	2.1 By the end of the project's second year, village authorities have developed and approved spatial and management plans for the 5,000 ha shrimp ponds using FAO's Ecosystems Approach to Aquaculture (EAA) that takes into consideration the 15,000 ha protected mangroves and village area *Interim target: not relevant.*	2.1.1 The Village Government's Spatial and Management plans using Ecosystem Aproach to Aquaculture approved and signed by Berau Regency Government 2.1.2 Scientific project report of potential CO2e emissions reduction/increase after the modification of shrimp ponds by the Project. The results submitted for peer-reviewed journal publication.	1. Consistent government policy to protect mangroves following Provincial government elections scheduled during this project's timeframe. 2. No natural disasters (e.g. forest fires, floods, storms, coastal erosion) that damage the aquaculture ponds. 3. The government succesfully provided a clear regulation and mechanisms on carbon financing for both domestic and international markets. To anticipate the slow legislation process, this project will also seek potential of voluntary carbon market.
	2.2 By the end of the project, ~80% of the 100ha SECURE model demonstration site is restored back to mangroves using hydrological or hybrid engineering restoration approaches Interim target: by the end of the Project's first year, the pond redesign and restoration plan for the 100 ha ponds are available.	2.2. Satellite imagery analysis of 100ha SECURE model demonstration site combined with ground mangrove biodiversity and population survey, to measure the success of mangrove restoration.	
	2.3 By the end of the project, ~20% of the 100ha SECURE model demonstration site is being managed as shrimp ponds with improved aquaculture practices, which will increase overall shrimp yield by 30% *Interim target: by the end of Project's second year, all 100 SECURE ponds have been operating with harvest equal to business as usual productivity.*	2.3.1 SECURE model ponds Performance Report comprised of annual shrimp yield and production costs, submitted for peer-reviewed journal publication. 2.3.2 Training Report comprised of attendance reports, before and after knowledge test of the training sessions at the Aquaculture Field School (Sekolah Lapang Perikanan) at the 100ha SECURE demonstration site.	
	2.4 By the end of the project, a business case for carbon finance for mangrove restoration and protection is developed and used as business proposal for carbon finance project.	2.4 Analysis report of the viability of carbon financing through the projection of carbon emission reduction potential, carbon price, shrimp production increased, and project costs to establish the SECURE ponds	

	Interim target: by the end of Project's second year the business case team has finalised the first draft of the business case.		
	2.5 By the end of the project, village authorities have the knowledge to co-manage carbon financing for the project area. *Interim target: By the end of Project's second year, village authority has finalised carbon financing training.*	2.5Training report with before and after knowledge test for local authorities attendees for capacity building sessions for the available carbon financing mechanisms	
3. At the completion of the project (2025) the income of people working in shrimp aquaculture, mangrove ecotourism, and mangrove-based household industries in the 3 target villages is increased by 15% (compared to baseline).	3.1 By the end of the project's first year, 100 selected households (400 persons, with at least 50% women) are trained in new practices in environmentally-friendly shrimp aquaculture, mangrove ecotourism, and non-timber mangrove-based household industry development. *Interim target: By the end of Project's first year, the team has identified households/ candidates for training activties.*	3.1 .1 List of training attendees and their knowledge surveys performed at commencement and end of training sessions (gender dissagregated) on shrimp aquaculture, mangrove ecotourism, and mangrove-based household industry development. 3.1.2 Household income monitoring survey report completed and combined with Indonesia's Statistical Agency (BPS) data.	1. At least 70% of community members reliant on shrimp aquaculture and mangrove-based industries for income are able to attend training courses. 2. The environmental quality is not drastically changed due to the occurrence of man-made or natural disasters such as an oil spills, floods, and tsunami that make aquaculture not feasible in Berau. 3. The economic situation, especially shrimp global demand, not disrupted by disasters such as pandemic or regional conflicts. To anticipate and minimise the impact on community's income, the project should invest also on market and product diversification
	3.2 By the end of the project, products produced by workers with mangrove-based livelihoods in at least two aquaculture ponds will meet the requirements for national and globally recognized certifications, (.e., Aquaculture Stewardship Council (ASC), Halal, and Indonesia Good Manufacturing Practices (GMP) improving the product value and quantity, with a broader access to markets.	3.2 Two model aquaculture ponds receive eco-certification (anticipated to be ASC) and at least 10 products halal and GMP certified.	

	Interim target: by the end of Project's second year, Aquaculture Improvement Plan to meet the certification requirement for the two ponds has been available and implemented.		

Activities

Output 1. Management plans for the protection of 15,000ha of mangrove ecosystem and their biodiversity are developed, approved, and implemented through strengthened village governance capacity.

Indicator 1.1 By the end of the project's second year consultations with local communities in the 3 target villages attended by 60 village leaders and community representatives are completed, and management plans for the protected mangroves are submitted by the Village Heads to the Regency Government for an approval through a Regent Decree and to the MOEF for an endorsement.

1.1.1 YKAN's Field Coordinators implement SIGAP (Communities Inspiring Actions for Change) approach through a live-in community facilitation to develop management plans for the protection of 15,000-ha intact mangroves. The coordinators will convene monthly community meetings in each village, facilitate discussion and provide technical advice based on YKAN's past experience (e.g. in the Bird's Head Seascape) regarding the demarcation, zoning, and management plan of a protected area. The meetings will be attended by min. 20 community representatives in each village, total 60 people for 3 villages.

1.1.2 YKAN with technical support from collaborating partners (University of Leeds and Mulawarman University) will assist the SIGAP process with GIS spatial analysis for demarcation, zoning, and produce preliminary management plans comprised of biodiversity status and conservation actions, sustainable harvest of the non-timber products of the protected mangroves, and communication and monitoring.

1.1.3 YKAN will facilitate final workshops in each village where the Village Government formally adopt the mangrove protection management plans and submit the documents to the Regency Government and the MOEF.

1.1.4 YKAN will facilitate consultation workshops at regency and provincial levels to assist the Village Governments to secure the Regency Government approval Decree for the management plan of the Protected Mangroves and the official endorsement from the MOEF.

Indicator 1.2 By the end of the project, the richness of mangrove tree species, mangrove-associated aquatic species, and key threatened species (e.g. proboscis monkeys-EN, chinese egrets-VU, adjutant stork-VU) for this target mangrove area in Berau are stabilized compared to validated baseline study.

1.2.1 Conduct biodiversity status reports (baseline and annually) that will include biodiversity survey and analyses by the collaborating university partners (University of Leeds and Mulawarman University). We will employ the use of environmental DNA sampling methods to monitor aquatic and associated terrestrial biodiversity, and field survey methods to monitor mammal and avifauna dependent on the mangroves in this region.

1.2.2 Conduct three-monthly physical-chemical characteristics of the water measurements (by collaborating university partners) in protected 15,000 ha mangrove area, and mangrove restoration, and daily measurement for the aquaculture shrimp ponds area of the 100ha SECURE site to understand their changes from the protection and restoration of the mangroves.

1.2.3 Using the biodiversity and water quality status information, develop biodiversity spatial prioritisation and protection recommendation which will inform the development of mangrove protection management plans across the three villages.

1.2.4 Provide biodiversity status data and information to Indonesia's Ministry of National Development Planning for the development of Indonesia's Biodiversity Strategy and Action Plan.

Indicator 1.3 By the end of the project, the village governments have capacity to develop policies, standards, and a management team to implement the management plan for 15,000 ha of village protected mangrove forest.

1.3.1 Undertake capacity needs assessment in terms of both human resources and equipment, and based on the findings, develop a strategy including a training plan, curriculum, and inventory of tools to improve the capacity of the government officials and community leaders.

1.3.2 Implement training plans; this will involve 3-5 workshop sessions where YKAN will assisted the village government and community leaders to develop mangrove protection policies and standard operating procedures for mangrove management.
1.3.3 YKAN supports village governments to establish community surveillance group and conduct community outreach protection and enforcement training sessions for 15 community surveillance group members.
1.3.4 Purchasing surveillance equipment, based on capacity needs assessment, anticipated to include: radio communication, drone, GPS, binoculars.
1.3.5 Conduct pre- and post-capacity building surveys to evaluate impact of both training and improved access to equipment
1.3.6 Disseminate lessons learned and best practices for community-based mangrove protection and restoration to the wider audiences through seminars at the regency, provincial, and national level, and other types of media such as poster, leaflets, and books.

Output 2. 10-year mangrove restoration and biodiversity improvement plan developed and approved for 5,000 ha of shrimp ponds and, a SECURE model 100 ha demonstration site (within the 5,000ha area) is established.
Indicator 2.1 By the end of the project's second year, village authorities have developed and approved spatial and management plans for the 5,000 ha shrimp ponds using FAO's Ecosystems Approach to Aquaculture (EAA) that takes into consideration the 15,000 ha protected mangroves and village areas.
2.1.1 YKAN will conduct carrying capacity analysis for shrimp aquaculture in the three villages using biodiversity and water quality information from 1.2 and develop preliminary plans for EAA development in the three villages.
2.1.2 Parallel with the 1.1 activities, Field Coordinators, with YKAN technical experts support, will facilitate the process to develop EAA using SIGAP approach in the three villages by convening monthly meetings for community leaders to review and finalize EAA management plans (zoning plan, communication and monitoring, and mangrove restoration plan).
2.1.3 Once finalized, YKAN will facilitate follow-up public consultations at the Regency level to obtain approval (Regent Decree) from Berau Regency Government for the implementation of EAA in the three villages.

Indicator 2.2 By the end of the project, ~80% of the 100ha SECURE model demonstration site is restored back to mangroves using hydrological or hybrid engineering restoration approaches.
2.2.1 YKAN will redesign the existing shrimp ponds for SECURE model by splitting the shrimp pond into two parts:(1) Aquaculture area (20%), mangrove restoration areas (80%). The community group will carry out the construction works: developing new pond dikes, creating water gate, shrimp pond canals, and supporting facilities including farmer hut and storage, and harvest platform.
2.2.2 Conduct mangrove restoration with the community, covering ~80% of the 100ha SECURE shrimp pond demonstration site. Restoration will be achieved by one of two possible approaches: hydrological improvement approach or hybrid engineering approach, depending on local situation
2.2.3 YKAN will undertake six-monthly vegetation analyses to monitor the restoration progress and identify actions necessary to ensure the success of restoration.

Indicator 2.3 By the end of the project, ~20% of the 100ha SECURE model demonstration site is being managed as shrimp ponds with improved aquaculture practices, which will increase overall shrimp yield by 30%.
2.3.1 YKAN will provide materials and technical expertise for community group to operate the SECURE ponds.
2.3.2 Community groups operating the total 20 ha shrimp ponds using YKAN's Better Management Practices for SECURE ponds.
2.3.3 Improve the community capacity (100 households) on implementing mangrove protection, restoration, and aquaculture improvement through the establishment of a community Aquaculture Field School (Sekolah Lapang Perikanan).

Indicator 2.4 By the end of the project, a business case for carbon finance for mangrove restoration and protection is developed and used as business proposal for carbon finance project.
2.4.1 YKAN will measure the carbon soil content, biomass (data from the six-monthly vegetation analysis), and analyse land cover change (via satellite imagery analysis and ground surveys) to provide accurate information about potential carbon emission reduction from the SECURE pond restoration at commencement and end of project.

2.4.2 A consultant will analyse the Berau mangrove carbon information, national regulation, and market opportunity to evaluate of the viability of carbon financing through the projection of carbon emission reduction potential, carbon price, shrimp production increased, and project costs to establish the SECURE ponds.

Indicator 2.5 By the end of the project, village authorities have the knowledge and capacity to manage carbon financing for the project area.
2.5.1 YKAN facilitates carbon project training for village government and BUMDES staff regarding carbon measurement, monitoring, and carbon accounting 101
2.5.2 YKAN will facilitate the Village Government and BUMDES staff to attend an apprenticeship week in a mangrove carbon project in Indonesia (eg. in North Sumatra).

Output 3. At the completion of the project (2025) the income of people working in shrimp aquaculture, mangrove ecotourism, and mangrove-based household industries in the 3 target villages is increased by 15% (compared to baseline in 2022).
Indicator 3.1 By the end of the project's first year, 100 selected households (400 persons, with at least 50% women) are trained in new practices in environmentally-friendly shrimp aquaculture, mangrove ecotourism, and non-timber mangrove-based household industry development.

3.1.1 Gather and analyse data on the natural resource conservation, poverty and livelihood (community benefits, social impacts), aquaculture practices and productivity, and village governance and social inclusiveness to improve the understanding on key socio-economic condition and changes (baseline and end of project).
3.1.2 YKAN to conduct training sessions and knowledge surveys to develop and strengthen Village Business Units by coaching BUMDES staff on the community's mangrove-based products business models.
3.1.3 YKAN will facilitate apprenticeship of community group members in a successful mangrove-based products business in other regency or province (e.g. South Sulawesi Province or East Java).

Indicator 3.2 By the end of the project, products produced by workers with mangrove-based livelihoods in at least two aquaculture ponds will meet the requirements for national and globally recognized certifications, (i.e., Aquaculture Stewardship Council (ASC), Halal, and Indonesia Good Manufacturing Practices (GMP) improving the product value and quantity, with a broader access to markets
3.2.1 YKAN will provide equipment needed by the Village Business Units for improving the quality of their products, including: refrigerator, water pump, solar panel.
3.2.2 YKAN will assist the communities in obtaining eco-certification (anticipated to be ASC) certification for two SECURE ponds and 10 halal and Indo GMP certificate for their mangrove-based products
3.2.3 YKAN will strengthen the community's small-scale enterprises by: (1) facilitating access to market through exhibitions and meetings with product off-takers, (2) linking the community enterprises with financial institutions, and (3) help connecting the community with relevant experts in livelihoods development.

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-B03	Community based mangrove management plan for conservation developed and implemented	Number of new/improved community management plans available and endorsed	Number	N/A	1	1		2	3
DI-A01	Ecosystems Approach to Aquaculture (EAA) improvement plan in shrimp ponds (including SECURE model demonstration site)	Number of people from key national and local stakeholders completing structured and relevant training	People Proportion (Households)	Gender	F: 8 M: 24	F: 11 M: 35	F: M:	F: 19 M: 59	100 households
DI-D01		Hectares of habitat under sustainable management practices	Area (hectares)	N/A	0	120 ha		120 ha	5,000 ha
DI-D07		Carbon Sequestered/Removed	Tonnes of CO2	N/A	2,376 tonnes	3,221 tonnes		5,597 tonnes	4,950 – 7,920 tonnes
DI-D03	Richness of mangrove flora and fauna (e.g. mammals, water birds, aquatic biota) are stabilized in the 15,000ha protected areas and increased by at least 10% in the mosaic of restored mangroves compared to baseline study of 2022	Number of policies with biodiversity provisions that have been enacted or amended	Number of instruments	Policy typology (Local, National Policy)	0	1 (local)		1	1 national and 1 local
DI-D04		Stabilised/ improved species population (relative abundance/ distribution) within the project area	% Increase	Flora/Fauna/Fungi	0	33% (true mangrove species found)		0	10% increase
DI-D11	Average household income of people dependent on mangrove-related livelihoods across the 3 target villages will have been increased by 15% compared to baseline study of 2022	Number of people benefitting from improved sustainable agriculture practices and are more resilient to weather shocks and climate trends	People/ household	Gender	F: 0 M: 0	F: 106 M: 32	F: M:	F: 106 M: 32	400 persons, with at least 50% women
DI-D16		Number of households reporting improved livelihoods	Households	N/A	0	86 (48.8% women)		86	100 Household

Table 2 Publications

Title	Type	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers	Available from
Microplastics Leaving a Trace in Mangrove Sediments (Study in Indonesia)	Journal: Marine Pollution Bulletin Volume 195, October 2023, 115517	Muhammad Reza Cordova[a], Yaya Ihya Ulumuddin[a], Ali Arman Lubis[b], Muhammad Taufik Kaisupy[a], Singgih Prasetyo Adi Wibowo[a], Riyana Subandi[a], Deny Yogaswara[a], Triyoni Purbonegoro[a], Jeverson Renyaan[a], Doni Nurdiansah[a], Untung Sugiharto[b], Dienda Shintianata[b], Sonia Saraswati Meiliastri[b], Faza Putri Andini[b], Suratno[c], Muhammad Ilman[d], Aji Wahyu Anggoro[d], Basir[d], Simon M. Cragg[ef] (2023) a. Research Center for Oceanography, The Indonesian National Research and Innovation Agency, BRIN Kawasan Ancol Jl Pasir Putih 1, Jakarta 14430, Indonesia b. Research Center for Radiation Process Technology, The Indonesian National Research and Innovation Agency, Jl. Lebak Bulus Raya No.49, Jakarta 12630, Indonesia c. Research Center for Food Technology and Processing, The Indonesian National Research and Innovation Agency, Gading IV Playen Gunung Kidul, Yogyakarta 55861, Indonesia d. Yayasan Konservasi Alam Nusantara, Jl. Iskandarsyah Raya No.66C, Jakarta 12160, Indonesia e. Institute of Marine Sciences, University of Portsmouth, Portsmouth, United Kingdom f. Centre for Blue Governance, University of Portsmouth, Portsmouth, United Kingdom	Male	Indonesia	ELSEVIER	Link 1 Link 2
How much carbon loss from mangrove conversion to aquaculture? A case study from East Kalimantan, Indonesia	Journal: Frontiers in Ecology and Evolution, section Biogeography and Macroecology	Nisa Novita, Adibtya Asyhari, Adi Gangga, Rasis Putra Ritonga, Chandra Agung Putra, Aji Anggoro, Yiwei Wang, Virni Budi Arifanti, Joni Jupesta and Muhammad Ilman (submitted on 26 April 2024)	30% F 70% M	Indonesia, Singapore	Frontiers	Link will be provided upon published

Annex 4: Onwards – supplementary material (optional but encouraged as evidence of project achievement)

Selected supplementary materials (produced in original Bahasa Indonesia) listed below can be accessed through this link.

Output	Related Output Indicator	File Name
1	1.1.1.	Summary Document of Minutes of Meeting and Attendance List for the Second Year SIGAP Activities
	1.2.1.	eDNA Report
	1.2.3.	Spatial Analysis Report
	1.3.1.	• Report on the Analysis of the Mangrove Management Group Discrepancy in Berau • Report Assesment and Gap Analysis Related to Field School and Mangrove
	1.3.2.	• Minutes of Handover for Draft RPJMK Documents in Tabalar Muara • Minutes of Handover for Draft RPJMK Documents in Teluk Semanting • Draft of RPJMK Tabalar Muara • Draft of RPJMK Teluk Semanting • Draft Village Regulation on the Management, Protection, and Empowerment of the Mangrove Ecosystem in Karangan Village • Decision Letter of the Tabalar Muara RPJMK Development Team • Decision Letter of the Teluk Semanting RPJMK Development Team • Village Regulation on the Management, Protection, and Empowerment of the Mangrove Ecosystem in Pegat Batumbuk Village Pegat Batumbuk No. 3 Tahun 2023 • Document of Strategic Plan for LPHD Samaturu • Document of Strategic Plan for TML
	1.3.3.	• List of Attendants of Mangrove Surveillance Training on 15-17 March 2023 • Mangrove Surveillance Training Report on 15-17 March 2023 • Draft of Standard of Procedure of Mangrove Management in Berau
2	2.1.1	• Report on EAA Socialization Activities in Berau Regency • Feasibility Study Report on Windu Shrimp Aquaculture Area for EAA Management • Preliminary Assessment Report and Aquaculture Management Plan using EAA in Berau Regency
	2.2.1.	Map and Table of SECURE-Darwin Ponds
	2.2.2.	• Activity Report of Community Based Ecological Mangrove Rehabilitation (EMR) Training in Berau • Documentation of CBEMR
	2.2.3.	Report on Mangrove Vegetation Analysis and Carbon Stock of SECURE Pond in Berau
	2.3.1.	SECURE Operational Documentation
	2.3.2.	Vegetation Analysis
	2.3.3.	• Activity Report Field School Training of Trainer's • Report of Field School in Tabalar Muara • Report of Field School in Suaran • Report of Field School in Pegat Batumbuk
3	3	Summary of Livelihood Activity Oct 2023 - Mar 2024

	3.1.1.	• Report of Gathering and Analysis Socio-Economy • Baseline Change Report
	3.1.2.	• BUMK Assessment Report of Suaran, Tabalar Muara, and Pegat Batumbuk • Minutes of Vision Training for BUMK in Tabalar Muara and Teluk Semanting
	3.1.3.	Comparative Study Ecotourism_CMC
	3.2.1.	• Documentation and Handover Minutes of Production Equipment Assistance for Mothers' Groups in Pegat Batumbuk Village • Business Plan and Development of Kerjasama Jaya Group
	3.2.2.	Collection Document of Group Accompanying Certificates for YKAN
	3.2.3.	• Attendance List for SMEs Technical Guidance – GSI • Minute of Meeting of Exchange Learning for Women Group • Packaging Exhibition of Women Group

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	X
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	X
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	-
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	X
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see Section 16)?	-
Have you involved your partners in preparation of the report and named the main contributors	X
Have you completed the Project Expenditure table fully?	X
Do not include claim forms or other communications with this report.	