Semau Island

COMDEKS CASE STUDY
SEMAU ISLAND INDONESIA

SATOYAMA INITIATIVE
The GEF Small Grants Programme
UNDP
gef
Japan Biodiversity Fund
PROCESS INSTITUTE

COMDEKS CASE STUDY : SEMAU ISLAND INDONESIA

PROCESS Institute is an institution that focuses on research, monitoring and evaluation, training, and facilitating services using data and visual display for environmental issues and natural resource management. PROCESS stands for pro to conservation, environment, social justice and sustainability. PROCESS Institute aims to produce accountable and qualified results of research and evaluation that can be well accepted and understood by partners and public, as well as providing training and facilitating services for various organisations both government agencies, non-governmental institutions and companies.

Project Team :

1. Ery Damayanti (Project Coordinator)
2. Nur Hidayati (Facilitator)
3. Katrun Nada Danielsson (Facilitator)
4. Ramadian Bachtiar (Video Director, Camera Person)
5. Sarie Wahyuni (Facilitator, Administration Assistant)
6. Adipati Cakraningrat (Layout Designer)

Photo Contributors :Ery Damayanti, Ramadian Bachtiar, Sarie Wahyuni, Hamzah Almuhadzdzib, Bingkai Foundation

SUMMARY

Semau Island in Kupang District, East Nusa Tenggara Province was selected as the target seascape for the activities of the COMDEKS (Community Development and Knowledge Management for the Satoyama Initiative Project) Country Programme. Semau Island was selected based on the consideration that it is an island separate from the mainland. The island also represents a highly vulnerable area with potential impacts from climate change and extreme weather on its agriculture given the limited fresh water and thin soil layer in karst dominated terrain. Furthermore, the island is rich in terrestrial, coastal, and marine biodiversity.

The COMDEKS Project in Semau Island is an example of management that combines several SGP focal areas, namely biodiversity, climate change, renewable energy and land degradation. In addition, the Semau Island project can become an example of comprehensive management for four focal SGP areas based on socio-ecological production landscapes (SEPL), through the use of four interconnected landscapes: (1) ecosystem and biodiversity protection; (2) agriculture diversity; (3) knowledge, learning and innovation; and (4) social and infrastructure justice.

This project was implemented in 10 villages in two sub-districts in Semau Island, namely Semau and South Semau Sub-districts. In general, it can be said that the communities involved in the project activities experienced good results and significant changes from this project based on the four aforementioned SEPL dimensions.

Significant changes were experienced by the communities involved in the fresh water provision, organic farming and biogas stove projects. Production forest development as a way to repair water catchment was still in its initial stages. Results were not yet evident from seaweed farming and post-harvest development as well as mangrove planting. Non-intensive facilitation in seaweed and mangrove development is attributed as one of the causes.

The project achievements produced in 1.5 years has the potential for replication and further development. Therefore the role of local government cannot be ignored, and dialogs with village, sub-district and district governments are needed to build commitment for project sustainability so that it can be replicated and extended to other villagers who were not involved in the previous project. A funding mechanism by the community for the community must be developed, such as arisan or rotating savings and credit groups to purchase agriculture and seaweed farming inputs or fresh water facilities as needed.

With regard to extending knowledge and expertise, facilitating NGOs must immediately undertake efforts to connect communities, develop communication forum and inter-learning among communities, to encourage inclusive capacity building among the entire Semau Islanders. The involvement of women in these groups will contribute to the project success. During the final assessment several women group initiatives were observed which can be facilitated by local government to carry out backyard farming, create organic fertilizers and harvest product processing to generate additional economic value.

CONTENTS

SECTION 1: LANDSCAPE BACKGROUND AND CONTEXT

Semau Island was the site selected by the COMDEKS program in Indonesia through multi-stakeholder consultation process. Semau Island was selected as a seascape target for COMDEKS Country Programme in Indonesia. This 265 square kilometer island is an example of management which combines several FGP focal areas including biodiversity, climate change, renewable energy, and land degradation. In addition, the Semau Island project can become an example of comprehensive management for four focal SGP areas using four interconnected dimensions: (1) ecosystem and biodiversity protection; (2) agriculture diversity; (3) knowledge, learning and innovation; and (4) social and infrastructure justice.

The island is regarded to represent the characteristics of small islands isolated from mainland with high vulnerability due climate change impacts such as extreme weather, agriculture with limited freshwater supply and thin soil layer dominated by karst rocks.

The island is administratively situated in Kupang District, East Nusa Tenggara Province. Semau Island directly borders Sawu Sea in the south, west and north, and borders the Semau Strait, an international sea lane, to the east. On the south of Semau Island lies Rote Island (Rote Ndao District), with Pukuafu Strait between the two islands. Semau Island can be accessed by sea from Tenau Port in Kupang which takes 30-45 minutes by motor boat and approximately 18 minutes by ferry boat.

Based on preliminary mapping and consultation with community, it was concluded that limited water sources, limited knowledge and innovations in terrestrial and marine culture systems, increased chemical use for agriculture, and the threat of the reduction of clan forest are the main issues to be addressed by COMDEKS program in this island. Consultation was done with local communities, village and sub-district government, district government, and other national stakeholders to gain inputs for strategy, selected activities and the potential for program collaboration.

Production activities in Semau greatly influence the community's food security. Community production greatly relies on nature, such as seasons. In addition to seasons, production in Semau depends on the work and roles of various elements of the community, namely farmers, fishermen, seaweed farmers, women, youth, clan leaders, landowners (tuan tanah), landowners for areas in which there are water sources (tuan air), collectors, village officials, church officials, and land and sea transportation operators. The Government, in this case Village, Sub-District, District, Province and Central Governments (through their local programs) as well as numerous non-government organizations play important roles in influencing community's food security. The Ministries of Agriculture, Marine Affairs and Fisheries, as well as Environment and Forestry are the branches of the central government with interests in Semau Island.

Nearly all communities in Semau Island have farmlands. The few who do not own land are usually newcomers from outside of Semau. However, many of those who came from outside Semau owned land given or purchased from clans. Nearly all of the Coast of Semau Island is part of the Marine Nature Recreational Park managed by the Ministry of Environment and Forestry, while part of the south/southeast waters are part of the Sawu Marine National Park managed by the Ministry of Marine Affairs and Fisheries (MMAF). It can be said that the Ministry of Agriculture plays the most critical role along with the Kupang District Government because agriculture has supported the lives of the Semau Islanders for generations. Among the communities, the tuan tanah (Land Owners), tuan air (Water Owners) and farmers (both land-based farmers as well as seaweed farmers) are the main actors in determining the success of COMDEKS program.

Based on Bingkai Indonesia's assessment which gave birth to the CPLS Strategy in Indonesia, COMDEKS in Semau Island was then developed together with several NGOs from various expertise in Kupang. These NGOs then formed the COMDEKS Program Coalition to implement COMDEKS program in Semau.

Map 1: Position of Semau Island

Map 2: Semau Island

Land and Marine Tenure and Management
There are two ethnical majorities in Semau: the Helong and the Rote. The Helong people are native inhabitants of Semau Island and they are believed to have originated from Maluku. Most of the land in Semau belongs to the Helong people, except for settlement and farm lands that have been purchased from their original owners. Land ownership by Helong clan leaders continues to this day. Usually clan leaders and paternal relatives own clan lands. In the past, great clans distributed land to be managed by sub-clans. Today there are still several great clans that control large parcels of land in Semau. The landowners usually are willing to give land for settlement, but farm land can be leased or sold.

For leased farm lands, the landlord determines a rent using a system called "Bunga Tanah" or land interest. In the past, this was paid by harvest, though nowadays there are landowners who request annual monetary payments. Its value is determined through an agreement between the landowner and the sharecropper and is determined when the farmer makes a request to the landowner to work a certain plot of land. This request is called Hol Hela Tamata, or sharpening the machete and sword. In this tradition, the farmer comes to the landowner with a payment of betel leaves and areca nut. The amount is either determined by the landowner or undetermined. Land management agreement includes the amount of land interest. Sometimes the amount is determined without basis of the land parcel size while others are based on the land parcel size. For Naikean Village, for example, most of the land belongs to a landowner from the Susang clan, led by Daud Susang. Daud Susang stated that land interest for each 2500 m2 to 5000 m2 land planted with onions, sharecroppers must share the onions in five blek or large cans of kerosene. The amount of blek is equivalent to kapisak or sapaik (a basket made from geuwang leaves) or approximately 50 kilos per basket. Meanwhile a profit sharing system is applied for rice, regardless of the land area. Harvest is divided into three parts: sharecropper, landowners, and costs for fertilizers and agriculture input. If sharecropper bore the costs of agriculture input and fertilizers, then they will receive two parts of the harvest. In other villages, the sharecropper should give 10 percent of harvest to land owners. For corn and vegetables, farmers usually grow them in their own land or gardens for their own sustenance.

In addition to farmland, land interest payment applies for well construction. In Semau, well construction permission may be given by landowner for IDR 500,000. Because wells must be dug prior to shallot harvest season, landowners receive IDR 500,000 a year. This can lead to the community digging many wells over a certain area, as long as they have landowner's permission, leading to quicker draughts because the water is spent at the same time.

Semau Islanders generally own farms. Those who do not own land are usually newcomers from other islands who have not settled long or those who depend on marine and coastal resources, such as the Rote and Bajo people. For landless farmers, there are no difficulties in leasing land from landowners who impose reasonable payment of harvest product or monetary payment that do not burden the farmers. Land in Semau is distributed as clan lands which are managed by each clan. Clan land applies all the way to the coastline area. Therefore seaweed farmers must pay a form of rent to coastal landowners whose land is used for seaweed farming. However, the regulation of land ownership to the coastline is still unclear. In Akle Village for example, the head of the seaweed farmers' group objects to having to pay fees to certain clan leaders for using the landowners land for huts used to spend the night along the beach. The farmers group believed that the government owns the land in coastal area from the tide up point to 100 meters upland.

Land regulation in Semau is entirely in the hands of landowners, except for private farms that have been purchased or whose rights have been given by the clans. The village government's role in this is to provide necessary facilities needed by the villagers, such as education, health, agriculture, facilities and infrastructure. Terrestrial land and marine management must have clear regulations that consider environmental balance, so that this may be a focus for village government in collaboration with landowners, farmers, and fishermen.

SECTION 2: BASELINE ASSESSMENTS (EX-ANTE AND EX-POST) AND COMMUNITY CONSULTATIONS

GEF SGP Indonesia has invested in several projects in Lesser Sunda: in Bali, West Nusa Tenggara, East Nusa Tenggara and Maluku. In East Nusa Tenggara, SGP focuses on biodiversity, food security and renewable energy in Alor, Flores and Timor Islands. Through several consultation meetings and discussions with PPN and other stakeholders, SGP has selected Semau Island in Kupang District, East Nusa Tenggara as the target landscape and seascape for the activities of the COMDEKS Country Programme.

Seaweed farmers

East Nusa Tenggara lies in the Wallacea bioregion and is host to rich marine biodiversity in the Lesser Sunda. Nearly all of the Coast of Semau Island is part of the Marine Natural Recreation Park and a smaller area is managed as Marine National Park. Semau Island was chosen based on considerations that it is a small island isolated from the main land, with potential impacts from climate change and extreme weather, agriculture with limited fresh water and thin soil layer in karst dominated terrain, but on the other hand is rich in terrestrial, coastal and marine biodiversity. The people of the island have survived for generations on the available agricultural and piscine resources of this small island.

The COMDEKS program is implemented in 10 villages: Uiasa, Huilelot, Letbaun, Batuinan and Bokonusan Villages in Semau Sub-district, and Uiboa, Uitiutuan, Uitiuana, Akle, and NaikeanVillages in South Semau. Local organizations involved in the COMDEKS Program Coalition are:
Pikul: represented the Semau community in developing customary agreements, social as well as formal agreements with local government in supporting COMDEKS program, including allocating and implementing planting in production forest with economically valuable hardwoods to create water catchment and forest rehabilitation.

Geng Motor Imut: provided transfer of knowledge and simple technology, and facilitate Semau community in organic farming.
CIS Timor: provided transfer of knowledge, technology and equipment procurement as well as facilitation for fresh water distribution in Semau.
Yayasan Pengembangan Pesisir dan Laut – YPPL (Coastal and Marine Development Foundation): provided transfer of knowledge and simple technology, as well as facilitation for community seaweed farming management and processing in Semau.

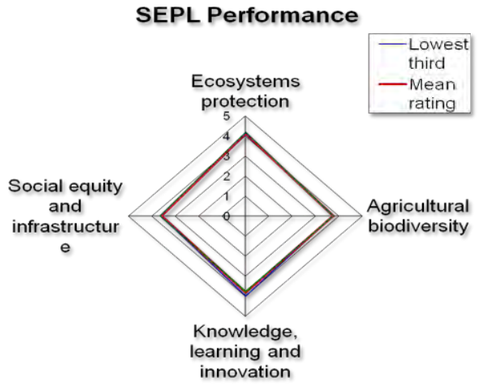
KOTAK (Tepeleuk Cooperative): provided support to strengthen community initiative and creative action for Semau Island protection, facilitated by Pikul, Geng Motor Imut, CIS Timor and YPPL.

Before the Program (ex-ante)
In late 2013, Bingkai Indonesia Foundation conducted a study on resilience by measuring SEPLS resilience through four interconnected dimensions, namely ecosystem protection and diversity management; agricultural and mariculture diversity; knowledge, learning and innovation; and social justice and infrastructure. These indicators were adapted to coastal and marine areas. The original SEPLS indicators did not accommodate marine factors and therefore in this assessment Bingkai Indonesia Foundation modified indicators 1-3 by combining and separating questions into "land" and "coastal-marine" categories.

Prior to the SEPL indicator assessment workshop, a number of FGDs and interviews were conducted with village leaders. Women involvement was ensured in their attendance in the FGD and workshop. Half of the workshop participants had also participated in the group discussion and individual interviews conducted several days prior. The second workshop was held after the assessment analysis was completed as a verification forum to collect inputs.

The assessment produced the following analysis.

The community resilience is categorized as good, as evident in that the community's ability to meet their need for sustenance and staple foods even in the dry karst lands. However, they also experience natural resources and biodiversity degradation that threaten their future in Semau Island. This perspective is based on the fact that the community's means to produce main food crops such as rice and corn are still partly produced in Semau. The Semau Islanders used to eat corn as their staple food, and have now shifted to consuming rice. Although the community admitted that usually they do not sell their rice harvest, this is still insufficient to meet the family's subsistence needs year round. Rice can be purchased easily nowadays with the availability of daily transportation from Kupang to Semau daily. However, the Semau Islanders have to spend much money to buy rice, a practice that was uncommon only ten years ago because they used to eat their crops as their staple food, namely corn.



After Bingkai's 2013 assessment and COMDEKS strategy were completed in 2014, GEF SGP held a meeting in Kupang with a number of local NGOs. It was then agreed that COMDEKS will be accompanied by a consortium comprising several NGOs and led by PIKUL. Role distribution for program was then developed based on recommendations from the COMDEKS Strategy.

In mid-2014, the COMDEKS program was implemented in Semau Island. However, since funding was received on October 2014, there were several implementing organizations that began its program on October. Therefore when the program was evaluated on December 2015, most of the program had not been completed in 18 months.

Based on interview results, information was gathered that starting a program in Semau is not an easy task. The benefits of several previous development programs carried out by government agencies or national and international organizations did not provide optimal benefits for the people of Semau. All this affected the community's acceptance of new programs, in which some responded to the program as a financial assistance. Others responded apathetically because they did not experience long-term benefits from previous programs.

The consortium did not always work together. YPPL, for example, directly visited the sites in accordance with the contract. They did not wait for GEF SGP funds. Other consortium members however only began working once they received the GEF SGP funds. This led to differences in project period among YPPL and other consortium members. Each organization has its own way in approaching the target villagers. However they usually work with village government as an entry point.

Geng Motor Imut that worked on organic farming and renewable energy had a unique approach by informally entering target villages (though still by introducing themselves to the village government), and carrying out socialization gradually through discussion and hanging out for months, and seeking active community members who responded and were willing to work together for the COMDEKS program. Through this process they were able to change the target village because the approach was regarded to be strategic for the COMDEKS program.

CIS Timor began its approach through the village government, land owners for areas in which there are water sources (tuan air), and land owners (tuan tanah), due to CIS Timor's role in freshwater distribution for the Semau Islanders. For matters involving the interest of many people and construction of physical facilities, CIS Timor feels that cooperation with village government is absolutely required. Therefore they conducted their approach with village government and formal socialization. Nonetheless, informal approach toward the community, especially community figures who determine water resources utilization such as tuan air, tuan tanah (for irrigation pipe pathway), and water users were also targets for CIS Timor to have discussions with and provide information. CIS Timor's program had the greatest challenge compared to other programs because water is a sensitive issue in Semau Island. In addition to the community target regarded to contain bias of village government's role, CIS Timor village facilitators often received threats from certain community members who felt uncomfortable with the freshwater distribution program because they were concerned that their water access would be limited. In addition, agreement between tuan air (as owners of water sources), tuan tanah (as owners of land where water pipes are placed), water user community and village government were often hindered by impediments. As of February 2016, freshwater distribution programs in nearly all the sites experienced obstacles. The problems were surrounding agreement and management, as well as technical difficulties due to inadequate electricity.

Pikul played a role as facilitator for strategic agreements required in the COMDEKS program, in addition to becoming an environmental conservation program implementer. After the assessment, Pikul believed conservation program could begin with replanting of tress in the deforested lands. The trees selected were trees of economic values for the community. The agreement between land owners and community who participated in the

replanting was critical in the replanting and tree maintenance for the next few years. Pikul also assisted CIS Timor in the agreement process between land owner, tuan air, village government and water user community.

YPPL employed an approach similar to CIS Timor. They came in through the village government with formal socialization for seaweed farming program. However, there were stark differences. YPPL sent a field facilitator who did not have much experience in community facilitation though they had the necessary expertise in seaweed cultivation. Therefore the community facilitation process in this program was relatively different as opposed to that of other organization's programs.

KOTAK was mandated to facilitate creative activities to support COMDEKS programs to improve Semau Islanders' welfare. The organizations that worked in the COMDEKS program received facilitation support from KOTAK, especially those relevant to creativity of resources produced from the Semau community.

After the Program (ex-post)
For the post-COMDEKS baseline assessment in Semau, Process Institute employed the Most Significant Change (MSC) technique as a participatory monitoring and evaluation format. This process involved collecting important stories of change from the ground. This technique was used as a measure in facing several challenges in conducting monitoring and evaluation of a complex community development program, with diverse implementation and outputs.

In this project, text or illustrative observations, interviews, FGDs, and recordings were employed in collecting important stories for the COMDEKS program in Semau. Interview questions were designed in a semi-structured manner, or in other words, there were key questions that could be developed according to the community's stories. The interviews conducted were individual or group interviews or group discussions. The consideration to use proactive method to identify important stories was more often employed during evaluation process as opposed to the monitoring process. In the group discussion, customary leaders, government leaders, NGO heads or their representatives, farmers, fishermen and other important people from the community were present and able to share their stories. With this approach, Process Institute was able to obtain essential additional stories that complement the COMDEKS program evaluation process.

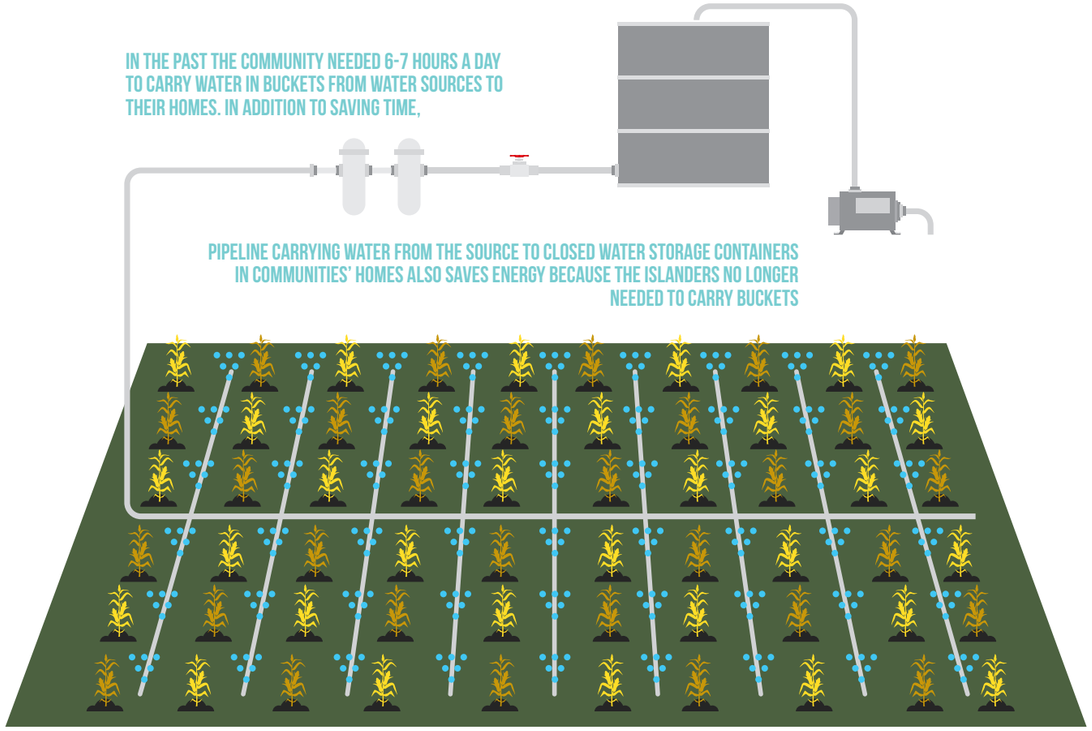
Before the field visit for the evaluation process, Process Institute conducted a desktop study to review documents on Semau pertaining COMDEKS strategy, proposals and reports from GEF SGP partners in Kupang. On the ground, evaluation process was done in a participatory manner for target selection as well as freedom to share stories. Active documentation with video and photos were done to provide evidence of verbal accounts, without analysis or opinions given by narrators or as text in the video.

Specifically, stories of significant changes on the ground were collected. The most important stories were selected based on discussions with program facilitators and stakeholders requested to identify and seek the stories of change that they perceived to be the results of this program.

After conducting the analysis, stories of the most significant changes were packaged into film documentaries or written reports, which are first verified by the community and relevant stakeholders. The last process conducted was consultation with National GEF SGP Steering Committee to obtain substantial inputs for the film and report.

At the end of the project, it may be said that, in general, the communities involved in the project activities felt significant results for them and experienced significant changes from this program. The following are several identified benefits.

In late 2015, however, planting season could not begin since regular rainfall did not commence. Rain came regularly on late January 2016 until February 2016. In result, only few farmers were able to harvest corn in 2016. The Semau Islanders generally do not stock corn in their attics.



In the nearly 18 month journey of the Semau program, several results were recorded.

Organic farming project: for communities practicing organic farming, the most substantial change is their financial savings. By making "bokashi" fertilizer (from rich organic materials) using plants/leaves and manure collected locally, this saved the community some money since they did not have to purchase chemical fertilizers (urea). In addition to saving money, community also experienced improved and softer soil texture as opposed to using urea fertilizers. Organic fertilizer application saves water. The community felt that chemical fertilizers require more water because the soil dries out easily. Additional benefit is that vegetables produced through organic farming taste better. Fresh water project: for the communities implementing clear water project, the most evident change was the time saved for water collection. In the past the community needed 6-7 hours a day to carry water in buckets from water sources to their homes. In addition to saving time, pipeline carrying water from the source to closed water storage containers in communities' homes also saves energy because the islanders no longer needed to carry buckets. In addition to household needs, fresh water provision is done to irrigate community vegetable farms. Farm irrigation improvement was done using sprinkler systems and farmers no longer have to walk to carry water and manually water their farms, and instead they only have to turn on a faucet and water

will flow from that sprinkler. The community feels that this saves much of their energy.

Seaweed project: there is much to do for communities involved in this project to produce greater impact than the current impact. So far, the project has made changes in improving seaweed cultivation, such as in planting distance and drying. In addition to cultivation improvements, the communities involved also received post-harvest training to make syrup, candied fruits and dodol (a sweet, sticky confection). However thus far the communities do not make these products for their own consumption.
Replanting or production forest: this project is still in its early stages, where at least two villages have begun implementation. The impacts received are the desire for communities in the two villages involved in this project to start thinking about water catchment rehabilitation by planting hardwood species that can hold water and can be sustainably utilized for its timber in the future.

After the COMDEKS program began in 2014 until early 2016, there were several changes originating from the community's perspectives based on the SEPLS indicators.

Indicators on Ecosystem Protection and the Maintenance of Biodiversity
The community perspective of this indicator in the preliminary assessment slightly changed toward the end of the evaluation. At first the community believed that their environment was in good condition though slightly degraded, but now they realized that they must do something to restore their environment for their future. Activities such as planting local tree species and the use of non-chemical products for agriculture attracted the community's attention. Groups and individuals among the community involved in the seedling program for production forest and organic agriculture began influencing other community members. Although their numbers are still insignificant, their impact on the community's perspective of the environment is considerable. In the interviews, several critical statements were raised regarding environmental issue in Semau Island, from infertile soil, vast forests cleared for farms, and increasing water scarcity. Several statements in this indicator were confusing, especially in attempting to assess the connection between landscape diversity. The SEPLS guideline does not state examples that can be used in their implementation on the ground.

Indicators on Agricultural and Marine-cultural Biodiversity
Questions in this indicator are the key to assessing the community's resilience to food security. The Semau Islanders initially never thought of their resilience with regard to food security because they had always believed in God's bounty, in addition to the boat that comes from Kupang daily to bring them rice. With the large number of people migrating to Kupang, there is a term of "relying on the people migrating to Kupang". In other words, Semau Islanders with family members living in Kupang expect to be assisted by money sent from Kupang if there are harvest problems in Semau.

Diversity of native plant crops have been reduced in the last several decades. The community has realized that some of their valuable commodities are already or becoming extinct such as sesame seeds, shallots, birds-eye chili, sorghum, watermelon, and various tubers. This has also led to reduced diversity of the community's food crops in Semau. However the community does not realize this fact since they can easily obtain rice. Only the elders have realized this change. Meanwhile the younger generation is accustomed to rice as their staple food. In actuality these factors greatly influence the Semau Islanders' food resilience. The fewer crops they fultivate, the more vulnerable their position will be with regard to food resilience.

Knowledge, Learning and Innovation
If innovation scored low in the preliminary assessment, after the COMDEKS program agriculture and marine culture knowledge transfer among generations did not occur well. Agriculture and seaweed farming practices employed by families, from fathers, mothers and children are regarded as the most effective knowledge transfer and learning method for younger people. At the end of the program, some elders shared statements that younger generations do not want to learn about agriculture or seaweed farming and instead prefer work that do not require hard physical labor or discipline, such as becoming ojek (motorcycle taxi) drivers. Therefore farmers, fishermen or seaweed farmers are the last option for the Semau youth, if there are no other work options. COMDEKS Consortium facilitation has initiated agriculture innovations. However there is much that Semau community must do for knowledge transfer, learning and attempt innovation in agriculture, aquaculture or seaweed farming.

Indicators on Social Equity and Infrastructure
This indicator did not change much since the preliminary assessment. General facilities especially infrastructures are deemed to be lacking but shows tendency of improvement. The most significant change in transportation is the presence of a regular ferry boat connecting Kupang to Semau twice a week. For that purpose, damaged roads were reconstructed and currently there are cars shipped to Semau from Kupang. Men and women have equal roles in agriculture, aquaculture and seaweed farming management. Women's most important role is maintaining food supply for the family. Women are the ones who know available food supply for their families, and must immediately discuss with their husbands if the family's food supply is inadequate.

Traditional fishing boat

SECTION 3: COMDEKS COUNTRY PROGRAMME LANDSCAPE STRATEGIES

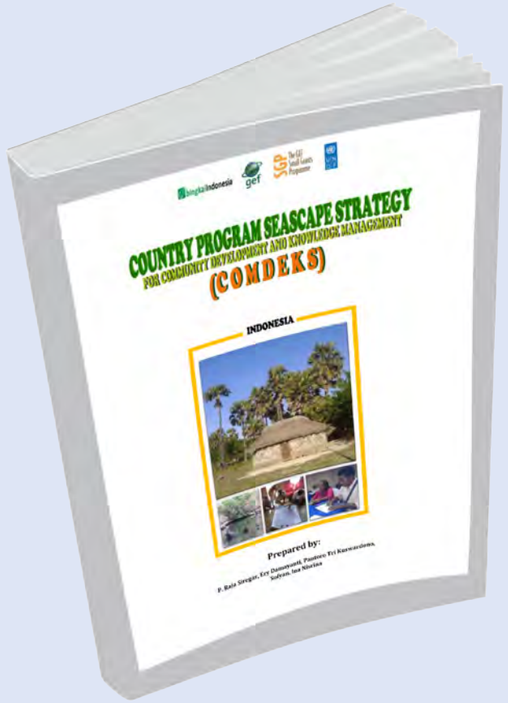
This strategy was developed in 2014 by Bingkai Indonesia Foundation in consultation with GEF SGP. Several workshops and FGDs were held as community consultation forums involving stakeholders in determining the status of selected landscape/seascape. This series of consultation process was then analyzed and produced a community-based participative strategy at the landscape/seascape.

The expected long-term plan for CPLS to achieve in Indonesia is to sociologically and ecologically increase production security in small islands and coastal communities through community-based activities. This plan is still relevant to date because Semau is a small island with extreme ecological conditions. This is strengthened by the fact that harvest failure occurred in early 2016 due to delayed and short rainy season lasting for only one month. Most of the Semau Islanders are farmers who depend on the seasons. Ecological crisis due to shifting seasonal cycles has occurred, and this can lead to future food crisis. Two-month old crops are turning yellow due to lack of rainfall even though all staple food crops like corn and rice are planted in the rainy season. With the late rainy season and early dry season, most of the community does not have food in stock for 2016. Therefore CPLS' long-term plan for Indonesia is already appropriate to be implemented. Innovations to face seasonal changes must become a priority.

The following are the expected outcomes from CPLS in Indonesia.
Outcome 1 (ecosystem, biodiversity and natural resources): island ecosystem functions preserved and enhanced through the maintenance of clan forest cover, as well as coastal, marine, and coral reef systems and the promotion of sustainable resource use practices.
Indicator 1.1: Number of hectares of forest land under protection or sustainable use
Indicator 1.2: Number of hectares of seascape (coastal, marine, coral reef) under protection or sustainable use

Outcome 2 (sustainable agriculture and aquaculture): increased resilience of agriculture and mariculture systems enhanced through improved and sustainable cultivation practices, diversification of crops and products, and improved management of water resources.

Indicator 2.1: Number of community members adopting sustainable agricultural and maricultural management practices and methods implemented.



Indicator 2.2: Number of community organizations managing water resources efficiently and effectively.
Indicator 2.3: Number and variety of new resilient crops and maricultural products promoted.

Outcome 3 (community livelihoods): community livelihood improvement through sustainable income generation.
Indicator 3.1: Number of sustainable livelihoods and income generation opportunities adopted.
Indicator 3.2: Increased household income as a result of supported activities.

Outcome 4 (Institutional governance): institutional governance systems created and/or strengthened for effective participatory decision making and knowledge sharing at the landscape level.
Indicator 4.1: Number of community-based institutions created or strengthened who are engaged in integrated seascape/landscape management.
Indicator 4.2: Number and type of policies influenced at the local level (village), landscape level. (For example: regulations established by village heads or clan leaders to maintain the clan forest cover in Semau Island; criteria, prohibitions, and penalties for cutting down large and important trees outside of the clan forest; regulations concerning replanting large and important trees; regulations concerning zoning for marine aquaculture, fishing, and coastal and marine protection).
Indicator 4.3: Number of best practices and lessons learned shared among island stakeholders.

To attempt and achieve the four COMDEKS program outcomes, the role of COMDEKS Consortium – comprising PIKUL, Geng Motor Imut (GMI), CIS Timor, YPPL and KOTAK – is crucial. Their presence is not only as a guide, but as also as a forum to connect and share the voices of the Semau Islanders to local government policies, as well as introduce knowledge and technology as innovations for natural resources management in Semau.
To the end of the program, the COMDEKS consortium is committed to continue facilitating the Semau community even after the COMDEKS program has ended. The consortium member that will not continue its facilitation is YPPL. After COMDEKS has ended, they will end their work contract with the field facilitators. The COMDEKS program evaluation workshop in Kupang has shown several potential government-initiated programs that are in line with COMDEKS. The COMDEKS Consortium is expected to provide tangible collaboration with programs that will enter Semau, keeping in mind the lessons learned and knowledge collected by the consortium on mutual utilization of the conditions in Semau.

Harvesting seaweed

SECTION 4: KEY ACTIVITIES AND INNOVATIONS

The COMDEKS activities developed together with local organizations refer to the COMDEKS Country Seascape Program Strategy (CPLS) Indonesia. This program development also took into consideration the ability of facilitating NGOs in Kupang. Therefore there are several indicators not yet implemented in this COMDEKS program, especially those regarding marine area management such as coral reef conservation and promoting sustainable capture fisheries.

The 18-months COMDEKS program activities implemented in Semau Island in general have contributed to most of the outcomes in CPLS. To better visualize how the activities are connected to the CPLS outcomes and indicators, this section is further explained as the following matrix.

Program	Activities	Outcomes	Remarks
Organic farming	*Voluntary organic farming sample plots (land provided by communities)*	*Outcome 1* *ecosystem and natural resources: maintenance of clan forest cover, as well as coastal, marine, and coral reef cover through village government regulations or agreement between clan leaders.* *Indicator 1: several village heads or clan leaders establish regulations to maintain the clan forest cover in Semau Island.* *Indicator 2: several village heads or clan leaders develop regulations with criteria, prohibitions, and penalties for cutting down large and important trees outside of the clan forest.* *Indicator 3: several village heads or clan leaders develop regulations concerning replanting large and important trees.* *Indicator 4: several village heads or clan leaders develop regulations concerning zoning for marine aquaculture, fishing, and coastal and marine protection.* *Indicator 5: several square meters of artificial coral reef or FADs are planted in several sites in shallow coastal waters.* *Indicator 6: honey bee keeping is done by the facilitated community as well as planting hardwood plants that are important for honey production.*	*In an effort to restore soil quality that has been cultivated using chemical fertilizers, and as a measure to replant nearly extinct local crops, the community must be ready to prepare land to manage as sample farms using natural materials. This activity contributes to outcome 2, indicator 1 for planting food crops with natural materials, and outcome 3, indicators 1 and 3.*
	Making natural fertilizers		

Program	Activities	Outcomes	Remarks
	Making natural fertilizers	*Outocome 2* *Diversity of agriculture and aquaculture: the increase of agriculture and mariculture resilience through cultivation diversification and improvement of management and water resources institutions and access* *Indicator 1: a number of community members plant annual medicinal plants and food crops.* *Indicator 2: a number of community organizations to manage water resources are established with the aim to utilize available water resources in a more efficient and effective way.* *Indicator 3: several new water canals or wells are constructed together with the community, and old water canals or water reservoirs are repaired and re-used.*	*The community's dependence on chemical fertilizers must be combatted by producing natural and more affordable fertilizer produced using locally collected materials. The use of natural fertilizers is proven to improve soil texture and reduces watering. This activity contributes to outcome 3, indicators 1, 2, and 3. Using natural fertilizers can restore diversity of local food crops that have been ignored, due to increasing use of chemical fertilizers and non-native superior seedlings, which can lead to sustainable and more pest- and disease-resistant agriculture practices.* *In villages with adequate water for crops, in the past watering was done by carrying water from wells and watering using perforated scoop. However, through simple technology using pipes from wells and sprinklers, watering becomes an agriculture breakthrough so that farmers can water easily and save energy, time and water. This activity contributes to outcome 2, indicator 2, and outcome 3, indicator 1. This activity supports organic farming because it saves much time and energy.* *Construction of pipes aims to carry water to water users. By saving time that was previously used to collect water, the community is expected to be more productive. In addition to household and garden use, water is also channeled to public facilities such as schools and for sanitation. Although limited, school children are now able to use water. In addition to channeling water from water sources, this program attempts to conserve water. To make things*
	Introduction to and practice of efficient watering (energy, time and water saving)		
Fresh water provision	*Pipe construction*	*Outcome 3* *Increasing knowledge and human capacity: the increase of agriculture and marineculture resilience through increase in community's knowledge of agriculture and aquaculture management and innovations* *Indicator 1: a number of community groups implement better and innovative agriculture and marine aquaculture to control pests and plant diseases sustainably.*	
	Sanitation		
	Water conservation (planting sweet potatoes)		

Program	Activities	Outcomes	Remarks
		Indicator 2: a number of community members plant a variety of food crops (rice or corn, seaweed) that are more resistant to inundations, draughts,high salinity, and extreme weather.	*interesting, water is conserved by digging 30 x 30 cm holes that is also planted with sweet potatoes in the dry season. Sweet potato has become a favorite crop among farmers and is commonly grown in Semau. Fresh water provision contributes to outcome 2, indicators 2 and 3, and outcome 3, indicator 2 because sweet potato is one of the crops that the community plants for subsistence or to sell.*
		Indicator 3: several areas/ hectares of farmlands reduce the use of chemicals and use organic materials to control grass, pests, and plant growth.	
		Indicator 4: a number of fishermen group implement innovative methods of safer, sustainable, and environmentally-friendly fishing.	
Renewable energy	*Making biogas*		*The Semau community on average has free-grazing livestock. However, there are also caged animals, such as pigs. The Semau livestock comprises cattle, pigs, goats and chickens. Biogas is actually another method to attract the community to use energy sources other than firewood for cooking. In addition, in sufficient amounts, biogas can be used as power source, for which diesel generators are commonly used in Semau. In each of the facilitated village there is one person able to produce biogas from manure. This person was selected because they volunteered their livestock and pens, and facilities that meet requirements for biogas production. This activity contributes to outcome 1 in general for reducing the use of firewood or kerosene for cooking. In the future biogas is expected to bring the community to a point where they can herd their livestock in one site to collect manure for greater biogas production. This can contribute to ensuring village sanitation, where currently livestock are free to roam in*
	Biogas stoves		

Program	Activities	Outcomes	Remarks
			the village. This activity also contributes to outcome 3 in general because there is an innovation to increase community resilience, as well as contributes to indicators 1 and 3 because in addition to biogas, manure can be used to make natural liquid fertilizer for farming.
Coastal and marine resources management	*Seaweed cultivation and processing training*		*Training for post-harvest seaweed management and processing contributes to outcome 1 indicator 4 and outcome 3 indicator 1. However since facilitation was not optimal, seaweed farmers did not feel any changes in their skills. There were no breakthroughs at the seaweed farmers' group scale for better management.*
	Mangrove planting		*Mangrove planting was done in each village facilitated for seaweed farming. This activity contributes to outcome 1 in general, specifically indicators 4 and 6, and outcome 3 indicators 1 and 4 because mangrove forest can act as water catchment as well as protection against intrusion and abrasion. In addition, mangrove can support sustainable capture fisheries or aquaculture. However, due to minimal facilitation, a system that would urge the community to protect mangrove was not developed. Therefore none of the mangrove planted survived.*
	Closing off sand mining activities		*This activity began with the gate construction in 3 villages to block motor vehicles from accessing certain areas of the beach. The gates were constructed with community permission and they key is kept by the village leader or village official who lives near the gate. In the past people collected*

Program	Activities	Outcomes	Remarks
			large volumes of sand to sell. After the gates were installed, there was no more large-scale sand quarrying to sell. Meanwhile there is still some sand collection for house construction. Sand quarrying for selling still occurs in other villages. Limiting access to sand quarrying contributes to outcome 1 indicator 4 in which coastal ecosystem must be protected because it is the frontline facing the sea. Sand in beaches is critical as habitats for organisms such as mollusks or beach vegetation including Pandanus spp. that can protect against abrasion.
	Production Forest Nursery *Replanting in clan lands and school yards.*		*This activity aimed to restore the forest cover in Semau that was previously cleared for farms, in order to restore water catchment functions. Site selection negotiations were done between land owners with farmers, facilitated by NGOs and village governments. The trees planted provide fruits or attract honey bees. Some tree seedlings were non-natives (though appropriate for Semau), and some seedlings were germinated from trees native to Semau. This activity contributes to outcome 1 in general because it focuses on environmental protection, and specifically to indicators 3 and 6. In addition this activity also contributes to outcome 2 indicator 2 on sustainable water management.*
Strengthening governance system for rural/community protection	*Mapping water resources*		*Water resources mapping helps for the production forest site determination negotiations because the hydrological system logic was discussed together with the community after seeing the water resources mapping results.*

Program	Activities	Outcomes	Remarks
			In addition, this activity also helped facilitating NGOs to understand the water exploitation from wells that is occurring in the farms, leading to brackish water to seep into the wells. Through this mapping, water resources management obtained a clear explanation so that the community was willing to devise a solution together by reducing the construction of wells too close to one another, and to replant trees in the area agreed for production forest. This activity contributes to outcome 1 in general.
	Procuring shredder/ mulcher for materials for bokashi fertilizers		*Procuring shredder/mulcher to help provide materials for bokashi fertilizer in two sub-districts: Semau and South Semau. This machine will be provided following community's need to produce bokashi fertilizer in a larger scale. This will support sustainable agriculture in Semau through technological innovation, or in other words, contribute to outcome 2 and indicator 1, as well as outcome 3 and indicators 1 and 3.*
Support in the form of facilities, facilitation, equipment/creative technology to extend COMDEKS program in Semau	*Marketing harvest products from non-chemical agriculture practices*		*This marketing activity was aimed to provide incentives for farmers who want to use natural materials for farming. Facilitating NGOs act as harvest buyers, market the products in Kupang, and carried out campaign for the consumption of pesticide-free agricultural products to the city residents. This motivates organic farmers to expand their farmland by using organic input and to show to other farmers that using natural materials is friendlier to the environment and economically more profitable. This activity contributes to outcome 3, indicator 3 by reducing the use of chemicals and using natural agricultural input.*

ACTIVITIES

Program	Activities	Sites	Pioneers	Impact to ecosystem/ biodiversity	Implementers
Organic Farming	*The making process of natural fertilizer*	*Uiasa*	*19 farmers (13 men, 6 women)*	*More friable soil; local fruits are revitalized such as local watermelon, honeydew. There are efforts to collect local seeds: rice-like cayenne pepper, local eggplant, local buckwheat.*	*GMI*
	Watering Techniques	*Uitiuhana*	*12 farmers (9 men, 3 women)*	*More friable soil; local fruits is revitalized such as local watermelon, pumpkin. New introduced fruits: 3 kinds of bananas (barangan, luan and meja), dragon fruit, and Californian papaya.*	
		Akle	*10 farmers (6 men, 4 women)*	*More friable soil; the use of yard to grow vegetables. Local crops are revitalized: tomato, eggplant. New introduced fruit: dragon fruit.*	
		Naikean	*27 persons (14 men, 13 women)*	*More friable soil; cropping pattern from monoculture to polyculture in a field. The use of bat droppings from caves to fertilize the soil is revitalized. Local crop is revitalized: cassava.*	
		Uitiuhtuan	*10 persons (8 men, 2 women)*	*More friable soil; used to have 3 times a year vegetable crop cycle, becoming up to 9 times a year. Local fruits are revitalized: watermelon, honeydew. Plants more resistant to pests. Diseases of onion can be treated with drugs from plants. Cropping pattern changed from monoculture to polyculture in a field*	
	Non program; the villages have joined the organic farming activities due to see the results of beneficiary villages	*Otan, Uitao, Batuinan: groups of farmers in these villages learn to make a watering system that save time, energy and water. They also learn how to make organic fertilizers and get acquainted with new seeds such as purple sweet potatoes.*			

Program	Activities	Sites	Pioneers	Impact to ecosystem/ biodiversity	Implementers
Fresh water distribution and sanitation	*Pipe, dynamo and water tanks installation.*	*Uiasa, Batuinan, Letbaun, Uitiuhtuan, Uitiuana, Uiboa*	*There is no pioneer yet. Should there is any damage, repaired by CIS*	*Some farmers start to grow crops in their yard because freshwater is nearby.*	*CIS Timor*
	Water conservation (along with planting purple sweet potatoes)		*There is no pioneer yet. Should there is any damage, repaired by CIS*	*Some farmers start to grow crops in their yard because freshwater is nearby.*	*CIS Timor*
Bioenergy	*The making of biogas*	*Batuinan, Uiboa, Uitiuhtuan, Uitiuhana*	*1 person in each village is able to make biogas from livestock feces.*	*To reduce the use of firewood from the nature*	*GMI*
	Biogas stoves	*There are 36 units of biogas stoves in Semau*			
Management of coastal and marine resources	*Training on seaweed culture and processing*	*Uiasa, Uilelot, Bokonusan, Naikean, Akle, Uitiuhana*	*Some focal persons are already existed in groups before the program came*	*There is no indication of positive/negative impact on ecosystem and biodiversity. The only impact is some seaweed farmers got training on managing mangrove. Yet, it was not enough to solve the seaweed disease, the biggest problem that farmers deal with.*	*YPPL*
	Mangrove planting in each village @1,750 seeds		*None*	*According to the interview, none of the mangrove seed grows.*	
	Sand mining closure by installing 4 portals on the beach in 3 villages	*Batuinan, Uiboa Uitiutuan*		*Currently there is no activity to take the sand for commercial purposes.*	*PIKUL*

Program	Activities	Sites	Pioneers	Impact to ecosystem/ biodiversity	Implementers
Governance empowerment of environment protection in village community.	*Forest production through Nurseries, Replanting clan's land and spola*	*Batuinan*	*4 persons*	*New introduced trees (mahogany, rain tree, silk tree) consist of 1,250 seedlings have been planted. Local trees are in the process of seeding.*	*PIKUL*
	Mapping of water resources in 4 villages	*Uiboa*	*2 adults, 2 students*	*New introduced trees (mahogany, rain tree, silk tree) consist of 1,250 seedlings have been planted. Local trees are in the process of seeding.*	
		Uitiuhtuan	*4 persons*	*New introduced trees (mahogany, rain tree, silk tree) consist of 1,250 seedlings have been planted. Redwood tree seedlings as local tree seedlings were seeding for 1500 seedlings.*	
		Uitiuhana	*5 persons*	*New introduced trees (mahogany, rain tree, silk tree) consist of 1,250 seedlings have been planted. 1500 redwood tree, 100 nitas tree, and 500 kula tree seedlings as local tree seedlings are in process of seeding.*	
		Mapping of water resources in 4 villages		*The map showed that in one area there are too many wells had constructed. At the end of the program there was agreement to close some of the wells in order to prevent seawater intrusion.*	

ACTIVITIES SITES

- Uiasa
- Batuinan
- Letbaun
- Bokonusan
- Huilelot
- Naikean
- Akle
- Uitiuhana
- Onansila
- Uiboa
- Uitiuhtuan

Semau

South Semau

SECTION 5: KEY RESULTS AND INNOVATIONS

1.Ecosystem Services and Biodiversity Conservation

In general it may be said that this project successfully strengthened efforts to protect nature and ecosystem services in the project intervention site, although still at a pilot scale, due to limited 18-month implementation time. The first four to six months were spent by developing ways to approach the community to be able to optimize the COMDEKS program.

The program that impacts ecosystem services and biodiversity conservation includes four main programs, namely organic farming, fresh water provision, coastal and marine resources management, and strengthening village protection governance.

In the agriculture program, there are 3 impacting activities, namely organic farming land pilot, natural fertilizer production, and time and energy efficient watering technique. The community voluntarily shared part of their land for organic farmland based on their still limited understanding of organic farming. After 20 years using chemicals to support their farming practices in Semau, it was not easy to convince the community to try organic farming. They doubted it would be successful. However, through continuous approach and discussions, there were community members in each of the facilitated village willing to voluntarily share an agreed portion of their land for organic farming pilot farm. These are community members with great confidence and are willing to take the risk of failure.

After the training to make natural fertilizer, the community was able to produce their own fertilizer for agriculture at a low cost. The results were evident in one planting season, and the natural fertilizer was proven to improve soil texture, making the soil softer and able to hold water for longer time periods (greater water retention), so that the community did not have to water their plants very often. In turn, this will improve water conservation because there is increased efficiency in water use. In the long run, organic fertilizer use will also improve the community's health because the dangerous chemicals contained in chemical fertilizers will no longer enter the food chain. This is where the connection between one project and the next is evident and the impacts of the fresh water and organic farming projects can mutually strengthen one another.

The watering technique that the facilitating NGO taught has improved the watering system for farming and allowed the community to be able to make better and easier use of their land due to more efficient use of time, energy and water. This watering system enhancement also allowed the community members to plant more crop species and obtained better results. Therefore this can also support biodiversity conservation and improve ecosystem conditions from what was at first abandoned land into planted areas. If this can be replicated in more areas, these efforts can extend landscape conservation efforts at a larger scale.

The villages implementing organic farming are Uituihana, Uituhituan, Akle, Naekean, and Uiasa Villages. These five villages are the facilitated villages for COMDEKS's organic farming program. However, throughout its implementation, communities from Uitao, Batuinan and Otan Villages, saw the results and became interested in participating in organic farming. Others from these villages then provided part of their farmlands to use for organic farming and at the same time to learn to make natural fertilizer. The pioneers who emerged from this organic farming program have become resource persons for other farmers in their villages as well as other villages. If this program continues to be expanded with the help of village as well as district governments, it not impossible that in the next few years, Semau Island can be free from chemicals and in turn, ground water quality will be protected.

Fresh water provision program comprised activities to plant

water by digging 30 cm x 30 cm holes that in the rainy season will hold water before seeping into the ground. When dry, the holes are planted with sweet potatoes, which have become a leading agriculture product from Semau.

The impacts of coastal and marine management programs should be able to optimally contribute to coastal and marine ecosystem conservation and ensure the protection of marine diversity. However, based on the interview with seaweed farmers, mangrove planting failed because nearly every seedling planted did not survive. This is due to lack of optimal facilitation by the facilitating NGO (YPLL) and the facilitated community felt that the communication during the program was inadequate. In addition, gate construction by Pikul to stop sand quarrying and as an effort to protect coastal ecosystem was deemed effective.

Conservation program in COMDEKS conducted to restore/replace forest cover in areas that were cleared for farming focused on reforestation in production forest. Following negotiations with landowners, the farmers facilitated by village government, 47 hectares in 5 villages were allocated for production forest. Nurseries for the trees had begun since 2015. The trees planted were hardwood species that can store water. Some trees were brought in from outside the island, such as mahogany (Swietenia spp.) and monkeypod (Albizia saman), and other species are natives to the island such as narra (Pterocarpus indicus) and kula (local name) tree can be harvested in turns with replanting, or to be used for honey trees.

2.Agro-ecology and Food Security

The agriculture system combined with planting species that are able to hold water, such as the plan for production forest, shows the beginning of the landscape's agro-ecological system. Planting slopes or highlands with hardwoods can help protect these slopes and prevent rainfall runoff from higher elevations. In addition, the communities cultivate food crops in the lowlands for their sustenance, such as corn, shallots, vegetables, etc. Some villagers, such as those in Uituituan Village, also constructed infiltration wells that also function to help store rainwater in the ground.

As explained above, with their watering and organic fertilizer systems that are able to improve their ecosystems and protect biodiversity, the community will also impact their food security. In addition to planting staple food crops, such as corn and dry land rice, the community also plants vegetables and fruits. The more and varied food crop species planted for the community's sustenance, then the community will have better food security. By using natural fertilizer, the facilitated communities were urged to recollect local seedlings that were once the wealth of Semau's past agriculture, including staple foods such as sorghum, tubers, vegetables and fruits. Food insecurity in Semau actually began with rice became easily obtained from outside Semau Island. The islanders became dependent of rice's practicality. The principle of only eating what you plant became eroded. With organic farming with efficient watering system, the diversity of food crops planted throughout the year can support food security, so that the Semau Islanders' dependence on outside food sources can be minimized.

The combination of organic farming and production forest development in water catchment areas in higher elevations can be mutually strengthening and benefiting. Organic farming is also connected to irrigation for fresh water provision, which brings access to water closer to the settlements where water users live. This improved access to water has led to the rise of vegetable gardens for families' consumption and the sale of surplus harvest. Water availability is also affected by water conservation efforts through tree planting and efficient watering of organic farming.

3.Sustainable livelihoods

Seaweed farmers were given training to improve their productivity and to process seaweed into syrup or dodol. If the current facilitation model is improved, this can become an economic potential for households. Seaweed products can become one of the unique products from Semau that can contribute to the income of Semau families.

In addition, organic farming system that produces greater and higher quality harvest has led to the opportunity for communities to sell their harvest to towns through Tapuleuk Cooperative (KOTAK) at a much better price compared to selling to collectors or selling directly in the villages. In addition, as what the women in Akle Village had hoped for, following improved water supply systems for households and farming the women now have more free time because they no longer have to collect water from sources far away. They hope to gain other skills to process their farm products into products with added value. This is one of the local economic potential that must be considered.

From the explanation above it is evident that the use of natural fertilizers and good watering system contributes to a sustainable ecosystem as well as potential for local economic development, such as marketable, higher quality harvest. In the future if there is increased capacity for farm product development the community can then gain added values. The production forest will also contribute to forest honey production which was once a leading product from Semau from the days when the island had greater forest cover.

4. Strengthening of institutional and governance systems at the landscape level

In addition to the village leaders, "land control" is also at the hands of landowners or tuan tanah. Even in the context of land and water utilization, the role of landowners is greater than that of village leaders. So far in the project implementation, negotiations were held between communities that will utilize the land or water sources with the landowners or tuan air. There are no formal institutions formed specifically to regulate these matters, and even the negotiations and agreements for natural resources utilization are non-formal/unwritten/verbal. For freshwater supply program, CIS Timor collaborated with the Provincial Government-owned Water Infrastructure Program (Pamsimas) that also has water pipes channels. CIS Timor prepared the community while Pamsimas prepared the water pipes and tanks needed. CIS Timor also showed its commitment in water issues through its involvement with the province Water Working Group.

For the production forest program, agreement process is currently in the works for production forest management, including defining rights and responsibilities between landowners and farmers. PIKUL is the NGO facilitating programs relevant to environmental governance and protection and plays a major role in the negotiations of other programs such as fresh water provision. In the future a local management institution will be formed to implement production forest and water management.

Innovation : planting water

The COMDEKS program was presented in front of the district government and received good response. A number of government programs for Semau Island in the next year have been planned to coordinate with the COMDEKS program. Coordination with other stakeholders working in Semau Island, including government, is critical to ensure that there is no duplication and to ensure there is learning from the programs that can improve the effectiveness of work between community and facilitating NGOs. In the future, COMDEKS' work will be coordinated with a Village Facilitator employed by each village government to facilitate the village in the program implementation. It is expected that the COMDEKS programs proven to improve community's lives and environment quality in Semau can be continued by the village program or programs supported by the government or other agencies.

Below is a program table containing the activities and figures for activity achievement indicators.

Program	Activities	Site (Village)	Indicators	Pioneers	Implementers
Organic farming	*Voluntary farming pilot*	*Uiasa*	*Pilot site: 34,300 m2 in 5 villages allocated for organic farming.*	*11 pax (10 men, 2 women)*	*GMI*
	Fertilizer production	*Uitiuhana*	*An average of 20 pax/village as training participants*	*Uitiuhana: 4 pax* *Akle: 3 pax* *Naikean: 7 pax* *Uitiutuan: 7 pax* *Uitao: 3 pax*	
	Watering technology	*Akle, Naikean, Uitiutuan*	*Participated in training 20 pax/village per group*		
	Sample plot	*Non-program: Otan, Uitao (training and independent watering technology development pioneers)*	*Training participants* *3 pax* *3 pax* *2 pax* *2 pax* *2 pax*	*Batuinan: 2 pax*	
		Batuinan, , Uiboa (support materials for watering replication from PIKUL, training from GMI)			
		Uiasa, Uitiuhana, Akle, Naikean, Uitiutuan			
Fresh water provision	*Pipe construction*	*Uiasa, Batuinan, Letbaun, Uitiuhtuan*	*Conducted by community together with CIS*	*No pioneers yet, repairs are done by CIS*	*CIS*
	Sanitation	*Uitiuhana* *Uitiutuan*	*Since water use is still hampered by technical issues and social agreements, the number of community members involved and benefited from the program cannot be calculated yet.*		
	Water conservation (planting sweet potatoes)	*Uiasa, Batuinan, Letbaun, Uitiuhtuan, Uitiuana, Uiboa*			

THERE ARE 47 HECTARES ALLOCATED TO BE PRODUCTION FOREST IN SEMAU

Program	Activities	Site (Village)	Indicators	Pioneers	Implementers
Bioenergy	*Biogas production*	*Batuinan, Uiboa, Uitiuhtuan, Uitiuhana* *Waste processing equipment to produce gas is available in each village*	*20 pax/village participated in training*	*There is 1 person in each village that can make biogas.*	*PIKUL* *GMI*
	Biogas stoves	*36 units biogas stoves available in Semau*			
Coastal and marine resources management	*Training on seaweed farming and processing*	*Huilelot* *Bokonusan* *Naikean* *Akle* *Uitiuhana*	*Participants* *30 men, 10 women* *28 men, 12 women* *29 men, 11 women* *16 men, 14 women* *27 men, 13 women*	*1 pax*	*YPPL* *PIKUL*
	Closing off sand quarry	*4 gates placed in 3 villages (Batuinan, Uiboa, Uitiutuan)*	*Participants* *30 men, 10 women* *28 men, 12 women* *29 men, 11 women* *16 men, 14 women* *27 men, 13 women*	*1 pax*	*PIKUL*
Strengthening governance system of village/ community environmental protection	*Production forest Nursery Replanting in clan land*	*Batuinan, Uiboa*	*1250 mahogany, monkeypod, Albizia falcataria for each village. Local tree nursery is in progress. In Baitunan there are 100 villagers involve, including 15 women. In Uiboa there 100 villagers involved and 250 schoolchildren, including 29 women.*	*4 pax* *5 pax*	*PIKUL*
	Water resources mapping	*Uitiuhtuan, Uitiuhana*	*1250 mahogany, monkeypod and A. falcataria trees planted in each village Local tree nursery is still in process.* *In Uitiuhtuan there are 100 villagers involved, including 11 women. In Uitiuhana 125 people are involved, including 19 women.*	*11 pax* *19 pax*	

Program	Activities	Site (Village)	Indicators	Pioneers	Implementers
Support in the form of facilities, facilitation, equipment/ creative technology to expand COMDEKS program in Semau		*Making water canal map in 4 villages* *Uiasa* *Naikean* *Uitiuhana* *Uitiuhtuan*	*The total production forest area is 47 hectares in 4 villages* *Activity in the form of survey to gather information from the community.* *There is sale of organic farming harvest involving 34 households from 4 villages, that directly impact the welfare of 170 family members since October 2015* *There is approximately 10%-20% difference with a higher price from KOTAK compared to collectors, in addition to the proof that organic farming produce higher yield.*		*KOTAK (Tapaleuk Cooperative)*

SECTION 6: CHALLENGES

Developing trust between communities and facilitators is critical to the success of this project. Although the entire community was included from the start in facilitating process, not every villager wanted to be actively involved in the project proposed by the facilitators. Most of the community took a "wait and see" attitude to see whether or not the proposed project would be successful or provide concrete benefits for the community. This may be mostly due to the community's past experiences, in which community were involved and participated on similar projects introduced by NGOs and government that were less successful, and this has led to the community's reluctance to readily accept this COMDEKS project.

In addition, land tenure that is generally in the hand of one or several land owners, has caused several projects to require negotiations with land owners or families with rights to the water source or land that will be used for agriculture or the project implementation. These negotiation processes may not always go smoothly. Negotiations are usually smooth if there are direct family ties between the land owners and land owners for areas in which there are water sources (tuan air). In Semau, the water program faced the most challenges, both technically as well as challenges in the community's response. Technical challenges include lack of facilities, such as electricity. In Uiasa Village for example, the dynamo machine installed to power a water pump could not start because of insufficient electrical power supply. Although the local State-Owned Electricity Company (PLN) has promised to adjust the electrical power supply, there were no changes even when the project nearly ended. Similarly was the community's response to negotiations to install facilities for fresh water distribution was difficult to settle. There was a case in which an agreement was made with several stakeholders facilitated by the village government, but during the equipment installment, suddenly a community members who lives next to the water/ land owner expressed his objection. There were also challenges regarding the organization for post-equipment instalment water management. Amount of fees, organizers and management have not been agreed by community water users and village government.

Other challenges came from the government itself, in which the government was still promoting agricultural practices using chemical fertilizers under the package of assistance programs. The community is concerned that this "aid" will degrade and erase the good initiatives developed by villagers. Therefore the community hopes that the COMDEKS program can be continued by extending the area of its intervention so that more villagers can participate and enjoy the benefits obtained through their participation in the COMDEKS project.

Facilitating NGOs must, to the best of their availability, avoid taking sides with certain groups within the community. However, this cannot be prevented if there are intensive interactions with the community members who are directly involved. At the start of the program, community meetings were held as a way to screen community members willing to learn and work together in this project with the resources that they have. In the organic farming program, the community was offered to try a new agriculture method using organic matters in their farms. The organic

Old lady and sand minning

“ THE PEOPLE HERE ARE ONLY WILLING TO WORK ON SOMETHING THAT WOULD BENEFIT THEM.

THAT IS WHY I PROVIDE THEM THE FREE SAMPLE OF NATURAL FERTILIZER SO THEY COULD DIRECTLY USE IT FOR THEIR LAND.

THAT WAY – THEY WILL KNOW THE EFFECT AND TRY TO MAKE THE FERTILIZER VOLUNTARILY”

Mama Mariana Soled
Female farmer from Uitiuhtuan Village

farming program was done by involving community members who voluntarily provided part of their farms for the program implementation. In other words, famers who shared their land were taking risks in the program process often referred to as learning and working together with facilitators. Programs with more tangible results, such as organic shallot farming, had two responses. The first response was positive, namely requesting information and attempting to do the same practice in their farms. There are others who responded negatively by seeing the program as exclusive for facilitating only the farmers who provided their land to implement organic farming activities. These are inevitable because of the diversity of characters in the community. The most important part is that information on the program is equally distributed from the very start of the process to the entire community through various entry points. This can minimize chances of claims that the program is exclusive and communities feeling left out.

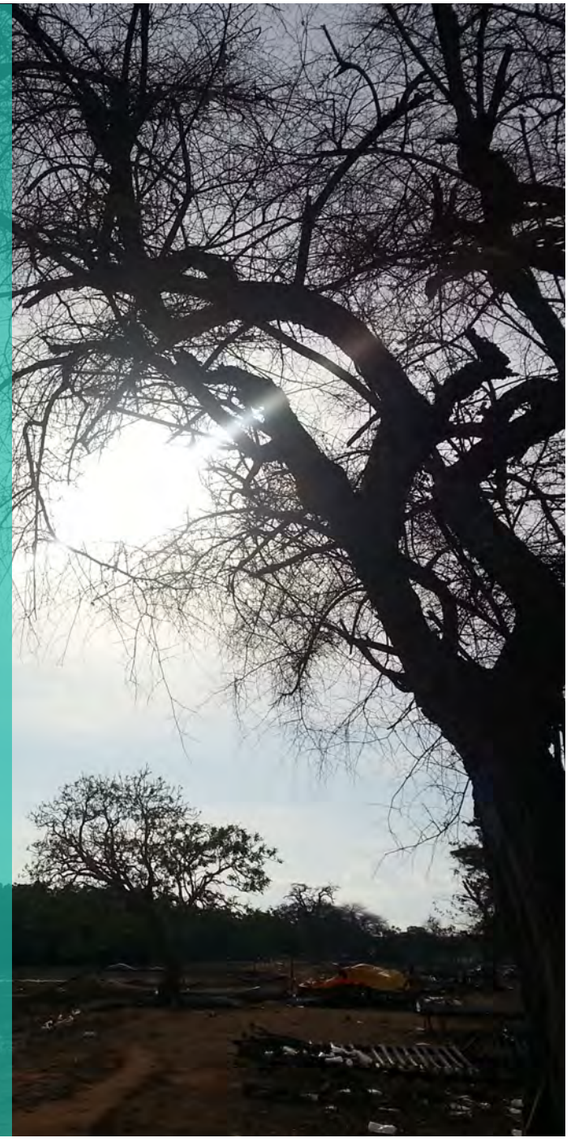
Community activities in coastal and marine areas did not show any significant changes in COMDEKS program. Lack of assistance by NGO is the key so that people feel have not been able to practice after the training. They also feel there is no room for discussions. Likewise on the activities of mangrove planting, which are considered unsuccessful, because almost all mangrove seedlings were planted were not grown. Nevertheless, there is one activity that is considered to have significant impact to sand mining activities that had already been threat for coastal ecosystem. By installing four portals on the beaches in three villages, the sand mining activities for commercial purposes recently are stopped.

For all of the challenges mentioned above, facilitators attempted to carry out continuous discussions with as many community members as possible to communicate the COMDEKS program while at the same time embracing village government, religious leaders and community leaders so that information and knowledge exchange can occur between community members. Communities who are directly involved in the COMDEKS program are urged to actively share information and knowledge on the work being done. Therefore pioneers are organically cultivated from nearly every COMDEKS program to act as extensions of the village facilitators. For the following community-based landscape program management plan, a specific assessment is needed to obtain information on human resources available to be the next pioneers for the specific villages. If this step can be done from the beginning, the facilitating NGO’s work will be easier with reduced risks of miscommunication with the community.

Seaweed farmers hut

SECTION 7: SUSTAINABILITY

Since the project directly involved the community as project actors and implementers, and used community or locally obtainable resources such as land, organic fertilizer materials, water and local seedlings, project sustainability is highly expected. However, as previously mentioned, the project scope must be expanded so that more community members can participate and receive the benefits of this project. The local community only wants to participate in an initiative only if they can see its success.



This COMDEKS project which was implemented in a limited manner may be called successful if it has achieved the expected targets, which is regarded as the initiation phase. Nonetheless, if this project is expected to provide greater benefits, especially in the landscape scale, a more structural and long-term intervention is required. Therefore it is important to carry out advocacy to local or higher government levels to support measures in extending the successes that has been achieved thus far. This advocacy must be carried out to government policies that not only display government and acceptance of the scale of the specially allocated these achievements recognition the efforts undertaken in project, but also must include government budgeting so that can be sustainable. Government budgeting can be provided especially to develop facilities needed to facilitate communities in collecting water, including provision of water tanks, piping, and renewable energy power plants such as biogas and solar that the community needs and can provide multiplier effects in improving the community's quality of life.

Government advocacy must be done so that the government no longer provides "aid" packages that in actuality are counterproductive to the community initiatives, such as distributing chemical fertilizers and pesticides. Application of chemical agricultural input has made the community dependent and hard to release themselves to shift toward an organic agriculture system that is more sustainable in the long term, and this practice also degrade the soil quality and remove local agriculture seeds.

Programs with community-based landscape approaches must be defined as optimizing local resources, including natural resources, (renewable) energy resources, and human resources. Programs focused on food, water and energy self-sufficiency so that the community preparation process must begin with discussion on understanding each element's roles in the landscape/seascape that influences the community's lives, to always be driven to experiment with local materials to resolve agriculture or marine culture problems, exchange knowledge with other villagers, and to lobby and negotiate for government policies that are regarded strategic for community's needs. Therefore, this type of program must be planned for a longer duration, at least 5 years, because it involves behavior changes in the community.

SECTION 8: REPLICATION AND UPSCALING

The most evident success of this COMDEKS project is in the organic farming and the community's perception of the role of water and forest in their lives. In the organic farming project, the facilitated village communities felt concrete positive transitions from their previous agriculture practice (using chemical fertilizer and herbicides) with the organic practice that COMDEKS introduced.

" FARMERS FROM OTHER VILLAGES LEARN HOW TO MAKE NATURAL FERTILIZER FROM THE FARMERS IN OUR SITE VILLAGES"

Arry Pellokila
Head of GMI, member of
COMDESK Consortium

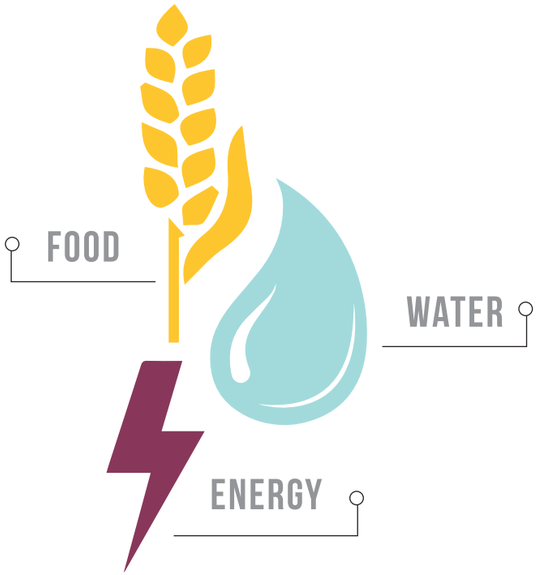
In this organic farming system, the community was taught to make Bokashi fertilizer (fermented organic fertilizer made from natural materials) using locally collected materials such as leaves, sticks, and manure commonly found around the villagers' homes. By using organic fertilizer, the community felt that the soil texture is softer, the soil can hold water for longer durations and does not dry as with chemical fertilizers, require less water, and the harvest produced taste better. In addition, the harvest yield is also greater in weight (for example with shallots). With these advantages, surrounding neighbors are motivated to purchase the harvest produced by COMDEKS project participants, such as vegetables, chilies and shallots. This trade directly created a limited market among the community. To a certain scale, bokashi fertilizer production can be increased with the help of a shredder/mulcher in each sub-district. There was an idea to have a traveling shredder/mulcher to make rounds in the village to assist farmers in making bokashi fertilizers.

In the meantime, the community was invited for a joint discussion on the island's ecological condition to restore the Semau forest. Limited water supply is not only caused by limited rainfall in Semau Island, but also on the condition of water catchment and the tree stands that function as water storage for the Semau Islanders. In addition to providing water, these water storages can postpone the flow of brackish water into wells so that the communities can use freshwater for longer time periods for their household or farming needs. The agreement to develop a production forest can be extended if the agreement implementation can be seen and the community has directly experienced its benefits.

COMDEKS program replication in other areas is highly possible, noting the similar though characteristics of Indonesia's small islands though they have different ecosystems. Indonesia's

Nursery

INDONESIA'S SMALL ISLANDS ARE VULNERABLE IN THREE ASPECTS:

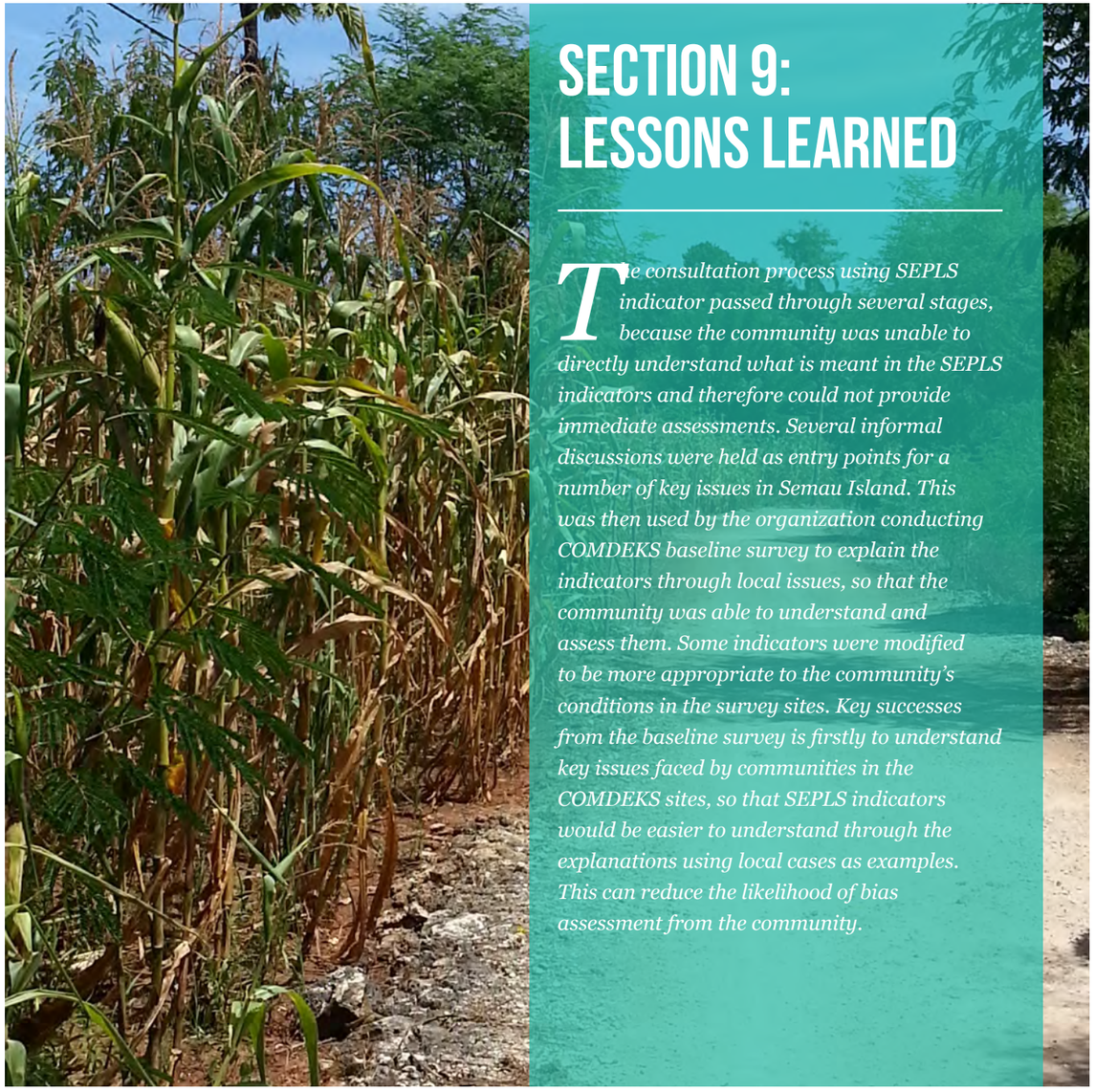


THE COMDEKS PROGRAM IN SEMAU CAN BECOME A MODEL FOR SMALL ISLAND DEVELOPMENT IN INDONESIA BECAUSE IT FOCUSES ON THESE THREE ASPECTS.

small islands are vulnerable in three aspects: food, water and energy. The COMDEKS program in Semau can become a model for small island development in Indonesia because it focuses on these three aspects. These three main issues are also the focus of other less developed though ecologically varied areas. In areas with abundant water the issue is not water shortages but instead accessible water for the entire community's households and farming needs. In the 18 months of its implementation it can be said that the COMDEKS project in Semau is in its initiation phase because only one farming cycle has been implemented in the program. The characters and potential of each village varies and thus leading to varying levels of program acceptance and implementation. Nonetheless, facilitating NGOs can build communication between villages to create mutual learning process among the communities. This will enable productive and beneficial peer-to-peer learning process to address issues faced throughout the program implementation. Peer-to-peer learning is critical because it can be the early step toward community self-sufficiency. Through exchange of information and experience, the community can encourage one another and conduct joint efforts to resolve problems that arise, such as agriculture pests and diseases. This process can also revive the local knowledge that has been forgotten to once again be employed for the communities' mutual benefits.

At least two things must be avoided in COMDEKS implementation on the ground, based on the experiences gained in Semau: Approaches aimed only at one element of the community, such as village government. This approach may lead to minimum outreach to beneficiaries. Close relationship and siding with certain groups will become a risk that the program must face. Approach should be made through several entry points, such as churches, farmers' groups, (respected) community leaders, clan leaders, and women's groups.

The facilitating NGOs selected should be those with true and tested track records of having good integrity and high motivation to learn and work with communities, not only as 'project' implementers. The quality of facilitating NGO is one of the keys.



SECTION 9: LESSONS LEARNED

The consultation process using SEPLS indicator passed through several stages, because the community was unable to directly understand what is meant in the SEPLS indicators and therefore could not provide immediate assessments. Several informal discussions were held as entry points for a number of key issues in Semau Island. This was then used by the organization conducting COMDEKS baseline survey to explain the indicators through local issues, so that the community was able to understand and assess them. Some indicators were modified to be more appropriate to the community's conditions in the survey sites. Key successes from the baseline survey is firstly to understand key issues faced by communities in the COMDEKS sites, so that SEPLS indicators would be easier to understand through the explanations using local cases as examples. This can reduce the likelihood of bias assessment from the community.

Based on the evaluation process conducted, it was discovered that the facilitating NGOs required some time to build trust with the surrounding communities. The initial process began by approaching village leaders, and then village leaders gathered all community members and allowed the facilitating NGOs to explain the project objectives. After obtaining permission, community consultation was conducted regarding the community's needs, and from that point the projects were designed based on the community's priority needs. Community participation was not mandatory, and therefore the facilitating NGOs conducted more intensive facilitation to community members who were interested in being involved in the project.

In addition, negotiations were conducted in the project implementation especially between the community with land owners and tuan air, especially for freshwater and production forest management to create a common understanding regarding their utilization and involvement in the project. This did not go entirely smoothly. Negotiation will go well if there are direct family ties between the land owners/tuan air with the community members and therefore there is pre-existing trust between them. There were also some concerns of reduced water allocation if water was to be distributed based on the nearest water sources. Negotiations for production forest are still ongoing between land owners and farmers willing to plant the land with economically valuable trees. The agreement should be in place prior to program commencement to ensure each party's rights and responsibilities.

Communities from different villages each receive the same project intervention (for example, for organic farming, seaweed, fresh water projects, etc.), but so far effective and organic learning process has not occurred. The NGOs implementing the projects have not utilized the advantages and experiences found in one village in the next. Sharing skills, experience and knowledge is a process that must be conducted to ensure learning among the communities. This is also useful for NGOs implementing the project. One example is the seaweed project. The Naikean Villagers did not know where they could get seaweed seedlings, while the Huilelot Villagers had adequate knowledge of seedlings and maintaining rope cleanliness, for example. On the other hand, there were programs like the organic farming program that successfully shared the skills to make organic fertilizer and efficient watering systems to other villages outside of the project site through farmers' peer-to-peer learning. If facilitating NGOs can help bridge communities to get to know each other, this can lead to peer-to-peer learning process and in the long run will be beneficial in making communities become increasingly independent and less reliant on facilitating NGOs. Furthermore, this can be an exit strategy for facilitating NGOs. It seemed that the facilitating NGOs in the seaweed and mangrove programs did not have very strong ties with the community. The field officer did not play a role as facilitator but instead only implemented the activities in the proposal. This was evident in the facilitated community's lack of knowledge of the implemented program. The community also expressed the lack of interaction time with the facilitating NGO, and therefore the capacity building training did not produce visible results.

Other lessons learned was that the facilitating NGOs must further build the community's self-sufficiency such as in fresh water provision. In the community interview process during evaluation, the community expressed that they still hoped that the facilitating NGOs would provide water tanks and pipes for other community members. Facilitating NGOs were still regarded as Santa Claus that comes to give assistance to the communities. Therefore it is imperative for facilitating NGOs to obtain local government's commitment to allocate village budget for fresh water facilities and infrastructure development for the long run. Facilitating NGOs must also explain to the community that NGOs presence is only temporary. The function of facilitating NGOs in this case is to facilitate communities to carry out activities as expected of their needs and activities that the community and local government can implement in the future. Facilitating NGOs must also impart information on alternative funding that the community can achieve through mutual assistance or gotong royong.

In Semau, facilitating NGOs had initiatives to connect the COMDEKS program with other stakeholders, namely local governments at the district and province, as well as village government. The Kupang District government through its Development Planning Agency (Bappeda) has given a positive sign to coordinate and collaborate for the Semau programs with the COMDEKS Consortium.

Traditional fishermen

The COMDEKS strategy development in Indonesia is a new process for donor program funding scheme. This can be developed into a new method and continually evaluated to become a Best Practice to later be adopted or used by other funding schemes. For example, the baseline survey analysis can be used by local governments to plan community programs in the Local Medium-Term Development Plans (Rencana Pembangunan Jangka Menengah Daerah – RPJMD). This can also be used as a guide for Village Governments who now have Village Funds for programs that communities need. The questions in the SEPLS indicators can be made into various versions in accordance with the target landscape or seascape conditions, therefore the assessment process using SEPLS indicators can become best practices in conducting baseline survey in the program's candidate sites. Live-in community facilitation in which local NGOs assign their staff who has the skills and passion to learn together with the community is more effective than merely placing people tasked to work based on their expertise only. Field facilitators are the determining factors of a program's success. In the COMDEKS program in Semau, villages that received serious and consistent facilitation showed better results compared to those receiving only basic facilitation. Multi-dimensional approach is important because solely approaching the village government means to depend on the quality of the village government officials. If the village government is insensitive to the community's needs, the program will be unlikely to succeed. Therefore a multi-dimensional approach must be done, for example through village government, religious groups such as churches, clan leaders, respected community leaders, farmers and fishermen groups, as well as women's groups.

The COMDEKS program can be successful if the survey and program planning process is done correctly, and program facilitation is done with a motivation to learn together with the community and groom the community toward self-sufficiency. The baseline survey was done by inviting participation of community members who work in natural resources management and production, such as farmers and fishermen. This means that there is a need to identify who must be invited to participate in accordance with the target site's landscape or seascape conditions. In addition to the FGD method employed, individual in-depth interviews are required to better understand the details of key issues in the target site. During program planning, discussion on the strategy developed based on the baseline survey analysis must be done intensively and productively with candidate partners from facilitating NGOs. This can contribute to program development according to the community's needs in the target sites. Program facilitation by facilitating NGOs is one of the successes of COMDEKS program implementation. In addition to expertise, facilitating NGOs must also mandate village facilitation to people of high integrity and who are willing to learn and work with the community.

A number of breakthroughs were observed in the COMDEKS program in Semau in the following fields:
Agriculture management techniques: the use of local materials to make bokashi fertilizer and control pest which farmers can do. This process was done as part of a joint learning between facilitators and farmers, and is expected that in the future farmers will have the ability to do experiments in other aspects of their agriculture. In addition, the pipe and sprinkler water systems save time, energy and water.

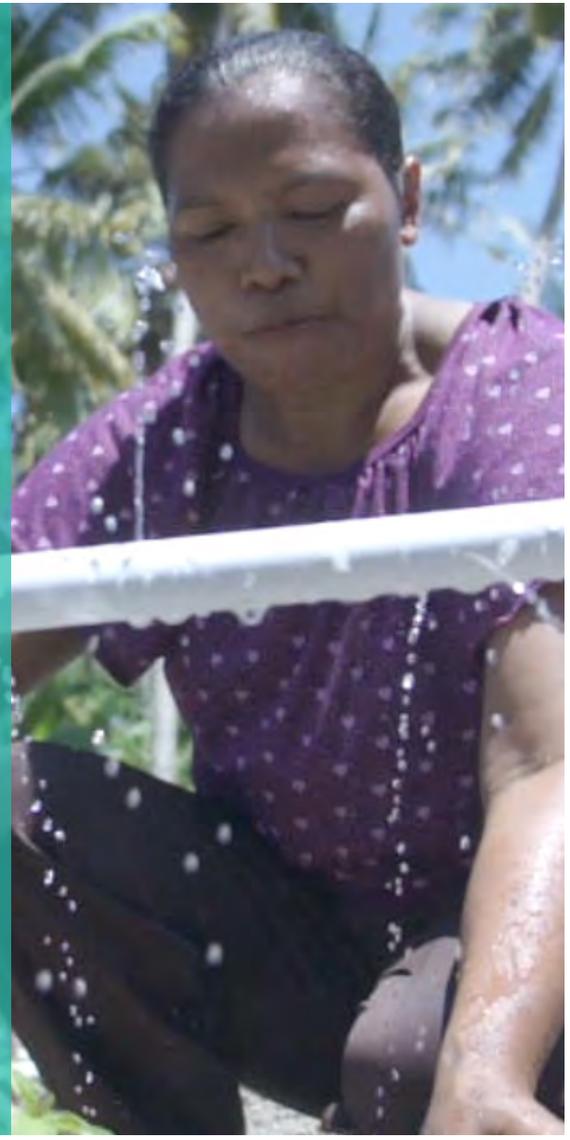
Water conservation techniques: conserving water by "planting" water during dry season by planting sweet potatoes. Sweet potato is currently a favorite agricultural commodity in Semau because it is tasty and has an attractive color and can be processed into other products that the family enjoys.

Institutional arrangements: facilitating negotiations between land owners and farmers that will plant productive plants in the land owner's land, to make agreements that did not previously exist.
Marketing: this initiative was done as an effort to provide incentives to farmers who have conducted agricultural practices without using chemicals. The harvest is purchased at a higher market prices by a cooperative formed by the facilitating NGO and sold in the city.

The aforementioned innovations occurred through an interactive process and intensive discussion between the communities and facilitating NGOs. Therefore from the start the facilitation is driven by the urge of learning and working together with the community.

SECTION 10: RECOMMENDATIONS AND WAY FORWARD

Referring to the COMDEKS strategy that has been developed, there are four outcomes to achieve and are expected to be completed through activities that have been partly implemented during the initiation phase for approximately 1.5 years. Therefore we recommend other activities that have not been implemented, and several additional activities proposed in line with the outcomes in the strategy.



OUTCOME 1:

Clan forest cover, coastal land cover and marine systems are preserved through village regulations and or agreement between clan leaders.

Activities needed to achieve Outcome 1 include the following:

- *Conduct negotiations and facilitation to develop written agreement on several agreements made in the production forest development with clan leaders to regulate a fair and sustainable production forest management. The right of ownership of this production forest will be entirely held by the clans. Its management must be regulated, both for its functions as water catchment and as the community's economic asset so that the forest functions will remain sustainable.*
- *Continue negotiation and facilitation to develop written agreement between village leaders and clan leaders (Manileo) to protect the remaining clan forest as a conservation area or water catchment for Semau Island.*
- *Conduct negotiation and facilitation to develop written agreement between villagers that use and villagers that have water supply (if they are from different villages) to manage the forest or trees around water sources together to ensure year round water supply.*
- *Continue lobbying and facilitation for village government and clan leaders (Manileo) to establish criteria prohibiting cutting down large trees and replanting, especially or trees around water sources, and introducing planting as a civil administration requirements and part of customary penalty system. Agreement from the clan leader in Naikean Village to preserve its large trees or lontar (Borassus flabellifer) trees in their land is one of the results of the facilitation program.*
- *Training and facilitation for village government in establishing zones for coastal and marine utilization and protection. With the development of seaweed farming in Semau, the entire calm, shallow coastal waters are occupied with seaweed farming. If this is not immediately regulated and managed, the coastal cover in the seaweed farms will appear littered, and bacteria from ropes used in seaweed farming will spread to surrounding waters. This will lead to a negative impact to capture fisheries, or tourism development in Semau.*
- *Facilitation for developing written agreement between community/clans and village government on prohibiting sand quarrying for commercial purposes.*
- *Introduction to the benefits of coral reef and fish aggregating devices (FAD) in fishing.*
- *Training and facilitating for community groups and village government in creating and planting artificial coral reef or FAD in shallow coastal waters.*
- *More intensive facilitation for community groups in preparing and keeping honey bees as well as increasing awareness on the importance of planting hardwood trees for honey production. Honey beekeeping has been restarted by several community members, which will affect in the preservation of lontar forests in Semau Island through the protection of lontar flower pollen availability for honey bees.*
- *Continue approach, negotiation and facilitation in every village in Semau Island to protect clan forest, develop production forest, prohibiting cutting down large trees, and regulating and managing coastal areas for cultivation or fisheries. Landscape and seascape management in Semau is greatly required taking into account the community's great dependence on nature.*
- *Conduct facilitation to produce agreement on mangrove forest management located outside conservation areas by the community and village government.*

OUTCOME 2:

Increased resilience of agriculture and marine culture systems through improved diversification of cultivation practices and access to water sources.

Activities needed to achieve Outcome 2 include the following:

- *Re-collect various local agriculture seeds native to Semau and facilitation for development of native/local food crops as healthy and unique products from Semau.*
- *Re-gather knowledge, introduction and facilitation to develop plant-based solutions for natural disease/pesticide and fertilizers.*
- *Training on seed germination and inventory of medicinal plants and herbicides.*
- *Re-gather knowledge and conduct inventory of medicinal plants.*
- *Training and facilitation for village government in establishing zones for coastal and marine utilization and conservation: for seaweed farming, marine aquaculture (if present), fishing, and coastal and marine protection.*
- *Extend facilitation for the formation of water resources management organizations (springs, ponds, wells, reservoirs) in and between villages in all villages in Semau.*
- *Facilitation for communities to construct new water canals or wells and facilitation for communities in repairing old, broken, or abandoned water canals or water reservoirs.*
- *Facilitation for good seaweed farm management for seaweed farmers in certain areas, not only for certain groups, for a stronger impact toward seaweed farming, e.g. seaweed planting and harvest time and standards must be uniform.*
- *Facilitation for seaweed farming to harvest, to increase its quality and affect prices to the point of collectors.*
- *Facilitation for intensive and equal seaweed post-harvest management for seaweed farmers, to the point of marketing.*
- *A funding mechanism by the community for the community must be developed, such as arisan or rotating savings and credit groups to purchase agriculture and seaweed farming inputs or fresh water facilities as needed.*


Water springer

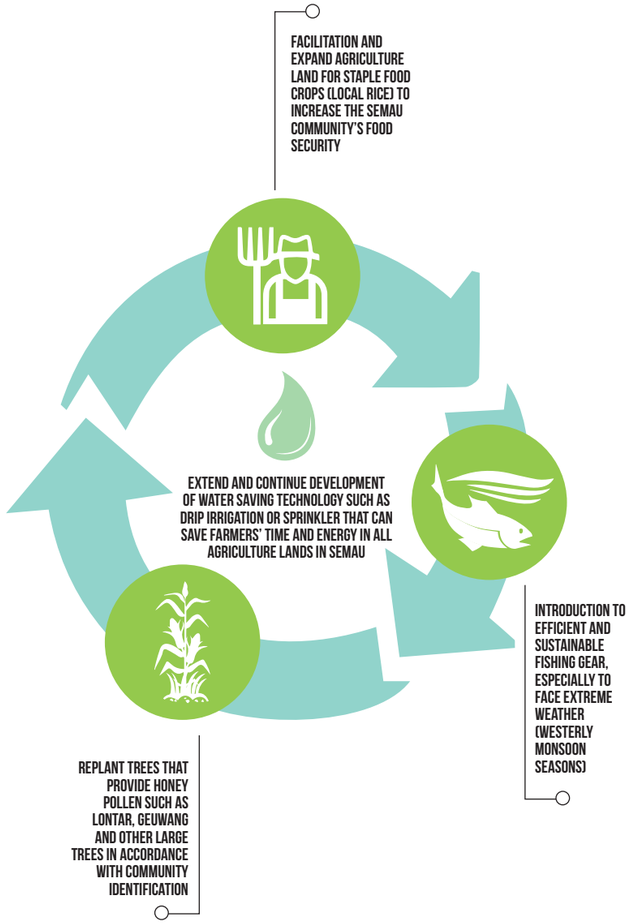
- *Gotong Royong or mutual assistance between communities for agriculture as well as seaweed planting and harvesting for must be revived, especially for communities with large plots. A profit sharing system can be implemented for this purpose.*
- *Extending organic agriculture introduction can be conducted through peer to peer method, direct learning between farmers to ensure equal distribution to all the villages in Semau.*
- *Replant using local seeds that have been proven to be more resilient to pests and diseases, such as shallots, chili, peanuts, sesame seeds, and others.*
- *Develop simple capture fisheries and aquaculture methods that can be implemented by the communities.*
- *Introduction to the benefit of weather and climate forecast information for agriculture and aquaculture as well as fishing.*
- *Dissemination of climate and weather forecast from the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) to the community to make agriculture, aquaculture, and fishing decisions.*

OUTCOME 3:

Increased resilience of agriculture and marine culture systems through increased community knowledge on aquaculture and marine culture management and innovations.

Activities needed to achieve Outcome 3 include the following:

- *Replant trees that provide honey pollen such as lontar, geuwang and other large trees in accordance with community identification.*
- *Extend and continue development of water saving technology such as drip irrigation or sprinkler that can save farmers' time and energy in all agriculture lands in Semau.*
- *Piloting and facilitation for agriculture and aquaculture products manufacturing and packaging.*
- *Develop propagation and storing methods for local seeds and non-native seeds that are safe for the environment.*
- *Facilitation for rehabilitation of land that has been applied fertilizers and other chemicals to return to its healthy and productive state.*
- *Facilitation and expand agriculture land for staple food crops (local rice) to increase the Semau community's food security.*
- *Develop natural pesticide and herbicide with communities.*
- *Develop a calculation of seasons and agriculture and seaweed farming schedule together with the community, including which species to plant so that farmers can prepare their activities for the year.*
- *Intensive facilitation to regulate livestock in Semau together with the community aim to optimalize organic fertilizer and biogas development.*
- *Conduct simultaneous rope maintenance and seaweed planting over a certain area.*
- *Intensive facilitation for seaweed farming management to minimalize risks of diseases.*
- *Introduction to efficient and sustainable fishing gear, especially to face extreme weather (westerly monsoon seasons).*
- *Conduct regular market development for agriculture and aquaculture products from Semau in Kupang as well as facilitation to guarantee the quality of Semau community's production.*

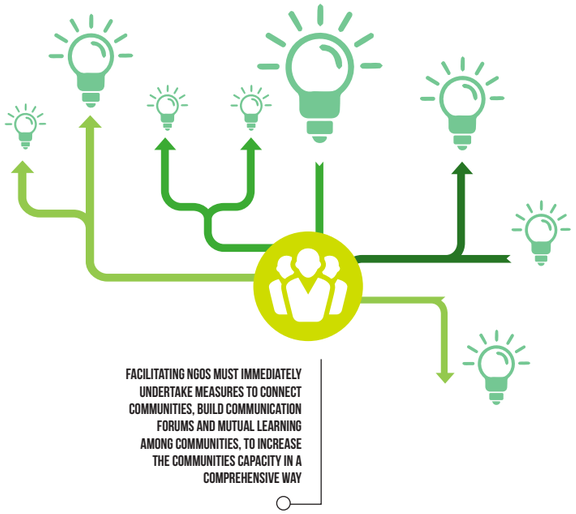


OUTCOME 4:

Institutional governance systems created and/or strengthened for effective participatory decision making and knowledge sharing at the landscape level.

Activities needed to achieve Outcome 3 include the following:

- *Facilitating NGOs must immediately undertake measures to connect communities, build communication forums and mutual learning among communities, to increase the communities' capacity in a comprehensive way.*
- *Dialog must be held between local village government and clan leaders to be replicated and extended to other communities in the village that are not previously involved in this project.*
- *All COMDEKS work agreement regarding public/community interest must be written, to become guidance for long-term activity implementation.*
- *Intensive facilitation for the formation of each program's managing organization, such as fresh water, organic fertilizer/ pesticide procurement, local seed supply, and others, is to be done until the organization's task is carried out.*
- *Follow-up on discussion results with local Public Works Agency and Community-Based Drinking Water Supply and Sanitation Provider (PAMSIMAS) for providing fresh water facilities in Semau by developing joint planning and distributing roles between government, facilitator and community which will be managed at the village level by the Drinking Water Facilitation Management Body (BP SPAM) or Village Owned Enterprise (BUMDes) or other management bodies selected by the community.*
- *CIS Timor's role in the provincial Water Working Group must be able to contribute to fresh water distribution strategy for Semau, by being the coordinating organization for all programs/activities related to fresh water distribution in Semau.*
- *Conduct advocacy for decision making to provide assistance for farmers and fishermen in Semau at the district, province and central levels, in accordance with applicable needs and is safe for the environment.*
- *Lobbying and facilitation for village government and clan leaders to establish criteria prohibiting cutting down large trees and replanting, especially or trees around water sources, and introducing planting as a civil administration requirements and part of customary penalty system*
- *Among all the programs, women engagement that was still lacking is in clear water and renewable energy (in this case, biogas). As the primary users of water and fire for cooking, women must be actively involved in these management programs. For agriculture program, women's capacity building must be done in harvest product processing to create additional economic value.*



Corn farm

COMDEKS CASE STUDY : SEMAU ISLAND INDONESIA

COMDEKS CASE STUDY
SEMAU ISLAND INDONESIA

SATOYAMA INITIATIVE

The GEF Small Grants Programme

UNDP

gef

Japan Biodiversity Fund

PROCESS INSTITUTE