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MANGROVE REHABILITATION FOR CLIMATE

USAID SUPPORT FOR INDONESIA CLIMATE CHANGE TRUST FUND (ICCTF)

Land-based Mitigation and Adaptation & Resilience Actions

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The Five Year Support of USAID:
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and Adaptation & Resilience Pilot Projects in Indonesia
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Belitung Mangrove Park by Indonesia Climate Change Trust Fund

ACRONYMS

CSOs	Civil Society Organizations
GHGs	Green House Gasses Emissions
HKM	Community Forest
ICCTF	Indonesia Climate Change Trust Fund
MoU	Memorandum of Understanding
NGOs	Non-Governmental Organizations
SRI	System of Rice Intensification
USAID	United States Agency for International Development

PROPONENTS

Baileo	Yayasan Baileo Maluku
CFES	Community Forest Ecosystem Service
CIS Timor	Perkumpulan CIS Timor
FHut UGM	Faculty of Forestry, Gadjah Mada University (UGM)
FIELDS	Yayasan Farmers' Initiative for Ecological Livelihoods and Democracy
FTP UGM	Faculty of Agricultural Technology, Gadjah Mada University
FWI	Forest Watch Indonesia
Geomet IPB	Faculty of Mathematics and Natural Sciences, Bogor Agricultural University
IFGI	Indonesian Forestry and Governance Institute
Javlec	Yayasan Javlec Indonesia
LOH	Lembaga Olah Hidup
Palung	Yayasan Palung
PPI ITB	Centre for Climate Change, Bandung Institute of Technology
Pusat Penelitian Karet	Indonesian Rubber Research Institute
PUSKA UI	Anthropology Study Centre (PUSKA), Faculty of Social and Political Science, University of Indonesia
Sesami	Perkumpulan Sesami
STIK-Aceh	Yayasan Teungku Chik Pante Kulu, STIK Aceh
Terangi	Yayasan Terumbu Karang Indonesia
UMP	Faculty of Agriculture and Forestry, Muhammadiyah University of Palangkaraya
UNEJ	Jember University
UNTAN	University of Tanjungpura
Walestra	Wahana Pelestarian dan Advokasi Hutan Sumatera
Yayorin	Yayasan Orang Utan Indonesia
YEU	YAKKUM Emergency Unit (YEU)
YLHS	Yayasan Lingkungan Hidup Seloliman
YLI	Yayasan Leuser Internasional
YPAM	Yayasan Pengembangan Akhlaq Mulia
YPB	Yayasan Penyu Berau
YRE	Yayasan Rumah Energi
YTNTN	Yayasan Taman Nasional Tesso Nilo
YTP	Yayasan Tiara Pusaka
YTPKI	Yayasan Transformasi Kebijakan Publik Indonesia

EXECUTIVE SUMMARY

From 2016 until 2019, ICCTF has successfully implemented several activities to support the government in coping with climate change by using the funding from USAID. ICCTF has managed 39 programs in two sectors which are the land-based mitigation sector and adaptation and resilience sector, and has spent IDR 70,275,000. From 39 programs, while 31 programs were choosen by Call for Proposals, started in 2016 and 2017, there are 7 new programs from both sectors started in 2018, and 1 program started in 2019. The 7 new programs in 2018 and 1 new program in 2019 are selected through the Call for Institution activity organized in 2018 and also from ICCTF's previous program that is chosen to be scaled-up.

This final completion report aims to summarize accomplishments and results produced from the programs during the Fiscal Year 2016-2019. The results shown in this report are developed through a grant program that has engaged non-governmental entities to become one of the front liners in achieving national objectives related to the low-carbon economic growth and national resilience development by prioritizing the climate change issue. Accordingly, ICCTF acts as a stimulator to produce various innovative programs and strategies to support three pillars of sustainable development which are the environment, economic, and social, also to assist the communities in enhancing the low-carbon development practices.

Various outputs are produced from the programs running in 2016-2019, which includes seeds purchasing and plantation, agricultural tools, lookout towers for forest fires and slash-and-burn activity, solar-power and water resource infrastructure, canal blocking infrastructure, tourism infrastructure, rainwater harvesting tanks, climate risk and vulnerability assessment documents, sea and agriculture vulnerability maps, local development planning and area management plan document, capacity building development, workshops, feasibility study documents and other activities related to the objectives of each program. The outputs have several impacts on the local and national levels, such as emission reductions, social and economic condition improvement, and better cooperation between stakeholders.

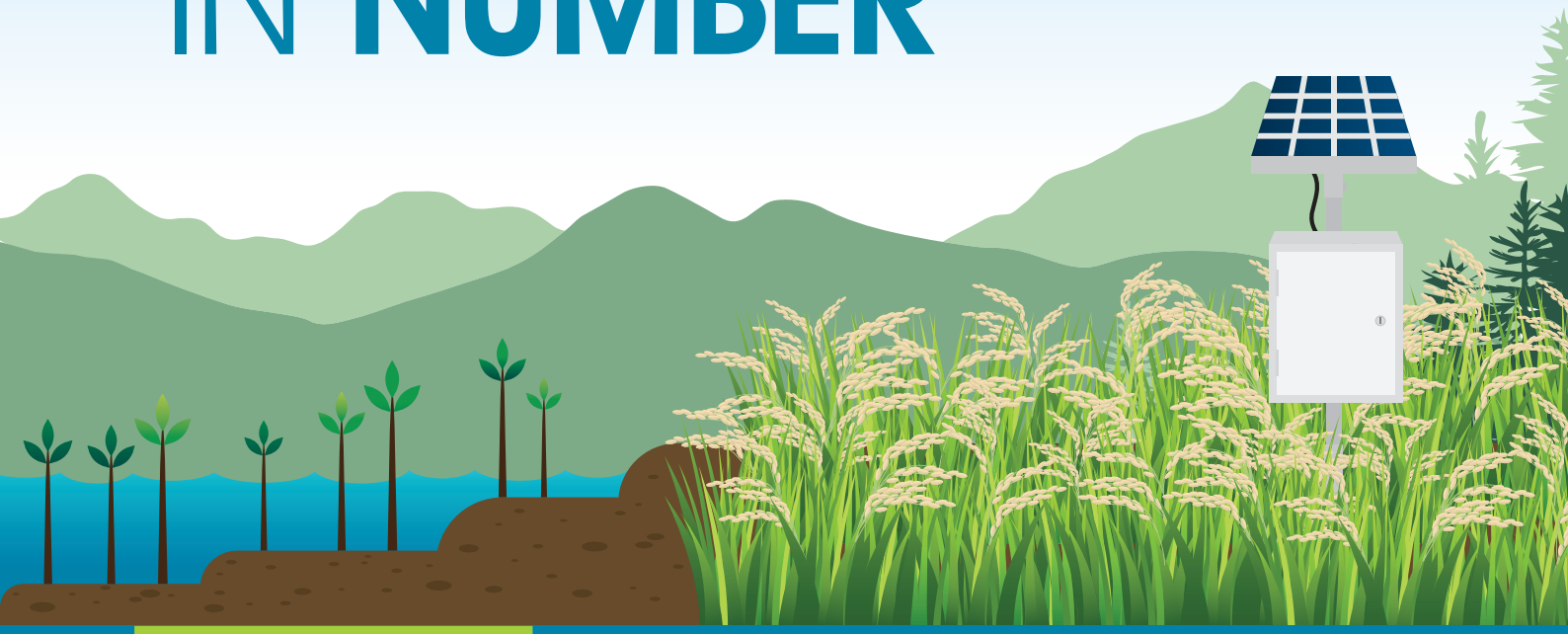
Furthermore, ICCTF believes that multi-stakeholder collaboration is one of the keys to coping with climate change. As such, a solid communication strategy is needed to raise more awareness, interest, and commitment from multi-level actors as in to engage more people in the project. Subsequently, in initiating the implementation of ICCTF's projects, ICCTF has engaged various stakeholders, such as local government, community groups, private sectors and non-governmental organizations to collaborate and work together to achieve the projects' objectives.

Some projects that have successfully engaged various stakeholders to collaborate or even replicate in different areas are:

- The project of System of Rice Intensification (SRI) with the integrated climate-crop-soil-water model approach collaborated with the Department of Agriculture and Biosystem Engineering, Gadjah Mada University (FTP-UGM) that has been replicated by the local government of East Nusa Tenggara Ministry of Village, Development of Disadvantaged Regions and Transmigration (Kemendesa), Ministry of Agriculture, and also the Coordinating Ministry for Economic Affairs.
- The land rehabilitation program through the non-slash-and burn method collaborated with Yayasan Orangutan Indonesia (Yayorin) that has been supported by and cooperated with the local government of Kotawaringin Barat in Central Kalimantan and Ministry of Agriculture.
- The project of Belitung Mangrove Park collaborated with Yayasan TERANGI that has encouraged multiple stakeholders to participate and invest in the project such as the local government of Belitung regency and Kepulauan Bangka Belitung province, the Local Watershed Management Center, and Ministry of Public Works and Public Housing.

Other than that, the initial 39 projects have generated a total of IDR 168,177,875,000 funds from various stakeholders who are interested in participating the projects, as well as other supports such as trainings, workshops, providing advocacy services, and extension agents.

ACHIEVEMENTS IN NUMBER



671,831
trees planted

4.01
million ton CO_2e
potential carbon emissions reductions

1,060 ha
lands reforestated

265
on-farm demonstration plots

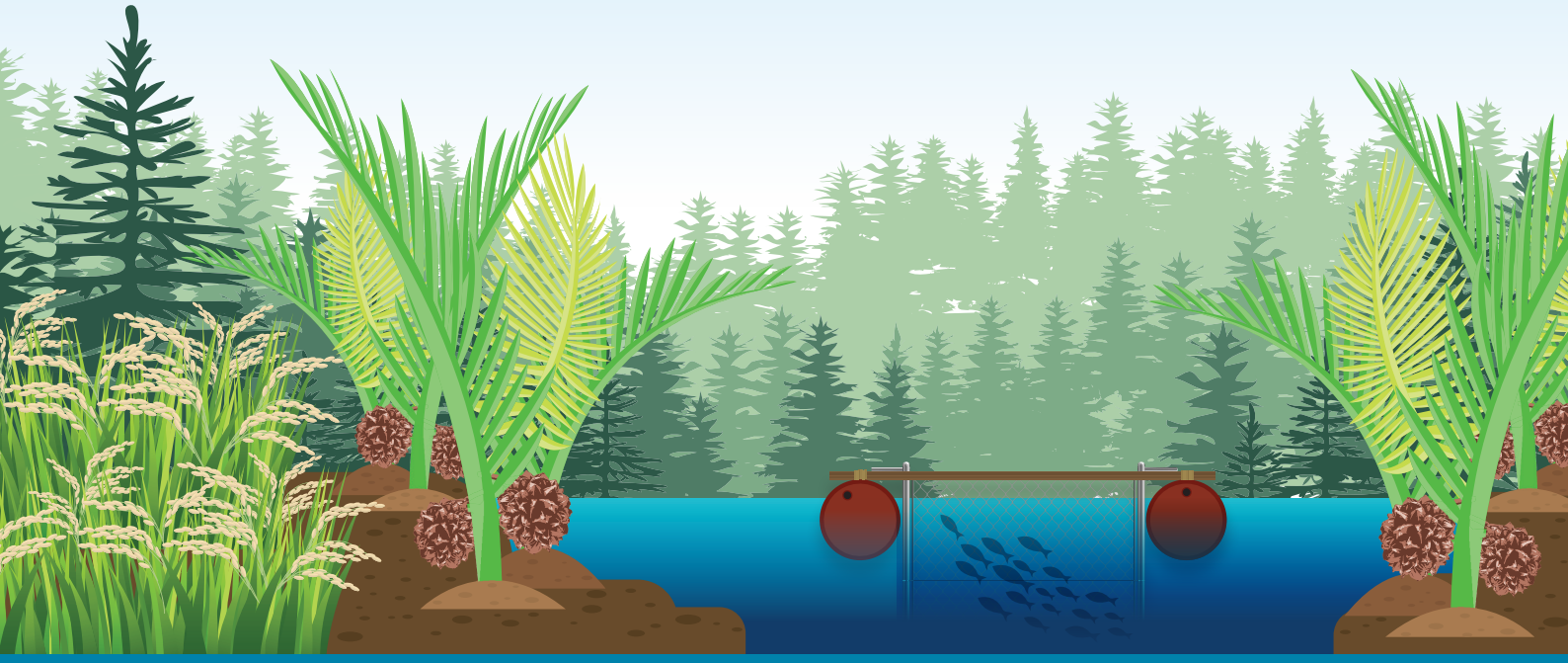
6,620 ha
lands rehabilitated

45.5 ha
lands implements the climate resilient agriculture technology

Direct Involved

110 students involved

44,732 local people directly involved



30 units of fish farming

11 farmer networks established

2 centers of cattle farming

28 canal blocked

20 bio digester built

200 infiltration wells built

100 rainwater harvesting tanks built

10 artesian wells built

villages engaged **81**

village policies implemented **7**

3 villages facilitated by the solar panels

5 villages developed as the bee harvesting center

ICCTF-USAID PROJECTS AT A GLANCE

Starting from 2016, ICCTF has carried out ICCTF-USAID (US Government funds) funded projects on two focus areas: land-based mitigation and adaptation and resilience. The projects are developed by considering local priorities and specific needs, also circumstances at the target group, to overcome the environmental and social problems based on the capacity of the target group and Civil Society Organizations (CSOs). As such, the projects' designs are varied from one to the others, yet, are still applicable or within the guidelines of ICCTF and USAID's agreement.

ICCTF and USAID have been agreed to increase collaboration between US and Indonesia on climate change and to support and strengthen ICCTF's capacity to receive and manage international financing for climate change-related activities. Accordingly, ICCTF and USAID have supported non-governmental entities, including private sector organizations and civil society organizations, in the activities that help achieve Indonesia's objectives related to the growth of a low-carbon economy and the development of national resilience with respect to the impact of climate change. The funds have been directed to non-governmental entities as ICCTF and USAID have agreed and intended to support non-governmental entities as further recipient's support for projects mentioned.

From 2016-2019, there are 39 projects managed by ICCTF that are divided into 3 different batches. The first batch implemented in 2016-2017 covered 8 Land-based mitigation projects and 7 Adaptation and Resilience projects; the second batch in 2017-2018 managed 12 Land-based Mitigation project and 4 Adaptation and Resilience projects; and the third batch in 2018-2019 are responsible for 5 Land-based Mitigation projects and 3 Adaptation and Resilience projects. Therefore, there are 25 Land-based Mitigation projects and 14 Adaptation and Resilience projects which were managed by 32 organizations as ICCTF's proponents from 2016-2019 (see table 1).

Table 1. ICCTF-USAID projects in 3 batches.

Batch	Land-based Mitigation projects	Adaptation & Resilience projects	Proponents
1 (2016-2017)	8	7	32
2 (2017-2018)	12	4	
3 (2018-2019)	5	3	

LAND-BASED MITIGATION

PILOT PROJECTS

ICCTF has managed 25 pilot projects on the land-based mitigation sector to support reducing greenhouse gas emissions and increasing carbon stocks. These projects are carried out in 17 provinces throughout Indonesia. As the implementation phase is divided into three batches, each batch has covered different projects in various provinces and are succeed in producing numerous outputs.

In the first batch, there are 8 projects focusing on the mitigation activities in the degraded peatlands, critical watershed areas, degraded forests, customary forests, national park buffer zones, waste treatment of the large livestock, and revegetation of karst areas. These projects are covering 8 provinces in Indonesia including Nangroe Aceh Darussalam, Central Kalimantan, Daerah Istimewa Yogyakarta, Central Java, South Kalimantan, Jambi, West Sumatera, and Nusa Tenggara Barat.
The second batch has 12 projects focusing on the mitigation activities in the community forest, agrarian reform in the critical production forests, national parks, revitalization of community gardens, re-wetting the peatlands, the social forestry system, restoration of the protected forests, and introduction on the organic agriculture and village forest. Projects on the second batch have covered 11 provinces including West Java, Central Java, East Java, Bangka Belitung, Riau, East Kalimantan, West Kalimantan, Maluku, Nangroe Aceh Darussalam, Banten, and South Sumatera.

The third batch has covered 5 projects focusing on the mitigation activities in the peatlands as well as several areas that have been scaled up from the Batch 1 projects. These projects have been implemented in 5 provinces including West Kalimantan, Central Kalimantan, Central Java, West Nusa Tenggara, and Maluku.

All projects in the three batches are implemented by ICCTF's implementing partners named as proponents which consisted of 15 Non-Governmental Organizations (NGOs), 1 research institute, and 5 universities.

NGOs

1. Yayasan Orang Utan Indonesia (Yayorin)
2. Perkumpulan Sesami (Sesami)
3. Yayasan Javlec Indonesia (Javlec)
4. Wahana Pelestarian dan Advokasi Hutan Sumatera (Walestra)
5. Yayasan Pengembangan Akhlaq Mulia (YPAM)
6. Lembaga Olah Hidup (LOH)
7. Community Forest Ecosystem Service (CFES)
8. Forest Watch Indonesia (FWI)
9. Yayasan Terumbu Karang Indonesia (Terangi)
10. Yayasan Taman Nasional Tesso Nilo
11. Yayasan Penyu Berau
12. Yayasan Palung
13. Yayasan Tiara Pusaka (YTP)
14. Yayasan Leuser Internasional (YLI)
15. Indonesian Forestry and Governance Institute (IFGI)

RESEARCH INSTITUTE

Indonesian Rubber Research Institute
(Pusat Penelitian Karet)

UNIVERSITIES

1. Yayasan Teungku Chik Pante Kulu, STIK Aceh
2. Faculty of Agriculture and Forestry, Muhammadiyah University of Palangkaraya (UMP)
3. Faculty of Forestry, Gadjah Mada University (Fhut UGM)
4. Jember University (UNEJ)
5. University of Tanjungpura (UNTAN)

GOALS

The goals of 25 projects in the land based mitigation sector have included slowing, halting, and reversing GHG from land use that also covers the forest and agricultural ecosystems. Detailed goals that relates to each project are shown in the table below:

Table 2. Projects' goals based on each proponent.

No	Proponents	Slowing and Halting GHGs	Decreasing GHGs	Potential Emission Savings	Increasing Resilience
	BATCH 1				
1	STIK Aceh			Yes	
2	Javlec			Yes	Yes
3	Yayorin	Yes	Yes	Yes	Yes
4	Walestra		Yes	Yes	Yes
5	Sesami	Yes	Yes	Yes	Yes
6	YPAM			Yes	Yes
7	LOH			Yes	Yes
8	UMP	Yes		Yes	Yes
	BATCH 2				
9	IFGI			Yes	Yes
10	UNEJ		Yes	Yes	Yes
11	Yayasan Penyu Berau			Yes	Yes
12	Yayasan Palung	Yes	Yes	Yes	Yes
13	YTP		Yes	Yes	Yes
14	Faculty of Forestry, Gadjah Mada University (UGM)		Yes	Yes	Yes
15	YLI			Yes	Yes
16	Yayasan Taman Nasional Tesso Nilo	Yes		Yes	Yes
17	Consortium CFES			Yes	Yes
18	Consortium FWI			Yes	Yes
19	Indonesian Rubber Research Institute	Yes		Yes	Yes
20	Yayasan Terangi			Yes	Yes
	BATCH 3				
21	LOH		Yes	Yes	Yes
22	Sesami		Yes	Yes	Yes
23	UNTAN		Yes	Yes	Yes
24	Yayorin	Yes	Yes	Yes	Yes
25	YTP		Yes	Yes	Yes

OUTPUTS

Several outputs are produced from the 25 projects on the land based mitigation sector for the climate change. These outputs are including the results of rehabilitation activities on various areas such as in the rehabilitation lands as well as the management of the lands, in the human resource capabilities, the GHGs and carbon stocks, and the relation between stakeholders including the local communities. Some highlighted outputs from the land based mitigation sector are:

- Degraded lands, forests, and peatlands are now having new plants in the form of wood plants and multi purposes trees.
- Several nursery centers are built to manage the rehabilitated lands.
- In some areas, the communities are managing the local annual plants.
- Various management plans are developed, approved, and implemented by the stakeholders in several areas.
- Some communities have succeed in developing a cooperation agreement between stakeholders.
- There is an increase in human resource capabilities.
- The amount of carbon stock increases.
- The amount of GHGs emission decrease.
- Community groups focusing on the forest fires are established to manage the forest fires as well as increasing the people awareness.
- Community groups are conducting forest fires patrols in several areas.
- Some monitoring towers are built to manage the forest fires.
- Local communities have developed and utilized the non-timber forest products as their monthly incomes.
- The natural ecosystems are restored and the wild life are protected in some areas.
- Land and water productivities for agriculture are increased.
- Aquaculture technology is applied.
- Clean water supply for household.
- In some areas, families income are improved from IDR 1,000,000-7.500.000 per family per month.

IMPACTS

The projects' impacts on the environment, social, and economy are significant. The impacts have been shown in the projects' areas, management and governance of the project, cultural sectors, and additional incomes for the community, and even in the influence of the project to the investors.
One of the highlighted impacts is portrayed in the project of ICCTF-Yayasan Terangi in Belitung. This project has a goal to rehabilitate mangrove in the ex-illegal tin mines located in the protected forest into a mangrove tourism park called Belitung Mangrove Park. After the project implemented, several impacts are shown in the area such as:

- The PB and sand mining activities have stopped completely.
- The tourism sector is growing rapidly with 73,000 visits in 2018
- An annual cultural festival for Sawang Tribe called Festival Titik Temu is developed and managed in the area.
- The area becomes one of the Geosite locations in Indonesia.
- The community of Juru Seberang as the local community who manage the Belitung Mangrove Park has a huge monthly income which is IDR 2 million/person.
- A fruit garden is develop to support Belitung Mangrove Park and as the location for environmental education for children.
- More institutions are interested in supporting Belitung Mangrove Park through some investments.

ADAPTATION & RESILIENCE

PILOT PROJECTS

In the adaptation and resilience sectors, ICCTF has managed 14 pilot projects to support the adaptation activities and develop the community's resilience on the climate change. These projects are developed and managed in 9 provinces throughout Indonesia. Similar with the land based mitigation sector, the adaptation and resilience sector's implementation phase is also divided into three batches in which each batch has covered different projects in various provinces and are succeed in producing numerous outputs.

In the first batch, there are 7 projects focusing on the adaptation and resilience activities in the agricultural, marine, and water sectors, also to mainstreaming the climate change issue into the Regional Medium Term Development Plan (RPJMD). These projects are covering 7 provinces which includes Central Java, West Java, East Java, Nusa Tenggara Timur, Nusa Tenggara Barat, Gorontalo, and Daerah Istimewa Yogyakarta.

The second batch has 4 projects focusing on the adaptation and resilience activities in the food security, field school for climate change, rain water harvesting, saving and the bio-slurry technology, and coastal community resilience. Projects on the second batch have covered 4 provinces that are Nusa Tenggara Timur, Nusa Tenggara Barat, Maluku, and South Sulawesi.

The third batch has covered 3 projects focusing on the technology development on the agriculture and marine sectors to adapt and build resilience of local people to the climate change. These projects have been implemented in 3 provinces including East Nusa Tenggara, North Sulawesi, and Daerah Istimewa Yogyakarta.

All projects in the three batches are implemented by ICCTF's implementing partners named as proponents which consisted of 8 Non-Governmental Organizations (NGOs) and 4 universities.

NGOs

1. Yayasan Lingkungan Hidup Seloliman (YLHS)
2. Yayasan Transformasi Kebijakan Publik Indonesia (YTKPI)
3. YAKKUM Emergency Unit (YEU)
4. Perkumpulan CIS Timor
5. Yayasan Baileo Maluku
6. Yayasan Farmers' Initiative for Ecological Livelihoods and Democracy (FIELDS)
7. Yayasan Rumah Energi (YRE)
8. Yayasan Terumbu Karang Indonesia (Terangi)

UNIVERSITIES

1. Faculty of Agricultural Technology, Gadjah Mada University (FTP-UGM)
2. Faculty of Mathematics and Natural Sciences, Bogor Agricultural University (Geomet IPB)
3. Centre for Climate Change, Bandung Institute of Technology (PPI ITB)
4. Anthropology Study Centre (PUSKA), Faculty of Social and Political Science, University of Indonesia (UI)

GOALS

The goals of 14 projects in the adaptation and resilience sector have included increasing the resilience of people, place, and livelihoods to climate change, which also covers the new or existing vulnerability assessments. Detailed goals that relates to each project are shown in the table below:

Table 3. Projects' goals based on each proponent

No	Proponents	People	Place	Livelihoods
	BATCH 1			
1	FTP UGM			Yes
2	YLHS	Yes	Yes	
3	UI			Yes
4	Geomet IPB		Yes	Yes
5	PPI ITB			Yes
6	YEU		Yes	Yes
7	Transformasi	Yes	Yes	
	BATCH 2			
8	YRE			Yes
9	FIELD			Yes
10	BAILEO			Yes
11	CIS TIMOR			Yes
	BATCH 3			
12	FTP UGM			Yes
13	Terangi	Yes	Yes	Yes
14	YEU			Yes

OUTPUTS

Several outputs are produced from the 14 projects on the adaptation and resilience sector for the climate change. These outputs are including the results of adaptation and resilience development activities on various areas such as in coping with the water scarcity, developing the food security, management of the project, in the human resource capabilities, and the relation between the stakeholders including local communities. Some highlighted outputs from the adaptation and resilience sector are:

- Several on-farm demonstration plots are developed in various areas.
- Improvement on the eco-tourism management for the local communities.
- Development of the hydroponic system which is implemented by the local people.
- Clean water infrastructures are developed in various provinces.
- Various demonstration plots for the fish cultivation and other non-timber forest products are built and developed by the local communities.
- Several Biopory units and infiltration well units are built for the local people.
- Development of the field school on the climate change adaptation.
- The local communities are well-trained on the development and implementation of bio-slurry technology.
- The technology of System of Rice Intensification (SRI) is implemented by the farmer groups.

IMPACTS

Impacts of the projects on the environment, social, and economy are significant. The impacts have been shown in several sectors such as projects' areas, management and governance of the project, cultural sectors, and additional incomes for the community, and even in the influence of the project to other areas. Some highlighted impacts have includes:

- The business sector changes along with the increase of public and local government knowledge on the climate change adaptation activities and technologies.
- Increasing community resilience in the agriculture sector to the climate change.
- The productivity of the clean water sources have increased.
- Production cost on the agricultural sector is decreasing.
- Less risk of failure on the crop and fish cultivation.
- Land productivity has increased which helps with the economic condition of local people.
- New innovations of the adaptation to the climate change activities through group agreement and regional/national development plans.

BEST PRACTICES & LESSON LEARNED

The ICCTF-USAID projects has been assessed by an independent consultant called PT. Hegar Daya to know the impacts, best practices, and lesson learned of each projects. The assessment has been done in the grassroots level by doing a field research to the projects' locations and interviewing all related stakeholders, as well as analyzing all reports submitted by the proponents to ICCTF and the reports published by ICCTF.

The assessment report shows that 87.4% of ICCTF-USAID projects are categorized Very Good for the impacts based on the assessment on the environment, economy, and social sectors. The social sector has been dominant in the impact assessment which then are followed by the economic and environmental sectors. The ICCTF-USAID projects are mentioned to have supported and strengthened the local institutions, improved the local communities' awareness and lifestyles to be based on the climate change adaptation and mitigation activities, and improved the capacity of the local communities. The projects have also impacts on improving the economic condition of local communities and in supporting the efforts to reduce greenhouse gas emissions.

This chapter provides selected best practices and lessons learned of USAID projects, which are categorized into three sections: economic growth, technology and innovation, and stimulating local government initiative. Every section presents one project that is selected from all USAID projects.

A. Growing Local Economies

Belitung Mangrove Park: transforming an ex-mining area into a Mangrove Tourism Park for Ecosystem Rehabilitation and Carbon Sequestration

Belitung Island in Bangka Belitung province is one of the biggest tin mineral-producers in Indonesia, even in the world. Unfortunately, as the mining activities increase the wealth of people, the tin mining areas in Belitung are attracting illegal miners, some of them are local people. The mining activities are even supported by the Local Government Regulation No.6 of 2001 about general mining which allowed local people to exploit the tin as long as they are fit in the specifications of the regulation. As such, both the tin-mining locations as well as the abandoned mining areas in Belitung can be easily seen across the island.

Situated in the coastal area of Belitung Island, Juru Seberang village is one of the onshore tin mining locations which has a large abandoned mining area. Although some of these areas have been developed into a community forest (HKM) planted with mangrove to rehabilitate the coastal area, there was a problem in the post-rehabilitation and management of mangrove. No sustainability system was provided to manage the mangrove forest and the local people were more interested in joining the tin mining activities rather than managing the community forest (HKM). As the results, the mangrove forest was neglected and the number of abandoned land has increased.

ICCTF in collaboration with Yayasan Terangi, and funded by USAID, intervened the issue by implementing "Belitung Mangrove Park Project", to transform ex-mining area into a Mangrove Tourism Park for Ecosystem Rehabilitation and Carbon Sequestration. Some significant impacts are currently can be seen from the project intervention, particularly for local economic and livelihood condition. For instance, there are reduction of abandoned mine land in the area as the local communities have become more active in reforestation and maintaining the Community Forest. Under the project, people are actively participating in the mitigation programs for the community forest

such as plantation of 6,000 mangroves, 4,500 nipah, and 4,500 ketapang; construction of forest watch tower; and development of solar panel tools and system. Other than that, they are also developing the Community Mangrove forest into an eco-tourism destination called Belitung Mangrove Park.

Belitung Mangrove Park has delivered a huge profit for the local people around the Belitung Mangrove Park. The data shows that from the entrance ticket they have received a total of IDR 50-65 million per month and also IDR 20 million at the end of 2018 from their cooperative (koperasi). Some local people who produce souvenirs and sell local foods are also receiving economic benefits from the visitors of Belitung Mangrove Park. In that regard, the project has indeed growing the economy of local people while also rehabilitating the mangrove forest and increasing carbon sequestration.

Project Preparation and Implementation Strategy. Stakeholder consultation was an integral part of the project preparation and implementation strategy. Yayasan Terangi, as the proponent of ICCTF in this project, developed several consultation and coordination sessions with local people, represented by the head of HKM Juru Seberang, as well as with the regent of Belitung.

Due to Belitung specificities, project's preference was given to activities that value the economic growth of local people, but also are responsible to the mangrove forest and ecosystem. Developing the mangrove forest as the eco-tourism destination was seen as the well-suited project for Belitung that might gain the interest of local people to actively participate in developing and sustaining the mangrove forest.

One of key factor for project sustainability is to gain support from communities, as well as local government. On the early period of the project, an institutional arrangement was set up through a Memorandum of Understanding (MoU) between Yayasan Terangi and HKM Juru Seberang. As HKM Juru Seberang is already a well-established community who manages the forest, it is clearly stated in the MoU that they are responsible to prepare, implement, and monitor the project together with Yayasan Terangi.

Experiences with Project Implementation. Both HKM Juru Seberang and Yayasan Terangi have extensive experiences in engaging local communities in the mangrove forest protection and management, also in drawing other institutions to participate in the project. After the kick-off project meeting, some local communities are keen to join the project, such as HKM Tanjung Rasa village, GAPABEL, and Keciput village. Other than that, several institutions are also participating in the project to support the construction of Belitung Mangrove Park's infrastructures, including Ministry of Public Works and Housing, Local Government Agency (Dinas) for Public Works and Housing, The Watershed Management Center (BPDAS), Local Government Agency (Dinas) for Environmental Affairs, and private sector, represented by PT.Timah. The budget allocation of the infrastructures construction from those institutes as project leverage is reaching a total of IDR 19.9 billion. Another point to add is since Belitung Mangrove Park has generated large amounts of money from the entrance fees, it has also contributed in the infrastructures construction.

B. Initiating A New Technology & Innovation

Climate Projection and Adaptation Strategy of System of Rice Intensification (SRI) Cultivation against Climate Change by the Integrated Climate-Crop-Soil-Water Model Approach in Nusa Tenggara Timur (NTT)

Nusa Tenggara Timur (NTT, or East Nusa Tenggara) is one of the provinces in the eastern Indonesia with most of the households are primarily employed in the agriculture sector. As their livelihoods are dependent on the agriculture sector, the uncertainty of the temperature and rainfall patterns that caused by the climate change might give a huge impact in the cultivation pattern and land productivity. A pre-study of the project by Department of Agriculture and Biosystems Engineering, Gadjah Mada University (FTP UGM) in 2018 mentioned that during the constant heat and low rainfall season, the farmers in NTT have to change their crops from paddy rice into other crops such as corn and nuts to prevent crop failure. It is because a limited source of water and uncertainty in the weather could lowering the quality of paddy rice and increasing the production cost for the water irrigation and chemical fertilizer. These people, thus, are facing a potential problem of losing income from the crop production failures due to the climate change.

Baumata village, as one of the villages that has a water spring spot in NTT, has been experiencing the problem of crop failure due to the climate change impacts. It is reported that from 2013-2015, the village struggled with drought and resulted in 34.5 ha crop fails out of 146 ha in 2015 due to the uncertainty of the temperature and rainfall patterns that caused by the climate change. Although there is a natural water spring in the village, it has not able to meet the water needs of farmers during the unpredictable season in the village of which 95% of people in the village are farmers. Therefore, securing water resource for the farming is essential in addressing the problem and a water saving technology is needed to adapt to the climate change.

System of Rice Intensification (SRI) with the field monitoring system or known as Smart Farming was introduced to the farmers in Baumata village through the “Climate Projection and Adaptation Strategy of System of Rice Intensification (SRI) Cultivation against Climate Change by the Integrated Climate-Crop-Soil-Water Model Approach in Nusa Tenggara Timur (NTT)” project. It is a farming system that needs less water input, less seeds, less production cost, less production time and has low emissions, but is able to increase land productivity by using the real-time field monitoring system that is integrating the climate-crop-soil-water model. There are 5 sensors installed in the field to monitor including solar radiation, rain gauge, anemometer humidity and air temperature, and soil moisture sensors. Every 30 minutes, the Field Router will collect and send the data and images to the server which can be accessed by the farmers through a website.

After a year of Smart Farming implementation in Baumata village, the crop production has increased as much as 3 ton/ha which is from 5-6 ton/ha to 8-9 ton/ha in one cultivation period. Tarus village, a village next to Baumata village, has also implemented the SRI and field monitoring system which is resulted in an increase of their paddy production about 5.6 ton/ha in the average in one cultivation period.

The success of Smart Farming system in increasing the crop production in NTT has been spread widely and replicated in other areas in Indonesia, such as in:

1. Situbondo regency, East Java
2. Malang city, East Java
3. Karanganyar regency, Central Java
4. Sleman regency, DI Yogyakarta
5. Gunungkidul regency, DI Yogyakarta
6. Sukabumi regency, West Java
7. Dompu regency, Nusa Tenggara Barat (NTB, or West Nusa Tenggara)
8. Siak regency, Riau

9. West Pasaman regency, West Sumatra
10. Dairi regency, North Sumatra

Project Preparation and Implementation Strategy. The project counted on good stakeholders' participation throughout the process and also cooperative working relations among the different stakeholders, including ICCTF, the Department of Agriculture and Biosystem Engineering, Gadjah Mada University (FTP UGM), The Artha Wacana Christian University (UKAW), Local Government Agency (Dinas) for Public Works and Public Housing, Local Government Agency (Dinas) for Agriculture, Center for River Basin Organization, Development Planning Agency at Sub-National Level, and farmer groups in NTT.

On the early period of the program, several meetings were organized with the stakeholders to introduce and discuss the project. As the field monitoring system is relatively new in Indonesia, formal and informal sessions to introduce and disseminate the information about the system are needed to implement the project. In addition to that, selecting and approaching the potential on-farm demonstration plot locations are also essential for the sustainability of the project.

Experiences with Project Implementation. Since relevant stakeholders have been actively involved in the process from the initial stages of the project, the implementation of the project is considered to have greatly engaged all stakeholders and has been successfully solving the problem. This is also added by the fact that other regions in Indonesia are replicating the smart farming system to their lands.

Another highlighted experience is to convince farmers to shift their conventional farming system to the smart farming system. An on-farm demonstration plot with the smart farming system was built next to a farm with the conventional farming system to show the excellence of smart farming system. At the beginning, a lot of farmers were skeptic with the results of the smart farming system. They, however, changed their opinions after the on-farm demonstration plot gave a better result than the conventional system farm.

C. Stimulating Local Government Initiative

Conservation of Nipa Palm Ecosystem and Buffer Zone Forest on Eastern Lamandau River Wildlife Sanctuary as the Allocation Area for Community Forest (HKm)

The local people in Tanjung Putri village, which is a village in the West Kotawaringin regency, have been doing the practice of slash and burn for decades to clear the land for planting the paddy and horticulture crops. However, started in 2012 there was a wind of change as some of the people became more interested in the palm oil plantation rather than only producing paddy and horticulture crops. This change was mainly caused by two main reasons. First, the uncertainty of temperature and rainfall patterns due to the climate change that lead to crop failure and lower quality as well as quantity of the crops, and second, the opening of private palm oil plantation in the village. As the result, some people started to open the lands in the village area and shifting their paddy and horticulture fields into the palm oil plantation to earn more income, while some are still practicing the slash and burn method for paddy and horticulture cultivation.

Increase number of the palm oil plantation along with the practice of slash and burn have indeed caused environmental and social problems, particularly for the local people. There was a huge forest fire in 2015 which adds to decades of existing deforestation by palm oil, timber, and other agribusiness operators in Kalimantan, and also a problem with clean water resource as the peat and Nipah forest in the village have changed into palm oil plantations. Due to these conditions, the villagers are having a problem with health issues and also struggling to find clean water resources which then push them to purchase clean water from another city. With the aim to help people facing those problems, ICCTF and Yayorin have introduced and developed the non-slash-and-burn practice to local people in Tanjung Putri village through a project of “Conservation of Nipah Palm Ecosystem and Buffer Zone Forest on Eastern Lamandau River Wildlife Sanctuary as the Allocation Area for Community Forest (HKm)”. Several trainings, capacity building workshops, and promotions were organized to support the local people in implementing the non-slash-and-burn method and provide them with economic opportunities in other sectors, such as fish farming and Nipah-based production. Some on-farm demonstration plots have also been arranged for cultivating paddy and horticulture crops in Tanjung Putri village by using the non-slash-and-burn practice.

Subsequently, the project has shown several good results as the 8 ha on-farm demonstration plot has become a protected area for the slash-and-burn practices and also has an increasing number of the paddy productivity from 2 ton/ha/year onto 5-6 ton/ha/year. In addition to that, there are new sources of income for local people who used to depend only on the agricultural cultivation through the fish farming (approx. IDR 2-3 million per 3 months) and the production of Nipah-based products (approx. IDR 300,000 per month).

The success of this project has attracted the local government to replicate the project on other areas in the regency. They have started to replicate and expand the 8 ha on-farm demonstration plot onto 2,000 Ha area of the non-slash-and-burn practice in the West Kotawaringin regency. The local government has further integrated the non-slash-and-burn system into their regional policy and forbid the practice of forest clearance by burning the forest in regency. As such, the project has indeed stimulating the local government to support the non-slash-and-burn method while also make a strong collaboration with the local people and other stakeholders in the area.

Project Preparation and Implementation Strategy. The project's preparation process undertook a thorough consultation with the local people of the project's location. By understanding the location's condition and finding the right approach to implement the non-slash-and-burn method, the project succeed in taking the local people's interest to participate in the project. Furthermore, there was also some capacity buildings and workshops to empower the participants before implementing the non-slash-and-burn method and developing local industries to maintain the project's sustainability.

Experiences with Project Implementation. In engaging the local government, some formal and informal meetings were organized to present the success story of the project. At first, ICCTF and Yayorin met with the Development Planning Agency at Sub-National Level which then was followed by approaching other local agencies in West Kotawaringin regency. Subsequently, they were invited to the on-farm demonstration plot to show both the results of the on-farm demonstration plot and local industries. These approaches were enforced to drive the local government in integrating the non-slash-and-burn method into the local regulation.

PROJECTS' LEVERAGE

After the projects implementation, it has been identified that the projects are able to provide enormous leverage for both the projects and the people in the projects' location. The initial 39 projects have generated a total of IDR 168,177,875,000 funds from various stakeholders who are interested in participating the projects, as well as other supports such as trainings, workshops, providing advocacy services, and extension agents. These supports, indeed, are also valuable for the local people to adapt to the climate change and to be resilient. As the climate change impacts have been contributed to the environmental and social problems, local people from the most of the programs have been happily collaborated and participated in the projects.

The highest leverage comes from the project in Gorontalo with Center for Public Policy Transformation (Transformasi) as ICCTF's proponent, which is "Organizational capacity building for local government to support the integration of climate change and greenhouse gases adaptation and mitigation into the Regional Development Plans". ICCTF-USAID has invested a total of IDR 1 billion for the project, which then motivated the local government of Gorontalo to put in more funds into the project. It has been recorded that there are IDR 113,000,000,000 funds from Regional Revenue and Expenditure Budget (APBD) of Gorontalo in 2017-2018 allocated for the climate change adaptation activities in the Regional Medium-Term Development Plan (RPJMD) of Gorontalo.

The next projects which has high leverages are the project of "Belitung Mangrove Park: Re-constructing the Abandoned Mine Land as a Mangrove Park for the Ecosystem Rehabilitation and Carbon Sequestration" with Yayasan Terumbu Karang Indonesia (Terangi) as the proponent and "Climate Projection and Adaptation Strategy of System of Rice Intensification (SRI) Cultivation against Regional Climate Change by integrated climate-crop-soil-water model approach in East Nusa Tenggara" with Faculty of Agricultural Technology, Food and Agricultural Product Technology of Gadjah Mada University as the proponent. The first project is reported to have attracted IDR 19,905,000,000 funds from multiple stakeholders with only IDR 2,000,000,000 as the initial budget from ICCTF-USAID, while the later project has received IDR 12,000,000,000 funds from multiple stakeholders with only IDR 1,000,000,000 funds from ICCTF-USAID.

Another project that is interested to highlight is the project of "Using Biogas to Provide Households with Energy and to Support the Environmental Conservation Movement" with Perkumpulan Sesami as the proponent. This project has presented multiple values to cope with the problems of environment, social, and economic through the implementation of bio-slurry and bio-gas methods in the household level. In the end, this project has resulted in the energy independence at the household level; ability to produce organic fertilizer for agriculture use and also to support the rehabilitation of ex-mining land; and increasing people awareness in preserving the nature.

FINANCIAL OVERVIEW

PROGRAM	BUDGET PROPOSED	EXPENDITURE					
		2015	2016	2017	2018	2019	TOTAL
Component 1	42,165,000,000	-	5,551,900,764	15,863,654,033	17,578,910,486	3,170,534,718	42,165,000,000
Component 2	14,055,000,000	-	3,444,474,635	4,588,166,526	3,527,957,283	2,494,401,555	14,055,000,000
Component 3	7,109,820,548	115,151,021	1,099,987,458	1,959,081,564	2,065,798,084	1,869,802,421	7,109,820,548
Component 4	6,945,179,452	173,162,400	3,695,251,798	2,400,818,483	675,946,771	-	6,945,179,452
TOTAL	**70,275,000,000**	**288,313,421**	**13,791,614,655**	**24,811,720,606**	**23,848,612,624**	**7,534,738,693**	**70,275,000,000**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