Plan Vivo Project Design Document
COMMUNITY FOREST ECOSYSTEM SERVICES INDONESIA

Improved Community-based Agroforestry For Upper Watershed Rehabilitation In Lombok Island, Indonesia

Intervention: Ecosystem Rehabilitation

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Executive Summary

The upstream area of Renggung watershed provides key ecosystem services, including forest biodiversity, acting as a buffer zone to Mount Rinjani national park, a source of non-wood forest products, and a source of water for downstream populations. The forest is under threat from forest clearing and tree felling, and needs to be reforested to maintain its ecosystem services.

Through agroforestry improvement, this Payment for Ecosystem Services (PES) reforestation project will start with 100 hectares of land in Aik Bual and expand to neighbouring degraded forest areas in Mount Rinjani slopes. The forest carbon project activities include tree seedling/nursery development, planting, maintenance, and monitoring. The project is expected to improve well being of participating small-scale farmers and improve the quality of ecosystem services (carbon sequestration, biodiversity conservation, and watershed stability). The agroforestry system that will be developed has a high proportion of Multi-Purpose Tree Species (MPTS) that will significantly increase small-farmers income.

Aik Bual forest area currently has an average tree density of 110 trees/ ha. The reforestation activities will improve the agroforestry system by planting an additional 290 trees/ha. This is to meet the government recommendation of 400 trees/ha in forest rehabilition. There are three land covers in Aik Bual community forest: forest (54.2 ha), agro-forest (28.6 ha), and non-forest (16.4 ha). The mean carbon density in tree-planting zone (agro-forest and non-forest land cover) is 93.09±7.08 tonnes C/ha, while the forested zone (forest land cover) is 261.3±54.21 tonnes C/ha. The ecosystem rehabilitation PES project's main intervention is to improve tree-planting zone land cover by planting an average of 309 trees/ha. An additional activity is forest protection on the forest zone. The ex-ante net average of CO_2 sequestration from tree planting is estimated 1,823.47 tonnes CO_2e per annum.

This Plan Vivo project helps to promote an improved agroforestry system with biodiversity and watershed benefits. Funds generated from the sale of credits resulting from the project will be used to incentivise participating smallholder households and the community groups.

Part A: Aims and Objectives

This project addresses the problem of upstream forest degradation in the island of Lombok and the concomitant impacts on water and other ecosystem services. The upstream forest areas adjacent to Mount Rinjani National Park have suffered deforestation and degradation from encroachment. The upstream forests have been subject to a history of legal logging and government reforestation, but then a major change happened on the island following the fall of Suharto's New Order dictatorship in 1998, known as the "reformasi euphoria" era. Migrants and village residents felled the government reforestation trees (including mahogany, dalbergia), and continued with subsequent cultivation of agricultural crops (e.g. coffee, cocoa, banana, maize). Like elsewhere in Indonesia, illegal tree felling and forest clearing for smallholder agriculture is decreasing the forest cover. Our project focus is on 100 ha of Aik Bual forest in the upstream area of Renggung sub-watershed.

Three decades of government reforestation projects, lacking local community support, have only resulted in limited success. As the reforestation projects focus heavily on planting hardwood species (e.g. mahogany, dalbergia), it failed to integrate local community needs for non-wood forest products and space for agricultural crops.

The introduction of community forestry (*Hutan Kemasyarakatan* [HKm]) permits and minor changes in government reforestation projects in late 1990s have helped to reduce initial conflicts over forested lands between local community and forestry authorities. But it has not yet resulted in desirable impacts with regard to increased forest cover and improved livelihoods. Lacking access to quality tree planting materials, poor HKm farmers are unable to plant trees as expected, and continue with crop cultivation instead. Under these new government reforestation programmes it was permissible to have 30% MPTS (Multi-Purpose Tree Species/non-wood forest products) and 70% hardwood trees (e.g. mahogany, dalbergia). With watershed protection (protection forest) status, however, tree harvest is strictly prohibited by law. The reforested land was soon taken-over by the hardwood tree cover, reducing space for agricultural cultivation, which led to reduced farming income. This gave no incentive for the local community to protect the reforestation hardwood trees. As a result, instead of achieving the national reforestation program target of 400 trees per hectares, field survey indicates an average of 110 trees per hectares in Aik Bual and neighbouring reforestation areas. These reforestation schemes were not working in practice, despite good intentions for watershed protection.

With funding from the British American Tobacco Biodiversity Partnership, Fauna & Flora International in collaboration with Mataram University and local NGO Transform have been active in providing technical assistance in improving land management of the Renggung watershed, Central Lombok district. In Aik Bual area, the upper part of the Renggung watershed, the project has been developing agroforestry within the framework of biodiversity and ecosystem services as the main focus. This includes supporting NTFP (Non Timber Forest Products) tree planting, assisting in securing the HKm community forestry permit, and field research. The focus in the upper catchment is essential to produce the benefits for water dependent livelihoods down-stream. The broader project ensures a landscape approach for improved forest and watershed management which also includes the establishment of local government institutions and working with farmers in the middle and downstream areas. PES is considered a promising way forward to the development of a model for watershed management in Lombok. This report presents results of field survey, interview, and stakeholder consultation undertaken (in 2013) to assess the feasibility of implementing PES reforestation/agroforestry initiative in Aik Bual and other neighbouring areas in need of rehabilitation for multiple benefits.

The proposed forest carbon project aims to promote an ecosystem-based approach to watershed management. The project objectives are to:

1) Rehabilitate upper watershed forests enhancing biodiversity and ecosystem services by; a) improving community agroforestry systems, and b) increasing natural forest protection.
2) Develop livelihood opportunities linked to sustainable use of agroforestry products.
3) Empower communities to manage forest resources sustainably for livelihood and conservation benefits.
4) Develop a pilot model for best practice of community-based management of upper watershed forests.

Part B: Site Information

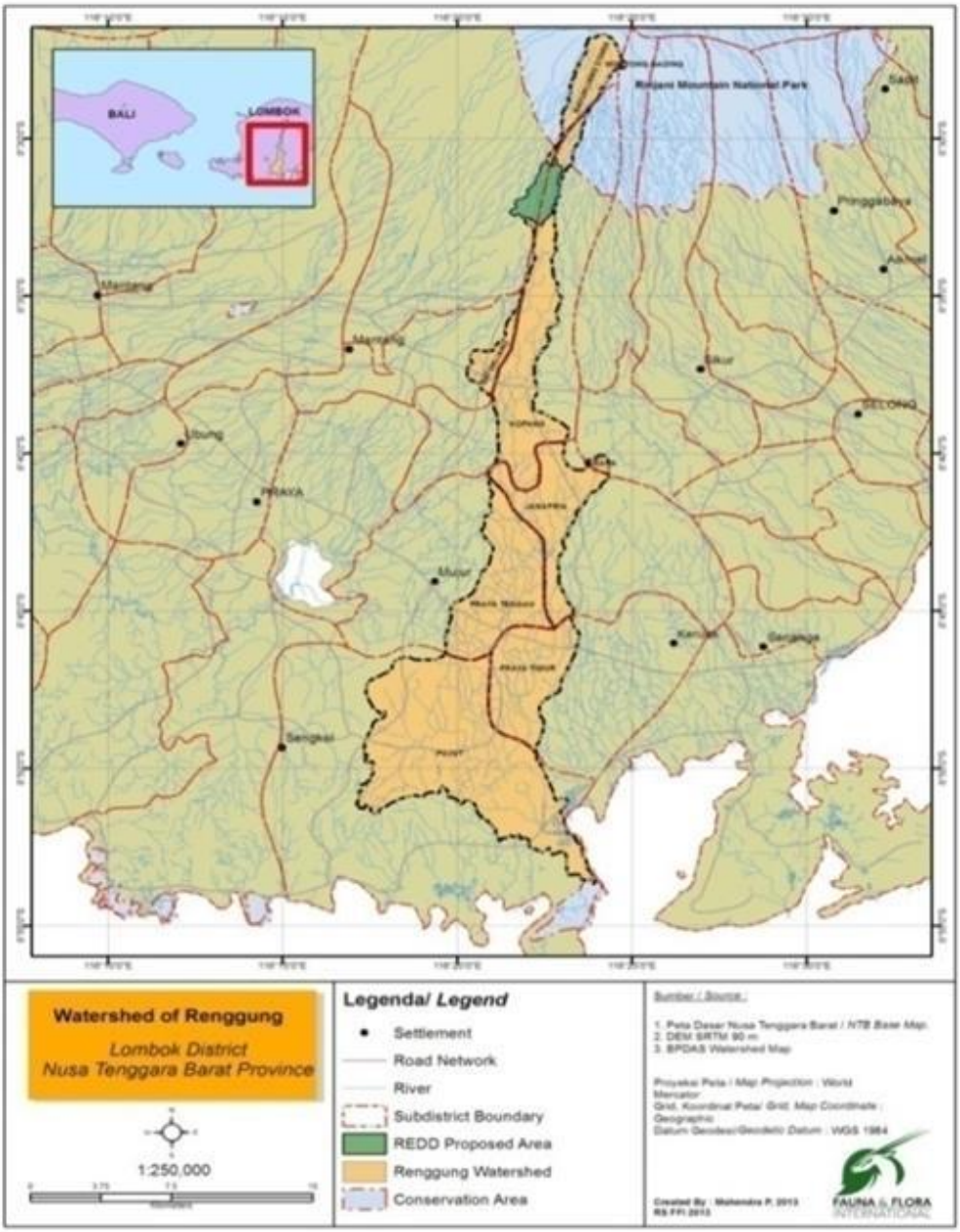
B1. Project Location and Boundaries

Aik Bual village is part of Kopang sub-district (*kecamatan*) of Central Lombok district (*kabupaten*). It borders protection forest zones to the north, Setiling village to the west, Jenggik Utara village (North Lombok district) to the east, and Wajageseng village in the south.

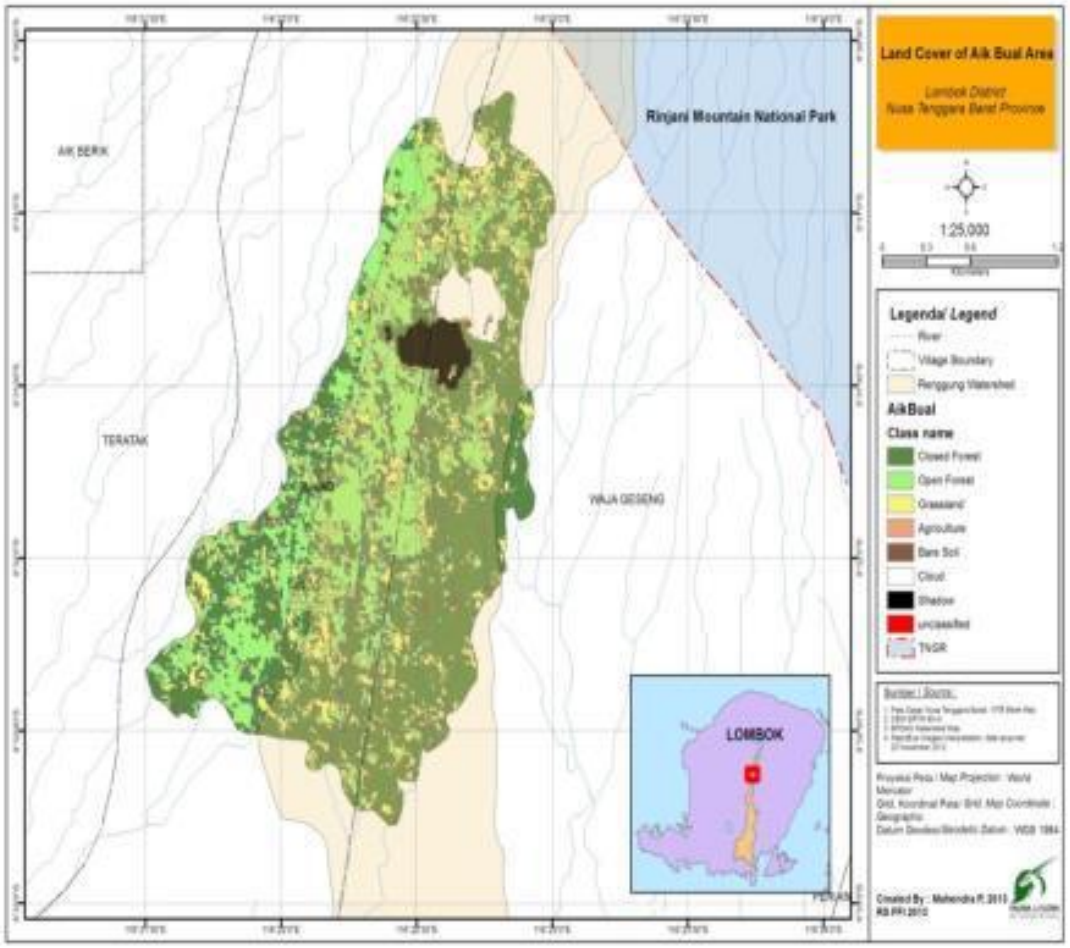
As part of an initiative to improve the management of Renggung watershed (Map B1-1), in 2012 the community of Aik Bual village has been facilitated to submit an application for community forestry license (HKm permit) to the district government. Of the total ± 445 hectares proposed for HKm (see Map B1-2), based on a field verification process, the district Forestry Office gave approval for 100 hectares. The Minister of Forestry area allocation (*pencadangan areal kerja*) has been secured and HKm permit form head of the district is currently in progress. Approval of the remaining 345 hectares will be given later after the community is able to demonstrate success in managing the forest land i.e. prevent further tree felling and clearing and increase forest cover.

The forest carbon project will start with 100 ha within the proposed 445 ha HKm areas (Map B1-2). This is then followed by project replication within the remaining 345 ha, and further expansion in other HKm areas in neighbouring villages that share similar threats and conditions to Aik Bual. These are Karang Sidemen, Lantan, Aik Berik, and Setiling villages. (See section 6.4 of this document for further discussion on project replication).

Map B1-1. Aik Bual Community Forest Area
in the Upper Renggung Watershed



Map B1-2. Land cover classification of Aik Bual HKm area (400 ha)



B2. Description of the Project Area

Lombok Island, West Nusa Tenggara Province, Indonesia has a land area of approximately 473,575 ha, 30% of this has 'forest land' status, which is classified as Mount Rinjani National Park (MRNP), Protection Forest, and Production Forest. MRNP (40,000ha) and the tropical rainforest covered foothills (an additional 85,000 ha) play an important role in Lombok's climate and hydrological cycles. Three of Lombok's four main Watershed Management Areas (SWP DAS), further sub-divided into 145 sub-watershed catchments, are connected to Mount Rinjani, making the volcano an essential resource supporting life on the island, particularly water for irrigation, industry and drinking.

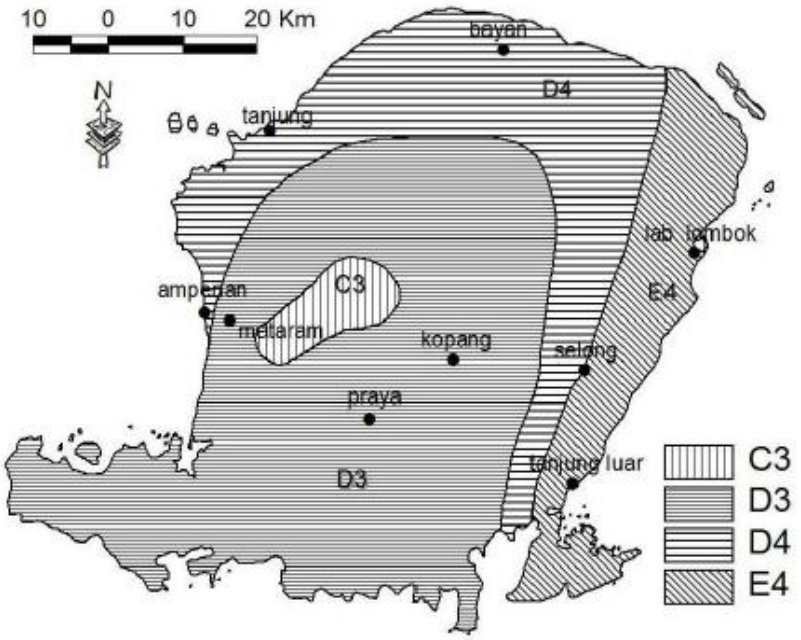
Climatic Conditions

Using Oldeman's (1980) agroclimatic classification system, the climate conditions in Aik Bual community forest are described as type C3 in the upper watershed and D3 in the middle to lower watershed (Map B2-1). Climate type C3 has 5-6 wet-months (rainfall >200mm/month) and 4-6 dry-months (rainfall <100mm/month). Climate type D3 has wet-months continuously for 3-4 months and dry-months continuously for 4-6 months. The rainfall intensity at Renggung watershed is affected mainly by the orography effects. The upper Renggung watershed, in Mount Rinjani National Park's

foothills, has higher rainfall intensity (> 2,500 mm/year) compared with the lower Renggung (1,200 mm/year). The average rainfall intensity at the Renggung watershed is 1,965 mm/year (Table B2-1).

Table B2-1. Agroclimate of Aik Bual Village.

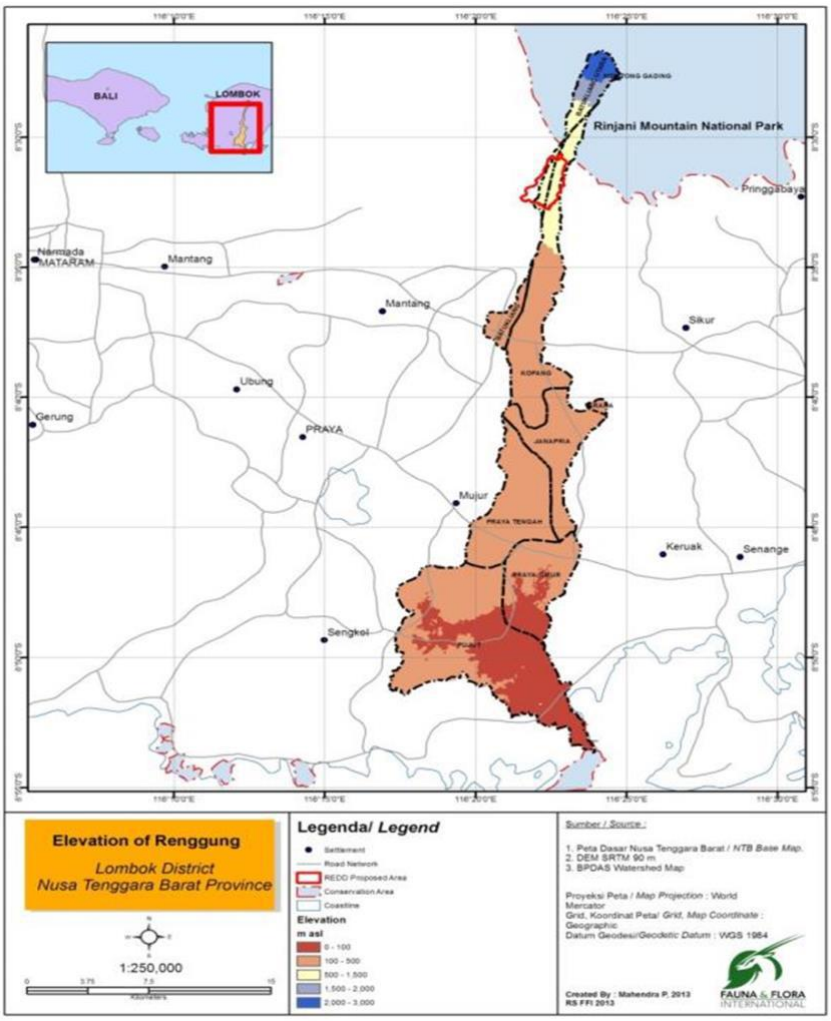
No.	Month	Temperature °C			Air Moisture (%)	Air Pressure (mb)	Wind Speed (knot)	Rain (mm)	Sun Exposure (%)
		Average	Min	Max					
1.	January	26.90	23.30	30.50	83.00	1,006.60	270/7	159.30	63.00
2.	February	26.60	23.30	29.90	85.00	1,005.00	270/10	229.,90	49.00
3.	March	26.50	22.30	30.70	86.00	1,006.20	270/6	20710	59.00
4.	April	27.00	22.50	31.50	81.00	1,006.50	270/7	205.30	81.00
5.	May	26.05	22.00	30.10	78.00	1,005.80	135/8	111.40	82.00
6.	June	25.10	20.70	29.50	82.00	1,006.40	140/8	43.80	80.00
7.	July	24.05	19.40	28.70	80.00	1,005.80	135/9	0.00	86.00
8.	August	25.50	21.10	29.90	78.00	1,004.60	180/9	3.60	63.00
9.	September	26.20	21.70	30.70	77.00	1,005.60	180/10	40.90	84.00
10.	October	27.55	23.00	32.10	80.00	1,003.60	180/8	147.40	79.00
11.	November	27.35	23.40	31.30	86.00	1,001.,60	180/7	448.80	49.00
12.	December	27.25	23.90	30.60	83.00	1,002.40	270/7	134.00	49.00
Average		**26.34**	**22.22**	**30.46**	**81.58**	**1,005.01**	**207/8**	**144.29**	**68.67**



Map B2-1. Climate Type Conditions in Lombok Island, Indonesia.

Elevation Requirements

Accounting for the choice of tree species, the watershed topography, and the distance from the volcanic crater at Mount Rinjani (3,726 m), the optimal growth for the selected tree planting must take place at elevation below 900 meters above sea level (Map B2-2).



Map B2-2. The elevation of HKm Aik Bual within the Renggung Watershed

Biodiversity

A baseline participatory biodiversity assessment conducted in the project area and neighbouring community forests in mid-2011 recorded 16 mammal species, 94 bird species and 30 herpetofauna species. Of these species, 5 mammal species, 24 bird species and 12 herpetofauna species of high conservation value (HCV). Four of the species are found in Aik Bual forest and surrounding areas:

1) Sunda Pangolin, local name Trenggiling (*Manis javanica*) - conservation status endangered (EN).
2) Lesser Sulphur Crested Cockatoo, local name Kakatua jambul kuning (*Cacatua sulphurea*) - conservation status critically endangered (CR).
3) Frog, local name Katak (*Oreophyrne monticola*) - conservation status critically endangered (CR).
4) One species of frog *Occidozyga floresiana* is a type that had not previously been recorded on Lombok (Mertens, 1930; Iskandar pers.com; Monk et al., 2000).

B3. Recent Changes in Land Use and Environment Condition

The Mount Rinjani landscape is home to the island's unique biodiversity and provides ecosystem services key to sustaining livelihoods of the island's population. These include regulating water and climate, provision of wood and non-wood forest products, scenic beauty, and cultural spaces. These services support smallholder agriculture (wet rice field, tobacco growing, and other annual and perennial crops/agroforestry) and tourism - the island's main economic driver. Continued degradation of Mount Rinjani forests threatens the island's future economy.

Watershed degradation, however, is a major issue on Lombok. Water supply is declining and springs in the upstream are drying up due to deforestation activities conducted since the 1980's, land conversion for agriculture as well as growing human settlements so that now local communities are becoming more reliant on the forest for their livelihood. All these factors are encroaching on the protected native forests and reducing the effectiveness of the watersheds. Since 2008, when the Indonesian Government removed the kerosene subsidy for industry, there has been an increase in fuel wood use by households and industry.

In addition, a recent assessment in Lombok showed the island is highly vulnerable to climate change; particularly at risk are the agricultural, water resources and coastal sectors, with a high risk of crop failure due to projected changes in the timings of the seasonal rains.

B4. Drivers of Degradation

Aik Bual forest area in the upstream area of Renggung watershed (Map B1-2), like other areas adjacent to Mount Rinjani National Park, suffers from deforestation and degradation due to massive illegal logging and forest encroachment. It happened following the fall of Suharto's New Order dictatorship in 1998, known as the reformasi euphoria era. Migrants and village residents felled the government reforestation trees (including mahogany, dalbergia), and continued with subsequent cultivation of agricultural crops (e.g. coffee, cocoa, banana, maize).

Like elsewhere in Indonesia, illegal tree felling and forest clearing for smallholder agriculture is decreasing the forest cover in the Mount Rinjani landscape. Three decades of government reforestation projects, lacking local community support, have only resulted in limited success. As the reforestation projects focus heavily on planting hardwood species (e.g. mahogany, dalbergia), it failed to integrate local community needs for non-wood forest products and space for agricultural crops.

The introduction of community forestry (HKm) permits and minor changes in government reforestation projects in late 1990s have helped to reduce initial conflicts over forest lands between local community and forestry authorities. But it has not yet resulted in desirable impacts with regard to increased forest cover and improved livelihoods. Lacking access to quality tree planting materials, poor HKm farmers are unable to plant trees as expected, and continue with crop cultivation instead.

Under these new government reforestation programmes, it was permissible to have 30% MPTS (Multi-Purpose Tree Species/ non-wood forest products) and 70% hardwood trees (e.g. mahogany, dalbergia). With watershed protection (*hutan lindung*) status, however, tree harvest is strictly prohibited by law. The reforested land was soon taken-over by the hardwood tree cover, reducing space for agricultural cultivation, which led to reduced farming income. This gave no incentive for the local community to protect the reforestation hardwood trees. As a result, instead of achieving the national reforestation program target of 400 trees per hectares, field survey indicates an average of

110 trees per hectares in Aik Bual and neighbouring reforestation areas. These reforestation schemes were not working in practice, despite good intentions for watershed protection.

Part C: Community and Livelihoods Information

C1. The Participating Communities/Groups

In 2011 Aik Bual village had a population of 4,424 people (2,120 men and 2,301 women), with 1,543 households of 1-5 people per household average. They are indigenous Sasak people (culturally and linguistically), with a strong Islamic tradition. Iliteracy is extremely high (60%), particularly among elders. The level of education is relatively low. Less than a quarter of the population (22%) have only elementary school education. A smalller portion of the population went to junior high school (10%), high school (4%), university (2%), and diploma (1%).

The village is the lowest government administrative structure, led by a democratically elected head and appointed secretary. Both receive a nominal salary from the district government budget. The village head reports to the democratically elected district head, but is directly supervised by a government-appointed sub district head. The village has a village-level legislative body (BPD) that supervises the performance of the village head and staff. In addition to the village government and a village-level legislative body (BPD), other institutions are farmers group, cooperative, women enterprise group, public health clinic, early childhood school, and (elementary, junior, and high) public and Islamic schools.

Aik Bual Village has an area of approximately ± 2,517.19 ha, which is divided into seven hamlets: Rabuli (210 households), Bual (284 households), Ramus (140 households), Bare Eleh (162 households), Nyeredep (225 households), Talun Ambon (259 households), and Pertanian (263 households). The village has ± 479.39 ha irrigated ricefields, ± 1,134.87 ha upland fields, ± 700.59 ha housing compound, and ± 202.32 ha other land uses.

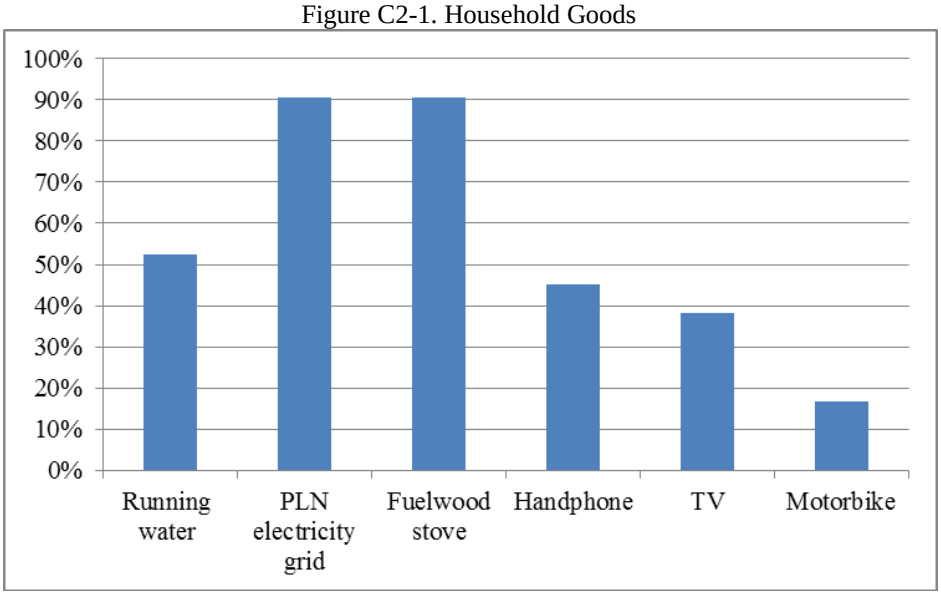
The project will start first with 100 ha HKm area in Aik Bual village, close to Pertanian hamlet. The area is currently managed by 300 smallholder farmers, 78 of them (26%) are females. The average landholding size is 0.3 ha with a range of 0.10 ha to 1.5 ha per household.

C2. The Socio-Economic Context

The main source of income for the Aik Bual villagers comes from farming. Other sources of income includes employment as manual labourers, cattle farming, digging for pumice, palm sugar processing, firewood collectors, carpenters, masons, traders, civil servants, driver, housekeepers, and bamboo craftsmen. Many households have family members living overseas as migrant workers in e.g. Malaysia, Hong Kong, and Saudi Arabia.

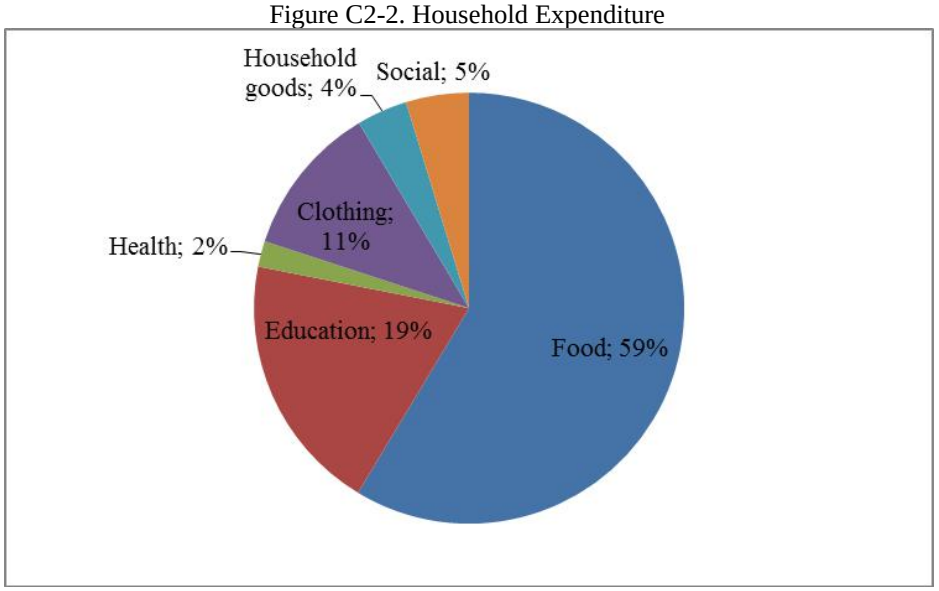
Thanks to remittence from these oversea workers, many villagers are able to build good housing with ceramic/ zinc roofing and cement walls and floors. Figure C2-1describes household possession of tools and goods. Half of the population enjoy the government running water service (PDAM), while the other half fetch water from rivers, streams and wells. Most households have access to electricity from the national grid network (PLN). Less than a half of the population possess basic modern goods: motorbikes, TV, and handphones. Nearly all households use a firewood stove for cooking. Despite a government scheme for LPG stoves, this has not reached the project area.

Figure C2-1. Household Goods



The household surveys conducted in 2012 reveal an average household income at IDR 14.3 million (USD 1192) per annum or IDR 1.02 million (USD 85) per month. Over a half of income (59%) was spent on food, indicating poverty. Other important spending items included children education (19%), clothing (11%), social/religious events (5%), and household goods (4%). Detailed information on household spending is presented Figure C2-2 below.

Figure C2-2. Household Expenditure



C3. Land Tenure & Ownership of Carbon Rights

The project area is inside the government-designated state forest zone and falls under the jurisdiction of the Ministry of Forestry (MoF), which has authority to award forest area and management rights to the local communities. Forest management and commercial utilisation plans are subject to MoF approval, although some of the MoF's authority has been devolved to local government as a result of

a decentralisation process started in the late 1990s. Results of periodic compliance monitoring determine whether management rights/ licences are revoked or continued. At the local level, while agroforests, agricultural fields and secondary forest/fallow areas are individually and privately owned, forest is considered as either common property or as an open access area.

The Aik Bual community forest user group and village government have submitted their application for HKm (Hutan Kemasyarakatan) community forest management permit to the district government and MoF. Completing the process of securing the community forest license will be a priority activity in this PES project.

Like wood, carbon is considered government 'property', and commercial utilisation of this 'commodity' by the private sector and community requires government approval. This license will be secured for each HKm as part of project activities. Approval for its dis/continuation is contingent on the results of monitoring. Government regulations on benefit-sharing must also be followed, as payment of government levies ('vertical' benefit-sharing) is regulated.

Part D: Project Interventions & Activities

D1. Summarise the Project Interventions

The project intervention is ecosystem rehabilitation. The main forest carbon project activity is reforestation of degraded forest lands by improving smallholder agroforestry systems. The forest carbon project will be started with 100 ha (within the proposed 445 ha HKm areas). This will then be followed by project replication within the remaining 345 ha, and further expansion in other HKm areas in neighbouring villages. These are Karang Sidemen, Lantan, Aik Berik, and Setiling villages.

D2. Summarise the Project Activities for Each Intervention

Table D2. Description of Activities

Intervention type	Project Activity	Description	Target group	Ecosystem services contracted (yes/no)
Ecosystem rehabilitation	Forest rehabilitation	Tree planting, agroforestry improvement	Smallholders, community groups	Yes
	Forest protection	Regular community patrolling in forest area	Community group	No
	Forest governance strengthening	Monthly meetings to discuss progress of replanting activities and any other issues regarding the management of these community agro-forests	Community groups	No
	Monitoring	A series of monitoring activities (including sapling and water monitoring) as listed in the Monitoring Plan (Table 14)	Community groups and FFI	No

	Capacity building	Patrolling, High Conservation Value/biodiversity and carbon surveys, tree propagation techniques	Community groups	No
	Sustainable livelihoods	Establishment of a women's enterprise focusing on NTFP and agricultural produce	Community groups	No

D3. Effects of Activities on Biodiversity and the Environment

No negative impacts on biodiversity and the environment are expected from this project. Forest patrolling will increase protection of species and habitats, as well as preventing deforestation and forest degradation. Forest rehabilitation and tree planting carried out by the community will help improve the forest cover. Improved forest cover will help maintain watershed functions, such as water supply stability, water quality, and stream flow regulation (preventing floods and droughts). Table F3 outlines expected biodiversity and environmental impacts of the project.

Part E: Community Participation

E1. Participatory Project Design

In collaboration with Transform, since 2008 FFI have been active in providing technical assistance in improving land management of the Renggung watershed, Central Lombok district. In Aik Bual area, the upper part of the Renggung watershed, the project has been developing agroforestry within the framework of biodiversity and ecosystem services as the main focus. This includes supporting NTFP (Non Timber Forest Products) tree planting and assisting the community in securing the HKm community forestry permit, the main barrier to succesful forest rehabilitation and protection.

The focus in the upper catchment is essential to produce the benefits for water dependent livelihoods down-stream. The broader project ensures a landscape approach for improved forest and watershed management which also includes the establishment of local government institutions and working with farmers in the middle and downstream areas.

PES is considered a promising way forward to the development of a model for watershed management in Lombok. In 2012 REDD+ awareness event in Aik Bual village was undertaken by a team from Rimbawan Muda Indonesia (RMI). The workshop introduced the key concepts of REDD+ (climate change, carbon trading, inter/national policy, FPIC) and the basic steps in the project's development (identification of drivers, project activity, benefit sharing distribution). In 2013, FFI and Transform teams completed household surveys, focussing on household assets, income, and spending.

Community consultation and planning for PES Plan Vivo project was intensified in 2013-2014. The community members were facilitated to assess ecosystem services that the village forest provide, threats/drivers of deforestation and forest degradation, activities to mitigate threats/drivers, and benefit sharing distribution. Initial meetings were conducted with village goverement officials, religious dand customary leaders, and members of HKm groups. The processes provided venue for removing barriers for greater participation of young generation, women, and the poor.

The HKm facilitation and PES designing have also resulted in improved clarity on governance

structure at community level. The HKm group with treasury, secretary, and head of divisions/sections takes the overall responsibility. Village government officials provide advice, political support and oversight/supervision.

E2. Community-led Implementation

The community planning and consultation processes resulted in an agreed-upon main project activity, namely reforestation of degraded forest lands by improving smallholder agroforestry systems. Activities to be performed include tree nurseries, planting, maintenance, and (internal and external) monitoring. Tree nursery establishment involves small-farmer groups. Tree planting will be carried out by individual farmers on their lands. This is to be followed by tree maintenance. Monitoring and supervision will be carried out at every stage of these activities, undertaken by the HKm groups.

The target is to have 400 trees in a hectare, considered as an indicator of success in reforestation (forest rehabilitation) programmes by the Government of Indonesia. With the existing average of 110 trees per hectare, this means that on average 290 trees per hectares will need to be planted. This is the HKm members's *plan vivo*. All selected species are or were commonly found and used in the area, and consist of hardwood and MPTS, respectively making up 30% and 70% of the total planted. This split was agreed during community consultations. A high proportion of MPTS means that NTFPs harvested will become an important component of farmers' income in the future.

The village forest regulation/law has also been promulgated through community consultation. It outlines prohibition of forest clearing, tree felling, and use of fire for land preparation. It stipulates that sanctions based on customary practices will be enforced for those violating the law/regulation. It gives the mandate to HKm groups to carry out forest monitoring and patrolling.

The Aik Bual HKm group members have received basic training in forest patrol and monitoring. They were involved in HCV/biodiversity and carbon surveys. Since 2013, Aik Bual HKm team has been conducting patrolling and monitoring of the HKm and surrounding forest areas.

The Aik Bual HKm groups have been trained on tree propagation techniques. They have also started to establish tree nursery consisting of native and naturalised high economic and/or high conservation values species. The seedlings will be made available to support HKm members to carry out their *plan vivo*.

An additonal activity is the development of a women's enterprise for the processing of NTFPs and agricultural products (e.g., fruit and vegetable crisps, crackers). A village institution specifically tasked with water management, monitoring and protection including that of springs and existing reservoirs and dams (*embung*) has also been established.

E3. Community-level Project Governance

Project designing and implementation are undertaken with in-depth community participation. HKm groups take a leading role, with village government officials providing oversight and support. The HKm groups and their individual members undertake project activities. Regular HKm and community meetings at village and hamlet level involving women and younger members of the community will continue to take place throughout the project implementation phase. The project's decision-making and management will be based on participatory processes.

Participating HKm groups has developed a grievance mechanism. Every member in the community is free to express complaints. These can be communicated directly to HKm leaders orally, in writing, or by SMS. HKm groups will record and provide a response within 30 days. Matters related to enforcement of village customary laws and regulations will be taken over by village officials.

Complaints to the project coordinator (FFI/CFES) will be received by designated project staff, through oral communication, written notice, or SMS. FFI/CFES staff will record the complaint and, as necessary, consult HKm group leaders to coordinate the response and solution.

Part F: Ecosystem Services & Other Project Benefits

F.1. Carbon Benefits

Table F1 – Carbon benefits

	1	2	3	4	2-(1+3+4)
Intervention type (technical specification)	**Baseline carbon uptake i.e. without project (t CO_2e/ha)**	**Carbon uptake/emissions reductions with project (t CO_2e/ha)**	**Expected losses from leakage (t CO_2e/ha)**	**Deduction of risk buffer (t CO_2e/ha)**	**Net carbon benefit (t CO_2e/ha)**
Ecosystem Rehabilitation	269.54	1,070	0	256.85	543.82
• Note that the underlying calculations in this table come from the technical specifications described in Part G					

F2. Livelihoods Benefits

Table F2. Livelihoods Benefits

No.	Socio-Economic Impact	Impact of Project activities
1.	Improved land management activities	• Increased productivity of land with appropriate technology • Increased business management • Increased diversity of products as well as increased employment
2.	Increase in income and poverty reduction	• Improved well-being of farmers • Reduction of poverty
3.	Capacity building	• Increased activity of group institution • The availability of human resources with environmental stewardship
4.	Increased gender roles	• Increased involvement of women in land management and marketing

F3. Ecosystem & Biodiversity Benefits

Table F3. Ecosystem Impacts

No.	Environmental Impact	Impact of Project Activities
1.	Biodiversity impacts	• Protection of flora and fauna • Increased biodiversity (flora and fauna)
2.	Impact of soil conservation	• Decreased levels of erosion and sedimentation • Increased water infiltration • Improved soil fertility
3.	Impact of water availability	• Protection of water resources • Stabilise the flow of water (keep the water flow in the dry season, flood control) • Increase the supply of water (surface and ground water)
4.	Increased climate change mitigation and adaptation	• Climate change mitigation (reduce carbon emission) • Increased community participation in environmental protection

Part G: Technical Specifications

G1. Project Activities

The main forest carbon project activity is reforestation of deforested and degraded forest lands by improving smallholder agroforestry system. More detailed activities are outlined in Table G1. Activities to be performed include tree nursery, planting, maintenance, and (internal and external) monitoring. Tree nursery establishment involves targeted small-farmer groups. Tree planting will be carried out on lands that individual farmers manage. This is to be followed by tree maintenance and care. Monitoring and supervision will be carried out at every stage of activity, involving the target groups.

Additional activities include:

a) Forest protection through monitoring and patrol by village community groups and forestry officials from local government and national park. The main purpose is to control encroachment and illegal tree felling in and around the project area.
b) Securing long-term community forest management rights (HKm license, valid for 35 years), a pre-requisite for establishment of a community PES mechanism.

This reforestation activity involves the planting, care and intensive management of MPTS. All of the selected species are/were commonly found in the area. They consist of long-lived hardwood and MPTS species with a 30%:70% proportions, as proposed during community consultations. The hardwood and MPTS species are of variable growth rates and shapes, allowing for various thinning before the entire stand reaches maturity to improve forest management. This thinning activity is assumed to contribute insignificant emission because the cut is left at the project area.

Table G1-1. Description of the ecosystem rehabilitation activities.

Period (Year)	Activity
Year 1-2	Tree seedling/nursery
	Land preparation, making of planting hole & marker, planting preparation, planting
Year 2-5	Monitoring, maintenance, replanting
Year 5-10	Maintenance and harvesting MPTS; *Annona muricata*, *Persea americana*, *Garcinia mangostana*, *Manilkara zapota*, *Lansium domesticum*, *Durio zibethinus*.

Table G1-2. Proposed species for the watershed rehabilitation.

Tree Species	Local name	Product type	%	Trees per ha
Annona muricata	Serikaya	Fruit	10	31
Duabanga moluccana	Elar	Wood	30	93
Durio zibethinus	Durian	Fruit	10	31
Garcinia mangostana	Manggis	Fruit	20	62
Lansium domesticum	Duku	Fruit	10	31
Manilkara zapota	Sawo nila	Fruit	10	31
Persea Americana	Alpokat	Fruit	10	31
Total			**100**	309

The planting design is based on multi-strata agroforestry system, similar to productive complex agro-forest model that exists in the area (Figure 7), whose structure is close to natural tropical forests. The multi-strata system ensures sunlight distribution between one strata and another. These are upper canopy strata I (20%); sub-canopy strata II (50%); middle strata III (30%); lower (under-storey) strata IV (15%). If tall trees in strata I are too dominant, the trees in the lower strata will be negatively

affected as lack of sunlight will inhibit their growth.

Figure G1-1. Illustration of a complex multi strata agroforest model in HKm Aik Bual.

The planting schematic design proposed by the community through participatory discussion is illustrated in Figure 8. All the tree species will be planted using a row system on bare land, and planting of minimum 5 x 5 m distance on land that already has trees.

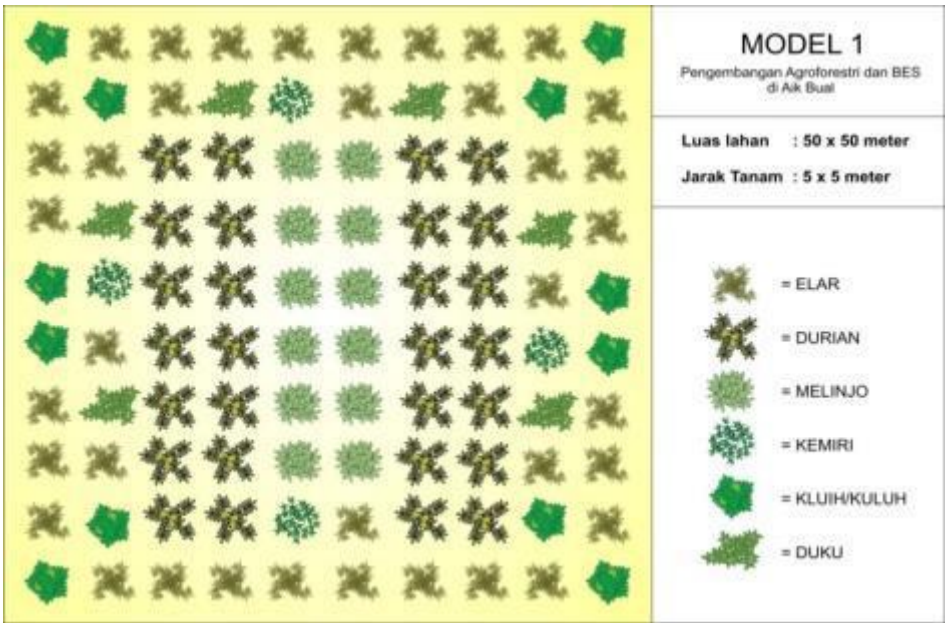


Figure G1-2. Schematic planting design.

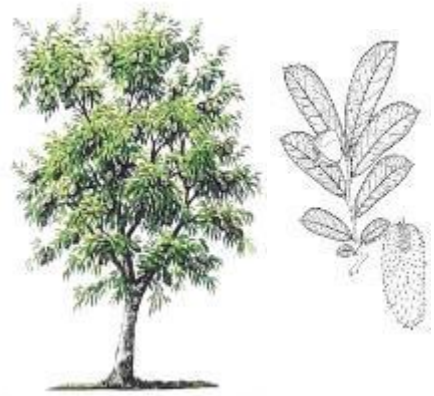
Tree species selected

Name: *Duabanga mollucana*
Common names : Benuang laki, Rajumas
Family : Lythraceae
Distribution : Found naturally in east of Java, South East, Borneo, Sulawesi Maluku, Papua, and Philipine
Elevation : 60 - 1200 meter above sea level
Description: *Duabanga mollucana* is tall tree , 45 m in height and 150 cm in diameter.
Uses : sawn-wood

Name: *Garcinia mangostana*
Common names : Manggis, mangosteen,
Family: Clusiaceae
Distribution: Growth in tropical forest. Native distribution in Indonesian forest and some South East Asian Forest
Elevation : 500 – 600 meters above sea level
Precipitation : 1.270 – 2.500 mm
Description: The tree reach height between 7 to 25 meters.
Uses: Food and medicine.

Name: *Durio zibethinus*
Common names : Durian, Duren
Family : Bombacaceae
Distribution : Growth naturally in South East Asia and most found in Borneo.
Elevation : maximum in 800 meters above sea level
Precipitation : 1.500 – 3.500 mm
Description: The tree reach height between 27 to 40 meters
Uses: Food. The fruit for consumption

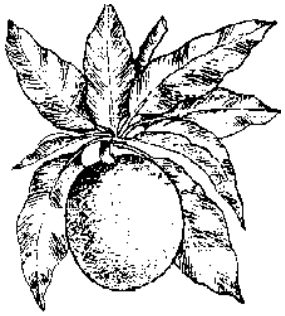
Name: *Annona muricata*
Common names : Sirsak, Srikaya, Nangka Belanda
Family : Annonaceae
Distribution : found naturally in caribia, Central America, and South America. Distribution to Indonesia since 19th century
Elevation : maximum in 1.000 meters above sea level.
Precipitation : Over 1000 mm
Description: Annona muricata is a slender, evergreen tree, 5-10 m in height and 15 cm in diameter
Uses : Food, medicine, and Timber



Name: *Persea Americana*
Common names : adpukat, avokad, avocado
Family : Lauraceae
Distribution : Found naturally in West Indian and some hybrid varieties are best adapted to a lowland tropical climate and relatively frost-free areas of the subtropics. Distributed in many country in Europe, America, Africa, and Asia.
Elevation : 0 – 2.500 meters above sea level.
Precipitation : 300 - 2.500 mm
Description: *Persea americana* is a medium to large tree, 9-20 m in height.
Uses : Food, medicine, poison for rat, and fodder

Name: *Lansium domesticum*
Common names : Duku, langsat
Family : Meliaceae
Distribution : Found naturally in tropical lowland forest, native distribution in Cambodia, China, Indonesia, Malaysia, Philippines.
Elevation : 0-800 m above sea level
Precipitation : over 100 mm
Description: Lansium domesticum is an erect, short-trunked, slender or spreading, reaching 10-15 m in height
Uses : Food, medicine, dye, and poison for frog and some insects.

Name: *Manilkara zapota*
Common names : Sapodilla, Chico, Chico sapote, Zapote chico, Zapotillo, Chicle, Sapodilla plum, Naseberry, Sawo (Indonesia)
Family : Sapotaceae
Distribution : The sapodilla is believed to be native to Yucatan and possibly other nearby parts of southern Mexico, as well as northern Belize and north-eastern Guatemala.
Precipitation : Sapodillas are not strictly tropical and mature trees can withstand temperatures of 26° to 28° F for several hours. Young trees are more tender and can be killed by 30° F. The sapodilla seems equally at home in humid and relatively dry environments.
Description: The sapodilla is an attractive upright, slow-growing, long-lived evergreen tree. Distinctly pyramidal when young, with age the tree may develops a crown that is dense and rounded or sometimes open and somewhat irregular in shape. It is strong and wind-resistant and rich in a white, gummy latex. In the tropics it can grow to 100 feet, but grafted cultivars are substantially shorter.



G2. Additionality and Environmental Integrity

Any forest carbon project has to demonstrate 'additionality', meaning that carbon benefit will not otherwise be generated without the project. The proposed project is not the product of legislative decree. The HKm license is a product of government legislation, but in itself it does not guarantee forest rehabilitation and protection.

The proposed 'with-project scenario' is community forest (HKm) with the planting of 400 trees per hectare. Barriers to implementing the proposed project activity are high. With weak law enforcement and poverty, the deforestation and forest degradation trends in the project area would continue without the project activity. Barriers are low for the alternative land use scenario of HKm without reforestation (the 'without-project' or 'baseline' scenario of existing 110 trees per hectare).

The awarding of HKm areas and management licences is through legislative decree but substantial support for, and facilitation of, target communities is required in order for this granting of community forest rights to be achieved. There is no requirement for HKm to be implemented in the context of a PES model.

Current barriers to implementing the proposed project were assessed for the Lombok contexts, see below. The barriers identified indicate that the project activity is additional. In the context of intense unplanned deforestation, degradation and planned conversion pressures, coupled with very weak law enforcement, the deforestation and degradation trends in the project area cannot be reduced or reversed in the area without the project activities that will remove barriers so as to shift incentives in favour of sustainable forest management.

The VCS Additionality Tool (VT0001) was applied to the project concept, to test assumptions about the additionality of activities proposed under the Plan Vivo Aforestation and Reforestation project activities in Lombok. The proposed with-project scenario is "community forest (HKm) managed sustainably and protected as standing natural forest with tree planting activities to enhance the carbon stock (HKm+R)".

Numerous barriers to achieve the proposed project scenario were identifed, as detailed in the table below. Barriers were lowest for the alternative land use scenario of *HKm without reforestation (HKm-R)*, a form of 'unplanned' deforestation and degradation, which is thus defined as the without-project or 'baseline' scenario.

Table G2. Barrier analysis

No.	Barrier Type	Barrier Detail	Baseline Scenario	Project Scenario
			HKm-R	HKm+R
1.	Investment	Sustainable finance to fund activity	No barrier	High barrier (3)
2.	Institutional	Weak law enforcement	No barrier	High barrier (3)
3.	Technological	Technical expertise to implement activity	No barrier	High barrier (3)
6.	Prevailing practice	"First of kind"/pioneering model	No barrier	High barrier (3)
7.	Social conditions		No barrier	High barrier (3)
7a.		Demographic pressure		
7b.		Social conflict		
7c.		Widespread illegal practices		
7e.		Shortage of skills in target community		
8.	Lack of community organisation	Lack of community organisation	No barrier	High barrier (3)
9.	Land Tenure/Property Rights		No barrier	High barrier (3)
9c.		Property rights		
9d.		Formal & informal land holdings		
9h.		Market Price		
9i.		Rent capture		
10.	Local Tradition	Traditional equipment and technology	Low barrier (1)	No barrier
11.	Ecological Condition	Degraded soil, catastrophic natural disaster	No barrier	Medium barrier (2)

HKm -R: with no reforestation
Hkm +R: with reforestation

G3. Project Period

The licence period for Hutan Kemasyarakatan (HKm) is 35 years, and the time limit for the implementation of REDD+ is maximum of 30 years: both can be extended (Ministry of Forestry, 2009). Thus, 30 years project period is aimed for HKmAikBual. This period is subdivided into six 5-years phases with annual payments. Every five years, monitoring should be conducted by the project proponents, local government, and the Ministry of Forestry to evaluate the carbon enhancement and tree growth and nextphase of project plan (Ministry of Forestry, 2009). With this strategy, a link between the payments and forest rehabilitation and protection activities over sufficient time will be maintained. The project period starts in 2013, and the crediting period start in 2014.

G4. Baseline Scenario

The first phase on determining the baseline consists of choosing the carbon pools within the project boundary. The above-ground biomass and below-ground woody biomass were selected as the most significant carbon pools for the project areas (see Table G4-1). Carbon pools were excluded if the cost and/or effort required for assessment or monitoring were likely to be disproportionate to the potential

carbon benefits. The biomass estimations were calculated from a forest survey, which provided land cover and ecosystem classifications. The vegetation parameters collected were; number of trees in each DBH class, tree species, Diameter at Breast Height (DBH), and tree height. The objective of doing the land cover and ecosystem classifications is to obtain an estimate of initial carbon stocks with a precision of plus or minus 15% with a 90% confidence level (two-tailed). This methodology in the section is based on the Afforestation Reforestation (A/R) methodological tool provided by the CDM (AR-AMS0007). The second phase consists of determining the likely trend of the carbon stock over time in the absence of the project.

Table G4-1. Selected carbon pool with rationale in HKm Aik Bual.

Carbon pool	Whether selected	Justification/Explanation
Above ground tree biomass	Yes	This is the major carbon pool subjected to project activities
Above ground non-tree biomass	No	Expected to increase as a result of project activities, but difficult and costly to measure with only a small increase in carbon benefit. Thus, conservatively excluded.
Below ground biomass	Yes	By using the IPCC default values for shoot to root ratios, this carbon pool can be estimated. Thus, included in the carbon calculation.
Litter	No	Expected to increase as a result of project activities, but difficult and costly to measure with only a small increase in carbon benefit. Thus, conservatively excluded.
Dead wood	No	Expected to increase as a result of project activities, but difficult and costly to measure with only a small increase in carbon benefit. Thus, conservatively excluded.
Soil	No	Expected to increase as a result of project activities, but difficult and costly to measure with only a small increase in carbon benefit. Thus, conservatively excluded.

Data Sources and Assumptions

- **Sampling**

The initial project area size is 100 ha in HKm Aik Bual. In total, 6 sampling plots were implemented in estimating the tree density and carbon stock in the project area with a total size of approximately 2 ha (1.97 ha). Four of the plots were randomly selected, while the other two is placed purposively at forest land cover (old government rehabilitation program, dominated by Mahogani) and at open area. Despite the sampling plots cover almost 2% of the whole project area, we found that the data precision is high (>15% at 95% confidence interval). To make the carbon accounting to be conservative, the analyses were conducted using the upper 95% confidence interval for the baseline for the carbon stock and tree density.

- **Aboveground biomass**

Several steps were incorporated in estimating the above ground biomass in HKm Aik Bual:

1) Determine the tree dimensions and characteristics (DBH, total height, and wood density).
   The plot sizes are described in Table G-2. The wood density was derived from the Wood Density Database (ICRAF, 2012). A 0.66 gr/cm^3 wood density was used for species that was not listed in the database, based on research by ICRAF (GOFC-GOLD, 2010; van Noordwijk, 2007). Where a range rather than a mean wood density value was reported, the range was assumed to be the 90% confidence interval. IPCC states carbon to be 47% of its biomass and CO_2 to be 3.67 of its carbon (molecular weight). Statistical analyses were conducted using SPSS 20 (IBM® SPSS® Statistic 20.0).

Table G4-2. Plot and sub-plot sizes and vegetation categories (Avery & Burkhart, 1994)

Plot Size	DBH	Categories	Class
10 m x 10 m	5 - 15 cm	Pole Trees	C
20 m x 20 m	15 - 30 cm	Small Trees	B
20 m x 125 m	> 30 cm	Large Trees	A

2) Select appropriate and validated allometric equations.
Non-destructive sampling method was used in the project area, and species-specific allometric equations were used to derive the carbon stock (Table G4-3). The allometric equations were used based on the highest r^2 value (>0.5, *p*-value significant at 95% confidence level), the largest and smallest DBH of trees fall within the DBH range of the trees within the project areas, and the closest geographic locations and ecosystem type.

Table G4-3. Allometric equations used for biomass estimations and carbon stock analyses.

Allometric Equation from DBH to AGB (kg)	
Tree DBH>5cm, tree height>2m	
Kemiri; *Aleurites moluccana*[1]	$0.064(DBH)^{2.4753}$
Nangka; *Artocarpus heterophyllus*[2]	$BBA = 0.065\ D^{2.28}$
Sengon; *Paraserianthes falcataria*[3]	$BBA = 0.1126\ D^{2.3445}$
Mahoni; *Swietenia mahagoni*[4]	$BBA = 0.903\ (D^2H)^{0.684}$
Kopi; *Coffea* sp.[5]	$BBA = 0.2822\ D^{2.0636}$
Mixed Secondary Forest[6]	$AGB = 0.11\ \rho\ D^{2.62}$

3) Estimate the AGB for each tree by using the allometric equations.
4) Estimate the AGB for each subplot by totalling the AGB for each tree in each subplot in the same plot.
5) Estimate the AGB for each plot and AGB of each forest stratum by following these equations (modified from SNI7724, 2011a and Manuri, et al., 2011):

$$AGB_{plot} = \left(AGB_{sub\ A} * \frac{10}{A_{sub\ A}}\right) + \left(AGB_{sub\ B} * \frac{10}{A_{sub\ B}}\right) + \left(AGB_{sub\ C} * \frac{10}{A_{sub\ C}}\right)$$

$$Biomass_{stratum} = \frac{\sum AGB_{plot} + \sum BGB_{plot}}{N_{stratum}}$$

where AGB_{plot} is mean AGB for each plot (ton/ha); AGB_{sub} is AGB in each subplot (kg); A_{sub} is subplot size (m^2); $Biomass_{stratum}$ is mean biomass on each forest stratum (ton/ha); $N_{stratum}$ is number of plots on each forest stratum.

- **Belowground biomass**

Below ground carbon includes roots (Eggleston, et al., 2006). Root to shoot ratio from the Indonesian National Standard (SNI7724, 2011a), 0.37, was used to obtain below ground carbon. The standard deviation follows the above ground carbon data.

- **Tree density**

Tree density was derived from forest carbon inventory data within the project area by dividing number of trees (tree>30 cm DBH) with plot size (hectare). The weighted average of tree density in

tree-planting zone is 91 trees/ha, while in forest zone is 168 trees/ha.

- **Carbon modelling**

The carbon modelling for tree growth has been derived from FFI field surveys. The results are showed on Table , with assumptions used to obtain the regressions formula as below:

1. Forest growth regressions derived from collected field data
2. BGB growth will follow the root to shoot ratio
3. Forest growth occurred at the second year of the project
4. All the data taken were true. Every answers reflect the reality
5. Typos and human errors were *de minimus*
6. The total number of samples are 156 of 14 tree species
7. Based on expert judgement, the total number of aggregated samples are reduced to 63 of 14 tree species
8. This growth is only for Aik Bual project area, do not reference outside this project area

Table G4-4. The species growth-regressions based on FFI field surveys.

No	Species	Local Nameal	N	Regression*	R2
1	*Alleurites mollucana*	Kemiri;	4	y = 1.4964x + 28.276	0.88
2	*Annona muricata*	Sirsak;	3	y = 1.2761x + 2.4925	0.98
3	*Artocarpus heterophyllus*	Nangka;	4	y = 1.9936x + 5.0535	0.96
4	*Ceiba petandra*	Randu;	5	y = 2.7324x + 7.028	0.87
5	*Duabanga moluccana*	Rajumas;	6	y = 4.7392x + 0.1773	0.85
6	*Durio zibethinus*	Durian;	5	y = 1.6023x + 11.663	0.98
7	*Erythrina sp*	Dadap;	5	y = 0.9375x + 27.334	0.95
8	*Garcinia mangostana*	Manggis;	6	y = 0.4574x + 3.7272	1.00
9	*Lansium domesticum*	Duku;	6	y = 0.5063x + 7.7606	0.88
10	*Manilkara zapota*	Sawo nila;	4	y = 1.4006x + 2.7043	0.99
11	*Paraserianthes falcataria*	Sengon;	4	y = 2.2008x + 22.253	0.94
12	*Persea Americana*	Alpukat;	3	y = 1.125x + 0.5417	0.86
13	*Psidium guajava*	Jambu Batu;	3	y = 2.07x + 2.86	0.96
14	*Swietenia mahagoni*	Mahoni;	5	y = 2.0695x + 14.816	0.86
	*y is DBH, x is age		57		

The modelling above is intended only to estimate the tree growth in HKm Aik Bual in an ex-ante manner, and the model should be revised based on the actual measurement of the project. It is obvious that the number of sample is too small to model the tree growth but this is the most available data to estimate species-specific growth, thus this modelling is merely to be used in the early stage of the project to account the baseline and project scenarios.

- **Mortality considerations**

All new-planted tree that face mortality, will be replaced immediately. Tree mortality recording, reporting, and replanting will be included in the monitoring plan.

Baseline Scenario

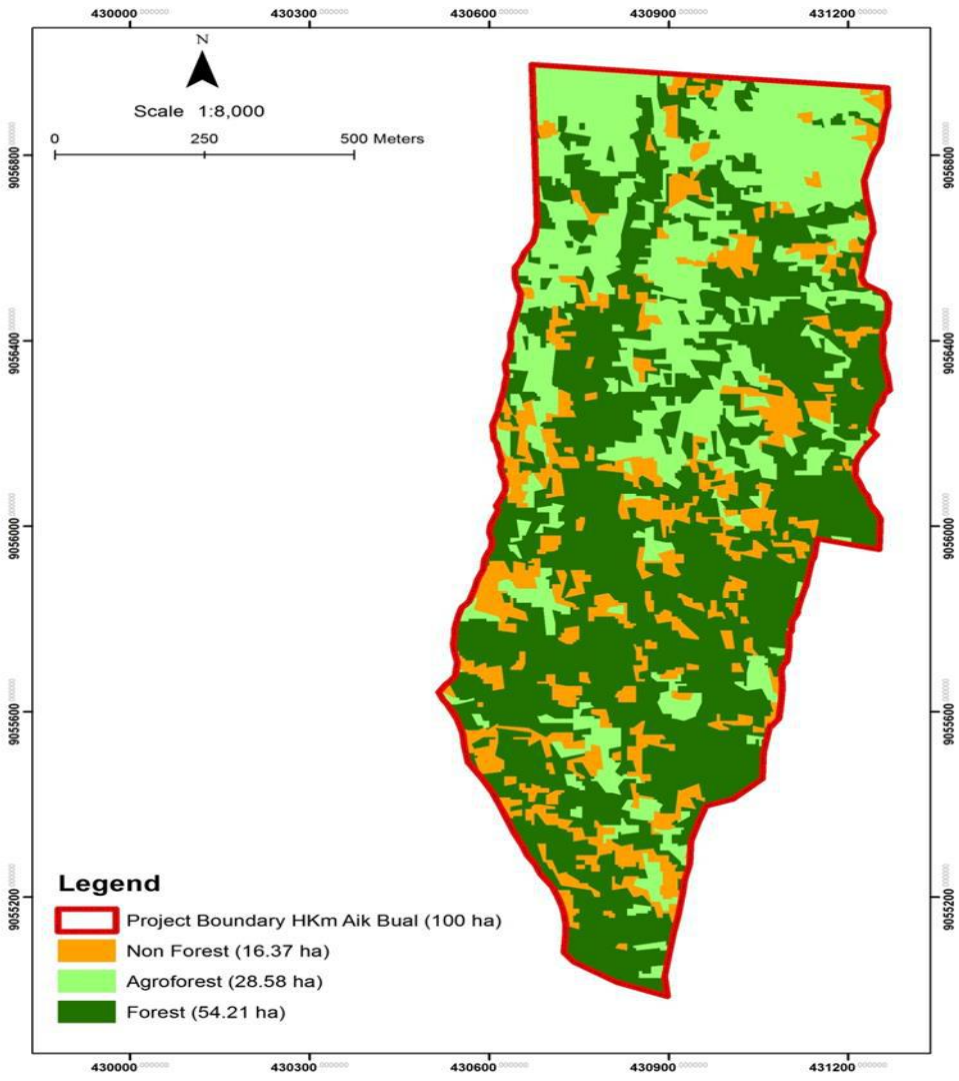
- **Forest area, type, and carbon stock**

Aik Bual area is part of a watershed protection forest (*hutan lindung*). Based on field surveys, there are several types of land management based on dominant plants and plant combinations. The forest types include *Erythrina sp*, *Swietenia mahogany*, and *Coffea robusta*. The types of forest and carbon stock are presented in **Error! Reference source not found.** The weighted mean carbon stock in tree-planting zone is 93.09±7.08 tonnes C/ha, and the mean carbon stock in forest zone is 261.3±54.21

tonnes C/ha.

Table G4-5. Forest type and carbon stock on different sampling plot in HKm Aik Bual.

Land Use	Mean (tonnes C/ha)	Low	High	Size (ha)	TOTAL CARBON (tonnes)	Sampling Plot
Non Forest	62.84	38.95	86.73	16.37	1,419.42	ABIV,BareLand
Agroforest	90.45	84.16	96.74	28.58	2,765.06	ABI.I,ABII,ABIII
Forest	233.85	206.41	261.30	54.21	14,163.96	ABI.II,Mahoni



Map G4. Land cover classification in HKm Aik Bual project area (100 ha).

- **Baseline scenario of forest cover and carbon stock changes**

Participatory vegetation surveys, involving communities from Aik Bual, have been conducted to estimate the existing carbon stock in the project area. The results showed that the lowest carbon stock in the area was 45.94 tonnes C/ha (plot bare land) and the highest was 253.26 tonnes C/ha (plot Mahogani). The lowest tree density was 22 trees/ha and the highest tree density was 161 trees/ha. The 'without project' scenario is the weighted average of tree density in tree-planting zone, 91 trees/ha,

with existing carbon stock 93.09±7.08 tonnes C/ha, and the carbon increment 5.25 tonnes C.ha^{-1}.year^{-1}. This carbon increment is derived from the forest-growth regression formula (Table G4-4) and the existing tree species (**Error! Reference source not found.**).

The forest-growth regression formulas were calculated based on tree-specific field data. These formulas are only used to model the first 15 years of the tree growth due to the limited age-data variations and should be updated in the first 5-years of the project. This is to reduce the possibility of error from using the regression on older tree-age. This is a conservative approach in accounting the forest growth. The first 15 years of baseline data is showed in **Error! Reference source not found.**

Table G4-6. Existing tree species (DBH>30cm) in HKm Aik Bual.

Existing Tree Species	# Tree	%
Artocarpus heterophyllus	7	6%
Ceiba petandra	1	1%
Erythrina sp	40	36%
Paraserianthes falcataria	9	8%
Swietenia mahagoni	54	49%
Total	**137**	

Table G4-7. The first 15 years of project baseline in HKm Aik Bual.

Year	Baseline (Tonnes/ha C)
1	93.09
2	98.34
3	103.59
4	108.83
5	114.08
6	119.32
7	124.57
8	129.82
9	135.06
10	140.31
11	145.55
12	150.80
13	156.05
14	161.29
15	166.54

Project Scenario

The 'with project scenario' is the planting of 309 trees.ha^{-1}, with mean carbon stock 108 tonnes C.ha^{-1}, and the carbon increment 14.54 tonnes C.ha^{-1}.year^{-1} (Table). The carbon increment (forest growth) is showed on
Table G4-9. All trees that die will be replanted in the first few years.

Table G4-8. The carbon stock of proposed planted trees under the project scenario in HKm Aik Bual.

No	**Planned Tree-planting Species**	**Tree**	**%**	**Tree Planting**	**Carbon Stock (Tonnes C/Ha)**	
					In 15 years	**Per year**
1	*Annona muricata*	40	10%	31	2.75	0.18
2	*Duabanga moluccana*	120	30%	93	183.06	12.20
3	*Durio zibethinus*	40	10%	31	14.58	0.97
4	*Garcinia mangostana*	80	20%	62	2.12	0.14
5	*Lansium domesticum*	40	10%	31	2.17	0.14
6	*Manilkara zapota*	40	10%	31	8.84	0.59

7	*Persea americana*	40	10%	31	4.64	0.31
Total		**400**		**309**	**218.17**	**14.54**

Table G4-9. The carbon increment (forest growth) under the project scenario in HKm Aik Bual

Year	Carbon Increment (tonnes C/ha)	Project Scenario
1	0.00	93.09
2	0.00	98.34
3	0.00	103.59
4	10.34	119.17
5	15.91	129.99
6	23.79	143.11
7	33.88	158.45
8	46.41	176.23
9	61.58	196.64
10	79.57	219.88
11	100.57	246.12
12	124.76	275.56
13	152.32	308.36
14	183.40	344.69
15	218.17	384.70

G5. Ecosystem Service Benefits

The project carbon benefit carbon sequestration is the difference between 'without project scenario' (110 trees per ha) and 'with project scenario' (400 trees per hectare), deducted with the 24% risk buffer. Table G5 and Figure G5 illustrate the potential project benefit from 100 hectares project area in Aik Bual. It is estimated that 1,823.47 tonnes of CO_2 will be sequestered every year or 40.57 tonnes CO_2 per hectare per annum.

Using the VCS Non-Permanence Risk Tool v.3 (2012), three risk factors to quantify the risk buffer have been identified within the project scenario:

1. Internal risk, includes the project management capacity, mitigation plans, adaptive management plans, and project longevity.
2. External risk, stems from the community and external factor. This factor mainly deals with the land and resource tenure and community engagement issues, and also the political context such as government policies and the country's international governance ratings.
3. Natural risk, is the potential risk to the project from natural disasters, such as drought, fire, pest and disease outbreaks, geological events, etc.

A 24% of non-permanence risk has been estimated in HKm Aik Bual. This risk buffer proportion has been built into the project benefit calculations.

Table G5. The estimated project carbon benefit from HKm Aik Bual

Crediting Year	Cumulative Baseline CO2e sequestration (tonnes)	Cumulative Project Scenario CO2e sequestration (tonnes)	Estimated CO2e Sequestration (tonnes)	Estimated CO2e Sequestration After 24% Buffer Deduction (tonnes)	Net Average CO2e Sequestration (tonnesCO2e)
1	15,357.06	15,357.06	0.00	-	1,823.47
2	16,222.45	16,222.45	0.00	-	1,823.47
3	17,087.84	17,087.84	0.00	-	1,823.47
4	17,953.22	19,658.43	1,705.21	1,295.96	1,823.47
5	18,818.61	21,443.60	2,624.98	1,994.99	1,823.47
6	19,684.00	23,608.23	3,924.23	2,982.41	1,823.47
7	20,549.39	26,139.14	5,589.75	4,248.21	1,823.47
8	21,414.78	29,071.41	7,656.63	5,819.04	1,823.47
9	22,280.17	32,438.29	10,158.12	7,720.17	1,823.47
10	23,145.56	36,271.51	13,125.95	9,975.72	1,823.47
11	24,010.95	40,601.51	16,590.57	12,608.83	1,823.47
12	24,876.34	45,457.64	20,581.31	15,641.79	1,823.47
13	25,741.73	50,868.25	25,126.53	19,096.16	1,823.47
14	26,607.11	56,860.82	30,253.71	22,992.82	1,823.47
15	27,472.50	63,462.06	35,989.56	27,352.06	1,823.47

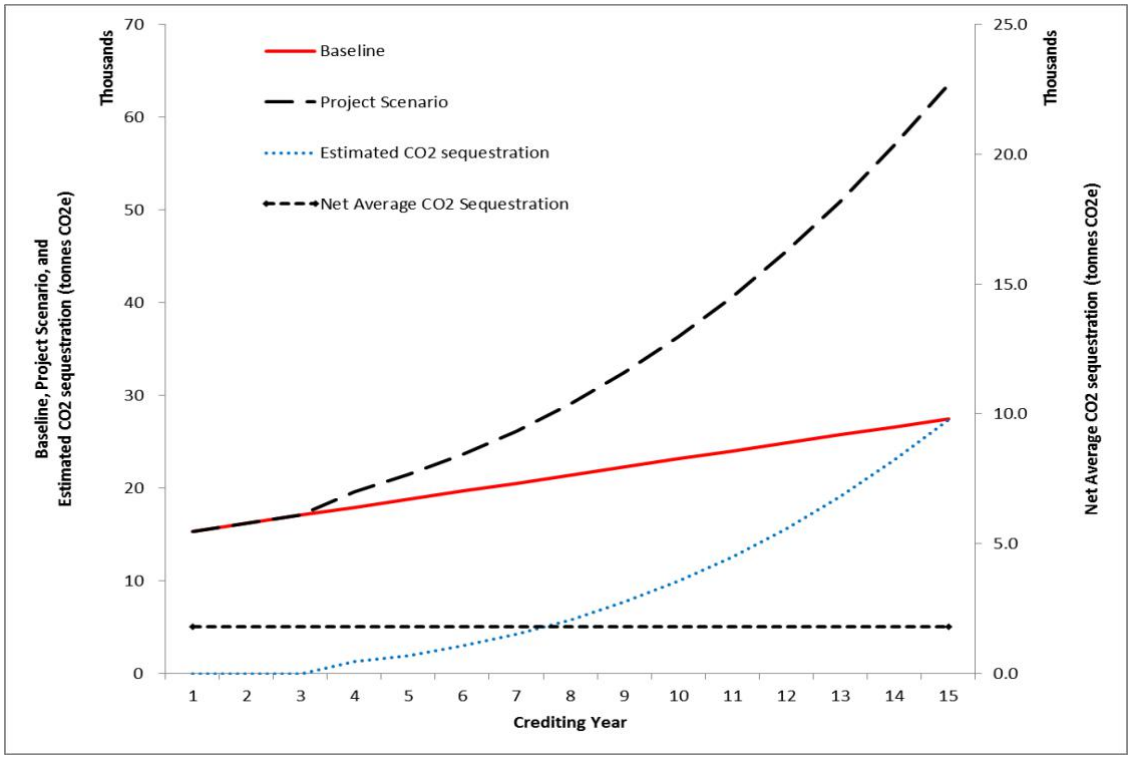


Figure G5. The graphical illustration for the potential generated carbon credits from the A/R project in HKm Aik Bual.

G6. Leakage & Uncertainty

Leakage is any unintended GHG emissions that occur outside the project boundaries as a direct result of project activities and is not included in the calculation of carbon benefits (Plan Vivo, 2009) Leakage exists if improving forest protection within project areas has a knock-on effect increasing

deforestation elsewhere (Plan Vivo, 2013). Leakage, if not identified and quantified, is the major obstacle for the development of forest carbon projects (Schlamadinger, et al., 2005). Several approaches have been undertaken in identifying all possible leakage agents, drivers, and underlying causes. The management, mitigation, and accounting of the risk of leakage is essential and Table G6 outlines these as well as other factors that could lead to leakage. These risks will be monitored at regular intervals (3-5 years) and adjusted if necessary.

Table G6. Leakage Risk, Level of the Risk and Management Measures

Leakage Risks	Level of Risk	Management Measures	Responsible
Displacement of agricultural activity	Low	- Technical support in the development of improved agroforestry	- HKm groups - Village Government
Displacement of fodder harvest	Low	- Technical support in the development of improved agroforestry - Use of high protein fodder species to provide source of food during dry season and thus reduce the area need for fodder harvest	- HKm groups - Village Government
Increased harvesting to meet demand for timber and posts	Low	Establishment of forest plantations on non-HKm areas to provide a sustainable source of timber and posts	- HKm groups - Village Government
Increased firewood collection	Low	- Establishment of forest plantations on non-HKm areas to provide a sustainable source of timber and posts - Introduction of fuel efficient cook stoves	- HKm groups - Village Government

To ensure that leakage is not caused by the project, periodic land cover analyses will be performed using Landsat and/or RapidEye imageries. The target for these surveys is that the change in the proportion of agriculture lands inside the project boundary relative to the land outside the project boundary should not be smaller If there is a detected change, then risk of leakage may be higher than expected and a more detailed review and corrective actions will need to be undertaken To reduce the risk of leakage, leakage mitigation actions will be taken by the project.

For example, during the replanting process, as tree stems become more dense and trees planted become larger and taller, there potentially could have been a risk for the closing canopy to reduce sunlight necessary to grow certain types of vegetables. In order to prevent this, the stem density planned for the area is lower than what it could be (it could easily be > 600 stems per hectare but the project is aiming to reach a density of 400 trees per hectare) ensuring some areas will still be suitable for vegetable planting.

Another strategy will be that of pruning some trees growing directly above vegetable gardens to allow for enough sunlight to filter through ensuring optimal conditions for the growth of vegetable crops. Along with these considerations and as detailed in table above (G6), the project will continue to provide technical support in the development of improved agroforestry, encouraging the planting of high protein species for fodder to avoid displacement of fodder harvest, and encouraging the planting of timber species on non-Hkm areas to meet the demands of timber use and firewood collection.

Risk Management

H1. Identification of Risk Areas

Table H1. The Risk Areas, Risk Levels and Action To Be Taken Mitigate Risks

No	Risk	Aspect	Type	Strategy
1.	Internal Risks	Technical	Coordinator capacity	Training
			Tree growth model	Collecting planted-tree DBHs
		Management	Ineffective management	Project managers and staff adequately trained
			Poor record keeping	Robust procedures and keen oversight
			Staff with relevant skills and expertise	Careful selection of project staff and training
2.	External risks	Financial	Project financial plan	Develop a funding plan
		Opportunity costs	Returns to producer and implementer stakeholders	Development of business plans (reviewed periodically) for economically viable management
		Political	External pressure to engage in non-sustainable livelihood activities	Implementation of project activities to improve livelihoods
		Land tenure	Disputes with landless individuals	Involve landless individuals in group activities (e g nursery) and seasonal work on neighbour's land
		Social	Community disputes over land tenure for women's groups	Participatory planning and continued stakeholder consultation over project lifetime
			Disputes caused by conflict of project aims or activities with local communities or organisations	Participatory planning and continued stakeholder consultation over project lifetime
3.	Natural Risks	Fire	Incidence of forest fire	Fire management plans including creation and maintenance of fire breaks
		Physical	Drought	Replanting of trees as required
			Hurricane	Replanting of trees as required
			Earthquakes	Replanting of trees as required
			Landslides	Replanting of trees as required
			Mudslides	Replanting of trees as required

H2. Risk buffer

Using the VCS Non-Permanence Risk Tool v 3 (2012), three risk factors to quantify the risk buffer have been identified within the project scenario (see Table H1):

4. Internal risk, includes the project management capacity, mitigation plans, adaptive management plans, and project longevity
5. External risk, stems from the community and external factor. This factor mainly deals with the land and resource tenure and community engagement issues, and also the political context such as government policies and the country's international governance ratings
6. Natural risk, is the potential risk to the project from natural disasters, such as drought, fire, pest and disease outbreaks, geological events, etc

A 24% of non-permanence risk has been estimated in HKm Aik Bual. This risk buffer proportion has been built into the project benefit calculations.

Part H: Project Coordination & Management

I1. Project Organisational Structure

The Hkm area and management licences are granted by the government to the village community groups The HKm group is responsible for conducting forest management activities to ensure complicance with laws and regulations pertaining to the HKm licence The HKm will function as the legally recognised community forest management group for the purposes of the Plan Vivo project.

FFI will act as focal point for project coordination, representing and providing the linkage with the Plan Vivo Foundation. A number of additional organisations will be involved as project implementing partners, including the Plantation & Forestry Department of Central Lombok district(local government) and long-standing local NGO partners. Transform is experienced in community facilitation, forest resource management, and agroforestry. Transform and RMI provided technical services to the project, supporting in-depth socialisation of REDD+ and the Plan Vivo System, participatory project design and PDD development. None of the partners have a commercial interest in the project.

FFI champions the conservation of biodiversity, to secure a healthy future for our planet where people, wildlife and wild places coexist. Lasting local partnerships have been at the heart of the organisation's conservation activities for more than one hundred years, and its work now spans the globe with more than 140 projects in over 40 countries. FFI Indonesia Programme was established in 1996. Today the programme works to conserve a diverse range of threatened species and ecosystems throughout the archipelago. The project team has developed substantial expertise in climate change and the development of REDD+ activities. In order to adapt to the local context of existing partner relationships and distribution of skills and expertise, certain project co-ordinator responsibilities will be led or co-implemented by the partners above.

I2. Relationships to National Organisations

The HKm tenure arrangement was introduced as a formal community forestry scheme in Indonesia in the mid-1990s. The purpose is to give access to local communities through farmer groups to legally recognised sustainable utilisation of forest resources. Improving local community well-being and sustainable management of the forest estate is another objective. The two main steps to establishing HKm are obtaining 1) a MoF licence for the forest area allocation and 2) head of district government licence for forest management. Both steps involve stringent formal verifications.

The HKm licence is non-transferable, valid for 35 years, renewable, and monitored by the government at least once every five years. The HKm group is responsible for area boundary demarcation, formulation of management plan, forest protection, rehabilitation, and restoration/enrichment. For watershed protection forest area (*kawasan hutan lindung*), timber harvest is illegal and strictly prohibited. Commercial non-wood products utilisation (up to 20 tonnes per annum) and environmental service payment schemes, including payments for carbon sink and sequestration, are allowed, but require separate MoF and local government approvals. FFI is currently intensive interacting with MoF, REDD+ national agency, and local government officials on this matter.

I3. Legal Compliance

The project will facilitate target communities to secure the necessary permit/approvals for carbon sequestration project and carbon trading. The project will comply with all relevant national regulations. Frameworks for carbon sink and sequestration project are already promulgated. MoF decrees P 36/2009 and, most recently, P 12/2012 regulate forest carbon/REDD+ projects. Entities (government, private sector, local community) with forest management rights must register their projects with the MoF. In forest zones with no competing licence, REDD+ project proponents need to apply for a carbon sink and sequestration business permit. International systems and standards for project development and marketing (CCBA, VCS, Carbon Fix, and Plan Vivo) are recognised in P 36/2009. The decree also stipulates vertical distribution/sharing of revenue from the sale of carbon credits, which is currently subject to inter-ministerial review. A clause in P 12/2012 states that to meet the national emissions reduction commitment, foreign country buyers will be permitted to purchase a maximum of 49% of the carbon emission reductions. Government regulation No 12/2014 sets tarrif for non-tax state revenues from forestry sector, including from the sale of carbon credits

The MoF has developed national standards for land cover classification (SNI 7645:2010), carbon stock measurement and accounting (SNI 7724:2011), formulation of allometric equations (SNI 7725:2011), and REDD+ demonstration activities (SNI 7848:2013)

I4. Project Management

The forest carbon project will be started in 2014, with 100 ha within the proposed 445 ha HKm areas in Aik Bual village. The timeframe for this project is outlined in Table I4 below.

Table I4. Timeline for project establishment

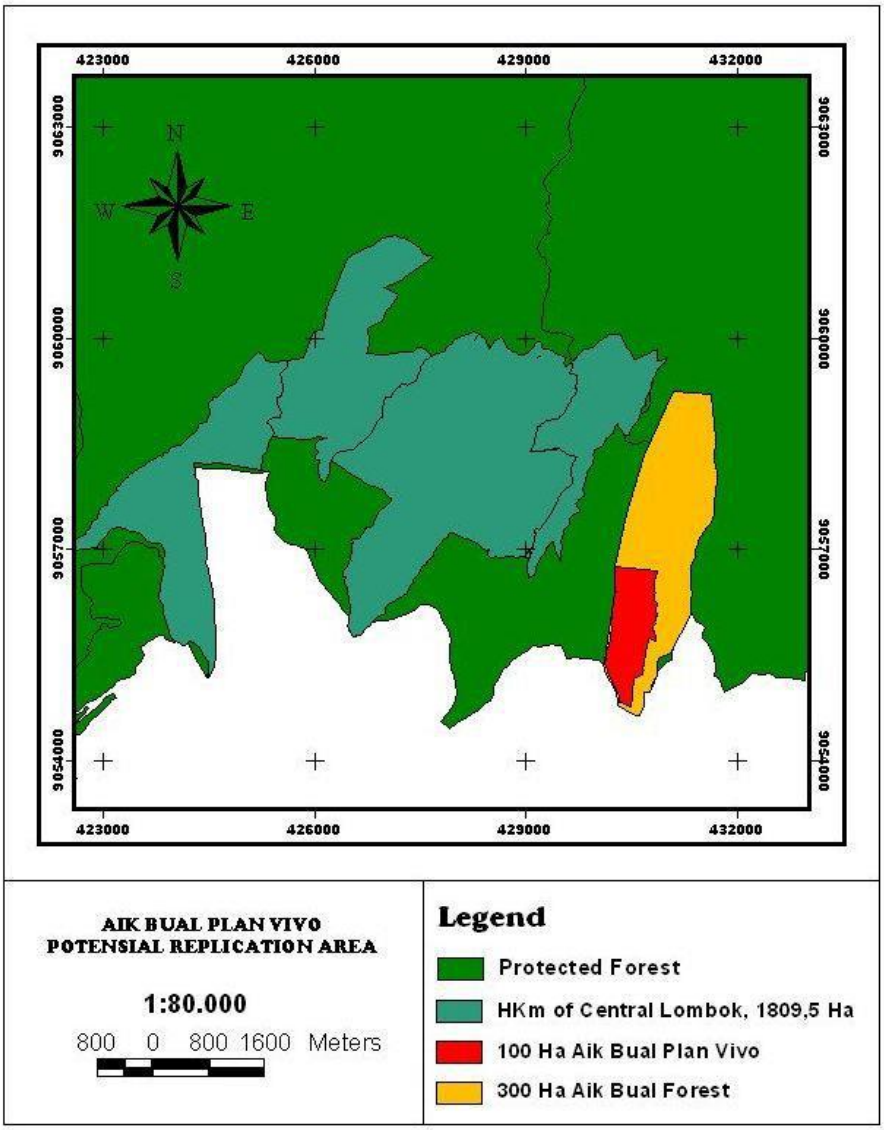
	Activity	Timeframe
1	Secure HKm approval and permit	2012 onward
2	Project designing:	
2 1	Community consulation	2012 - 2014
2 2	Carbon survey/accounting	2012 - 2013
2 3	PDD development	2013 - 2014
2 4	Registration& validation	2013 - 2014
2 5	Plan Vivo certificate issuance	2015 onward
2 6	Project implementation and monitoring	2014 onward
2 7	Fund raising/marketing	2013 onward

As part of the project record keeping system, FFI and Transform will develop the project data base system. Electronic and hard copies of project files and documentations such as village forest zoning map, records of community consultation, results of survey and monitoring, photos, reports of project activity, PES agreement, and financial disbursement records, and records on grievance handling will be stored at HKm office and FFI field office. Additionally, the electronic files will also be stored at FFI Jakarta office. The data base system will be checked updated on monthly and/or quarterly basis.

Once the project is shown to be successful in 100 ha of Aik Bual forest, the forest carbon project can then be expanded to include 345 ha of the remaining proposed HKm area in AikBual village. The next immediate area for project replication are other HKm areas in the same subdistrict of North

Batukliang, covering a total area of 1,809.5 hectares (see Map I4). It covers four villages: Karang Sidemen, Lantan, Aik Berik, and Setiling.

Map I4. Project Immediate Replication Areas



Karang Sidemen village has a population of 5449 (2597 males and 2852 females). The village has an area of 38,96 km2 divided into ten hamlets. Most of Karang Sidemen people are farmers (rice land and forest area). Lantan village is part of the North Batukliang Sub-district and is a 'forest village', with most of the village area dominated by forest and a high degree of dependence on forest for its people. It has a total area 8183,77 hectares, with forest area reaching 7 688,37 ha. Lantan village has protected forest 7252,37 ha, 276 ha are production forest while conservation forest is 160 ha. The village population is 5036 people or 1870 households (2610 females and 2426 males).

Aik Berik village is an area of about 41.870 ha. The forest area around the village of Aik Berik is 7688,37 ha, comprising of 3201 ha protection forests while conservation forest is 6101,04 hectares and 480 hectares are production forests. Aik Berik village residents are 5800 persons or 1573 families (2842 females and 2958 males). The village of Setiling covers an area of approximately 8183,77 ha. Its forest area is 7688,37 ha, consisting of 7 252,37 ha protection forest, 217,5 hectares of protection forest and 160 ha of conservation forest.. The population is 6 209 people or 1 418 households (3 247 females and 2 962 males).

Other potential areas for replication are all the HKm areas in Lombok Island, with a total area of 5639 ha (including the 1809,5 ha in Central Lombok district). They are situated in all 4 (four) districts in the island.

I5. Project Financial Management

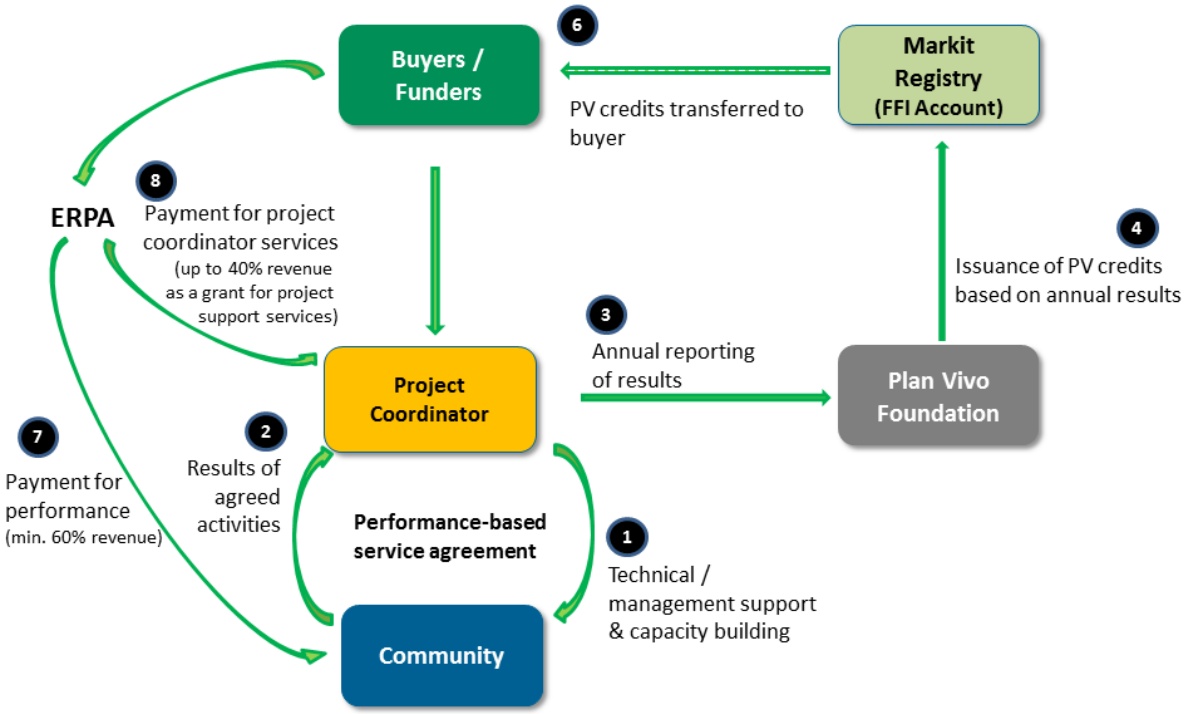


Figure I5 – 1. Contracting structure

FFI is proposing a model where communities enter into two contracts, which are as follows:

The first is, a 'performance-based service agreement', signed by FFI and the community. This includes all the key components that would have been in the PES agreement with the only exception that there is no transition of carbon rights to FFI and sales of carbon credits are not made directly by FFI.

The second is an ERPA that is signed directly with a buyer. It is purely a transaction, and FFI is not a signatory. However, there are various safeguards included in the text of the ERPA, such as the requirement that FFI provide project coordination support to the project, to ensure adherence to the requirements and recommendations of the Plan Vivo Standard[1]. Both the performance-based service agreement and the ERPA should be legal documents.

The performance-based service agreement must provide assurance that the requirements and recommendations of the Plan Vivo Standard are met. Examples of key elements that should be included as follows (not an exhaustive list):

1 Note that under this model, it would be preferable if communities could sign an ERPA with a SINGLE buyer. This would be a lot less complex to administer than the community entering multiple ERPAs for different amounts and timeframes. Therefore, the aim should be to find buyers that are large enough to absorb credit total annual credit generation capacity of one/more communities for duration of the ERPA.

- Roles and responsibilities of the two parties:
    - Agreed community activities under the Plan Vivo and expected outcomes
    - Agreed technical and administrative support activities by FFI
- Performance monitoring targets, procedures, and timetable
- Payment schedule
- Details of link between performance thresholds (100% target met; 50% etc) and payment thresholds

What will make this document different from a 'traditional' PES agreement is that it will include:

- Commitment by FFI to market the project and facilitate negotiation of ERPAs directly between buyers/funders and communities;
- Commitment by FFI to guarantee a minimum payment to communities from grant funds ('*minimum payment*'), in the case that a buyer is not found - this would be a grant to the community with donor funds and it should be made clear in the contract that there is no link to carbon credits. It should be clarified to PV how the level of the '*minimum payment'* has been set to ensure that it is sufficient to be meaningful to the communities. At a minimum this payment will need to cover all forest patrolling costs.
- If an ERPA is signed between the community and a buyer that is of greater value than the FFI 'minimum payment', then this will replace the 'minimum payment' for the duration of the ERPA.

    - If a 'minimum payment' using grant funds is paid by FFI, but an ERPA is signed shortly after (in the same reporting year), the grant funds should be returned into the FFI managed PES Fund once the larger ERPA payment has been received to avoid over payment in a single year and enable the store of grants funds to be replenished to provide guarantee in future years. The two streams of finance (minimum grant payment and actual income from a buyer) will be treated separately.

As the carbon benefits achieved are not transferred to FFI in the proposed model, Plan Vivo cannot issue PVCs into an account owned by FFI. As discussed this could be easily resolved by a) issuing into an account owned by the participant or by b) including a waiver in the performance-based service agreement where FFI waive any claim to the PVCs. Option b will still be viewed by the Indonesian Government as FFI holding rights over the carbon. In addition, only communities are likely to be able to open Markit accounts as village forest license and PES license holders. Therefore FFI will adopt option a.

FFI is responsible for overseeing project MRV and reporting to the Plan Vivo Foundation, and needs to retain its role in ensuring that certificates are only issued upon performance targets being met. For this reason the request for certificate issuance will not be made by communities, and PV will in practice be issuing into community Markit accounts on the instruction of FFI. FFI can demonstrate permission to make this request by writing a clause into its performance-based service agreement with the communities. FFI will also include a short letter of confirmation (or other form or declaration) that the request is being made on behalf of the communities in the annual reports.

It is definitely understood that buyers may want to transfer one or more years of payments upfront, and also prefer not to make transfers to two different entities; i.e. community (min 60%) and FFI (max 40%). FFI proposes that funds are paid into an Escrow account, managed by a third-party Escrow service, and money is held there until targets are met, monitored and reported on and the time has come for payments to be made.

It is also understood that being very clear about performance thresholds and payments levels in the ERPA may make risk of non-delivery more obvious to potential buyers. However, this risk will exist with any project and probably it is better to look for buyers that understand that. Definitely all ERPAs should be very carefully examined to ensure buyers to not try to introduce clauses that put communities at risk in situations of non-delivery.

The language in the ERPA could refer to FFI providing project coordination services in support of the community. The text of the ERPA would need to make it clear this support contributes to FFI's core conservation mission and contributes to meeting direct costs of project support at zero profit to FFI. Any income to FFI from this type of agreement would be defined as 'primary purpose' (i.e. contributes to FFI's core mission), and would not be subject to income tax in the UK. At the time of writing, FFI is still discussing the finer details of this contracting structure with the Plan Vivo Foundation and it is understood that some revisions to this proposed model are likely to occur.

The project is expected to expand to include an additional 6 (six) village forests. Table I5 presents a conservative estimate of the annual budget to develop and expand as well as potential revenues from sales of Plan Vivo certificates.

The project is expected to expand to include HKm groups 4 (four) neighbouring villages. Table I5 presents estimate of annual budget for new project development and expansion.

Table I5. Annual Project Budget and Financial Plan (in USD)

	Project area (in ha)		
	100	**200**	**400**
Cost (in USD)			
Nursery (30,000 seedlings for 100 ha)	6500	13000	26000
Monitoring (technical person)	2000	4000	8000
Sub-total	8500	17000	34000
Revenue			
CO2-e tonnes	4300	8600	17200
Sale at 5 USD per tone	21500	43000	86000
Split of Revenue (in USD)			
Project coordinator (40%)*	8600	17200	34400
Project participants (60%)	12900	25800	51600
*Budget available for project replication to cover costs	8600	17200	34400

I6. Marketing

FFI will help with marketing the Plan Vivo certificates domestically in Indonesia and internationally FFI offices in Indonesia, UK, US, Singapore,and Australia will actively engage with aid agencies, foundations, corporations, and carbon credit buyers/re-sellers. Plan Vivo certificates will be issued after funders and/or buyers have been identified and secured.

I7. Technical Support

The section below highlights the expected division of key responsibilities of supporting NGOs in the Plan Vivo project.

Administrative:
- Registration and recording of community land-use management plans (Plan Vivos) and sale agreements (FFI);
- Managing the use of project finance in the Plan Vivo and making payments to producers (FFI));
- Coordinating and recording monitoring (FFI and local NGO partners);

- Negotiating sales of Plan Vivo Certificates (FFI);
- Reporting to the Plan Vivo Foundation (FFI);
- Contracting project validation and verification (FFI);
- Managing project data (FFI and local partners)

Technical:

- Providing technical support and training to producers in planning and implementing project activities (All partners plus additional external technical support on a needs basis);
- Developing, reviewing and updating forestry and agroforestry systems – the technical specifications (FFI andlocal partners);
- Evaluating the quality of community Plan Vivos (FFI and local partners);
- Monitoring implementation and impact of Plan Vivos (FFI and local partners)

Social

- Conducting preliminary discussions and on-going workshops with communities (FFI, Transform);
- Gathering socio-economic information for project registration and reporting purposes (FFI, Transform);
- Helping groups/individuals to demonstrate land tenure (FFI and local partners);
- Advising on issues such as community mobilisation, setting up bank accounts, dispute resolution etc (FFI and local partners)

Part I: Benefit sharing

J1. PES Agreements

The signing of the PES agreement will take place after the completion of the following steps have been completed:

1) Formal tenure/management right (e.g., HKm approval/license) has been approved by the government or progressing toward finalisation.
2) Plan for forest rehabilitation of the project area (plan vivo) completed.
3) Project participants are aware of REDD+ and PES agreement,and gave their consent (FPIC).
4) Calculation of estimated net emission reduction finalised and communicated project participants.
5) Completed project designing phase (drivers and project activities identified; benefit sharing, monitoring, and governance structure developed).

Intensive facilitation will be provided to ensure HKm leaders are able to perform community-level coordination functions. These include planning, implementation, and reporting of project activities Specific attention will be given for the HKm groups to be able to assess and report project performance againts target indicator that will trigger payment. This include, as necessary, undertaking corrective actions. In the case of failure to meet the performance targets, the duration of PES agreement will be extended to allow for corrective actions.

To mitigate the risk pertaining to market uncertantly, due to difficulty in finding buyers of the carbon credits, initial grant funding (from BATB for 25 ha) has been secured for the first 3 years. Another possible risk is internal conflict within the community on the financial benefit sharing distribution. To cope with this, assistance for the HKm groups will be provided by FFI and Transform to organise community consulation meeting and ensure that grievance mechanism is put in place.

J2. Payments & Benefit Sharing

The result of a series of community consulation presented in Table J2 shows indictors that directly links perfomance and payment of incentives. Annually, HKm groups will coordinate the submission of report of project activities and the results of monitoring againts indicators. The project's field staff

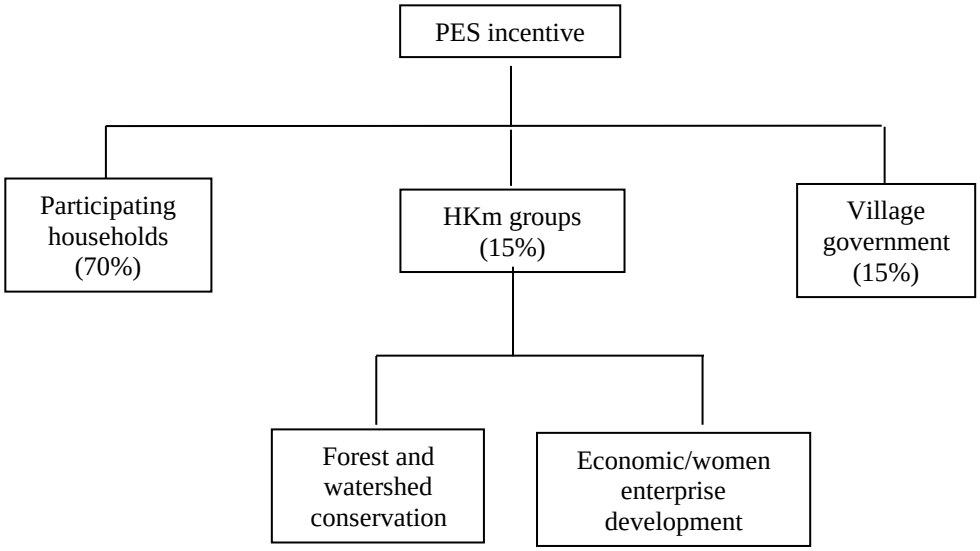
will verify the report and will organise the submission of the reports to Plan Vivo Foundation for aproval. Payments will be made trough bank transfers from CFES account to HKm groups bank accounts.

Table J2-1 Performance indicators and payment

Payment (%)	# tree/ha	% of 400/ha
Full payment (100%)	≥ 400	≥ 100%
Partial payment (50%)	>300 - < 399	> 75% - < 100%
No Payment (0%)	< 300	< 75%

From intensive community consultations, the agreed benefit sharing distribution for PES incentives is outlined in Figure J2. The HKm group treasurer will transer the funds to the activity groups and particpating households. To ensure transparent and equitable benefit sharing disribution, regular community conslutation meetings will be organised to discuss issues as they emerged. Any individuals in the community is also encoureged to raise questions, complaint and/or suggestion through the agreed grievance mechanism.

Figure J2-2 Benefit Sharing Distribution



Note:

- Participating farmers (70%); individual farming household members of the HKm groups managing lands within HKm areas are provided with direct incentive in the form of cash or in-kind as decided community consultation meeting
- Community forest institution/HKm group (15%) will manage the fund for forest rehabilitation/agroforestry improvement activities (e g tree nursery, tree planting/enrichment), forest protection (monitoring, patrolling), watershed conservation, and economic developement activities, such as for NTFP development and women enterprise.
- Village government (15%) to provide supervisiion and support to HKm groups. Village government organise village meeting to discuss matters related to forest rehablitation and protection

Part J: Monitoring

K1. Ecosystem Services Benefits

The project's monitoring will be carried out using a community based and participatory approach. The monitoring activities will not only be on the project area (HKm area zone), but also its surrounding area to minimise the risk of leakage, and to ensure biodiversity and watershed benefits are achieved.

The annual monitoring will be participatory, with individual HKm members submitting reports to the HKm groups. The monitoring indicator will be the presence-absence of trees. The HKm groups will verify, collate, summarise, and report the monitoring data to the project coordinator. The project coordinator will conduct verification, aggregate monitoring reports and submit an annual report to the Plan Vivo Foundation for certification.

The FFI team will visit and collect data from up to 20% of all project participant plots every years. Habitat photos will be taken on fixed points that capture the forest landscape. Several fixed points that view the forest stands in the HKm area will be determined, and photos taken and compared every year. The use of remote-sensing analysis to monitor land cover change will also be done with Landsat 8 satellite image (30m spatial resolution), at least every 5 years. Field monitoring will be used to validate remote sensing analysis in the project areas. Along with the satellite images, habitat photos will also be analysed.

Tree monitoring, at least once every three months, will be conducted by the community patrol group to determine the condition of plant growth. These monitoring results are the basis to measure the success of reforestation and to revise the tree growth models used in the project scenario after the first 5 years of project implementation.

K2. Socio-Economic Impacts

A Participatory Wellbeing Assessment (PWA) will be completed in the first year of the crediting period. Examples of the criteria and indicators used in this sort of assessment from Laman Satong village in West Kalimantan, are reported in Table K2-1. Context-specific equivalents for Aik Bual Village will be identified through in-depth community consultations. A PWA will be repeated every 3-5 years. The result of the assessment is locally defined wellbeing categories and indicators, a number of households in each wellbeing category are periodically assessed. The monitoring will focus on the change in number of households falling into the most vulnerable group, which is classified as poor. The project is expected to improve community wellbeing by contributing to the reduction in the number of poor households Result of the monitoring will be used to inform improvement of project design (e g project activities, benefit sharing, grievance mechanism).

A household survey was conducted in the beginning of the project, and will be repeated every 3-5 years. The survey will assess household asset, income , and spending The indicator for monitoring is change on household asset, income, and spending This then followed with assessment on the change is affecting and affected by the project activities. The results of the household surveys will compliment results of the PWAs to inform overall project design improvement.

Table K2-1. Wellbeing indicators

Criteria	Poor	Medium	Rich
House	Bamboo or board/wooden plank walls, roof leaves, floor board/plank, average size of building 4x6. Comprises kitchen, living room, bedroom.	Metal or tile roof, plank/board walls, plank/board floor. Building dimension 6x9. Comprises kitchen, living room, 2-3 bedrooms.	Metal roof, cement walls, ceramic floor. Building dimension 6x12. Comprises kitchen, living room, dining room, 3-4 bedrooms. 1-2 floors.
Electricity	Rent/link with electricity supply of neighbour; use oil lamp when powercut.	450w electricity supply to house. Use candles when powercut.	900w electricity supply to house. Can provide electricity to neighbours. Own generator (for when powercut)
Electronics & Vehicles	Radio; bicycle	TV, bicycle, motorbike	Fridge, TV, bicycle, motorbike, car
Land ownership	Max. 5ha / household head	5-10 ha/ household head	10+ha
Agroforestry gardens	Max 2ha fruit trees and rubber	2-7ha fruit trees and rubber	7+ha fruit trees, rubber and gaharu (resin trees)
Work	Unskilled labourer, farmer, stone miner, hunter/poacher	Daily or permanent labourer/employee, teacher / civil servant, oil palm labour)	Permanently employed worker; businessman
Income	Less than IDR 1.2 million / month	IDR 1.2 – 5 million / month	IDR 5+ million / month
Sanitation facilities	No toilet in the home	Toilet in the home, with board/plank walls	Toilet with ceramic floor

Table K2-2: Socio-economic monitoring plan

Type of monitoring	**Indicator**	**Methods**	**Indicator unit**	**Frequency**	**Intensity**	**Responsibilities**
Socio-economic	Fruit from MPTs and NTFPs harvested	Interview, ground checking	Kilos of fruit/NTFPs are taken, from how many trees. IDR per kilo earned from the sale of harvested fruits	Annually	Per household/per Hkm permit	FFI

Socio-economic	Yield of agroforests and vegetable gardens for women's "snack" business from agricultural and NTFP products	Data is recorded periodically	Kilos of each type of vegetable or fruit harvested / Number of IDR earned from the sales of snacks and other products	3 months	The women's agri/NTFP small business	Head of the women's small enterprise group
Social	Law enforcement	A record of all law enforcement actions is kept	Cases of law enforcement conducted	Annual	Community-wide	Traditional leader
Social	Strengthening of Hkm forest management group	Keeping a record of village meeting attendance and minutes in which forest management is discussed	Number of meetings/proportion of young/old in the institution	Monthly	Community-wide	Chairman of HKm forest management group
Social	Increased access to healthcare and social services	A log of people receiving healthcare and social services is kept	Number of individuals receiving health care and social services	Annual	Community-wide	Head of Human Resources
Socio-economic	Expenditure of PES funds as agreed in management plan and PES agreement	Book keeping and financial reporting	Number of Indonesian rupiah (IDR) spent on each activity	Annual	For all community groups established	HKm treasurer

K3. Environmental and Biodiversity Impacts

Coordinated by the village government, HKm groups will form a forest patrol/monitoring team. Monitoring will be undertaken for biodiversity. The quarterly monitoring carried out by community forest patrol teams will mark the location of encounters with high conservation value (HCV) species (e.g. birds, primates) and threats to biodiversity (e g cleared forest and trees, poaching, fire). The patrols will record perimeter coordinates for the location using handheld GPS. The monitoring indicators are presence-absence of HCV species and incidence of threats.

Monitoring will also be undertaken for water. The indicator for stability of water supply is the height of water surface (water-table) of spring, stream, and/or researvoir sourcing drinking and irrigation to downsteam areas. The quarterly monitoring carried out by community forest patrol teams will collect the measurement data. The patrol teams will collate, summarise, and report the monitoring data to HKm groups on a quarterly basis. The HKm groups will share the quarterly report with the project coordinator. The project coordinator will aggregate quarterly monitoring reports into the annual report. Details of environmental and biodiversity monitoring protocols are reported in Table K3 below.

Table K3: Environmental and Biodiversity monitoring plan

Type of Monitoring	Indicator	Methods	Indicator unit	Frequency	Intensity	Responsibilities
Agroforestry	Forest cover change	SMART patrol/GPS records of cleared/burnt agroforest and felled tree locations	Number of hectares of cleared/burnt forest and number of felled trees	Monthly	1 transect every month	HKm forest patrol group
Agroforestry		Forest cover as documented by fix-point photography. Visual assessment of photos	Extent of cleared areas/intact areas	6 months	10% of the total farmers parcels	HKm forest patrol group and FFI
Agroforestry	DBHs	Field measurements in sample plots	Cm	Every 3 months to calculate tree growth rates after first 5 years of implementation	All 7 tree species being planted	Community groups/FFI
Tree planting	Trees alive, dead, replaced, DBH	Ground checking	No of trees and cm	Quarterly	Per household per Hkm permit	Community groups
Soil	Soil erosion	Photo and GPS records	Location of landslides or soil erosion	Every 6 months (During rainy season)	Main roads, public access, and HKm areas	Community groups
Forest	Forest condition (degradation)	SPOT satellite image classification	Hectares of degraded forest	5-yearly	Protection zone	FFI remote sensing expert
Water	Water table	Measure water level on a fixed graded pole	Millimetres	Monthly	Water fall, spring, lake, and upper rivers	HKm forest patrol group
Threats	Poaching, hunting	SMART patrol	SMART patrol implemented	Monthly	The project and adjacent area	HKm forest patrol group
Biodiversity	Species richness, with particular attention to the Sunda Pangolin, local name Trenggiling (*Manis javanica*) (EN) and the Lesser Sulphur Crested Cockatoo, local name Kakatua jambul kuning (*Cacatua sulphurea*) (CR)	SMART patrol	Number of sightings and individuals	Monthly	1 transect per month	HKm forest patrol group

K4. Other monitoring

Data will be collected from records of community meetings and reports of project activities to indicate number of community members, particularly women, participating in project activities and decision-making meetings. Monitoring on project governance will focus on community participation in project decision making and activities. From records of grievances and responses, satisfactory complaints handling will also be used as indicators. The HKm groups will share a quarterly result to the project coordinator. The project coordinator will aggregate quarterly monitoring reports into the annual report.

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Annexes

Annex 1. List of key people involved with contact information

Institution	Name	Contact information
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Transform	Alfian Pujian Hadi	Mobile: +6281 803 692 951 Email: alfianpujianhadi@gmail com
Forestry services of Central Lombok District	L Priadi Utama	Mobile: +6287 864 322 433 Email: lalupriadi@yahoo co id
HKm group of Aik Bual Village	Zulkarnain	Mobile: +6287 865 830 470
	Safarudin	Mobile: +6281 952 610 309

Annex 2. Information about Funding Sources

The development of this biodiversity ecosystem services initiative undertaken by FFI in Central Lombok is possible thanks to the generous support from the BATBP. Transform has been working on HKm facilatation in the area since 1990s with support various funding sources, these include from the Ford Foundation and other donor agencies Currently, PES funds are secured for 25 ha of the Plan Vivo project in Aik Bual for 2014-2018, this is provided by grant funding from BATBP. Interaction with various source of funds (e.g. WeForest, donor agencies) is currently taking place.

Annex 3. Producer/Group Agreement Template

PES Agreement
Between KTH Aik Bual and CFES

1) Introduction

Forest provides ecosystem services that are useful for human survival. The benefits of forest ecosystem services include the provision of clean air, water regulation and soil fertility, habitat for animals and plants, forest products, tourism, and cultural value. Forest ecosystems maintain climate, watershed (DAS), and biodiversity.

PES (Payment for Ecosystem Services) is the provision of compensation in the form of financial and non-financial payments to land managers for environmental services generated. Payment for environmental services is an award in the form of payment, ease, relief to management actors producing environmental services from forest area, land or ecosystem. The success of forest protection and management can be measured from changes in forest cover and the presence of trees in it.

CFES *(Community Forest Ecosystem Services)* merupakan wadah yang menampung dan menyalurkan dana imbal jasa ekosistem dari hutan-hutan yang dikelola masyarakat setempat. Kelompok Tani Hutan (KTH) Desa Aik Bual merupakan kelompok masyarakat yang mengelola kawasan hutan di Desa Aik Bual yang telah mendapatkan penetapan areal kerja (PAK) HKm (Hutan Kemasyarakatan) dari Menteri Kehutanan berdasarkan SK No. 500/Menhut-II/2014.

CFES (Community Forest Ecosystem Services) is a facility to keep and disburse funds for payment for ecosystem services from forests managed by local communities. Forest farmers group (KTH: *Kelompok Tani Hutan*) Aik village is a community group who manage the forest lands in Aik Bual village, that have secured approval of working area (PAK: *Pencadanagn Areal Kerja*) HKm (*Hutan Kemasyarakatan*: community forestry) from the Ministry of Forestry with decree No. 500 / Menhut-II/2014.

On the basis of goodwill and mutual trust, CFES and KTH Aik Bual voluntarily enter an agreement on pamyment for forest ecosystem services as part of efforts to achieve sustainable forest management and the poverty alleviation. The beneficiaries are KTH members and other benefit groups in the village community.

2. Legal basis and rules

a) Implementation of this agreement refers to the Indonesian laws and regulations on forestry, biodiversity conservation, environment, and reduction of greenhouse gas emissions (GHG).
b) The provision of incentives/funds for community managed forest and the monitoring of forest ecosystem services benefits in this agreement follow the Plan Vivo Foundation requirements.

3. Roles and Responsibilities

CFES (Community Forest Ecosystem Services):

a) Channelling funds for forest ecosystem services to KTH Aik Bual based on monitoring results of the success of tree planting activities. Indicators of success and the payment of compensation set out in Annex 1.
b) Together with partner agencies and KTH Aik Bual, coordinate planning, implementing, and monitoring the success of tree planting for ecosystem rehabilitation. Including water monitoring, biodiversity, and socio-economic.
c) Together with partner agencies, prepare and submit periodic reports to the Plan Vivo Foundation.

KTH Aik Bual:

a) Supporting tree planting activities by members of KTH for the rehabilitation of forest ecosystems and efforts on forest and biodiversity protection, which in turn produce forest ecosystem benefits / services.
b) In collaboration with partner agencies, carry out monitoring of tree plantingfor forest rehabilitation by KTH members.
c) Ensuring the protection of forests and biodiversity. Monitoring of water, biodiveristy, and socio-economic.
d) On behalf of KTH members and village community and beneficiary groups, receiving funds for ecosystem services provision from CFES.
e) Implement the distribution of forest ecosystem service payments to members according to the level of success, refering to Annex 1 and the PES agreement between KTH Aik Bual and its members. Prevent certain parties take advantage over PES fund.
f) As necessary, KTH Aik Gab and CFES can agree, implement, monitor remediation efforts, including changes to the content of this agreement.

Benefit groups:

a) KTH members carry out tree planting. Each member reported the success / failure of tree planting activities. Members receive compensation as set out in Annex 3.
b) The village government receives PES funds as set out in Annex 1. The funds to be used directly related to the protection of forests and biodiversity, forest rehabilitation, women empowerment, and poverty alleviation. Proposed activities and use of funds agreed upon between the village government and KTH Aik Bual.
c) The use of fund is reported publicly.

Partner institution:

a) FFI-IP Lombok as a partner institution provides technical support in the implementation of this agreement.
b) Partner organizations prepare and submit report to the relevant government agencies.

4) Monitoring and payment

Procedures for monitoring are described in Annex 2.

The indicators will be observed mainly include:

a) The number of trees planted/ cared and grow
b) Protection of forests and biodiversity (logging, poaching)
c) Protection / improvement of watershed

The amount PES funds depends on the achievement of success in tree planting, based on the results of monitoring. Indicators of achievement of success and payment values listed in Annex 1.

5) Sources and Uses of Funds

a) The PES fund is provided by BATBP (British American Tobacco Biodiversity Partnership) and other sources.
b) Benefit sharing distibution of the PES fund is set out in Annex 3.

6) Change

a) CFES and KTH Aik Bual may propose changes to the content of this agreement, through deliberation to reach a consensus on the necessary improvement.
b) If an agreement is not reached, CFES and KTH Aik Bual may appoint third parties to reach agreement / consensus.

7) Duration

a) This agreement is valid for three (3) years beginning March 1, 2015 until February 28, 2018
b) CFES and KTH Aik Buak can make changes on agreed terms of the agreement and improvement efforts.

The parties have agreed with the contents of this agreement:

KTH Aik Bual	CFES
Nasri Chairpeson	.... Represntative
…. March 2015	….. March 2015

Witness:

Aik Bual Village Government	BPD Aik Bual	Hamlet
Zulkarnain Village head 15 April 2015	..... Chair person 15 April 2015	Safarudin Head of Pertanian hamlet 15 April 2015

Fauna & Flora International

Adam Aziz
Lombok Project Leader
15 April 2015

Annex 1. Indicator, payment, and schedule

Indicator	Full payment (100%)	Partial payment (50%)	No payment (0%)
# trees planted	≥ 400 trees/ha	300 – 399 trees/ha	< 300 trees/ha

HKm area: 100 ha
Tree planting/ projectarea: 25 hektar
Total members: .... households
PES fund per annum: Rp …

Schedule for monitoring and payment:

First year : 28 February 2016
Second year : 28 February 2017
Thirdyear : 28 February 2018

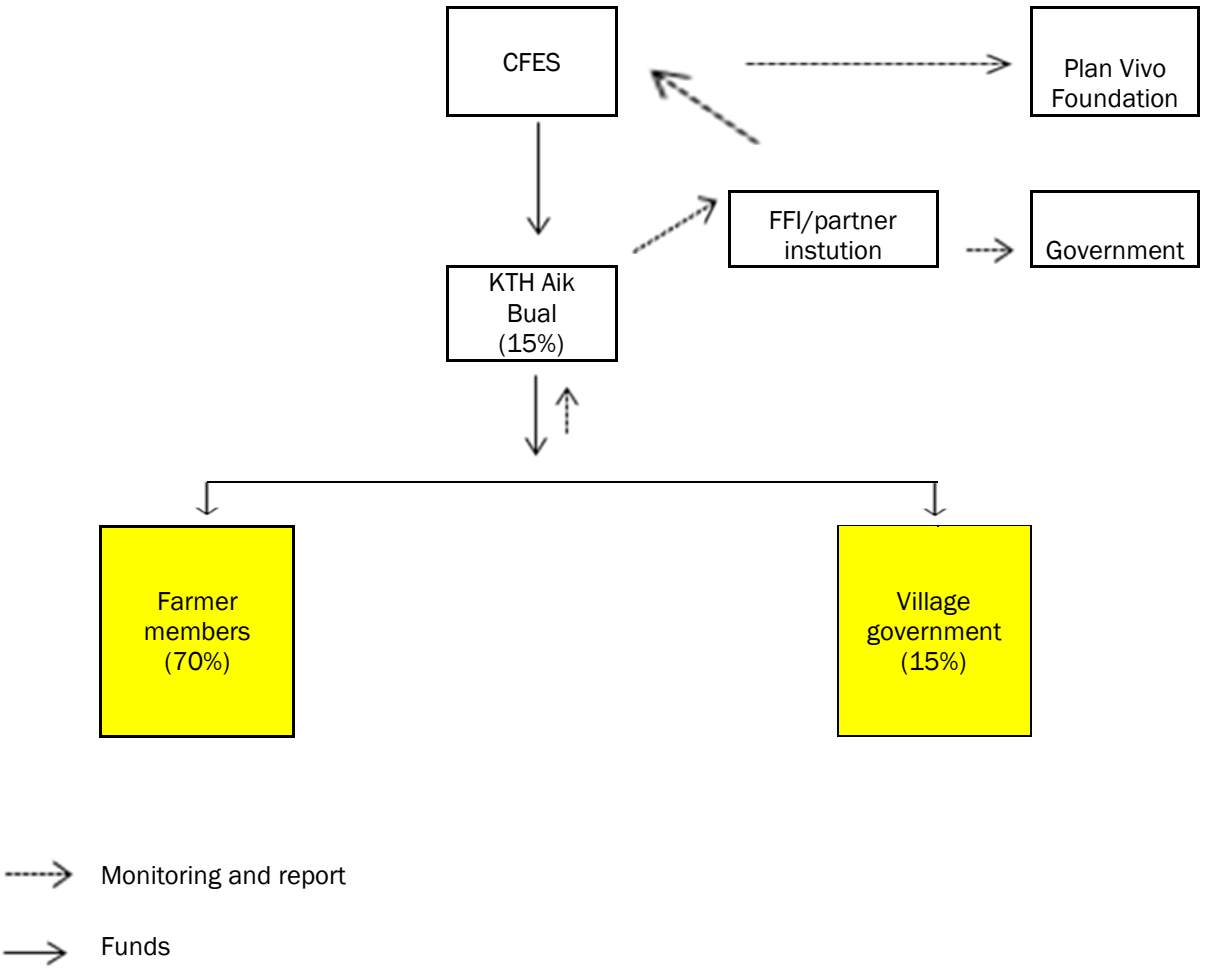
Annex 2. Monitoring

1) The result of monitoring of growing trees is the basis to measure the success of reforestation or rehabilitation of forest ecosystems
2) The success of reforestation is measured by the number of trees grow (live) to meet the planting target per hectare.
3) Payment be made based on the planting target, the indicators are listed in Annex 1.

Monitoring and patrolling group:

1) Carry out monitoring (at least once every three months) to determine the condition of plant growth.
2) Carry out patrols regularly (at least once per month) and record other information related to threats to forest and biodiversity.
3) Gather additional information (actors / owner, the type of equipment used, type of crops planted, etc.), take photos.
4) Perform data collection using GPS way points
5) Each quarter prepares a report containing a summary of the data, observations, and photos to be submitted to KTH Aik Bual
6) Monitoring reports will be verified by the partner institutions and subsequently submitted to the CFES.
7) Results of monitoring reports determine payments, based on the achievement of indicators listed in Annex 1.

Annex 3. Benefit sharing distribution



PES Agreement
Between KTH Aik Bual and KTH Member

1) Introduction

This agreement guides forest ecoystem service payment between KTH Aik Bual and farmer/member. KTH (*Kelompok Tani Hutan*; forest farmer group) Aik Bual is community group that has obtined HKm (*Hutan Kemasyarakatan*) forest management right from the Minster of Forestry based on MoF Decree No. SK.500/Menhut-II/2014. The area of Aik Bual HKm is 100 ha, situated in Aik Bual village, Kopang subdistrict, Lombok Tengah district, Nusa Tenggara Barat province.

This agreement is part of PES agreement between CFES (Community Forest Ecosystem Services) and KTH Aik Bual.

The implementation of this agreement based on terms and conditions in the implementation of forest ecosystem rehabilitation dan benefit sharing of payment (Annex 1 and 2).

2) Role and Responsiblity

Scope of role and responsibility is outlined in Annex 3.

KTH Aik Bual:

1) Fasilate member farmers in preparing plan and carry out tree planting activities according to target indicator, as part of forest ecosystem rehablitation.
2) Regularly, at least every three months, prepare monitoring report of tree planting by member farmers.
3) On behalf of KTH members and village community received payment of ecosystem services from CFES. Carry out payment to member farmers and other benefit groups as agreed.
4) Carry out protection and conservation of forest, biodiversity, and watershed. Promote empowerment of women and poor households.

Member farmers:
1) Develop and implement plan for tree planting (Annex 4). Report monitoring result of tree planting (Annex 4), at least once in three month.
2) Received payment based on achievement of target indicators (Annex 6).
3) Actively participating in actions to protect forest, biodiversity, and watershed.

Timeframe

This agreement valid for 3 (three) years, from 1 March 2015 to 28 February 2018.

Parties signing this agreement:

Head of KTH Aik Bual	Farmer/member
Nazri ...March 2015	....March 2015

Witnes,

Village government,

Zulkaranain
Village Head
...Maret 2015

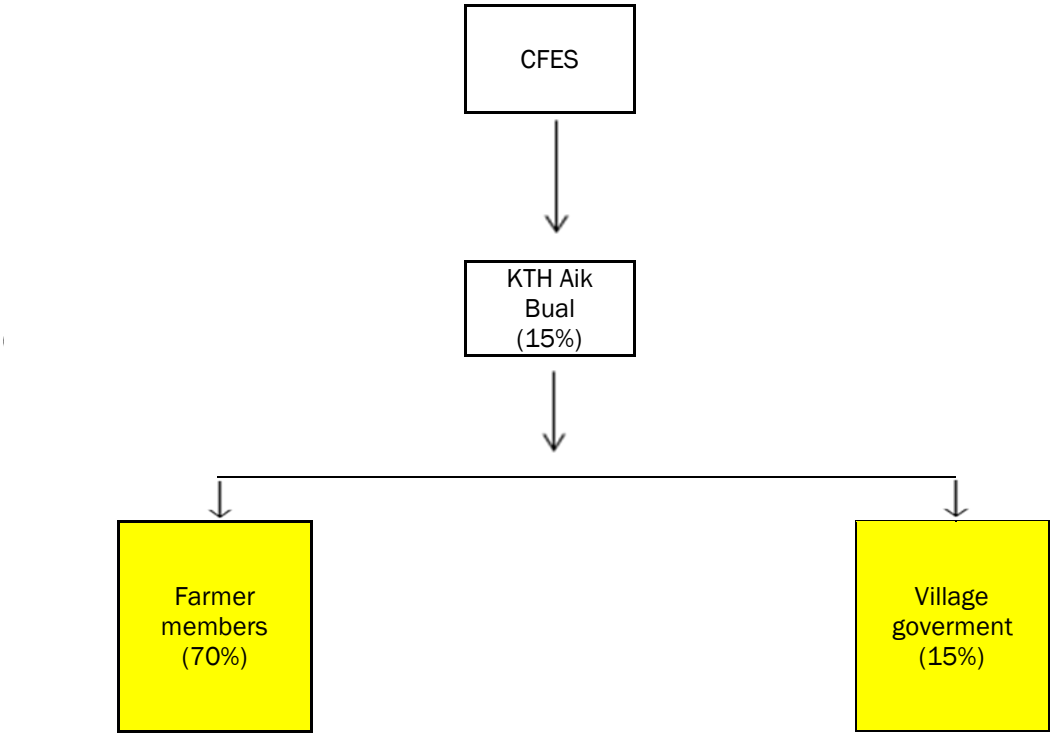
Annex 1. Indicator, payment, and schedule

Indicator	Full payment (100%)	Partial payment (50%)	No payment (0%)
Trees planted / # survive trees	≥ 400 trees/ha	300 – 399 tress/ha	< 300 trees/ha

Name: ....
Land size: .... ha
Ttree planting targe: ....
Payment per year: Rp …

Scedule for monitoring and payment:
First year : 28 February 2016
Second year : 28 February 2017
Third year : 28 February 2018

Annex 2. Benefit sharing distribution



Annex 3. Scope of role and responsibility

No.	Groups name	Role and responsibility	
1	KTH	1	Atas nama petani anggota, menandatangani kesepakatan imbal jasa ekosistem dengan CFES. On behalf of member farmers, to sign PES agreement with CFES.
		2	Sign PES agreement with member farmers.
		3	Receive PES money and disburse it to member farmers based on result monitoring of succes indicator.
		6	Receive and verify plan and report from farmer members and other benefit groups.
		7	Prepare periodic report to CFES' partner intitution.
		8	Responsible for facilitating farmer members to carry out tree planting and care based on plan and succes target
		9	Carryout initiative to rehablitate watershed
		10	With village gaovernment, coordinate forest protection patrolling
		11	With village government, facilitate empowerment of women and poor.
		12	With village goverment, prepare and implement village regulation (*awik-awik*) on forest and biodiversity protection
2	Member farmers	1	Planting tree with agreed species and number trees on each managed forest land.
		2	Caring and mantainaning trees planted
		3	Prepare monitoring report on tree planting
		4	Receive payment based on level of succes in achieveing planting target
		5	Obey/enforced *awik-awik*
		6	Supervise/monitor land managed
3	Monitoring dan patrol team	1	With KTH and village government support, conduct regular forest patrolling.
		2	Carry out monitoring and reporting of success in achiveing tree planting aterget on farmer member lands
		3	Ensure KTH activities are well implemented

Annex 4. Tree planting plan (*plan vivo*)

Name :
Land size (ha) :
Location :

Tree planting plan scetch map

Exisiting trees planted

No	Tree species	Total	Code
1			
2			
3			
4			
5			

Tree planting plan

No	Tree species	Total	Code
1			
2			
3			
4			
5			
6			
7			

Annex 5. Tree planting monitoring report

Name :
Land size (ha) :
Location :

No	Tree species	Kode	Status/ *DBH*				
			2014	2015	2016	2017	2018
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Status:
Tn: *tanam*/planted
Tb: *tumbuh*/alive
M: *mati*/died
S: *sulam*/replanted

Annex 4. Database Template

Community Patrol Report

Name(s) :
Date :
Location/route :

No	Location/waypoint	Type of threat encoutered	Action taken	Remarks

No	Location/waypoint	Species sighted	Remarks

Watertable Monitoring Report

Name :
Date :
Location :

No.	Date	Location	Watertable	Remark

Annex 5. Example Forest Management Plans/Plan Vivos

Figure Annex 5.1. Scetch of Aik Bual HKm Area (100 ha)

Annex 6. Permits and Legal Documentation

BUPATI LOMBOK TENGAH

Praya, Desember 2012

Nomor : 522/461/Hutbun/2012
Lampiran : 1 (satu) gabung
Perihal : *Usulan Pencadangan Areal Kerja HKm di Kab. Lombok Tengah Tahun 2012*

Kepada
Yth. Bapak Menteri Kehutanan Republik Indonesia
di-
Jakarta

Dengan hormat,

Dalam ranagka memberikan kesempatan kepada masyarakat untuk mengelola dan memelihara hutan agar lebih bermanfaat dan memberikan nilai tambah yang lebih guna peningkatan kesejahteraan, bersama ini disampaikan permohonan pengelolaan Hutan Kemasyarakatan (HKm) di kawasan Hutan Gunung Rinjani (RTK 1) seluas 396,65 ha dengan penerima manfaat sejumlah 418 KK yang berada di 3 desa yaitu desa Pemepek Kecamatan Pringgarata dan Desa Lantan Kecamatan Batukliang Utara dan Desa Bual Kecamatan Kopang Kabupaten Lombok Tengah. Diharapkan dengan diberikannya ijin pengelolaan HKm ini masyarakat menjadi termotivasi untuk ikut serta menjaga hutan guna meningkatkan kesejahteraan masyarakat.

Demikian untuk menjadi perhatian dan atas pertimbangannya disampaikan terima kasih.

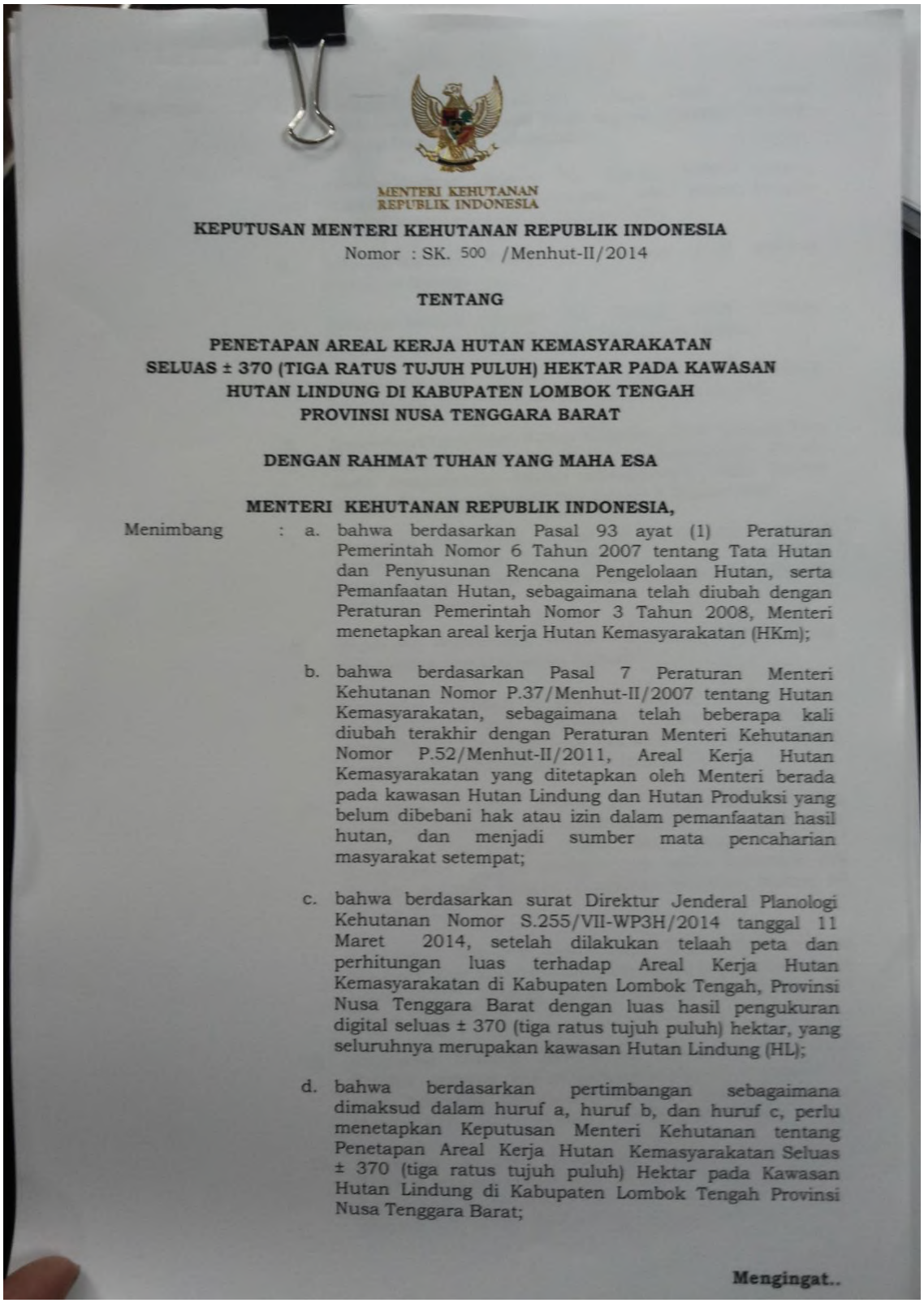
BUPATI LOMBOK TENGAH,

(H. MOH. SUHAILI FT., SH.)

Tembusan disampaikan Kepada Yth.

1. Kepala Dinas Kehutanan Provinsi Nusa Tenggara Barat di Mataram
2. Kepala BPDAS Dodokan Moyosari di Mataram

Head of District recommendation letter to the Minister of Forestry, requesting area allocation approval for HKm Aik Bual area (100 ha)



MENTERI KEHUTANAN
REPUBLIK INDONESIA

KEPUTUSAN MENTERI KEHUTANAN REPUBLIK INDONESIA

Nomor : SK. 500 /Menhut-II/2014

TENTANG

PENETAPAN AREAL KERJA HUTAN KEMASYARAKATAN SELUAS ± 370 (TIGA RATUS TUJUH PULUH) HEKTAR PADA KAWASAN HUTAN LINDUNG DI KABUPATEN LOMBOK TENGAH PROVINSI NUSA TENGGARA BARAT

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI KEHUTANAN REPUBLIK INDONESIA,

Menimbang : a. bahwa berdasarkan Pasal 93 ayat (1) Peraturan Pemerintah Nomor 6 Tahun 2007 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, serta Pemanfaatan Hutan, sebagaimana telah diubah dengan Peraturan Pemerintah Nomor 3 Tahun 2008, Menteri menetapkan areal kerja Hutan Kemasyarakatan (HKm);

b. bahwa berdasarkan Pasal 7 Peraturan Menteri Kehutanan Nomor P.37/Menhut-II/2007 tentang Hutan Kemasyarakatan, sebagaimana telah beberapa kali diubah terakhir dengan Peraturan Menteri Kehutanan Nomor P.52/Menhut-II/2011, Areal Kerja Hutan Kemasyarakatan yang ditetapkan oleh Menteri berada pada kawasan Hutan Lindung dan Hutan Produksi yang belum dibebani hak atau izin dalam pemanfaatan hasil hutan, dan menjadi sumber mata pencaharian masyarakat setempat;

c. bahwa berdasarkan surat Direktur Jenderal Planologi Kehutanan Nomor S.255/VII-WP3H/2014 tanggal 11 Maret 2014, setelah dilakukan telaah peta dan perhitungan luas terhadap Areal Kerja Hutan Kemasyarakatan di Kabupaten Lombok Tengah, Provinsi Nusa Tenggara Barat dengan luas hasil pengukuran digital seluas ± 370 (tiga ratus tujuh puluh) hektar, yang seluruhnya merupakan kawasan Hutan Lindung (HL);

d. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a, huruf b, dan huruf c, perlu menetapkan Keputusan Menteri Kehutanan tentang Penetapan Areal Kerja Hutan Kemasyarakatan Seluas ± 370 (tiga ratus tujuh puluh) Hektar pada Kawasan Hutan Lindung di Kabupaten Lombok Tengah Provinsi Nusa Tenggara Barat;

Mengingat..

Minister of Forestry decree on HKm area allocation approval, including for Aik Bual area (100 ha)

Annex 7 Evidence of Community Participation

Community meeting on tree species selection (16/05/2013)

Project area scetch mapping (22/07/2013)

Carbon survey (12/02/2013)

Community meeting on PES agreement (03/07/2014)

FGD for PES agreement (03/07/2014)