Monitoring Report

Project Profile	
Project Code	AFoCO/023/2021
Project Title	**Innovative Solutions for Climate Change and Biodiversity Landscape Strategy to Support SDGs in Indonesia**
Project Duration	Start date: 1 July 2021 End date: 30 June 2024
Implementing Agency	Center for Standardization of Sustainable Forest Management Instruments, Agency for Standardization of Environment and Forestry Instruments *(Prior to internal organizational restructuring: Forest Research and Development Center (FRDC), Ministry of Environmental and Forestry)*
Participating Countries	Indonesia
Project Site	1. Tropical peatlands forest of Kepau Jaya Forest Area with Specific Purpose (FWSP), Kampar Regency, Riau Province 2. Mangrove ecosystem in Ampang Plampang Forest Management Unit, Sumbawa District, West Nusa Tenggara Province. 3. Karst and lowland ecosystem of Forest Management Unit of Bulusaraung, in Maros district, South Sulawesi province
Main Objective	1. Establish baseline information by mapping the existing biophysical (spatial temporal), socio-economic condition (before and after the project), and potency of natural resources in the three study sites in the beginning of the project. 2. Eacilitate the preparation of business plans of the Forest Management Units (FMUs) at three study sites. 3. Develop demonstration plots of at least 10 ha in each study site for carbon stock enhancement in FMUs or Forest Area with Specific Purpose (KHDTK) areas. 4. Transfer techniques and raise awareness of project model establishment to relevant stakeholders through the synthesis of knowledge and experiences, recommendations on policy practices, and dissemination of project outputs.
Budget and Source of Finance	Total: US$ 800,000 • AFoCO: US$ 700,000 • National: US$ 100,000
Overview of Monitoring Trip	
Monitoring Period	11/06/2023 – 16/06/2023
Monitoring Site	Riau and South Sulawesi Province

Monitoring Check Points	• Check the following information on the established demonstration plots: (1) no. of seedlings planted (2) type of species planted (3) survival and growth rate of the planted species (4) established nurseries (5) maintenance plan of the demonstration plots upon completion • Check the progress of capacity building activities delayed from 2022 to 2023 • Check the financial utilization rate and any other remaining issues
Summary of Monitoring Outcomes	
• The monitoring team recommends a no-cost extension of (6) months to address implementation delays caused by unforeseen circumstances. This extension will enable thorough maintenance, monitoring, and planting, ensuring the development of healthy and stable forest ecosystems. The 6-month extension falls within the planned completion year (2024), posing no budget execution issues for the Secretariat. • In the utilization of project savings, the monitoring team agrees with the implementation of new activities can contribute to positive long-term economic impacts on local communities, promote sustainable forest management practices in FMU-managed areas, support policy development, and support knowledge expansion. Such activities include the establishment of a permanent plot, expansion of existing demonstration plot area, enhanced maintenance of demonstration plot, building of facilities that serve multiple purposes, and the publication of additional research articles.	

ACRONYMS

AFoCO	Asian Forest Cooperation Organization
BRIN	National Research and Innovation Agency (*Badan Riset dan Inovasi Nasional*)
CSSFMI	Center for Standardization of Sustainable Forestry Instruments
CAEFSI	Center for the Application of Environmental and Forestry Standards Instruments
FMU	Forest Management Unit
FWSP	Forest With Specific Purposes
IA	Implementing Agency
MAP	Months after planting
MPTS	Multi-purpose Tree Species
SJB	Long-term Rehabilitation Strategy (or *Strategi Jangka Benah*)

CONTENTS

1. INTRODUCTION

AFoCO's project AFoCO/023/2021 on *"Innovative Solutions for Climate Change and Biodiversity Landscape Strategy to Support SDGs in Indonesia"* is being implemented to introduce innovative solutions on sustainable management practices and enhance the capacities of Forest Management Units (FMUs) and local communities on contributing to Indonesia's emissions reduction targets and also to improve biodiversity landscapes to support the achievement of the Sustainable Development Goals (SDGs), in particular SDGs 1, 8, 13 and 15. The 10-ha demonstration plots established in the three (3) sites support the project's main objective of implementing solutions to reduce carbon emissions while simultaneously helping improve the livelihood of farmers through empowerment in agroforestry schemes.

The Center for Standardization of Sustainable Forestry Instruments (CSSFMI) of the Agency of Standardization of Environment and Forestry Instruments under the Ministry of Environment and Forestry of Indonesia is the Implementing Agency (IA). The project was incepted on 24 June 2021 and project implementation commenced from 1 July 2021. The Project Progress report has been submitted until December 2022. As per the existing monitoring routine based on the AFoCO Project Manual, the first monitoring was planned during Q1 of 2022, however, due to the difficulties of the COVID-19 epidemic, the monitoring schedule has been changed in Q2 of 2023.

The overall objective of this monitoring trip was to check the project sites physically and especially be updated on the progress of the established demonstration plots for two out of the three project sites in Indonesia. Stakeholder meetings especially with the responsible Forest Management Units (FMUs) to gather project impacts and stories was another objective of the monitoring trip. Discussions on other technical issues regarding the no-cost extension of the project and the utilization of the project savings was another objective of this monitoring as the issue was also discussed during the 3rd Project Steering Committee (PSC) meeting conducted in January 2023.

The monitoring team has successfully conducted the monitoring as planned; two (2) project sites in Riau and South Sulawesi Provinces were visited in-person together with the Project Manager and staff to track the project implementation progress, verify the progress reports and draw recommendations and suggestions for the effective implementation of the remaining project activities. Furthermore, the monitoring team has discussed technical issues of the project regarding the no-cost extension of the project and the potential activities for the utilization of project savings. Hence, this monitoring report provides a detailed and comprehensive view of the current implementation progress and necessary way forwards and recommendations for the rest of the project period.

2. MONITORING SCOPE & METHODOLOGY

The monitoring trip included the on-site visits to two out of three project sites in the provinces of South Sulawesi and Riau. The monitoring for the third project site in the West Nusa Tenggara province was replaced with a desk review of activity reports and interviews with the IA due to the time constraints during the monitoring trip. The key findings and isses for all three project sites are detailed in Section 3. The overall objectives of the monitoring trip are as follows:

- Monitor the project progress in the karst and lowland ecosystem project site in South Sulawesi Province and the tropical peatlands site in Riau Province
- Discuss the project impact and best practices with the IA
- Discuss the project closure process with the IA
- Discuss any other project-related matters

The participants of the monitoring trip are as follows:

[Monitoring Team]
- Cha Jiyea (Program Officer, Project Management Team, AFoCO Secretariat)
- Emily Marie Lim (Program Officer, Communications & Informatics Team, AFoCO Secretariat)

[Project Staff]
- Ayun Windyoningrum
  (Project Manager/Coordinator and Policy Analyst of the Center for Standardization of Sustainable Forestry Instruments (CSSFMI),
  Agency for Standardization of Environment and Forestry Instruments)
- Husnul Khotimah
  (Project Staff and Researcher of National Research and Innovation Agency (BRIN))
- Siti Nurjanah (Project Accountant, freelancer)

The monitoring team will monitor the activities of project AFoCO/023/2021 as follows:

Activity		Performance Indicator	Monitoring Method	
			Quantitative	Qualitative
Objective 1 To establish baseline information by mapping the existing biophysical (spatial temporal), socio-economic condition (before and after the project), and potency of natural resources in the three study sites in the beginning of the project				
Output 1: Map of existing biophysical condition and baseline data of biophysical condition of three project sites (Riau, Bali, and South Sulawesi) produced through GIS mapping and analysis by first semester of Year 2				
1.4	Collect and analyze data and information for scoping and spatial analysis	-Three meetings /consultations with the local government/FMUs. - Maps and Data sets for each project site obtained from the scoping and spatial analysis	Review of 3 Activity Reports written by National Experts (Appendix – List of References)	Interviews with IA, FMU and national expert during monitoring visit
1.5	Collect and analyze baseline data and information of carbon stock, emission, biodiversity; and identification of potential commodities in three sites (Riau, Bali, South Sulawesi	-Baseline dataset of Carbon stock and emission assessment before project obtained within 6 months Q4 of Y1 -Baseline dataset of Biodiversity assessment before project in three sites (Riau, Bali, South Sulawesi) obtained within 6 months Q4 of Y1 -Potential commodities list based on site resources obtained within 6 months Q4 of Y1	Review of 3 Activity Reports written by National Experts (Appendix – List of References)	Interviews with IA, FMU and national expert during monitoring visit

		-Dataset of evaluation of carbon stocks and emission assessment after project in three sites obtained within 6 months Q1 of Y4. -Dataset of evaluation of biodiversity after project in three sites obtained within 6 months Q1 of Y4		
Output 2: Current status and baseline data of socio-economics condition of three project sites (Riau, Bali, South Sulawesi) made available by first semester of Year 2				
2.1	Survey and assess data and information of Socio-economic (livelihood, economic assessment, market analysis) at the beginning and end of the project	*-Number of respondents (max. 30 participants) for socio-economics survey in each site* *-Three meetings (with the communities in each site* *-Baseline dataset and information of Socio-economic condition (livelihood, economic assessment, market analysis) before project in three study sites (Q1 Y2)* *-Dataset of evaluation on socio-economics condition after project in three sites obtained within 6 months, Q1 Y4.*	Review of 3 Activity Reports written by National Experts (Appendix – List of References)	Interviews with IA, FMU and national expert during monitoring visit
Output 3. Prospective Commodities that have good market opportunities identified in three study sites by semester1 Y2				
3.1	Investigate and conduct value chain analysis and market analysis of potential commodities	-Value chain result for each potential commodity and its market analysis in one time -The highest and most prospective commodity value in one time	Review of 3 Activity Reports written by National Experts (Appendix – List of References)	Interviews with IA, FMU and national expert during monitoring visit
Objective 2: **To facilitate business plans of the FMUs at three study sites**				
Output 4: Strengthened capacity of FMUs and community in business plans development at three project sites				
4.1	Conduct capacity building on GIS and Remote sensing analysis for FMU Officers at three project sites	-One training on GIS and remote sensing analysis at three project sites in Q 2 of Y2 -30 participants will be involved in each project site	Verification of photo records in Annual and Mid-Year reports	Interviews with FMU head and staff to hear their training experience and comments/feedback
4.2	Conduct capacity building on accounting of carbon stocks and emissions reduction, for FMU officers in the three project sites	-One training at each project site on accounting of carbon stock and emission reduction -20 participants of forest managers will be involved	Verification of photo records in Annual and Mid-Year reports	Interviews with FMU head and staff to hear their training experience and comments/feedback
4.3	Conduct Capacity building/training on initiating and promoting eco-tourism for FMU personnel at the three project sites	-One training on initiating and promoting at three project sites in Q3 of Y2. -30 participants involved (communities & forest managers) in each project site	Verification of photo records in Annual and Mid-Year reports	Interviews with FMU head and staff to hear their training experience and comments/feedback
4.4	Conduct Capacity building on startup business (including upgrade products or services through value addition) and online business for FMU personnel at the three project sites	-One training on initiating and promoting at three project sites in Q4 of Y2. -25 participants involved in each project site	Verification of photo records in Annual and Mid-Year reports	Interviews with forest farmer group members and FMU officer to hear about their training experiences and comments/feedback
Output 5: Developed Business Plans of the FMUs in three study sites				
5.1	Workshop on developing scenario of Business Plans (forest-based ecotourism, etc., based on site resources	-One workshop at each project sites in Q4 Y2 -One viable business plan for each site developed within 6 months.	*Activity has been delayed till Q3Q4 2023*	-

	potential and market opportunities) for the three project sites			
5.2	Share learning and policy dialogue (workshop & FGD) in the district and provincial level on the developed Business Plan of the FMUs	-One workshop and one FGD at each project site at Q2 Y3, 25 participants Recommendation or corrective actions on the business plan.	*Activity has been delayed till Q3Q4 2023*	-
Objective 3. To develop demonstration plots for carbon stock enhancement in FMUs or Forest Area with Specific Purpose (KHDTK) areas 10 ha each site in Q4 of Y1				
Output 6. Three sites for demonstration plot establishment appropriately located and technically designed				
6.1	Participatory rural appraisal (PRA) on demonstration plat site matching	-Participant of 25-30 farmers at each site -One FGD at each project site to select plant species based on tree-site matching and other criteria.	Review of 3 Activity Reports written by National Experts (Appendix – List of References)	Interviews with IA, FMU and national expert during monitoring visit
Output 7: Demonstration plots in 3 types of area established in three sites at least 10 ha each site				
7.1	Establishing demonstration plots	-Planting stocks individuals by species at least 5000 seedlings per site -Temporary nurseries are established -Planting seedlings -Soil amendment or fertilizer addition -3 Demonstration plots are established	Review of 3 Activity Reports written by National Experts (Appendix – List of References)	Interviews with IA, FMU and national expert during monitoring visit
Output 8. Demonstration plot at each project site is well maintained and monitored at the interval of 6 months after planting				
8.1	Establishing demonstration plots	Growth data set including the survival rate, height, diameter (after seedling reaching> 1.3 m), health status at, 6 MAP, 12 MAP, 18 MAP, 24 MAP and 30 MAP.		Site visits and validation for demo plots in Riau and South Sulawesi; Verification of photo records and interviews with
Objective 4: To transfer techniques and awareness of project model establishment to relevant stakeholders through Synthesis, policy practice recommendations, and disseminations				
Output 9. Technique and awareness of project model transferred to project stakeholders through workshops, policy briefs and publication				
9.1	Organize workshop for the midterm and end project results	-Two workshops for partners involved in the project. This meeting will be held Q4 of Y2 & Y3 -One metadata from all activities per project site.	-	(To be submitted to the Secretariat for review together with Annual report)
9.2	Publication and dissemination (workshop, seminar, conference, publications)	-One seminar or workshop held at Q4 of Y3 -One international conference will be attended	-	(To be submitted to the Secretariat for review together with Annual report)
9.3	Review, Monitoring, Evaluation: mid-term, annual review, and reporting substance and financial	Review, Monitoring, Evaluation: mid-term, annual review, and reporting substance and financial	-	O
9.4	Monitoring and Evaluation of each output	-Eight field trips to each site for monitoring & evaluation of 8 outputs, at Y2, Y3 and Q1 of Y4. -One semester project report on 15 July every year. -One annual project report on 15 January every year	-	O
9.5	Staff Resources (Allowance or honorarium of project personnel)	-Monthly salary receipts -Bills and receipts of all expenditure.	-	O

3. IMPLEMENTATION STATUS OF PROJECT ACTIVITIES

The IA has agreed to provide the progress updates per activity along with the mid-year report submission reflecting project progress (up to June 2023) in July 2023. The following table describe the implementation status of project activities based on the document review.

****Detailed progress updates will be provided by the IA together with the mid-year report of 2023.**

The list of Activity Reports drafted by the 18 National Experts for activities 1.4, 1.5, 2.1, 3.1, 6.1 and 7.1 are in the Appendix (List of References).

Activity no.	Activity description	Planned	Status (as of June 2023)	Observation and further checkpoints, if any, based on the document review (project financial progress as of December 2022)
Objective 1 To establish baseline information by mapping the existing biophysical (spatial temporal), socio-economic condition (before and after the project), and potency of natural resources in the three study sites in the beginning of the project				
Output 1: Map of existing biophysical condition and baseline data of biophysical condition of three project sites (Riau, Bali, and South Sulawesi) produced through GIS mapping and analysis by first semester of Year 2				
1.1	Inception meeting (Meeting between IA, PSC and AFoCO secretariat)	*Q4 2021*	*Completed*	-
1.2	Kick-off meeting (Meeting between IA, PSC and relevant stakeholders)	*Q4 2021*	*Completed*	-
1.3	Stakeholders meeting (Meeting between IA and site coordinator)	*Q4 2021*	*Completed*	-
1.4	Collect and analyze data and information for scoping and spatial analysis	*Q1, Q2 2022*	*Completed*	Physical: 3/3, 100% Financial: US$ 9,918 / US$ 13,260, 75% Savings: US$ 3,342
1.5	Collect and analyze baseline data and information of carbon stock, emission, biodiversity; and identification of potential commodities in three sites (Riau, Bali, South Sulawesi	*Q1, Q2 2022*	*Completed*	Physical: 3/6, 50% Financial: US$ 14,697.54 / US$ 15,096, 97% Carried-Over: US$ 398.46 | Not yet transferred: US$ 14,916 ** This activity will be updated in the mid-year report of 2023
Output 2: Current status and baseline data of socio-economics condition of three project sites (Riau, Bali, South Sulawesi) made available by first semester of Year 2				
2.1	Survey and assess data and information of Socio-economic (livelihood, economic assessment, market analysis) at the beginning and end of the project	*Q1, Q2 2022* *Q1 2024*	*On-going*	Physical: 3/6, 50% Financial: US$ 8,967.45 / US$ 17,910, 50% Carried-Over: US$ 8,942.55 | Not yet transferred: US$ 17,850 ** This activity will be updated in the mid-year report of 2023
Output 3. Prospective Commodities that have good market opportunities identified in three study sites by semester1 Y2				

3.1	Investigate and conduct value chain analysis and market analysis of potential commodities	*Q1, Q2 2022*	*Completed*	Physical: 3/3, 100% Financial: US$ 9,461 / US$ 14,400, 65.7% Savings: US$ 4,938.9 **Original report submitted
Objective 2: To facilitate business plans of the FMUs at three study sites				
Output 4: Strengthened capacity of FMUs and community in business plans development at three project sites				
4.1	Conduct capacity building on GIS and Remote sensing analysis for FMU Officers at three project sites	*Q4 2022*	*Completed* *3 trainings*	Physical: 3/3, 100% Financial: US$ 35,881.68 / US$ 39,225, 91.5% Savings: US$ 3,343.32
4.2	Conduct capacity building on accounting of carbon stocks and emissions reduction, for FMU officers in the three project sites	*Q4 2022* *Q1 2023*	*Completed* *3 trainings*	Physical: 2/3, 66.7% Financial: US$ 14,277.46 / US$ 29,725, 48% Carried-Over: US$ 15,447.54 ** This activity will be updated in the mid-year report of 2023
4.3	Conduct Capacity building/training on initiating and promoting eco-tourism for FMU personnel at the three project sites	*Q1, Q2 2023*	*Completed* *3 trainings*	This activity will be updated in the mid-year report of 2023
4.4	Conduct Capacity building on startup business (including upgrade products or services through value addition) and online business for FMU personnel at the three project sites	*Q1, Q2 2023*	*Completed* *3 trainings*	This activity will be updated in the mid-year report of 2023
Output 5: Developed Business Plans of the FMUs in three study sites				
5.1	Workshop on developing scenario of Business Plans (forest-based ecotourism, etc., based on site resources potential and market opportunities) for the three project sites	*Q3, Q4 2023*	*Delayed* *(3 trainings)*	12 out of the 18 trainings planned for the project have been implemented. The IA intends to implement the remaining training activities by the end of 2023.
5.2	Share learning and policy dialogue (workshop & FGD) in the district and provincial level on the developed Business Plan of the FMUs	*Q3, Q4 2023*	*Delayed* *(3 trainings)*	12 out of the 18 trainings planned for the project have been implemented. The IA intends to implement the remaining training activities by the end of 2023.
Objective 3. To develop demonstration plots for carbon stock enhancement in FMUs or Forest Area with Specific Purpose (KHDTK) areas 10 ha each site in Q4 of Y1				
Output 6. Three sites for demonstration plot establishment appropriately located and technically designed				
6.1	Participatory rural appraisal (PRA) on demonstration plot site matching	*Q4 2021* *Q1, Q2 2022*	*Completed*	Physical: 3/3, 100% Financial: US$ 22,120.01 / US$ 30,800, 72% Savings: US$ 8,679.99 ** Original report submitted
Output 7: Demonstration plots in 3 types of area established in three sites at least 10 ha each site				
7.1	Establishing demonstration plots	*Q4 2021* *Q1, Q2, Q3 2022*	*Completed*	Physical: 3/3, 100% Financial: US$ 43,362.35 / US$ 54,234, 80% Savings: US$ 10,771.65

				****SITE VALIDATION COMPLETE (for 2 sites)** - Demonstration plots have been established well in the two project sites with thorough planning and appropriate signboards have been installed.
Output 8. Demonstration plot at each project site is well maintained and monitored at the interval of 6 months after planting				
8.1	Maintenance growth monitoring of the demonstration plots	*Q1, Q2, Q4 2022* *Q2, Q4 2023* *Q2 2024*	*Ongoing*	Physical: 3/15, 20% Financial: US$ 2,498.61 / US$ 6,345, Carried-Over: US$ 3,846.39 | Not yet transferred: US$ 8,843.61 ******SITE VALIDATION COMPLETE (for 2 sites)** - Maintenance was being conducted by the forest village groups and the Secretariat has been updated by the national experts on the survival rate of the planted species in the demonstration plot.
Objective 4: To transfer techniques and awareness of project model establishment to relevant stakeholders through Synthesis, policy practice recommendations, and disseminations				
Output 9. Technique and awareness of project model transferred to project stakeholders through workshops, policy briefs and publication				
9.1	Organize workshop for the midterm and end project results	*Q4 2022* *Q4 2023*		This activity will be updated in the mid-year report of 2023
9.2	Publication and dissemination (workshop, seminar, conference, publications)	*Q4 2023*	*Ongoing*	Physical: 3/8, 37.5% Financial: US$ 8,502.93 / US$ 8,520, 99.8% Carried-Over: US$ 17.07 | Not yet transferred: US$ 42,350 ** Original report submitted
9.3	Review, Monitoring, Evaluation: mid-term, annual review, and reporting substance and financial	*Q1, Q3 2022* *Q1, Q3 2023* *Q1 2024*	*Ongoing*	Physical: 3/6, 50% Financial: US$ 5,861.38 / US$ 6,105, 96% Carried-Over: US$ 243.62 | Not yet transferred: US$ 13,895
9.4	Monitoring and Evaluation of each output	*Q1, Q3 2022* *Q1, Q3 2023* *Q1 2024*	*Ongoing*	Physical: 9/12, 75% Financial: US$ 7,900.68 / US$ 8,010, 98.6% Carried-Over: US$ 109.32 | Not yet transferred: US$ 3,200
9.5	Staff Resources (Allowance or honorarium of project personnel)	*Q3, Q4 2021* *Q1Q2Q3Q4 2022* *Q1Q2Q3Q4 2023* *Q1, Q2 2024*	*Ongoing*	Physical: 12/24, 50% Financial: US$ 30,168.77 / US$ 32,760, 92% Carried-Over: US$ 2,591.23 | Not yet transferred: US$ 29,760

4. KEY FINDINGS

4.1. Bulusarang FMU, South Sulawesi Province

The management area of KPHP Unit I at UPT KPH Bulusaraung Bulusarang covers a total area of 51,406 ha (karst area = 7809.8 ha). The area is composed of Protected Forest (HL) - 23,765 ha, Limited Production Forest (HPT) - 8,459 ha, and Permanent Production Forest (HP) - 19,182 ha

Forest area management problems within region administratively under the management of Bulusaraung FMU includes forest fires, forest encroachment, and illegal logging. For this reason, deforestation and forest degradation that occur in several Bulusaraung KPH areas require appropriate forest and land rehabilitation models. Maros Pangkep Karst area is included in the Bulusaraung Forest Management Unit (FMU). The project site is a 2-hour drive from the Bandar Udara International Sulatan Hasanuddin Airport in Makassar.

(a) Demonstration plot establishment

The pine forest in Tala-Tala Hamlet, Bonto Manai Village, Tompobulu District is one of the production forest areas of the Bulusaraung FMU. Pine trees and understory vegetation were damaged by lightening-induced forest fires in 2016. Hence there was a need for forest rehabilitation to improve land conditions and retrieve the lost carbon stock. Recognizing that forest rehabilitation will be successful with community participation as villagers/farmers can help in the management and monitoring of the demo plot regularly while benefiting from additional income, the project team adopted an agroforestry approach. Based on the consultations with local communities, agroforestry-based rehabilitation approach was adopted through the planting of forest plant species, MPTS, and crops. The plot site belongs to the FMU and from the village, the demo-plot is accessible by car (20-minute drive).

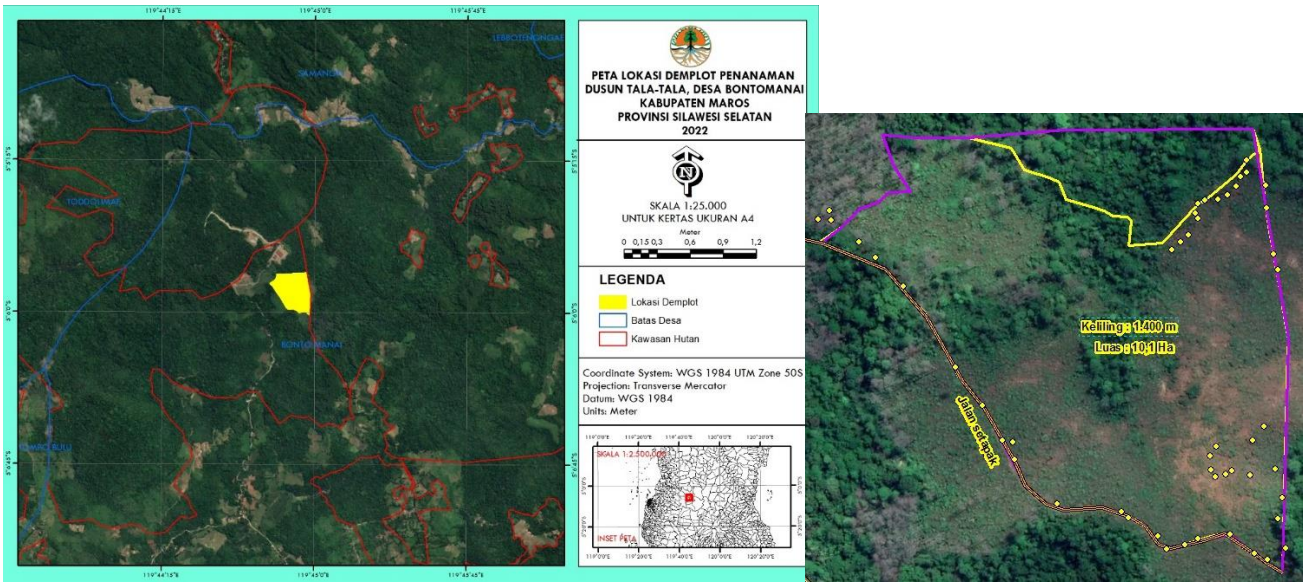


Figure 1. Location of demo plot in South Sulawesi province

The 10-ha demo plot was completed in July 2022. Approximately 5 ha of the rehabilitated burnt area is used for research. The research design used an RCBD (Randomized Complete Block Design) designed with 4 treatments of agroforestry cropping patterns (Figure 1):

- A: Alternate rows (1 row alternating between forestry plants and MPTS plants, where in 1 row there were 2 types of plants)
- B: trees along the border (forestry plants as a border for MPTS plants),
- C: Alternate strips (alternating 2 rows between forestry plants and MPTS in each row of the same type),
- D: Random mixture (in 1 row mixed between forestry plants and MPTS).

As seen in the below figure, each treatment had 3 blocks (indicated in light brown, purple, green and lime green) as replicates and each block had a different topography (flat, steep, and gentle slopes). The planting distance is maintained at 5 m x 5 m. At the end of the project, the national experts responsible for the demonstration plot will identify the best suitable treatment for the ecosystem and calculate the expected carbon stock.

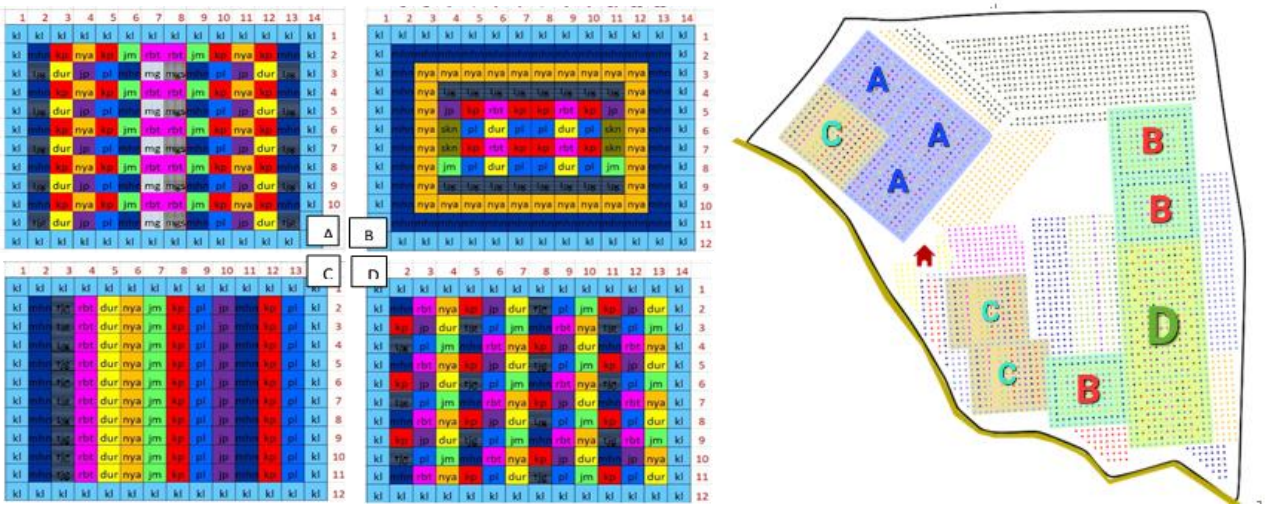
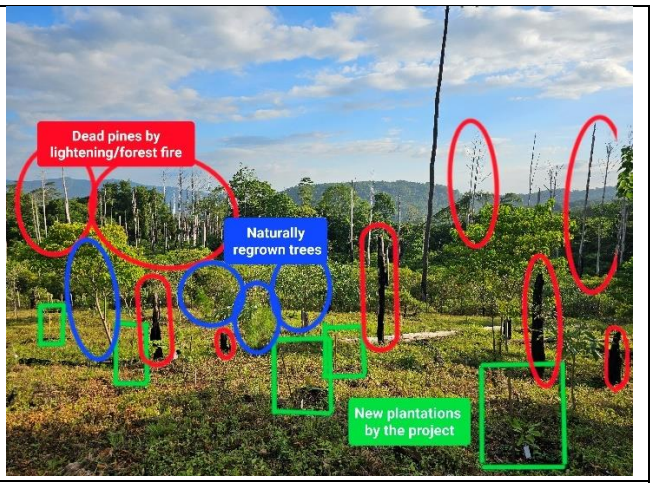


Figure 2. Demo plot layout of each rehabilitation treatment model applied in the karst and lowland ecosystem in Tala-Tala Hamlet, managed by Bulusarang FMU

	
Project signboard at the demo-plot entrance	Composition of demo-plot

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<tr>
<td>Entrance to the demo-plot site
(Around 5 minutes-walk from the road)</td>
<td>Weeding in the demo-plot is done by cutting down weeds surrounding the planted seedlings</td>
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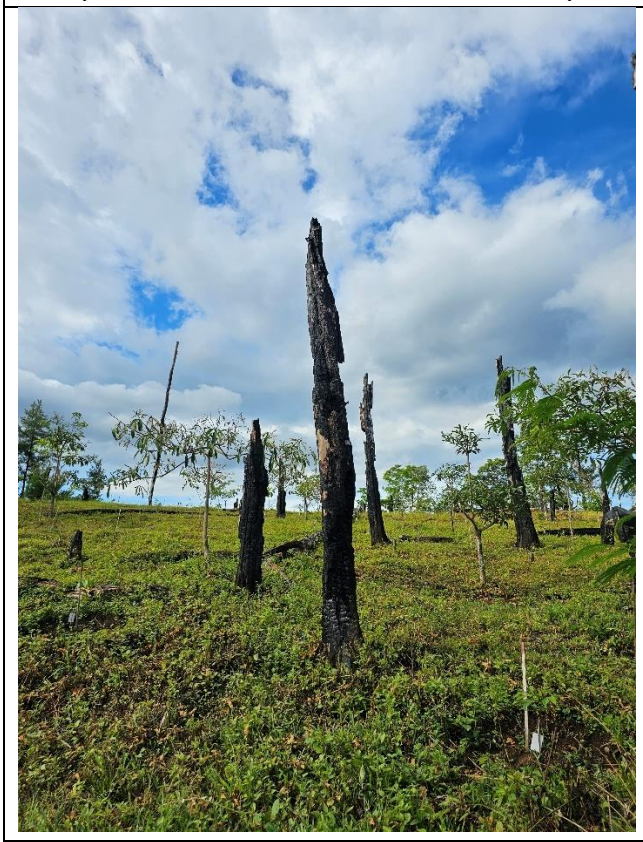
<tr>
<td>  </td>
<td>  </td>
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<tr>
<td>Burned trees from forest fire</td>
<td>Demo-plot site management building constructed through the project</td>
</tr>
</table>

(b) Species planted and survival rate

With the aim of improving the ecosystem condition and increasing carbon stocks, the agroforestry-research demonstration plot planted 13 types of plants (rambutan, durian, breadfruit, mango, mangosteen, nutmeg, mahogany, tanjung, red jabon, white jabon, nyatoh, cajuputi, calliandra) in July 2022. The selection of plants is based on consultations with forest farmer groups (KTH) and considerations existing land conditions. The seedlings were provided in the temporary nursery that was established in one of the farmer's houses in the village, who is also the member of the forest farmer group at the initial stages of establishing the demonstration plot.

Although the planning and establishment of the demonstration plot was led by the national expert from the Center for the Application of Environmental and Forestry Standards Instruments (CAEFSI) Makassar, members of the forest farmer group were involved in every step of the establishment of the demonstration plot; from preparation to actual planting and women from the village also helped in the planting and land preparation process.

No.	Species	No. planted	% of surviving plants after 1 month (August 2022)	% of surviving plants (2023)
1.	Durian (*Durio zibethinus* Murray)	114	88.60	
2.	Red Jabon (*Anthocephalus macrophyllus (*Roxb) Havil)	105	80.95	
3.	White Jabon (*Anthocephalus cadamba* Roxb)	102	87.25	
4.	Calliandra (*Calliandra calothyrsus)*	540	98.52	
5.	Cajuputi (*Melaleuca cajuputi*)	186	84.41	
6.	Mahagony (*Swietenia macrophylla* King.)	249	85.54	Estimated to be >90% based on measurements in July 2023
7.	Mango (*Mangifera indica* L)	15	86.67	
8.	Mangosteen (*Garcia mangostana* L)	15	93.33	
9.	Nyatoh (*Palaquium spp*)	195	89.74	
10.	Nutmeg (*Myristica fragnans* Houtt)	129	86.05	
11.	Rambutan (*Nephelium lappaceum* L)	99	94.95	
12.	Breadfruit (*Artocarpus altilis* (Park.) Fosberg)	12	66.67	
13.	Tanjung (*Mimusops elengi* L)	147	94.56	
	TOTAL	1908	87.48	>90%

*Most of the plant deaths in were caused by termites that feed on roots.

For the maintenance of the site, a forest farmer group was consisting of 25 farmers from Tala-Tala Hamlet was formed to patrol, monitor, and maintain the demo plot. In particular, as the growth of plants in the research plots have to be monitored on a regular basis every three months, the national expert explained that the members of the forest farmer group of Tala-Tala Hamlet were trained on how to carry out growth measurements. With the participation of the local farmers, the national expert is able to effectively monitor the progress at the planting site remotely. Regular patrols are also being conducted in the area by the FMU officials and the forest farmer group.

Maintenance is mainly done through cutting the weeds surrounding the newly planted seedlings and laying them down so that the demonstration plot is accessible to farmers for monitoring.

(c) Livelihood product identification in Tala-Tala Hamlet

Among the identified potential commodities by the national expert from CAEFSI, the supply chain and market analysis of palm sugar was presented at the project site by the national expert. While palm sugar was only produced in very basic forms without proper packaging to be directly provided to the collecting merchant with minimum price before the project, training on commodity development and packaging was provided through the project, enabling the villagers and the forest farmer group to package and sell it to the retailer or the collecting merchant with a higher price in three different forms – whole block, cube, and heart-shaped. The full report of the analysis on potential commodities in South Sulawesi province can be found in the appendix.

	
(left) whole palm sugar block (right) palm sugar cubes packaged	Heart-shaped palm sugar produced and packaged by the village

The national expert suggested that for better sustainability of project impact, further support of hardware such as packaging equipment is necessary for the villagers and forest farmer group to continue the applying the training provided by the project in their daily livelihood. The head of the CAEFSI ensured the Secretariat that the activities conducted and led by the national experts of CAEFSI will be closely monitored and supervised together with the FMU for the continuation of project impact and sustainability.

While the national expert has provided valuable recommendations and suggestions for developing palm sugar as an additional source of income, it is worth noting that the traditional palm sugar production techniques require extensive heating for many hours. Although the use of firewood resources may raise sustainability concerns, it is important to consider that the main objective of the project is to provide an alternative viable source of livelihood. In this regard, the project has also provided valuable support through marketing, product branding, and packaging trainings, which further contribute to achieving this objective. Although the national expert has provided some recommendations and suggestions for developing the palm sugar as another

source of income generation, it was found that much firewood is used during its production (which uses traditional techniques), while the project only supported in the analysis, not the possible solutions. Hence, after the project is completed, the application of the analysis and recommendation from the national expert cannot be fully guaranteed.

(d) Issues and concerns

- As the area is covered by dead logs (right photo), termite attacks have been the main factor affecting the survival rate of the planted seedlings in during the first few months of planting. Although the use of insecticides and pesticides in the planting phase have helped ensured a high survival rate, the removal of dead logs from the area could be a more adequate long-term solution and sustainability of the project site. The IA has informed the Secretariat that the cost for the removal of all dead logs would be approximately 2,000 USD in the 10ha site. This suggestion will be further considered by the IA upon further monitoring of plant growth in the area.

- Although the national expert has provided some recommendations and suggestions for developing the palm sugar as another source of income generation, it was found that much firewood is used during its production, while the project only supported in the analysis, not the possible solutions. Hence, after the project is complete, the application of the analysis and recommendation from the national expert cannot be fully guaranteed.
- The main issue involved in the maintenance and the survival rate of the planted species were deaths caused by termite attacks that feed on the roots of the newly planted seedlings. For sustainable maintenance of the project site, separate plan on how to address and control the pest issues in the project site should be developed.

4.2. Minas Tahuras FMU and Kepau Jaya Forest with Specific Purpose (FWSP/KHDTK), Riau Province

The Minas Tahura FMU (under the Environmental and Forestry Service Office of Riau Province) covers an area of 109,361 hectares, including 11,490 hectares of limited production forest, 90,796 hectares of permanent production forest, 903 hectares of convertible production forest, and 6,172 hectares of TAHURA Sultan Syarif Hasyim. The Minas Tahura FMU area overlaps with Siak Regency (70,490 hectares), Kampar Regency (35,940 hectares), and Pekanbaru City (2,931 hectares).

Kepau Jaya FWSP/KHDTK (under the Office of Instrument Standard Implementation of Environmental and Forestry (BPSILHK) Kuok) covers an area of 1,027 ha.

The demo plot was initially planned to be established in two peat areas: 5 ha in Minas Tahura FMU and 5 ha in Kepau Jaya FWSP/KHDTK). After conducting the site surveys in both areas, it was found that the peat area in Minas Tahura FMU was in good condition (>95% deep peat, and often flooded). Due to the irrelevance of having a demo plot in a forest area with good conditions, adjustments were made to secure 10 hectares for demo plot establishment in Kepau Jaya FWSP. Planting was completed in December 2022, and the IA expects to conduct supplementary planting to replace the dead seedlings this year.

Although the demonstration plot is located and managed by the Kepau Jaya FWSP officials, the project team clarified that close cooperation with Minas Tahura FMU is maintained as the FMU continues to play an integral role in the capacity-building activities on the development of local commodities by local farmers and villagers. The demonstration plot was established based on a carefully designed plan by the national experts of the Institute for the Application Standards of Environmental and Forestry Instruments Kuok.

(a) Demonstration plot establishment

The different types of blocks established in the peat land site represented the initial vegetation cover of the area prior to the plot development. Moreover, the demonstration plot was divided into 5 blocks of 3 block types:

- **Secondary Forest Block – 4 ha**
  The Secondary forest block is divided into 2 blocks as the land has been claimed by two farmers. The block consists of **Secondary Forest Block I** (2 ha, 200 x 100m) (half of this block is covered with shrubs and small trees; the other half is planted with multi-purpose tree species (MPTS)) and **Secondary Forest Block II** (2 ha, 100 x 200m)
- **Agroforestry block – 3 ha**
  This block consists of **Agroforestry Block I** (1.5 ha, 300 x 50m) that is reserved for intercropping by farmers and **Agroforestry Block II** for intensive agroforestry – 1.5 ha (300 x 50m)
- **Palm Oil Block – 3 ha**
  The planting activity in the palm oil block in which land ownership was claimed by a farmer, the activity can be applied as a pilot of the long-term rehabilitation strategy (*Strategi Jangka Benah* or SJB), where the

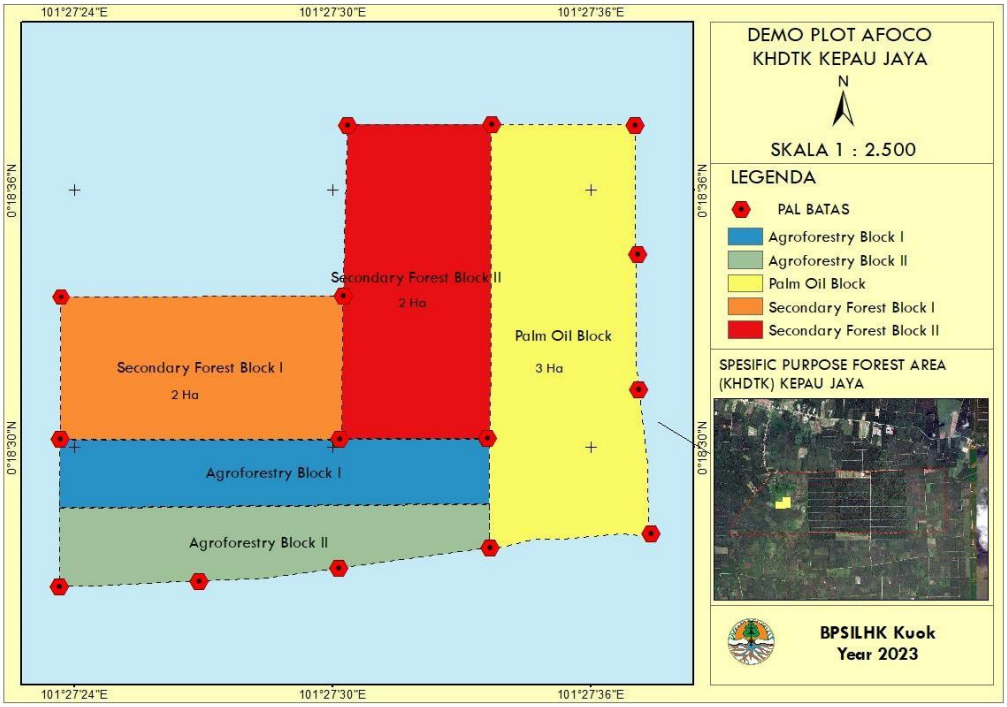
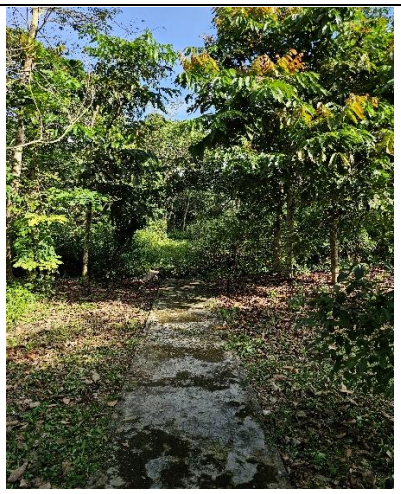


Figure 3. Demonstration plot map in Kepau Jaya FWSP, Kampar Regency, Riau Province

	
Mini office that belongs to the Kepau Jaya FWSP temporarily used by the project staff and national experts	Entrance to the demo plots next to the office (the nearest agroforestry block is a 10-minute walk away)

	
Project signboards at project site	The start and end of each block is marked with red-tipped pole

(b) Survival rate of planted species

A total of 7,414 seedlings were sourced from local forest plant nursery in Pekanbaru and Meranti Island, Riau Province. The survival rate and species planted in each block are as follows:

No.	Block	Species	No. planted	% of surviving plants (2023)	% survival by block
1.	Secondary Forest Block I	Pulai (*Alstonia scholaris*)	400	66.43%	33.88%
		Matoa (*Pometia pinnata*)	363	35.81%	
		Durian (*Durio sp.*)	363	33.06%	
		Nangka (*Artocarpus heterophyllus*)	363	10.19%	
		Jengkol (*Archidendron pauciflorum*)	363	7.16%	
		Petai (*Parkia speciosa*)	363	29.48%	
	Replanting in 2023	Pulai (*Alstonia scholaris*)	1000	Not Available	
		Geronggang (*Crataxylon arborescens*)	20	55.00%	
2.	Secondary Forest Block II	Pulai (*Alstonia scholaris*)	554	65.13%	20.44%
		Matoa (*Pometia pinnata)*	335	25.67%	
		Durian (*Durio sp.)*	335	24.78%	
		Nangka (*Artocarpus heterophyllus*)	335	0.00%	
		Jengkol (*Archidendron pauciflorum*)	335	0.00%	
		Petai (*Parkia speciosa*)	335	0.00%	
	Replanting in 2023	Pulai (*Alstonia scholaris*)	900	Included in	
		Trembesi (*Samanea saman*)	200	27.50%	
3.	Agroforestry Block	Liberika Coffee *(Coffee liberica)*	930	29.25%	25.51%
		Cajuput (*Melaleuca cajuputi*)	930	38.49%	
		Shorea *(Shorea balangeran)*	500	8.80%	
	Replanting in 2023	Geronggang (*Crataxylon arborescens*)	480	50.42%	75.61%
		Pulai (*Alstonia scholaris*)	100	94.00%	

		Tembesu (*Fagraea fragans* Roxb.)	1000	82.40%	
	Tree-planting during visit by Vice Minister of MOEF IN 2023	Nangka (*Artocarpus heterophyllus*)	17	100.00%	100%
		Mangga (*Mangeifera indica L.*)	23	100.00%	
		Durian (*Durio sp.*)	11	100.00%	
4.	Palm Oil Block	Liberika coffee *(Coffee liberica)*	500	17.80%	21.17%
		Shorea *(Shorea balangeran)*	110	24.55%	
		TOTAL	11,165	46.10%	-

The planting of MPTS were requested by the farmer groups as fruit trees could provide economic benefits. However, after monitoring the growth and survival rates, it was observed that certain MPTS species, specifically Nangka (*Artocarpus heterophyllus*), Jengkol (*Archidendron pauciflorum*), Petai (*Parkia speciosa*), had very low survival rates, implying that they are unsuitable for peatland rehabilitation. The national expert explained that although MPTS can thrive in shallow or mineral peat, they are unable to survive well in deep peat. This experience suggests that MPTS species is not suitable for planting in the demo plot area, which appears to have moderately deep peat. The lack of small-scale site-specific information, as the peat depth assessment was conducted at the district level by the Forest Management Unit (FMU), contributed to this mismatch.

① **Secondary Forest Block – 4 ha**
Land is claimed by 2 farmers, hence is divided into 2 blocks

- **Secondary Forest Block I** – 2 ha (200 x 100m) (half of this block is covered with shrubs and small trees; the other half is planted with MPTS) - 400 seedlings of pulai/blackboard tree (*Alstonia scholaris*), 363 petai (*Parkia speciosa*), 363 jengkol/stinky bean (*Archidendron pauciflorum*), 363 matoa (*Pometia pinnata*), 363 durian (*Durio Sp.*), and 363 nangka (*Artocarpus heterophyllus*)
- **Secondary Forest Block II** – 2 ha (100 x 200m)
  Planted with 554 seedlings of pulai/blackboard tree (*Alstonia scholaris*), 335 petai (*Parkia speciosa*), 335 jengkol/stinky bean (*Archidendron pauciflorum*), 335 matoa (*Pometia pinnata*), 335 durian (*Durio Sp.*), and 700 nangka (Artocarpus heterophyllus)

② **Agroforestry block – 3 ha**

- **Agroforestry Block I** (see picture below for example) reserved for intercropping by farmers – 1.5 ha (300 x 50m)
- **Agroforestry Block II** for intensive agroforestry – 1.5 ha (300 x 50m) consisting of 930 planted seedlings of liberica coffee (*Coffea liberica*), 930 cajuput (*Melaleuca leucadendra*), and 500 *Shorea spp.*

The agroforestry block was designed to accommodate intercropping. Farmers, (KTH and residents) can carry out intercropping / plant crops in between perennial plants.

③ **Palm Oil Block – 3 ha (right picture)**

Intensive planting could not be done as the block was already covered with palm oil planted at a space of 9 x 8m. The rows of plant oil trees were separated by alternating maintenance and harvest (to allow machinery and small vehicles to enter during the harvesting) lines. Planting could only be done in between the palm oil rows alternately as the land claimer only allowed the project team to plant in maintenance rows. The national expert in charge of the plot establishment that this was the main reason why a comparatively smaller number of plants was being planted in the palm oil block.

The palm oil block consists of 500 liberica coffee (*Coffea liberica*) and 110 *Shorea spp.* The planted species in the palm oil block show the lowest number of survival rate amongst the five blocks because the heavy dead palm oil tree branches trample the planted species. This is explained in detail in section (c).

The project staff will make further efforts to raise awareness of the adverse impacts of extensive palm oil monoculture plantations and continue to encourage the adoption of alternative livelihoods to encourage palm oil farmers and laborers to cooperate with the Kepau Jaya FWSP to maintain the demo plot and ensure the survival of the planted species.

The measurements regarding the diameter and survival rate of the planted species took place one year after the planting was completed, by each national expert responsible for establishing the demonstration plots.

(c) Livelihood products developed and impacts on farmer livelihoods

During the visit to the Minas Tahura FMU (Sultan Syarif Hasyim Grand Forest Park), the national expert presented on the mentions that Acacia and eucalyptus production forests dominate the Minas Tahura FMU area, revealing the high potential for honey bee harvesting. The national expert provided a brief presentation on the value chain and market analysis of honey and it huge potential during the Secretariat's visit (**Annex-2**). On average, 50L of pure organic honey is being produced daily and 1-2 tons per month, with a price range of 60,000 IDR~120,000 IDR per packaged kg depending on the type and quality of the honey. Monthly revenue is thus estimated to range from 60,000,000 IDR~240,000,000 IDR. Interviews with the local farmers attending the consultation revealed that training provided to the farmers have equipped them with the skills and knowledge on packaging and digital marketing, with one local farmer managing a YouTube channel ('*Tranformasi Tani'* https://www.youtube.com/@transformasitani9639) on honey harvesting techniques with 22,000 followers. The channel is one example of a successful digital marketing strategy, as the owner of the channel has made approximately 100 USD profit per month in some of the most popular videos.

However, there is still room for improvement, particularly regarding the certification of quality standards, as the products have not yet obtained standard quality certification. The FMU explained that the glucose level in the organic honey products does not meet the requirements for certification. Considering that increasing the glucose concentration would require additional treatments, which could compromise the product's organic nature, the FMU and villagers will carefully consider this in the long term. The full report on the potential commodities in Riau province, prepared by the national experts of the Institute for the Application Standards of Environmental and Forestry Instruments Kuok is attached as **Annex-3**.

Different types of honey products from different farmers being produced at the project site

(d) Capacity enhancement of Minas Tahura Forest Management Unit

Training of staff from the Minas Tahura FMU on international level carbon accounting and GIS technology has been regularly conducted through the project. The staff of the Minas Tahura FMU is already applying the techniques in their everyday work. Mr. Satrio (right photo), one of the FMU officers has been selected as the best trainee of the carbon accounting and GIS training provided by the project. During his interview, he commented that since the FMU has already started to apply the techniques in their work, he hopes to further enhance and use the skills he has gained from the trainings in the future as well.

One of the activities to be added as sub-activity under *A.5.1. Workshop on developing scenario business plans for three project sites* is to provide the FMU with a strategic action plan to achieve the Indonesia's national NDC target. Currently, although Indonesia has an overall NCD on a national level, no action plan or strategy for FMUs have been developed, and hence many FMUs in Indonesia struggling to find their own grass-root level action plans and strategy to contribute towards Indonesia's overall NDC target. The project, together with the FMU and the villagers will develop together a long-term (2025-2035) strategic action plan for the Minhas Tahura FMU, to include not only action plan on NDC achievement, but also on long term strategy on social forestry, business plan development for forest products, local forest management plan, green economy, climate change mitigation and adaption strategies that incorporate the international agreements and programs. This is expected to contribute greatly to the sustainability of the project, as the established demonstration plot, trainings and workshop, and the market chain analysis already provided through this project will be fully utilized for action.

(e) Issues and concerns

- Careful discussion and negotiation should be conducted with land claimants and farmers. However, in certain situations and specific circumstances, firm warnings may be necessary, as some occupants and farmers may not comply with the agreement. The plot will need thorough maintenance in weeding and pest control during the initial year after planting due to rapid weed growth that tends to cover the area.

- The management and sustainability of the plantations in the palm oil block is not guaranteed, as the land has been claimed illegally (legally the land belongs to the State) by the palm oil farmers, the workers have not been properly informed by the owner of the palm oil farm on how to manage and take care of the planted species. Hence, there has been cases where due to lack of attention by the workers, huge palm oil branches and leaves have been thrown on top of the planted species, either killing them or blocking necessary nutrients and sunlight for proper growth. This has drastically affected the survival rate of the palm oil farm block. However, the solution for this issue is not clear, as the entire country suffers from encroachment issues and legal regulations are not strong enough to stop or punish the claimers of state-owned land and forest. The lack of

human resources (forestry sector officials) and tenurial conflicts also complicates the problem. Thus, there are currently national efforts to stop the expansion of palm oil farms since the farm cycle is 25 years, the Indonesian government is preparing for a gradual and long-term rehabilitation of palm oil farms called *Strategi Jangka Benah* (SJB - https://sposindonesia.org/news-article/jangka-benah-strategy-an-initiative-for-resolution-of-palm-oil-in-forest-area/). The tending and maintenance plan for the palm oil block need to be developed based on such situation.

- The FMU has requested the support of AFoCO funding through this project on the development of FMU website as a form of digital marketing strategy so that they will be able to showcase the available products that the villagers produce and use the website to increase income from the produced products. Currently, there is an absence of such platform, which is limiting the promotion of the produced products and the potential profit for the villagers. The IA has proposed using parts of the generated project savings for this additional activity.

4.3. Update on project progress in West Nusa Tenggara

Ampang Plampang FMU is one of the FMUs of Sumbawa island, Sumbawa Regency, West Nusa Tenggara Province. The forest area under the administration of Ampang Plampang FMU is about 73,184 ha and consists of dryland forests and mangrove forests. The mangrove forests are distributed along the coast and its area is around 1,100 ha. One of the major problems faced by the FMU in the management of their forest areas is forest encroachment. Most of the dryland forest areas were converted for dryland farming and mangrove forest converted into fishponds.

(a) Demonstration plot establishment & planted species

The demo plot is located in Sepayung Village, Plampang district, Sumbawa Regency, which is included in the management area of Amplang Plampang FMU. All stages of activities in the field are coordinated by Ampang Plampang FMU. The Nanga Gali Farmers Group (of Sinar Jaya hamlet, Sepayung Village), as site counterparts, play a role in providing seeds, and labor, assisting in the process of land preparation, temporary nursery operations planting, and maintenance.

Planting was completed in July 2022, and a total of 33,000 seedlings (including 2,000 seedlings for replanting purposes) were sourced from BPTH Balai Perbenihan Tanaman Hutan Sulawesi Selatan (South Sulawesi Forest Plant Nursery Agency) – forest tree species, BPDAS (Watershed Management Agency) Jenebereng-Sadang South Sulawesi – MPTS, and Bulukumba Regency, Nyatoh from Toraja Regency – pala (nutmeg).

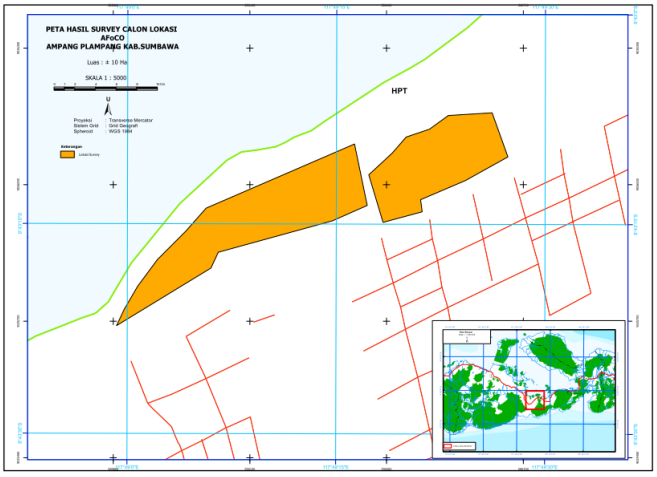


Figure 4. Demonstration plot map in Plampang District, Sumbawa Regency, West Nusa Tenggara Province

The IA also updated that the mangrove plantation site has shown relatively high survival rate for all three mangrove species planted in the site — *Rhizophora mucronate, Rhizophora apiculate* and *Bruguiera gymnorrhiza.*

No.	Species	No. planted	% of surviving plants (2022)	% of surviving plants (2023)
1.	*Rhizophora mucronata*	31,000 seedlings planted initially (additional 2,000 were planted to replace dead seedlings)	88.60	Estimated to be ~100% after replanting 2000 seedlings in February 2023
2.	*Rhizophora apiculata*		80.95	
3.	*Bruguiera gymnorrhiza*		87.25	
	TOTAL	31,000	87.48	>90%

(b) Training on livelihood product development

The IA updated that they conducted a training on mangrove product development with women in local communities in West Nusa Tenggara.

Making coffee beans from *Rhizophora mucronata* to produce low-caffeine drinks

Making chips and Asinan (preserved spicy vegetables) from *Bruguiera gymnorhiza*

Mangrove 'eco-printing' using mangrove leaves

(c) Issues and concerns

The raised one concern regarding the demonstration plot site in West Nusa Tenggara. In the mangrove demonstration plot, the planted mangrove species were carefully chosen for their carbon storage capacity and potential for developing various mangrove livelihood products such as soap, food, fruits, coffee, etc. However, recent monitoring has revealed the presence of another mangrove species, *Avicennia Alba*, growing naturally in groups in several parts of the project site. The IA and experts believe that this is a result of natural dispersion by water. Both *Rhizophora* and *Avicennia* are popular choices for plantation and mangrove forest rehabilitation in Indonesia. However, the national expert responsible for the plot sought the Secretariat's suggestion on whether the naturally growing *Avicennia* species should be removed from the plot since it was not part of the original project plan. The expert's experience suggests that although *Avicennia* is a fast-growing species, its growth rate will not significantly affect the planted species.

Photo of mangrove demoplot taken in end-June 2023

As the naturally growing *Avicennia Alba* species can also contribute to restoration and carbon stock enhancement objectives, the Secretariat suggested to have the naturally growing mangrove trees be left uncut and allowed to continue growing in the site while carrying out regular monitoring. However, if the IA needs to maintain a smaller plot of the planted *Rhizophora* species for specific research purposes, the naturally growing species may be removed in the sub-plot if necessary.

Illegal encroachment and land conversion pose significant challenges in Indonesia, particularly in the case of mangrove forests being converted into pond cultivation areas. This issue has persisted for a considerable period of time, with the Sepayung village area in Plampang sub-district being affected, amounting to nearly 50 hectares according to information from Ampang Plampang FMU. Once the land is converted to pond areas, restoring its original function becomes exceedingly difficult. Therefore, measures should be taken to prevent further conversion of mangrove forests in the area.

5. SYNTHESIS OF PROJECT CONTRIBUTIONS & IMPACTS

5.1. Project impacts

The project is a multi-faceted one with varied and significant contributions to research, community livelihoods, capacity development of forestry sector officials, forest managers and local communities.

- **Policy contributions & enhancing good governance**

  The project is intrinsically linked to enhancing forest governance as it is implemented based on the MoUs between the IA and the FMUs. As the capacity building activities targeted at the FMU officials trained them in the utilization of GIS tools and forest carbon stock assessment, while imparting an understanding of the concepts and methods applied in the development of Indonesia's Forestry and Other Land Use (FOLU) Net Sink 2030 (the newest forest policy in Indonesia that identifies the FOLU sector as a net sink). The trainings provided not only promote sustainable forest management practices, but also improve the capacities of FMUs and local stakeholders in mitigating climate change and increasing landscape biodiversity. (See article on training here: https://afocosec.org/newsroom/news/project-highlights/afoco-project-supports-indonesias-folu-net-sink-2030-targets/)

  The IA mentioned the complexities in land management in the country, where illegal encroachment and tenurial conflict is widespread. In the palm oil block of the peat land demo plot in Riau Province, planting was carried out in palm oil area that was claimed by a farmer. Hence the IA believes the activity can be a pilot of the Long-term Rehabilitation Strategy (or the *Strategi Jangka Benah* (SJB)).

  The Long-term Rehabilitation Strategy (SJB) aims to solve problems of monoculture smallholder oil palm plantations that exist within forest areas. *Jangka Benah* refers to the period of time needed to achieve desired forest structure and ecosystem functions according to management objectives. In SJB, the process of improving structure and function of forest ecosystems damaged by expansion of monoculture oil palm plantations is carried out in stages, with focus on improving the ecology, social and economic aspects of community. The first stage in SJB socialization is to change the monoculture smallholder oil palm plantations inside forest areas into mixed crops in form of agroforestry. The agroforestry species (e.g. Shorea and jengkol) planted in the project sites were also planted with the objectives of providing both ecological and economic benefits.

  In both South Sulawesi and Riau province, the market chain and value analysis of potential commodities provided a baseline information for the villages to build upon, and with the given trainings and workshops on how to package and market the products, the villagers were already seeing improvement in their packaging and marketing skills for livelihood improvement.

- **Research contributions**

  The project has a strong research aspect as Activities 1.4 (Collect and analyze data and information for scoping and spatial analysis), 1.5 (Collect and analyze baseline data and information of carbon stock, emission, biodiversity; and identification of potential commodities in three sites), 2.1 (Survey and assess data and information of Socio-economic (livelihood, economic assessment, market analysis) at the beginning and end of the project), 3.1 (Investigate and conduct value chain analysis and market analysis of potential commodities), 6.1 (Participatory rural appraisal (PRA) on demonstration plat site matching) and 7.1 (Establishing

demonstration plots) (undertaken by a total of 18 national experts) on remote sensing, GIS data collection and analysis, collection of data on carbon stock emission, biodiversity, socio-economic status, and value chain analysis have produced valuable research outputs. The IA has made efforts to integrate the research outputs from these activities in 5 research articles to be submitted to international journals. This will not only constitute part of the project outputs but also contribute to enhancing AFoCO's visibility in the academic sector.

One of research article, titled "Value chains and market analysis for the potential commodity of Tuah Tani Tonggak Negeri forest farmers group" has already been published in November 2022 as a research output of Activity 3.1 Investigate and conduct value chain analysis and market analysis of potential commodities.

- **Livelihood benefits**

  The project has successfully generated tangible livelihood benefits through the production of palm sugar and honey products in South Sulawesi and Riau, respectively. According to the interviewed farmers, they have gained significant advantages from the specialized training provided by livelihood product experts, enabling them to enhance the packaging of their products and increase marketability. However, when asked about the extent of livelihood transformation, the national experts clarified that their analysis and projections indicate that the newly explored livelihood products will not be able to fully replace primary sources of income. Instead, they can provide supplementary sources of income, helping to reduce dependency on livelihood activities associated with unsustainable forest management practices (such as palm oil harvesting). The overall and specific amount and percentage of income increase will be calculated at the end of the project (target: 10% increase from baseline)

5.2. Project sustainability considerations

Aside from the obvious benefits from alternative livelihoods (forest products), the members of the Forest Farmer Groups also acquire additional income from their involvement and participation in the planting and demo plot maintenance. Since the IA (CSSFMI) has an MoU with each FMU, the FMU manages the personnel at the site level, including the relationship with the Forest Farmer Groups, on behalf of the IA. Each Forest Farmer Group has an agreement with the FMU and the duration of the agreement cover the entire project duration. After the completion of project, the farmer groups will continue to contribute labor and possibly become 'partners' of the FMUs (who are authorized to manage their respective forest areas). The project envisions that benefit-sharing mechanism will be put in place when marketable produce is ready for harvest in the demo plots. The details of the Forest Farmer Groups involved in the regular maintenance of the plot are as follows:

Province	**Overall management of demo plot**	**Forest Farmer Group**	**Daily pay for plot maintenance**
South Sulawesi	Bulusarang FMU	Tala-tala Hamlet (25 farmers)	IDR 100.000-120.000/person/day
Riau	Kepau Jaya FWSP	2 farmers and 5 non-government FWSP officers	IDR 150.000/person/day
West Nusa Tenggara	Ampang Plampang FMU	KTH Nanga Gali (25 farmers)	IDR 100.000/person/day

6. RECOMMENDATIONS

6.1. Recommendations on utilization of project savings

As trainings and meeting were usually held in the field/FMU areas to reach out to more villagers/farmers residing in remote community areas, costs associated with airfare and accommodation were reduced. Moreover, as the initial work and budget plan was developed using cost estimated based on hotel meeting packages in city centers, substantial project savings were produced. The COVID-19 outbreak also saw many transitions into hybrid/online meetings, contributing further to the project savings.

The following suggestions were proposed by the IA on the usage of project savings, **mainly to address the issues and concerns raised in the project sites**. **The IA will further consolidate their suggestions and submit an official request for the utilization of project savings together with the final list of proposed activities to be approved by the PSC (by circulation of documents or by conducting a special PSC meeting) in due course.** The list of recommendations are as follows:

IA Proposed Activity	Related Activity	Justification/Details	Recommendations from Monitoring Team
(a) Permanent plot development	Activity 7.1 (Establishment of demonstration plots)	**The IA suggested the "Development of Permanent Sampling Plot of Forest Carbon Stock" as a new activity at the 3rd PSC Meeting**. This activity will support the conversion of the demonstration plots into permanent plots through the installation of signboards and demarcation of boundaries for surveyors to easily locate the sites in regular monitoring activities and carbon stock calculations. This is also a recommendation from the initial carbon stock baselining study, which resulted in the delineation and marking of many points onsite. A concept note of the permanent plot development to be submitted to the Secretariat for approval.	The establishment of a permanent plot would contribute to the long-term management and monitoring of the demo plots, while serving as a valuable resource for knowledge sharing and capacity building among FMUs, contributing to the replication and scaling up of successful rehabilitation strategies. This suggestion has been proposed at the Progress Meeting in 2022 and should be further discussed during the next PSC meeting upon the submission of the concept note of the permanent plot from the IA.
(b) Expansion of existing demo plot	Activity 7.1 (Establishment of demonstration plots)	**Each project site plot area could be expanded by an additional 5 ha.** yes, in the front of our demo plot in South Sulawesi there is an area of burned pines which still has stumps. in West Nusa Tenggara, the critical land is still large, including mangrove area under FMU. but we have to concern about the conflict tenurial with the ponds farming.	Considering that the IA has already established strong cooperative relationships with the local communities, it would be more efficient to expanding the existing demo plot area than to seek new areas for demo plot establishment. This suggestion should be further discussed during the next PSC meeting upon the submission of the concept note of the permanent plot from the IA

		in Riau, FWSP Kepau Jaya under Kuok BPSI still has potential land to be rehabilitated, especially on oil palm plantations with the Long-term Rehabilitation Strategy (or Strategi Jangka Benah (SJB) with Shorea Belangeran or Tembesu trees; and agroforestry with kaju putih, coffee liberika, and pineapple have potential to be developed.	
(c) Enhance management of demo plot	Activity 8.1 (Maintenance and growth monitoring of demonstration plot)	**To improve site conditions as part of maintenance in the South Sulawesi (Bulusarang FMU), dead logs in the area may be removed.** In the case of the South Sulawesi demo plot (karst ecosystem), termite attacks have been reported to be main threat to plant survival in the demo plot area. These termites primarily inhabit fallen dead logs, which were previously struck by lightning. Additionally, the presence of numerous standing dead/burned trees increases the risk of damage to the planted species during heavy rain. The national expert and IA estimated that the cost of the dead long removal to be approximately ~2,000 USD for 10 ha. The IA will further consider this suggestion together with the suggestion for demo plot expansion.	Considering the need to ensure effective long-term management, the removal of dead logs from the site is one of the most viable options to reduce the number of the termites in the area and the damage they pose to the planted species (by feeding on their bark and roots). As the cost of the additional maintenance is fairly reasonable, the Secretariat believes that project savings can be used to cover this maintenance-related activity if deemed necessary. This suggestion should be further discussed during the next PSC meeting upon the submission of the concept note of the permanent plot from the IA.
(d) Development and adoption of Climate Mitigation and Adaptation Strategic Plan of FMU	Activity 5.1 (Workshop on developing scenario of Business Plans) and Activity 5.2 (Share learning and policy dialogue in the district/provincial level on developed business plan of FMUs)	**The development of a new climate change-focused long-term plan for FMUs could be developed as a model for other FMUs.** In the project document, Activity 5.1 (*'Workshop on developing scenario of Business Plans (forest-based eco-tourism, etc. based on site resources potential and market opportunities)'*) was intended at the development of business plans by the FMUs. However, in 2020, government regulations mandate that FMUs can no long do any form of businesses. As the existing long-term strategic plans of FMUs are expected to end in 2024/2025, it is timely for FMUs to begin preparing for the National Mid-term Development Plan of Forest Management Unit 2025-2045 based on mitigation and adaptation to climate change beginning in 2025. Hence, project savings can be used by	This endeavor would be especially meaningful as the AFoCO project could serve as a model for other FMUs in the country to follow. This suggestion should be further discussed during the next PSC meeting.

		FMUs to hold workshops and policy dialogues necessary for the development of a climate change-focused plan that is aligned with the country's NDCs targets.	
(e) Website development of Minas Tahura FMU (Riau province)	New activity associated with FMU Business Plan	**The FMU head suggested developing an FMU website to showcase forest products.** The development of a digital marketing platform would connect forest products to more consumers (beyond the local market) to improve livelihoods and also contribute to enhancing the capacities of FMU officials in online marketing of forest products. (Based on information provided by the IA, Minas Tahura FMU and Bulusarang FMU do not have websites of their own, while Amplang Plampang FMU and Kepau Jaya FWSP each operate an FMU website. All 4 entities operate an Instagram account.)	Considering that this is an entirely new activity that does not have direct links to the planned project outputs, the Secretariat believes that this activity should be further assessed/reviewed to determine if it is truly necessary for implementation at this stage. This project activity will also have to be implemented across all 3 FMUs if decided to be proceeded.
(f) Establishment of a packaging unit in Bulusaurang FMU (South Sulawesi)	New activity associated with FMU Business Plan	**The FMU and villagers suggested establishing a packaging unit in the area can be used by farmers and villagers producing forestry products.** The unit will provide basic and relevant machinery, equipment and tools that can be used in the packaging of the livelihood products. This will allow farmers and villagers to apply the practical skills acquired by farmers and villagers during the livelihood product development training supported by the project.	The additional of a new activity involving the establishment of new infrastructure is a proposal that requires more consideration. If the production capacity at the moment is small-scale and consumers are mostly from the local markets, the establishment of a packaging unit at this point in time is not considered an urgent issue. However, it would be meaningful to consider establishing a multi-purpose facility (i.e. training center).
(g) Additional publications	Activity 9.2 (Publication and dissemination)	**The IA intends to release 3 additional journal publications co-authored by national experts involved in the project.** The project staff reported that they have been working with the 18 national experts involved in the project activities to reorganize the research findings and outputs from the project into 5 thematic topics. Since the original budget (Activity 9.2) only allocates budget for the publication fees for 2 research publications, the IA proposes to utilize savings for the publication of additional research articles.	The team believes that research publications help document project achievements and contributions to the scientific community, while increasing AFoCO's visibility. The peer review process also adds credibility and validation to the project outcomes This suggestion should be further discussed during the next PSC meeting. (Such activities are mentioned in the guidelines on usage of project savings provided by the Secretariat.)

6.2. Recommendations on no-cost project extension

The IA has proposed a one (1) year no-cost project extension for the following reasons:

(1) In Indonesia, the maintenance and monitoring of newly planted trees should last at least 3 years after the planting so as to guarantee the stable growth of the planted seedlings into forests. The planting of plants in the 3 sites was completed from March to August 2022 due to several unforeseen internal/administrative circumstances:

(2) The lack of available resource persons is causing delays in conducting the planned 18 in-person trainings across three different islands in Indonesia. This shortage has resulted in challenges in organizing workshops and trainings as initially scheduled. However, by implementing a no-cost extension, the implementing agency (IA) will have the opportunity to carry out all the required trainings within the specified timeframe, ensuring sufficient duration and content.

(3) The additional time provided will give the IA time to establish a permanent plot for field visit and study tours by other FMUs, as the demonstration plots will serve as an example for many other FMUs, the IA has requested more time to properly develop a plan and establish a permanent plot.

The monitoring team believes that it would be reasonable and fair to grant a no-cost extension of a minimum of three (3) months and maximum of six (6) months. Considering the need for the sustainable, long-term management of the demo plots as well as the unexpected situations that have contributed to implementation delays in the first and second years of the project, the Monitoring Team recommends no-cost extension of six (6) months, to ensure that all planned project activities and proposed new activities (making use of project savings) are completed by 2024. The extended time will allow the IA to thoroughly maintain, monitor and conduct supplementary/enrichment planting to ensure that the demo plot plantations develop into healthy and stable into forest ecosystems in the long-run. The 6-month no-cost extension does not pose any budget execution issues for the Secretariat as it falls within the planned year of completion (2024).

The list of unforeseen circumstances that have contributed to implementation delays in the first (2021) second (2022) years of the project are as follows:

- Although the date of project inception was on 24 June 2021 (Ref. No. 2021[IM-112] and [IM-116]), the project activities officially commenced in October 2021 due internal arrangements such as the opening of the bank account, which required approval from the Cabinet.
- There was an internal reorganization of Ministry of Environment and Forestry, which involved a change in the IA (formerly Forestry and Environment Research and Development Agency (FORDA) into the current CSSFMI under the Agency for Standardization of Environment and Forestry Instruments (Ref. No. 2021[IM-168] and [IM-169]. The was also accompanied by a change in management (Ref. No. 2021[IM-296]).
- The Secretariat was informed of the resignation of the former Project Coordinator (Ref. No. 2022[IM-21]) in early 2022. After which, the current Project Coordinator, Ms. Ayun Windyoningrum took charge of the project management.
- In February 2022, due to limited planting area, there was a change in project site in Year 2 of project. The site original selected for mangrove demo plot establishment in Ngurah Rai Forest Park, Bali

province, was changed to the mangrove area managed by Amplang Plampang FMU in Sumbawa Regency, West Nusa Tenggara Province (Ref. No. 2022[IM-24]).

- Adding on to this delay is the outbreak of the COVID-19 pandemic, which lasted from January 2020 to May 2023 (based on World Health Organization reports). As the site locations are located in remote areas in different islands, the IA was unable to conduct the planned project activities due to the domestic travel and social distancing restrictions. In particular, this has resulted in a delay in the implementation of training activities, which the IA intends to complete within this year.

The 6-month no-cost extension of the project is essential to ensure the long-term success and sustainability of the demo plots. The additional time will allow for thorough maintenance, monitoring, and supplementary/enrichment planting, ensuring that the planted seedlings develop into healthy and stable forest ecosystems. This extension will also provide the opportunity to establish a permanent plot, serving as a model for other FMUs and facilitating field visits and study tours. By granting the extension, the project will have a lasting impact and contribute to the broader goal of promoting sustainable forest management practices in Indonesia.

APPENDIX

Appendix-1. Full details on the expenditure of the trip

Appendix-2. Detailed monitoring schedule

(LIST OF REFERENCES)

The following list includes the 18 activity reports written by a National Experts (each supported by a team of 1~4 experts). These reports were referred to extensively in the desk review process.

No.	Activity	Activity Report Title (used as references in research articles)	Drafter (National Expert)	Date
1	Activity 1.4 Collect and analyze data and information for scoping and spatial analysis	(Activity Report – Riau)	Rinaldi Imanuddin Researcher of National Research and Innovation Agency (BRIN)	November 2021 – February 2022
2		(Activity Report – South Sulawesi)	Dr. Budi Hadi Narendra Researcher of BRIN	November 2021 – February 2022
3		(Activity Report – West Nusa Tenggara)	Dr. Ogi Setiawan Researcher of BRIN	March 2022 – May 2022
4	Activity 1.5 Collect and analyze baseline data and information of carbon stock, emission, biodiversity; and identification of potential commodities in three sites	(Activity Report – Riau)	Wahyu Catur AdinugrohoResearcher of BRIN	November 2021 – February 2022
5		(Activity Report – South Sulawesi)	Fajri Ansari Researcher of BRIN	November 2021 – March 2022
6		(Activity Report – West Nusa Tenggara)	Wahyu Catur Adinugroho Researcher of BRIN	March – June 2022
7	Activity 2.1 Survey and assess data and information of Socio-economic (livelihood, economic assessment, market analysis) at the beginning and end of the project	(Activity Report – Riau)	Dodi Frianto Staff of BPSI LHK Kuok	June - August 2022
8		(Activity Report – South Sulawesi)	Isdomo Yuliantoro Staff of BPSI LHK Makassar	March – June 2022
9		(Activity Report – West Nusa Tenggara)	Dhany Yuniati Researcher of BRIN	March – June 2022
10	Activity 3.1 Investigate and conduct value chain analysis and market analysis of potential commodities	(Activity Report – Riau)	Eko Sutrisno Staff of BPSI LHK Kuok	July – August 2022
11		(Activity Report – South Sulawesi)	Indah Novita Dewi Staff of BPSI LHK Makassar	March – June 2022
12		(Activity Report – West Nusa Tenggara)	Rubangi Al Hasan Researcher at BRIN	March – May 2022
13	Activity 6.1 Participatory rural appraisal (PRA) on demonstration plat site matching	(Activity Report – Riau)	Andhika Silva Yunianto Researcher of BRIN	November – December 2021
14		(Activity Report – South Sulawesi)	Nur Hayati Staff of BPSI LHK Makassar	November 2021 – Februari 2022

15		(Activity Report – West Nusa Tenggara)	Husnul Khotimah Researcher of BRIN	March – June 2022
16	Activity 7.1 Establishing demonstration plots	(Activity Report – Riau)	Eka Novriyanti, Researcher of BRIN	December 2021 – June 2022
17		(Activity Report – South Sulawesi)	C. Andriyani Prasetyawati Staff of BPSI LHK Makassar	November 2021 – August 2022
18		(Activity Report – West Nusa Tenggara)	M. Hidayatulah Staff of BPSI LHK Mataram	March – July 2022