ADAPTATION FUND

PROJECT PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT INFORMATION

Project Category:	Small-Sized Project
Country:	Indonesia
Title of Project:	**Reducing vulnerability and increasing the adaptation capacity of community through the improvement of irrigation management system and sustainable agricultural practices in responding to climate change impacts in lowland and estuary area in sub-district of Muara Sugihan and Air Sugihan, South Sumatera.**
Type of Implementing Entity:	National Implementing Entity
Implementing Entity:	Kemitraan (Partnership for Governance Reform)
Executing Entity/ies:	Penabulu Alliance (Yayasan Penabulu, Yayasan Relung, Yayasan Depati and Yayasan Bina Vitalis)
Amount of Financing Requested:	USD 1,002,101

A. PROJECT BACKGROUND AND CONTEXT

Indonesia is very vulnerable to climate change effects. With 17.504 islands, the impact of sea level rise, rainfall patterns changes and extreme climate are the main problems. The intensity and frequency of extreme climate, the risk of floods during the rainy season and drought during the dry season will increase. This will have an impact on the sectors of water resources, agriculture and forestry, fisheries, health and infrastructure. Land subsidence, sea level rise, floods, droughts, avalanche and forest fires have been felt as a destructive and detrimental disaster for Indonesia. To avoid multiple impacts of natural disasters, adaptation actions at national and regional levels become very necessary.

The level of climate change vulnerability is determined by indicators that affect exposure, sensitivity, and adaptive capacity of a system. These three factors change according to time in line with the implementation of development activities and adaptation. The level of exposure and sensitivity can be reflected by biophysical and environmental conditions, as well as socio-economic conditions.

Based on SIDIK data (Source of 2011 PODES data), from 77,961 villages in Indonesia, 2.507 (3%) were categorized as Very Vulnerable, 2.433 (3%) are Vulnerable, 31,875 (41%) are quite vulnerable, 32,999 (42%) are rather vulnerable, and 8,146 (8%) are not vulnerable. From these data it can be concluded that almost half of the villages in Indonesia have a high risk of vulnerability.[1]

1. Vulnerability Caused by Climate Change in South Sumatra

Climate change causes increased vulnerability to lowland and coastal areas. Upstream areas and degraded watersheds coupled with extreme rainfall have caused lowland and coastal areas experiencing severe flooding. This is compounded by the rise in sea level which causes the lowlands and coastal areas become more vulnerable to flood puddle.

The province of South Sumatra has specific characteristics, where most of its territory is lowland and has a high degree of exposure to climate change, in particular the threat of water-logging in coastal areas caused by the combination of rising sea levels, sea waves, and La-Nina phenomena at the maximum tide.

[1] Data Information System Vulnerability Index: Jakarta. Directorate General of PPI-Ministry of Environment and Forestry 2015

Vulnerability to ecological disasters caused by climate change approaches the South Sumatra region at each season change. Flooding is the most important problem to immediately find a solution and prevention because the impact in several districts and cities is starting to worry. This certainly needs attention so that the development process can continue by considering the possibility of ecological disasters caused by climate change.

Climate change as a global warming implication caused in two main things, namely high rainfall fluctuations and sea level rise. As an archipelagic country, Indonesia is most vulnerable to sea level rise. Climate change projections for the Indonesian region show sea level rise cause the loss of coastal areas and small islands. South Sumatra Province has a coastal area that has a high extent of vulnerability to sea level rise. Based on projection that is carried out using 3 scenarios, namely a combination of extreme waves, La Nina, and storm surge; sea level can reach a height of 276.9 cm in 2030.The change in sea level will certainly have consequences on many things that lead to economic, social and environmental losses. If we look at the RTRW Space Pattern of South Sumatra, it can be seen that spatial planning is still not adaptive to the potential possibility of sea level rise caused by climate change.

If it is projected on the Spatial Plan Space Pattern, sea level rise will cause some areas to be submerged by sea, especially in lowland areas which dominate the South Sumatra. There are risks in some spatial patterns such as Plantation, Wetland Agriculture, Nature Reserve Forests, Protection Forests, Dryland Agriculture, Production Forests, Land Fisheries, Settlements, Tanjung Api-api Area, Other Usage Areas and road infrastructure will be submerged by sea. The spatial pattern requires re-planning by estimating danger of sea level rise to avoid the potential considerable losses in South Sumatra Province. According to the SIDIK data, South Sumatra is a relatively vulnerable province with the highest number of villages among other provinces (349 villages).

2. Climatology Conditions of South Sumatra

Analysis results generally show that South Sumatra has a wet climate, where the area is boundary between monsoon patterns characterized by one rainy period peak and an equatorial pattern characterized by two rainy period peaks. Data around Palembang shows two rain peaks that differ in magnitude, in December-January (around 300-450 mm) and in March (250-350 mm). The data also shows that rainfall in the last 50 years (1951-2008) has more varied magnitude than the previous period.

Geographically, the rainfall pattern is generally same for the entire South Sumatra region. There is little difference in mountainous areas in the Northwest region where rainfall is relatively high throughout the year, so the dry season becomes less apparent. On the other hand, the average air temperature is around 27°C for Palembang and around 26°C for the average in the entire South Sumatra region. The global warming impact in South Sumatra can be caused by an upward trend over the past 25 years of 0.31°C around Palembang and 0.67°C on average across South Sumatra. Nevertheless, this number may be influenced by various factors such as systematic errors in measurement and local changes such as the effects of urban heat islands and regional climate shifts, because if seen in the 50 and 100 years period, the increase is very small only counted around -0.12-12.03°C/century. This rainfall pattern is confirmed by data around Singapore.

Thus the study of climate change in the South Sumatra region is more focused on rainfall variability patterns. But different from temperature, changes in rainfall cannot be approached in a linear trend. The inter-decadal study of variability from 1951 to the present shows that around 1965-1970 was a relatively very wet period, while the 1990s were least rainfall period. The variability trend of inter-decade rainfall has been tried to be predicted until 2020 with an empirical model. Judging from variation components between decades, the average rainfall of this decade is not classified as extreme conditions. However, the current hazard climate is more due to inter-annual climate variability and extreme rainfall.

Rainfall change projection shows an insignificant change of rainfall patterns until the 2050s although fluctuations still occur for several times. These results also show that the potential threat of climate hazards until 2030s is still dominated by climate uncertainty caused by inter-annual variability of rainfall. In South Sumatra, extreme rainfalls on daily scale are also a danger threat that needs to be analyzed. In this case, the probability of accidence is very dense (the definition of BMKG: more than 100 mm/day) can be calculated.

Although the rainfall projection from the IPCC-AR4 model is only done for monthly data, from the correlation analysis between daily and monthly rainfall it can be seen that the months with accumulated rainfall between 250-400 mm have the highest chance of extreme rainfall. The projection results show that the odds of extreme rainfall on average are relatively unchanged in 2020-2030s period relative to current conditions (2010s), but actually increased compared to previous period (1991-2000s).

3. Oceanographic Conditions in South Sumatra

The dynamic general conditions of sea levels and currents on the east coast of South Sumatra (including the Bangka Strait) are analyzed from several oceanographic models such as HYCOM and FVCOM. During the Asian monsoon, the current of sea surface is heading south, with a maximum of 30 cm/second in January; on the contrary, during the Australian monsoon, the surface currents turned northward at lower speeds. While the influence of currently tidal is quite significant in the Bangka Strait, especially the rising functions at the Musi River mouth/estuary when the water is heading down. As a result of the monsoon pattern, sea surface temperatures have a seasonal cycle, where up to maximum increases occur in May given the intense solar warming and low surface wind, and vice versa run into a decline towards the minimum in January. The factor that a lot of influences sea surface temperature is transport of sea water masses from the Pacific Ocean through the South China Sea.

The trend of rising sea surface temperatures around the east coast of South Sumatra ranges from 0.02oC/year which is equivalent to the average value in all Indonesian waters. The sea level rise is reconstructed using the SODA (Simple Ocean Data Assimilation) model, where the increase rate on the east coast of South Sumatra ranged 0.3 mm/year between 1871 and 2008. Through a combination of ROMS (Regional Ocean Modeling Systems) and SODA models, in the period 1960-2008 the rate of sea level rise became 1mm/year. The next satellite altimeter observes the rate of sea level rise of 4.1 mm/year since 1993.

Forward estimation, the rate of sea level rise based on the altimeter, model, and tidal data ranges between 0.5-0.7 cm/year. The projection of sea level rise in 2030 is 13.5 ± 6.15 cm relative to sea level in 2000. Among these values, 6-15 cm is the result of ice melting contributions estimated by the HYCOM and ECCO models. Extreme events also influence sea level rise such as the occurrence of the La-Nina phenomenon (influence of the Pacific Ocean) which can cause an increase of 15 cm to the sea level under normal conditions. In the future, the La-Nina phenomenon is predicted to be longer and often occur which can result in higher sea waves, greater wind speed, besides increasing sea level. ENSO projections which include the phenomenon of El-Nino and La-Nina based on SRES a1b scenario show that both will occur almost every year interspersed with normal conditions in 2013/2014, 2021/2022 and 2027/2028. The occurrence probability of La-Nina, El-Nino, and normal conditions is about 55%, 30% and 15%. Significant waves on the east coast of South Sumatra rises in the Asian monsoon around December-January, and declined in the Australian monsoon in May. According to satellite altimeter records, high waves that have occurred around 2.5 m in 2000, 2001 and 2007 are estimated to be caused by the strengthening of La-Nina and El-Nino, which is accompanied by a lack of influence on IOD (Dipole Mode from the Indian Ocean).

4. Project Targeted Location

Among 15 districts/cities in South Sumatra Province, only two districts have coastlines or are bordered by sea water, namely **Ogan Komering Ilir (OKI)** and **Banyuasin**. However, the danger of coastal flooding triggered by climate change stimuli can reach six districts/cities by 2030, namely Banyuasin, Muara Enim, Musi Banyuasin, Ogan Ilir, OKI, and Palembang[2]. The Project will located around **the estuary of Musi River and Sugihan River,** in Muara Sugihan sub-district, Banyuasin District and Air Sugihan sub-district, Ogan Komering Ilir District which is one of the areas with high to very high vulnerability to the effects of climate change in South Sumatra referring to the results of study conducted by the Ministry of Environment 2012. The study above is in accordance with SIDIK data where Banyuasin and Ogan Komering Ilir (OKI) are the districts with the most number of vulnerable villages among other districts in South Sumatra Province.

[2] Risk Assessment and Adaptation to Climate Change: Tarakan City, South Sumatra and Malang Raya, Ministry of Environment 2012

Complete data on village classification based on vulnerability level in South Sumatra Province by District presented below[3]:

Table 1: Number of Vulnerable Villages in South Sumatra Province

No	District	Vulnerability Level					Total Villages
		1	2	3	4	5	
1	District of Banyu Asin	3	76	151	1	73	304
2	District of Empat Lawang		57	79		20	156
3	City of Lubuklinggau	7	12	53			72
4	City of Pagar Alam		16	18		1	35
5	City of Palembang	13	4	82	6	2	107
6	City of Prabumulih	1	12	24			37
7	District of Lahat	12	234	119		11	376
8	District of Muara Enim	4	97	206		19	326
9	District of Musi Banyuasin	19	37	164	3	13	236
10	District of Musi Rawas	10	111	132		24	277
11	District of Ogan Ilir	5	113	68		55	241
12	District of Ogan Komering Ilir	9	102	142	1	56	310
13	District of Ogan Komering Ulu	6	51	88		9	154
14	District of Ogan Komering Ulu Selatan	4	84	116	2	53	259
15	District of Ogan Komering Ulu Timur	19	77	187		13	296
	Total	112	1083	1629	13	349	3186

Based on the conditions consideration above, the Project location is determined in 2 locations, **Muara Sugihan sub-district (Banyuasin District)** and **Air Sugihan sub-district (Ogan Komering Ilir District)**. Muara Sugihan sub-district has 71,956.55 km2 areas, consisting of 22 villages and has a population of 41,085 people, 21,255 men and 19,830 women. Whereas Air Sugihan sub-district has 2593.51 Km2 areas and consists of 19 villages with a population in 2017 around of 36,098 people consisting 18,706 men and 17,392 women. The population in this area works as farmers and planters and some work as employees in factories or industries. The composition of the population is dominated by young and productive age groups and few are elderly. Wetland agriculture is the main potential of community's economy. In Air Sugihan sub-district there are 22,170 km2 areas of rice fields (BPS, 2017). Besides agricultural crops, the community also cultivates a variety of vegetable crops; the types of vegetables grown are beans, chili, cucumber and eggplant.

Muara Sugihan sub-district in Banyuasin District consists of 22 villages namely: (1) Daya Murni, (2) Daya Bangun Harjo, (3) Sumber Mulyo, (4) Margo Mulyo, (5) Sugih Waras, (6) Indrapura, (7) Cendana, (8) Argo Mulyo, (9) Rejosari, (10) Tirto Harjo, (11) Daya Kusuma, (12) Margo Rukun, (13) Ganesha Mukti, (14) Gilirang, (15) Tirta Mulyo, (16) Beringin Agung, (17) Jalur Mulya, (18) Timbul Jaya, (19) Juru Taroh, (20) Kuala Sugihan, (21) Sido Makmur And (22) Mekar Jaya. **Air Sugihan sub-district** in Ogan Komering Ilir District consists of 19 villages namely: (1) Sungai Batang, (2) Bukit Batu, (3) Rengas Abang, (4) Simpang Heran, (5) Banyu Biru, (6) Pangkalan Sakti, (7) Rantau Karya, (8) Nusakarta, (9) Srijaya Baru, (10) Jadi Mulya, (11) Suka Mulya, (12) Mukti Jaya, (13) Kertamukti, (14) Negeri Sakti, (15) Pangkalan Damai, (16) Nusantara, (17) Bandar Jaya, (18) Tirta Mulya, And (19) Marga Tani.

In the plantation cultivation activities, there are 4 main types of commodities, namely rubber, coconut, oil palm, and coffee. Production results from BPS 2017 data, rubber can produce (256 tons), coffee (108 tons), and palm oil can produce the largest yield (18,434 tons). In addition, the community also cultivates livestock such as cattle, goats, chickens and ducks. In its development the community also penetrated the mangrove forest area for fish farming activities with a pond system.

[3] Data Information System Vulnerability Index: Jakarta. Directorate General of PPI-Ministry of Environment and Forestry 2015

The Project targeted area borders the eastern coast of Sumatra (Bangka Strait) in the northeastern part. It is very wide lowland with an average height of 7 meters above sea level. The real effect of this climate change impact is disruption of community's livelihood system. Most of people in this area are wetland farmers (swamps) who are very at flooding risk in rainy season and drought in dry season. The current system and irrigation infrastructure have not been able to meet the community's irrigation needs. The existing irrigation infrastructure has been built since the 1980s, but caused by changes in hydrology; the infrastructure and facilities cannot function optimally.

The management of swamp irrigation in this area is the authority of the central government authority, the provincial government, and also the district government. Until now, this authority division has not been followed by adequate coordination in managing the potential of existing wetlands. The following is an irrigation map and its area. The farming system on tidal land is very different from other agricultural land. Farming is an attempt to allocate resources such as land, labor, capital, and management effectively and efficiently with the aim to produce output greater than input (Luntungan, 2012).Production on tidal farms is highly dependent on land and water management systems. Farming systems in wetlands require integrated farming, especially for land management and micro-governance which are the success determinants of farming in wetlands.

The character of wetland processing is also very different from the irrigated land in Java and Bali. Wetland fertility rates are lower compared to irrigated rice fields. This land typology has a water source that can influence on management techniques. According to Widjaja et al (1997), the character of soil and water in wetlands are related to acid sulphate soils with pyrite compounds, peat soils, large and small tides, into groundwater, and acidity of water that inundates the land. Therefore, wetland management must pay attention to soil and water management. The purpose of it is to regulate the optimization of land resource utilization (Widjaja et al., 1997).

Maximizing the wetland agricultural production results must be supported by maintaining the sustainability of the land ecosystem itself. Conservation is carried out by implementing a sustainable farming system using organic materials. The use of organic fertilizers and pesticides is expected to reduce the use of chemical fertilizers and pesticides. Many farmers are only able to harvest once a year and are even at risk of falling on crop failure caused by flooding. As a result, many people have switched to pond fisheries sector by cutting down mangrove forests which has resulted in mangrove ecosystems destruction. It is also increases vulnerability to sea level rise, coastal abrasion and tsunami risk.

The context of climate change vulnerability in this region can be described in the following scheme:

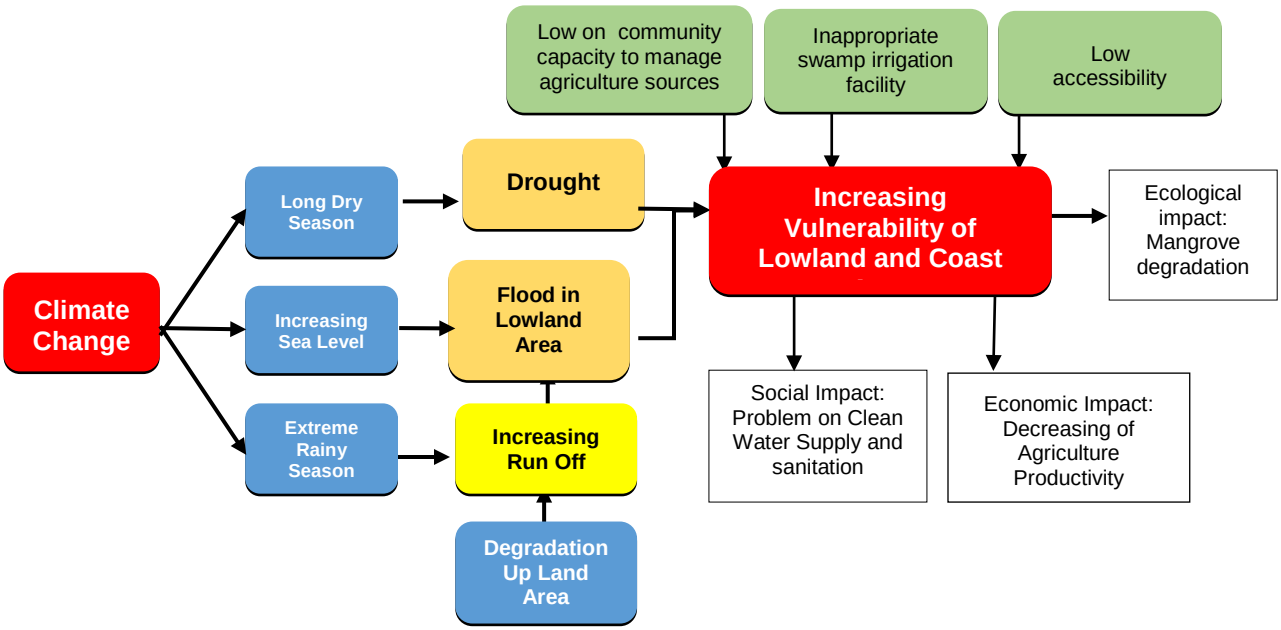


Figure 1: Vulnerability schemes to climate change that exist at the Project site

Based on the scheme above, vulnerability at the Project location are multidimensional. Strengthening from the community and also the government is needed. In addition, to help the community in technical matters, institutional strengthening is also needed, especially related to the management of irrigation networks. Support is also needed physically related to the repair of irrigation facilities. In addition, policy support from the regional government and the central government is also needed to optimize existing potential. Mangrove forests that are undergoing degradation also need to be considered to maintain natural protection systems and this can be combined by increasing the variety of community income sources through a sustainable agriculture development scheme.

B. PROJECT OBJECTIVES

Project Goals is to reduce the vulnerability and to increase the adaptation capacity of community through the improvement of irrigation management system and sustainable agricultural practices in responding to climate change impacts in lowland and estuary area in sub-district of Muara Sugihan and Air Sugihan, South Sumatera.

Objective 1: Assessment and mapping of risk and vulnerabilities caused by climate-related hazards and threats in estuary area of Musi River and Sugihan River in sub-district of Muara Sugihan and Air Sugihan ***(Baseline Data and Knowledge)***,

Objective 2: Strengthening the adaptive capacity of village, sub-district and district government in targeted area in South Sumatera to reduce risks associated with climate-induced socio-economic and environmental losses ***(Government Capacity)***,

Objective 3: Strengthening the community awareness and participation in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in adaptation and climate risk reduction measures ***(Community Engagement)***,

Objective 4: Diversification and strengthening livelihoods of vulnerable communities in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in relation to climate change impacts, including variability ***(Community Livelihood),***

Objective 5: Increasing the resilience of lowland and coastal ecosystem in estuary area of Musi River and Sugihan River in response to climate change and variability-induced stress ***(Ecosystem Resilience)***,

Objective 6: Improving the policies and regulations related to irrigation management system and agricultural practices in South Sumatera that promote and enforce climate resilience ***(Policy and Governance)***.

The six Project objectives above is an integral part which are inseparable to one another and together contribute to the Project goal to reduce vulnerability and to increase the adaptive capacity of community through the improvement of irrigation management system and sustainable agricultural practices in responding to climate change impacts in sub-district of Muara Sugihan and Air Sugihan, South Sumatera and can be presented in the following figure:

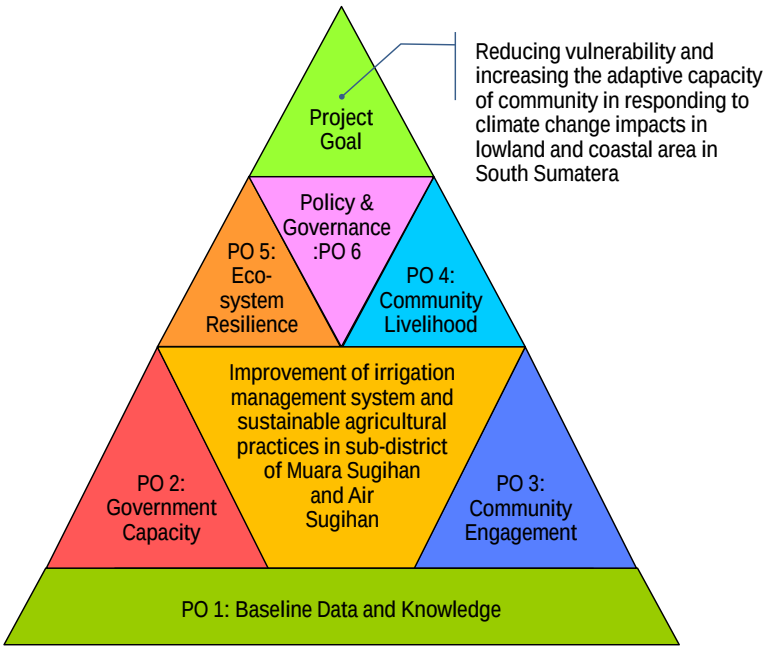


Figure 2: Inter-relation among Project Objectives/ Components and contribution flow to Project Goal

C. PROJECT COMPONENTS AND FINANCING

The details of the expected outcome and output accompanied with budget indications per Project component are presented as follows:

Table 2: Project Components and Financing

Project Components	Expected Outcomes	Expected Concrete Outputs	Amount (US$)
1. Baseline Data and Knowledge	1.1. Risk and vulnerabilities caused by climate-related hazards and threats are assessed and mapped.	1.1.1. Risk and vulnerabilities caused by climate change, including socio-economic and environmental aspects of vulnerability are participatory assessed. 1.1.2. Action research of the impact of climate change on irrigation infrastructures, irrigation management system and agriculture practices are conducted.	$82,808
	1.2. The levels of adaptive capacity of climate change, including the availability of early warning systems are assessed.	1.2.1. Policy and regulation at village, sub-district, district, and province level related to climate change adaption are assessed and mapped. 1.2.2. Climate-related of local/indigenous knowledge and community-based monitoring system of risk and vulnerabilities caused by climate-change are assessed.	
	1.3. Climate-related data are well managed and socialized to the wider community.	1.3.1. Climate related data management systems are developed in coordination with other key stakeholder. 1.3.2. Project best practices and lesson learned are documented, published and disseminated.	
2. Government Capacity	2.1. Developed strategy of climate change adaptation and adopted into a regular government planning cycle.	2.1.1. Sub-district and village level of spatial map and governance system are developed. 2.1.2. Landscape and sub-district level of climate change adaptation strategy and action plan are developed. 2.1.3. Increased quality of village planning, which consider the aspects of disaster risk reduction, food security and sustainable agriculture, and water management.	$62,106
	2.2. Strengthened capacity of village, sub-district and district government apparatus to reduce risks associated with climate-induced socio-economic and environmental losses.	2.2.1. Improved capacity of village and sub-district apparatus in the formulation of policy and regulation related to climate change adaptation. 2.2.2. Improved capacity of village and sub-district apparatus in the budget allocation/resource management and mobilization related to climate change adaptation.	
3. Community Engagement	3.1. Strengthened community awareness and participation in adaptation and climate risk reduction measures.	3.1.1. Developed the Climate Change Adaption Multi-stakeholder Forum at landscape level, covering 2 sub-districts of Project targeted area. 3.1.2. Community participation in landscape and sub-district level of climate change adaptation strategy and action plan (see 2.1.2.).	$227,721
	3.2. Strengthened community adaptive capacity in climate risk reduction measures.	3.2.1. Village regulation on sustainable-use of natural resources and climate change adaptation are developed. 3.2.2. Increased capacity of farmer institution, in the aspect of management, good and adaptive agriculture practices, access to finance and sustainable market. 3.2.3. Irrigation infrastructures are revitalized through community-based cash for work mechanism. 3.2.4. Community-based and integrated irrigation management systems are developed.	

Project Components	Expected Outcomes	Expected Concrete Outputs	Amount (US$)
4. Community Livelihood	4.1. Strengthened livelihoods of vulnerable communities in relation to climate change impacts, including variability.	4.1.1. Developed integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries. 4.1.2. Developed agrosilvofisheries system in mangrove area and agroforestry system in terrestrial.	$186,317
	4.2. Diversified and enhanced livelihoods of vulnerable communities.	4.2.1. Developed new models of community livelihood of post harvesting/processing stages, particularly for women and youth group. 4.2.2. Developed community or village-owned enterprises and cooperatives.	
5. Ecosystem Resilience	5.1. The essential areas are conserved in order to maintain the ecosystem services and ecosystem carrying capacity.	5.1.1. Delineated and developed community-based conservation area. 5.1.2. Developed village regulation of community-based conservation area. 5.1.3. Developed conservation partnership schemes between corporation and village/communities.	$144,913
	5.2. Improved ecosystem condition affected by climate change.	5.2.1. Restoration of degraded mangrove and coastal forest area are conducted. 5.2.2. Restoration and plant enrichment of degraded upstream and watershed areas are conducted.	
6. Policy and Governance	6.1. Improved policies and regulations and enforce climate resilience.	6.1.1. Improved capacity of related institution to develop climate change adaptation policies, strategies and activities. 6.1.2. Developed cross-sectoral governance to optimize the irrigation infrastructures system.	$124,211
	6.2. Developed climate change monitoring system which enforces climate resilience.	6.2.1. Promoted and established climate change monitoring system at district and provincial level. 6.2.2. Established community-based climate change adaptation learning system at sub-district and village level.	
7. Project Execution Cost[4]			**$87,742**
8. Total Project Cost			**$835,854**
9. Project Cycle Management Fee charged by the Implementing Entity[5]			**$78,506**
Amount of Financing Requested (USD)			**$1,002,101**

D. PROJECTED CALENDAR

The proposed indicative milestones of the Project are as follows:

Table 3: Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	1 January 20X1
Mid-term Review	January 20X2
Project Closing	31 December 20X2
Terminal Evaluation	December 20X2

[4] **Project Execution Cost (7)** is calculated at 8.5% of Total Project Cost (8) and will be managed by Penabulu Alliance as Executing Entity.

[5] **Project Cycle Management Fee charged by the Implementing Entity (9)** is calculated at 9.5% of Amount of Financing Requested and will be managed by Kemitraan (Partnership for Governance Reform) as Indonesia National Implementing Entity.

PART II: PROJECT JUSTIFICATION

A. PROJECT COMPONENTS DESCRIPTION

As described in Part I.B, the six Project objectives/component below is an integral part which are inseparable to one another and together contribute to the Project goal **to reduce vulnerability and to increase the adaptive capacity of community through the improvement of irrigation management system and sustainable agricultural practices in responding to climate change impacts in sub-district of Muara Sugihan and Air Sugihan, South Sumatera**:

Component 1: Baseline Data and Knowledge

Objective: Assessment and mapping of risk and vulnerabilities caused by climate-related hazards and threats in estuary area of Musi River and Sugihan River in sub-district of Muara Sugihan and Air Sugihan.

Expected Outcome and Output:

1.1. Risk and vulnerabilities caused by climate-related hazards and threats are assessed and mapped.

1.1.1. Risk and vulnerabilities caused by climate change, including socio-economic and environmental aspects of vulnerability are participatory assessed.

1.1.2. Action research of the impact of climate change on irrigation infrastructures, irrigation management system and agriculture practices are conducted.

1.2. The levels of adaptive capacity of climate change, including the availability of early warning systems are assessed.

1.2.1. Policy and regulation at village, sub-district, district, and province level related to climate change adaption are assessed and mapped.

1.2.2. Climate-related of local/indigenous knowledge and community-based monitoring system of risk and vulnerabilities caused by climate-change are assessed.

1.3. Climate-related data are well managed and socialized to the wider community.

1.3.1. Climate related data management systems are developed in coordination with other key stakeholder.

1.3.2. Project best practices and lesson learned are documented, published and disseminated.

Process and preparation of climate change adaptation strategy for a particular area must begin with understanding of local knowledge and area characteristics both biophysically and sociologically related to the lives of people living in the region. This component activity will explore and measure various aspects that influence efforts to improve community resilience to climate change. Various aspects of socio-economic characteristics will be explored at the beginning of Project to find out Project effects on this issue later. It is important to understand how people use and manage resources to meet their needs.

Sociologically, it needs to be understood about the history of their social and economic life. By doing so, it can be explored about social problems and future life challenges that must be faced by the community at the Project location. Historically, most of the people who lived in the Project location are transmigration communities from Java who came in 1980s.Through this Project it is expected that rice production areas will emerge in South Sumatra by utilizing the vast potential of wetlands and tidal land. Therefore the government has prepared sufficiently massive irrigation infrastructure in this region even though its development is not functioning optimally. It is also need to be explored about the community social capacity in managing existing potential and infrastructure. Area biophysical information and data need to be understood and explored to support the development of climate change adaptation strategy in an area. By examining this aspect, a number of important things can be explored and become the basis for strategic decision making, such as: locus and distribution of natural disasters impact (floods and droughts) caused by climate change, environmental degradation, or specific things such as biosynthesis factors for crop failure.

Methodology/Approach: The observation and assessment will be carried out in a participatory and action research approach, where experts and community will compile a research design and make observations together. This is intended to use the assessment and research process as part of awareness and knowledge development process of community. The action research approach will be carried out by managing demonstration plots, both in the fields of food crop production, livestock and fisheries. Demonstration plots will be a common object between researchers with scientific backgrounds and communities who will use research findings. Action research can also be applied in terms of reviewing existing irrigation facilities management systems. How their management practices are implemented and their impacts will be assessed together with the community.

Table 4: Research Scope and Data Needed

Research Scope	**Data Needed**
Assess risk and vulnerabilities caused by climate change, including socio-economic and environmental aspects.	• Village history and changes • Social problems • Economic problems and challenges • Land distribution and ownership • Agribusiness analysis (C/B analysis): crops, livestock, fisheries • Cultivation problem analysis • Market analysis
Conduct action research of climate change impacts on irrigation infrastructures, irrigation management system and agriculture practices.	• Flood impacted area • Drought impacted area • Vulnerable area from aberration • Number of household impacted and threatened by flood and drought • Sanitation and drainage condition • CC impact on irrigation infrastructure • Irrigation facilities damages
Assess and map policy and regulation at province, district, sub-district, and village level related to climate change adaption.	• List of policy related to climate in province and district level • List of Government programs and initiatives related to CC adaptation in province and district level • List of policy, program or initiative of village government related to CC adaptation

Component 2: Government Capacity

Objective: Strengthening the adaptive capacity of village, sub-district and district government in targeted area in South Sumatera to reduce risks associated with climate-induced socio-economic and environmental losses.

Expected Outcome and Output:

2.1. Developed strategy of climate change adaptation and adopted into a regular government planning cycle.

2.1.1. Sub-district and village level of spatial map and governance system are developed.

2.1.2. Landscape and sub-district level of climate change adaptation strategy and action plan are developed.

2.1.3. Increased quality of village planning, which consider the aspects of disaster risk reduction, food security and sustainable agriculture, and water management.

2.2. Strengthened capacity of village, sub-district and district government apparatus to reduce risks associated with climate-induced socio-economic and environmental losses.

2.2.1. Improved capacity of village and sub-district apparatus in the formulation of policy and regulation related to climate change adaptation.

2.2.2. Improved capacity of village and sub-district apparatus in the budget allocation/resource management and mobilization related to climate change adaptation.

Village government has very important role in the people lives in Indonesia today, Village Law provides large and broad authority including in terms of budget. Therefore the community ability to deal with climate change effects will depend on village government ability to carry out its duties and authorities. So this Project will enhance the ability of village governments to support communities in increasing resilience to climate change. In this case the village government needs to be supported by the ability to provide village profile data, planning capacity and also develop village policies. However, in managing a potential vast wetland and interconnected villages cannot do it in fragmented way. Villages in Muara Sugihan and Air Sugihan Sub-districts are connected with a wetland hydrological system that influences each other. Besides strengthening at the village level, inter-village policies must also be developed. The sub-district government will play an important role in coordination and integration among villages.

District governments also need to increase their capacity in developing adaptation strategies for the climate change impacts. This is due to low level of knowledge and awareness of government apparatus on climate change and its impacts, especially in vulnerable areas. Policies at district level are still not sensitive and responsive to climate change dynamics that occur globally and have had an impact on communities in the region. This Project will facilitate strengthening the apparatus capacity at district level on climate change and its impacts, while facilitating them in developing policies and development programs that support adaptation to climate change effects. Strengthening the government capacity is not only facilitating them to get new knowledge. Lack knowledge of region government apparatus of climate change and its effects makes them not creative in arranging projects and allocating budgets that support community adaptability. This Project will strengthen the village and district government in developing programs and initiatives while developing a development budgeting system that supports community adaptation improvement to the climate change effects.

Methodology/Approach: This component development will be carried out in conventional ways in the form of knowledge transfer through training combined with direct practice. The question practice is action when and after training in formulation of regulations, policies, programs and budget allocations. Thus this component will produce a set of policies, rules, work programs or government budget allocations that can be implemented and have a direct effect on improving people's adaptability.
Policy development is not limited to the definition of a village policy but will be developed on a rural scale or landscape scale. The landscape approach will result in management of wetland ecosystems at village and supra-village level which involve and are supported by many parties.

Component 3: Community Engagement

Objective: Strengthening the community awareness and participation in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in adaptation and climate risk reduction measures.

Expected Outcome and Output:

3.1. Strengthened community awareness and participation in adaptation and climate risk reduction measures.

- 3.1.1. Developed the Climate Change Adaption Multi-stakeholder Forum at landscape level, covering 2 sub-districts of Project targeted area.
- 3.1.2. Community participation in landscape and sub-district level of climate change adaptation strategy and action plan (see 2.1.2.).

3.2. Strengthened community adaptive capacity in climate risk reduction measures.

- 3.2.1. Village regulation on sustainable-use of natural resources and climate change adaptation are developed.
- 3.2.2. Increased capacity of farmer institution, in the aspect of management, good and adaptive agriculture practices, access to finance and sustainable market.
- 3.2.3. Irrigation infrastructures are revitalized through community-based cash for work mechanism.
- 3.2.4. Community-based and integrated irrigation management systems are developed.

Community awareness and ability are the main keys to resilience of climate change. But the community has a fundamental problem in this regard, namely the lack of knowledge and understanding of climate change itself. Even though the impact of climate change has actually affected their daily lives, rural and coastal communities have not been able to connect the actual conditions with global changes, especially about global warming and climate change. As a result of lack knowledge about climate change and its impacts, rural and coastal communities are not able to formulate adequate adaptation strategies. On the other hand, this Project believes that rural communities are actually able to formulate adaptation strategies according to their living conditions. So, this Project will develop activities and methods that will raise people's ability to develop adaptation strategies.

Methodology/Approach: This component will be implemented with a multidimensional approach. Communities need to be strengthened from various aspects such as managing farmer organizations, knowledge of techniques for food production that are environmentally friendly, and concern for the protection of nature. One of the environmental awareness that must be developed is that the people live in an expanse of tidal lowland ecosystems that are connected to each other ecologically. Therefore the landscape approach needs to be encouraged in carrying out this Project. Inter-villages communities will be encouraged to develop joint and integrated strategies between villages. In this case, the role of village and sub-district governments is very much needed in strengthening community capacity. Hopefully, it will develop and create an adaptation strategy at landscape level that involves many parties: community, government and private sector in the region. This landscape level approach will specifically strengthen communities in managing the tidal swamp irrigation systems in their area. Thus a new social system will be created based on the adaptation development of climate change effects.

Component 4: Community Livelihood

Objective: Diversification and strengthening livelihoods of vulnerable communities in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in relation to climate change impacts, including variability.

Expected Outcome and Output:

4.1. Strengthened livelihoods of vulnerable communities in relation to climate change impacts, including variability.

- 4.1.1. Developed integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries.
- 4.1.2. Developed agrosilvofisheries system in mangrove area and agroforestry system in terrestrial.

4.2. Diversified and enhanced livelihoods of vulnerable communities.

- 4.2.1. Developed new models of community livelihood of post harvesting/processing stages, particularly for women and youth group.
- 4.2.2. Developed community or village-owned enterprises and cooperatives.

Activities in this component will support community life sources developments that are more adaptive to climate change. The agricultural sector will be developed towards integration between the agriculture-livestock-fisheries sub-sector which will improve efficiency in resource use and dependence on external resources. This Project will also strengthen the community in post-harvest handling with the support of post-harvest equipment. In addition, efforts to develop small-scale processing business unit (home industry) will be developed to improve alternative employment for women and reduce economic dependence on the land-based sector. The fisheries sector will also be developed through agrosilvopastoral development. Initiatives that will be developed will strengthen livelihood and economy aspects of community and at the end will also contribute to strengthening the community's adaptability in areas that are vulnerable to climate change.

Methodology/Approach: Livelihoods and economy development of community will be carrying out by Agrosilvofisheries System with an integrative and multi-sectoral approach.

Sector development (food crops for example) will also be used as a foundation in the development of the livestock sector and vice versa, likewise the other sectors development. Then livelihood development model that are oriented towards environmental sustainability will be selected besides being oriented to increase production and community income. One model that will be developed is agrosilvofisheries. This agrosilvofisheries system is a scheme for utilizing more environmentally friendly mangrove ecosystems in aquaculture sector. With this system the mangrove forest is not fully opened for cultivation space, but it is still left so that the ecological function of the mangrove is not completely lost. To strengthen economic resilience and variations in community products, agroforestry systems will be developed in the lowlands. Lowland also has potential for multi-product agriculture development such as agroforestry systems where forestry, plantations and food are produced in a single landscape. Besides adding variety to community products will also improve the quality of existing land cover.

Component 5: Ecosystem Resilience

Objective: /ncreasing the resilience of lowland and coastal ecosystem in estuary area of Musi River and Sugihan River in response to climate change and variability-induced stress.

Expected Outcome and Output:

5.1. The essential areas are conserved in order to maintain the ecosystem services and ecosystem carrying capacity.

5.1.1. Delineated and developed community-based conservation area.

5.1.2. Developed village regulation of community-based conservation area.

5.1.3. Developed conservation partnership schemes between corporation and village/communities.

5.2. Improved ecosystem condition affected by climate change.

5.2.1. Restoration of degraded mangrove and coastal forest area are conducted.

5.2.2. Restoration and plant enrichment of degraded upstream and watershed areas are conducted.

In coastal areas, a natural protection system has been formed. Mangroves, coastal forests, and river banks are natural components that support resilience to coastal dynamics and climate change. Its existence must be maintained and if damaged it must be restored. This Project will strengthen the community in an effort to protect the natural resources around them. The community will be accompanied in agreeing to protection zones and also areas to be restored. Damaged coastal and mangrove forests will be rehabilitated. Greening will also be developed to protect riverbanks, or as road shelters and settlements. This component is expected to maintain and even improve environmental capacity in adapting to climate change

Methodology/Approach: The implementation of this component will be based on the Community-based Conservation approach. In applying this approach the main thing that must be done is finding basic reasons and motives that will increase community awareness and initiative in carrying out protection. A spatial approach will also be used in this initiative. The community and village government will be guided in arranging the village spatial with the main goal of establishing protected areas. And in the next process these agreements will be legalized by formulating formal policies at the village level. In addition, a partnership approach between the community and the company will be encouraged.

Component 6: Policy and Governance

Objective: Improving the policies and regulations related to irrigation management system and agricultural practices in South Sumatera that promote and enforce climate resilience.

Expected Outcome and Output:

6.1. Improved policies and regulations and enforce climate resilience.

6.1.1. Improved capacity of related institution to develop climate change adaptation policies, strategies and activities.

6.1.2. Developed cross-sectoral governance to optimize the irrigation infrastructures system.

6.2. Developed climate change monitoring system which enforces climate resilience.

6.2.1. Promoted and established climate change monitoring system at district and provincial level.

6.2.2. Established community-based climate change adaptation learning system at sub-district and village level.

The Project location is quite extensive and is also a strategic location in food production in South Sumatra. Many local government agencies and central government have authority to manage this area, both in infrastructure development and food production. Unfortunately, many government initiatives and programs are still partial and have not been managed sustainably. To manage vast potential of lowland ecosystem, product policies are needed and the implementation of coordination system of sufficient authority division. The policies and programs are developed to manage this area also have not led on strengthening the community's adaptation to climate change. This component is expected to be able to produce a policies product and initiatives of government in strengthening community adaptability, including in the development of an early warning system that can be implemented by the community.

Methodology/Approach: This Project will support the government in improving coordination and monitoring systems, especially in utilization and management of tidal irrigation infrastructure that greatly affects community livelihoods. The steps that will be carried out in this component are in order to integrate policies and programs between central and regional government institutions. The latest information technology utilization will be encouraged to develop a monitoring system that is always up to date and integrated with many parties. The evolving integration must later be in line with and can cover community initiatives and village government in an effort to increase their adaptability to the climate change effects.

B. ECONOMIC, SOCIAL AND ENVIRONMENTAL BENEFITS

1. Economic Benefit

The Project is expected to provide concrete economic benefits to farmers who work and live in the Project targeted area in **Muara Sugihan Sub-district (Banyuasin District)** and **Air Sugihan Sub-district (Ogan Komering Ilir District)**, South Sumatera. Muara Sugihan Sub-district has a population of 41,085 people with a composition of 21,255 man (51.73%) and 19,830 women (48.27%). Population density of Muara Sugihan is 59 people/ km^2. The main income source of population relies on the agricultural sector with the main commodity types is rice which developed in 15 villages (68.2%). In addition, commodities developed include; pepper planted in 4 villages (18.2%); capture fisheries in 2 villages (9.1%) and horticulture in 1 village (4.5%). From the level of family income, the majority of families in Muara Sugihan are work in agriculture based on the percentage of farmer families, namely 52% or 5,860 families. While in 5,436 families (48%) work in non-agricultural fields.

The types of agriculture cultivated in Muara Sugihan are food crops, horticulture and plantation commodities. Food crops land area in this sub-district is dominated by rice with an area of 53 841 ha and corn with a land area of 7,615.5 ha. The land area for horticultural plants is dominated by Siamese citrus plants and banana plants with an area of 350 ha. Plantation commodities in Muara Sugihan are dominated by rubber plantations with an area of 7,672 ha. Other than that, plantation commodities in Muara Sugihan include: palm oil with an area of 57 ha; coconut with an area of 6,452 ha; and coffee with an area of 654 ha.

Air Sugihan Sub-district has a population of 4.46% from total population of Ogan Komering Ilir District, which are 36,097 people. Air Sugihan has a population density 16 people/km^2. The population composition of Air Sugihan for men is 18.706 (51.82%) and female is 17,391 (48.18%).The majority of population occupation of Air Sugihan is agriculture, forestry, hunting and fisheries sectors amounted to 228,439 people (58.95%). Other livelihoods is manufacturing sector amounting to 27,069 (6.99%); general trade, retail, restaurants and hotels totaling 49,478 people (12.77%); social, social and individual services 47,081 people (12.15%); and another 35,428 people (9.14%).

Food crop commodities in Air Sugihan are dominated by wetland rice with a land area of 22,170 ha, rice fields with an area of 2,450 ha, and corn covering 1,849 ha. Other food crops, namely cassava with a land area of 120 ha and sweet potatoes with land area of 11 ha. Horticultural agriculture is dominated by long beans with a land area of 26 ha. Other horticultures in this sub-district include chili covering 17 ha, cucumber 2 ha, and eggplant covering 19 ha. Plantation commodities are dominated by oil palm with a planting area of 3,042 ha. In addition, other plantation commodities include: coconut with a planting area of 658 ha; rubber with a planting area of 578 ha and coffee with a planting area of 400 ha[6].

The Project will focus on improvement of water irrigation management and governance system for food production. The Project targeted area is a food production center in South Sumatra with an extensive irrigation infrastructure which built since 1980. Sub-district of Muara Sugihan and Air Sugihan have many Irrigation Areas (**Daerah Irigasi/DI**).

An **Irrigation Area** is a unit of land that gets water from an irrigation network. The provincial government has the authority and responsibility for developing and managing primary and secondary irrigation systems with an area of 1000 ha-3000 ha, and irrigation areas across districts/cities. Irrigation areas stated in Ministry Regulations in the form of irrigation areas that have been built by the Central Government, provincial governments, and district/city governments whose types include[7]:

a. surface irrigation,
b. swamp irrigation,
c. underground water irrigation,
d. pump irrigation, and
e. pond irrigation.

Many irrigation channels at the Project location are not managed and function properly. Production infrastructure that sustains community farming activities is very vulnerable to flooding and rising sea levels at high tide. Based on field observations result, the irrigation facility management system is also not supported by an adequate institutional system at the community/farmer level.

At present, many parts of the irrigation canal do not function optimally caused by damage or consequences of changing climate patterns, even the damage also effect in increased risk of flooding in settlements and rice fields. As a result of irrigation networks damage, there are many fields that cannot function optimally and hamper farmer productivity. Optimizing irrigation facilities is expected to increase the area of productive rice fields that will increase local agricultural productivity and ultimately be able to improve the welfare of local farmers.

The Project will also strengthen the community in post-harvest handling by providing post-harvest equipment and facilities. Women will be supported in developing small-scale processing, agriculture and fisheries home industries. Some potential to be developed are: packaged rice, smoked and salted fish, and various processed food from shrimp and fish.

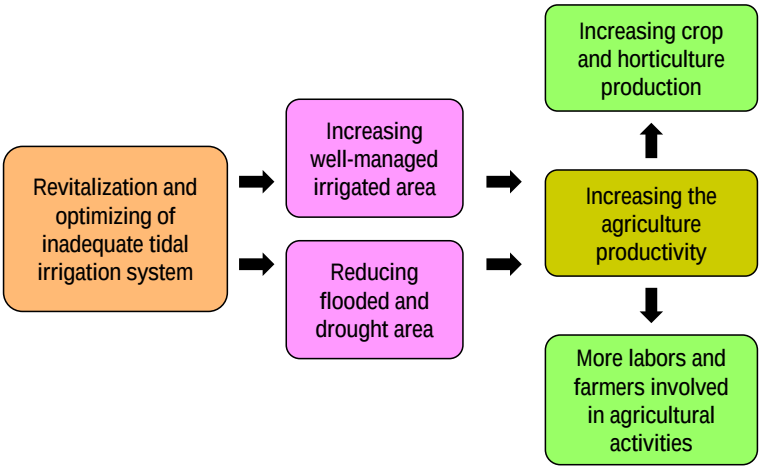
In addition, to increase the community capacity in implementing food agriculture practices, the Project will also put special pressure on the improvement of integrated irrigation systems. The Project will work through several main activities, including studies of existing irrigation systems and analyzing the linkages of irrigation patterns and the level of infrastructure damage caused by climate change, together with communities and local governments.

Participatory design and modification of irrigation systems that are adaptive to climate change encourage revitalization of community-based irrigation systems through cash for work schemes and strengthen institutional management of inter-village irrigation networks.

The economic benefits of this Project can be illustrated in the following scheme:

[6] Ogan Komering Ilir District and Air Sugihan Sub-District, 2018 (Central Board of Statistics (BPS) of Ogan Komering Ilir District)
[7] Ministry Regulation of Public Works and Public Housing Republic of Indonesia No. 14/PRT/M/2015 concerning Criteria and Determination of Irrigation Area Status

Figure 3: Scheme of Project Economic Benefit



2. Social Benefit

Project is expected to provide benefit in social aspects, especially at village level. Project interventions will be implemented based on community involvement and participation, and will be consolidated and integrated into the village development framework. Based on Law No. 6/2014 on Village, now the village has a new perspective compared to the old concept of village that can be presented in the following table[8]:

Table 5: Comparison of Old and New Concept of Village

	Old Concept	New Perspective
Legal Basis	Law No. 32/2004 and Government Regulation No. 72/2005	Law No. 6/2014
Main Approach	Decentralization-residual	Recognition-subsidiary
Position of Village	The government that is in the state government system (local state government)	Community governance, hybrid between self governing community and local self government.
Position of Head of Village	As the central government's operator	As a community leader
Role and Position of District	Districts/regencies have large and wide authority	Districts/regencies have limited and strategic authority
Objective Basis	Target	Mandate
Locus Politics	Location: Village as the Project location from upper government	Arena: Village as an arena for the Village community
Development Roles	Object	Subjects
Development Model	Government driven development or community driven development	Village driven development

In the section of Village Objectives and Governance (Articles 3 and 4 of Law No. 6/2014 on Villages) state that village arrangements are held, among others, on the basis of recognition, namely the recognition of the rights of origin and the basis of subsidiary, and the determination of local authority and local decision-making for the benefit of the village community. Village arrangement among others aims to: encourage the initiative, movement, and participation of the village community for the development of potential village assets for common well-being; improve public services for villagers to accelerate the realization of public welfare; and advancing the economy of the rural community and addressing the national development gap. Based on the framework of village development with a new perspective as outlined above, the Project will be strongly supported by the involvement and participation of village communities and the commitment of the village government in managing village resources sustainably. It also includes the ability of the community and the village government in maintaining agricultural infrastructure that has a vulnerability to floods and the effects of tidal water.

[8] Regulasi Baru, Desa Baru; Sutoro Eko (2015)

The Project will support a number of activities that will enhance the capabilities and capacities of village government apparatus in responding and adapting to climate change. The villages within the Project targeted area, 22 villages in sub-district of Muara Sugihan and 19 villages in sib-district of Air Sugihan, will be assisted in order to manage data, developing strategies and plans, formulating adequate regulations to support climate change adaptation schemes at village level.

Specifically, the Project will encourage the establishment of **Rural Areas**, as a cross-village agricultural infrastructure management unit which cannot be managed based on the territorial boundaries of each village. Law 26/2007 on Spatial Planning has defined Rural Areas as areas that have main activities of agriculture, including natural resource management with arrangement of area functions as places of rural settlements, government services, social services, and economic activities. Article 48 states that Spatial Planning for Rural Areas is directed to:

a. empowering rural communities,
b. local environment quality defense and area it supports;
c. natural resources conservation,
d. preservation of local cultural heritage,
e. eternal land of food agriculture defense for food security; and
f. balance protection of rural-urban development.

Law 6/2014 on Villages in the Rural Areas Development (Article 83 - 85) mandates that Rural Areas Development is a combination of inter-village development in one District/City. The Rural Areas development **aims to accelerate and improve the quality of services, economic development, and/or rural community's empowerment through a participatory approach by integrating various policies, plans, programs, and activities of parties in the designated area**. Rural Areas development is prioritized in developing potential and solving problems in rural areas. Rural Areas development will include:

a. use and utilization of village areas in the framework of establishing development areas in accordance with District/City spatial planning,
b. services that is carried out to improve the welfare of rural communities,
c. infrastructure development, rural economic improvement, and development of appropriate technology,
d. empowering rural communities to improve access to economic services and activities.

Law 6/2014 on Villages states that the draft of Rural Areas development is discussed with the Central Government, Provincial Governments, District/City Governments, and Village Governments. The Rural Area development plan is determined by the Regent/Mayor in accordance with RPJMD (Regional Medium Term Development Plan). The Rural Areas development is carried out by the Central Government, Provincial Governments, and District/City Regional Governments through regional work units, Village Governments, **and** BUM Desa (Village-owned Enterprises) by involving village communities (Article 85), with the obligation to utilize the local potential of natural and human resources. Whereas the Regulation of the Minister of PDTT (Underdeveloped and Transmigration Areas Development) and Village No. 5/2016 concerning Rural Areas Development (Article 12) states that rural area development is carried out by regional work units appointed by the Regent/Mayor based on input from the district/city TKPKP and/or the Village Government. TKPKP is a Rural Area Development Coordination Team, which is an institution that organizes rural development in accordance with the authority at the central, provincial and district/city levels.

The Regulation of Village PDTT Minister No. 5/2016 Article 4 also mentions the existence of four (4) stages of rural area development which include: (a) proposing rural areas, (b) rural area determination and planning, (c) implementation of rural development, and (d) reporting and evaluation of rural development. Regions that can be defined as rural areas are part of a district/city consisting of several villages bordering in an integrated planning area that has similarities and/or problems linkages or potential development by paying attention to aspects: agricultural activities, natural resources management and other resources, rural settlements place, government services place, rural social and economic, strategic values and regional priorities, harmonization of inter-regional development in District/city areas, local wisdom and existence of indigenous peoples, integration and sustainability of development.

In addition, the Project will also develop and strengthen the capacity of civil social institutions, especially farmer and irrigation user groups. All this time, one of the causes of irrigation management systems are not functioning effectively is the weak management of tidal irrigation users in the Project targeted area. The institution of cross-village community-based irrigation systems management will have the least function: regulating water flow during high tide or low tide, dividing water supply needs according to farmers' needs, maintaining irrigation infrastructure that has been built, together with village governments and district governments improving the quality and coverage of irrigation systems, and coordinating community participation forms in collective irrigation management.

3. Environmental Benefit

One of the climate change adaptation strategies that will be implemented by the Project is to develop community-based conservation areas. This approach is an integration of two main approaches in climate change adaptation strategies, namely Community Based Adaptation (CBA) and Ecosystem Based Adaptation (EBA).CBA and EBA each have a special emphasis where the first relies on empowering local communities to reduce their vulnerability and the second relates to the use of ecosystems as a means of providing goods and services in facing climate change.

Community-based conservation areas will encourage the empowerment of local communities to have ability and authorities to manage existing resources by utilizing ecosystems as a base resource that will be developed as capital in facing climate change. In this case, the anthropocentric principles will be integrated with environmental principles where the impacts and consequences of two things are interrelated and cannot be separated. The explanation above is in line with the definition of community-based conservation, that is various practices to improve the conditions of natural resource management for coexistence between humans and nature (Mallen-Ruiz Isabel, 2015) where the interests of nature and humans are equally important in management goals. He also noted that the motivation of community involvement in a minimum conservation program would be related to three (3) things; the conservation program would create a livelihood, the income derived from the conservation program was greater than the loss caused by the cessation of economic activities as a program result, and it gives authority to local communities to manage resources so as to generate empowerment.

To reduce vulnerability to the risk of rising sea water and flooding, the Project will encourage rehabilitation activities in areas that are degraded along coastal areas, rivers and upstream areas. Watersheds can be divided into three components, namely: upstream, middle and downstream. The upstream ecosystem is the main water catchment area and flow regulator, the middle ecosystem as a distributor and regulator of water, while the downstream ecosystem is a water user. This relationship between ecosystems makes the watershed as a hydrological unit. Within the watershed integrated various factors that can lead to sustainability or degradation depend on how a watershed is managed.

In the mountains, highlands and lowlands to the coast there are climates, geology, hydrology, soil and vegetation that interact with each other to build ecosystems. Ecosystem improvements are important for watersheds such as mangrove areas, coastal forests, riparian, and upstream rivers that are expected to increase the carrying capacity and resilience of ecosystems to the potential for climate change shocks.

The Project will also develop agroforestry and agrosilvofisheries as part of a strategy to adapt the climate change. Agroforestry is a land use system (farming) that combines trees with agricultural crops to increase profits, both economically and environmentally. Whereas agrosilvofisheries is a land-use system that integrates agricultural, forestry and fisheries cultivation activities that are structured both partially and temporally in one stretch of land.
Technically, the combination of tree crops such as wood or fruit with short-term agricultural crops will result in higher ecological and economic stability. In an ecological perspective, it is known that the more diverse and complex a system is, the more stable the system will be. Likewise in the economic context, the more diverse the diversity of commodities produced in a land area, the stability of price fluctuations will be higher even though the complexity of this commodity will also correlate with the complexity of management. Thus the development of agroforestry and agrosilvofisheries will be in line with the climate change adaptation strategy both in the context of Community Based Adaptation and Ecosystem Based Adaptation.

Due to the severity of climate change projections in the future and the risks related with human and natural systems, community is now faced with a strong need to develop adaptation policies and actions as a response. Spatial planning, which is a process where development and use of land are visualized, negotiated and regulated, has an important role in adapting with climate change.

Climate change is a matter that must be considered in spatial planning because climate change has a very large impact on the lives of all human/organism (Hilman, 2008). The spatial plan is basically a form of interaction between organism and their environment so that they can be harmonious, balanced to achieve the welfare of living beings and environmental preservation and sustainable development. The definition of spatial planning according to Law 26/2007 is a process to determine the structure of space and spatial patterns which include the preparation and stipulation of spatial plans. The impact of climate change will certainly affect existing spatial patterns so that impacts projections can be used as a basis for anticipation of spatial planning activities that adapt to climate change.

Therefore, this Project will facilitate spatial governance planning at the village level. This activity will become the basis for the preparation of climate change adaptation plans at the village level, Rural Areas (landscape approach), and sub-districts with a focus on adaptation measures on food security, disaster resilience, rural area development and water management.

Adaptation of food security is related to spatial planning in the context of spatial pattern that will be built where the existing pattern of adaptation can be in the form of adjusting the location of cultivation systems or technical choices and existing food cultivation system. Disaster resilience at the village level will be regulated through residential spatial patterns and protected area functions that can be a barrier to disasters. On a broader scale, namely rural areas, spatial integration with climate change adaptation can use a watershed approach where integration of spatial planning based on potential ecosystems is expected to be able to support resilience to disasters caused by climate change.

4. Risk Management and Negative Impact Mitigation

The Project has identified risks and negative impacts on social and environmental aspects that can affect the process of Project, including:

Table 6: Risk Management and Negative Impact Mitigation

No	Risk and Potential Negative Impact	Mitigation Plan
Social Aspect		
1	The prospective beneficiary community involved in the assessment will get information earlier than others. There is a risk of jealousy and confusion of information about planned activities.	Conduct socialization at the village level, so the information is received by the community relatively simultaneously
2	Workers recruitment for activities will cause public unrest.	Workers for activities that do not require special abilities are preferred from local area.
3	Determining location of irrigation revitalization will cause public unrest	Determining location of irrigation revitalization through field studies and village meetings.
4	Determination of pilot location for community livelihood development will cause community anxiety.	Location determination through study on a pilot field for community livelihood development and village meetings
5	The development of cross-sector policies, institutional arrangements to optimize infrastructure, and existing irrigation facilities will get bureaucratic challenges that sectoral work.	Conduct consultations and discussions for mainstreaming cross-sector collaboration in optimizing existing irrigation infrastructure/facilities
Environmental Aspects		
1	Main road damage caused by land preparation and plant poly-bag waste in agroforestry activities.	Prepare budget for road repairs and provide waste disposal/recycling poly-bag waste.

The Project will develop the Environmental and Social Management System (ESMS) which will contain procedures to identify environmental and social risks for Project activities, to develop mitigation plans and timelines, and to identify potentially affected parties and involved in the mitigation plan.

5. Gender Equality and Social Inclusion

Gender equality and women's empowerment are among the 15 ESP principles such as: Principle 1 - compliance with the law; Principle 4 - human rights; and Principle 6 - core rights of workers, which always applies to every project/program under the Fund, and which risks need to be identified.

The Project will consult with stakeholders at all stages of the program cycle in gender responsive and equivalent way. Such participatory methods based on gender information are needed to address the main challenges of the lack of women representation or men in consultation at all stages of the project/program cycle. Facilitating and actively supporting increased women participation as important stakeholders ensures the inclusion of their needs, concerns, and abilities that are often ignored in planning, implementation, monitoring and evaluation. In particular, GESI approach will be carried out by the Project in accordance with the characteristics of each Project component with the following detailed plans:

Table 7: Gender Equality and Social Inclusion

Component	Gender Equality and Social Inclusion Plan	Measurement
1. Database and Knowledge	Dig data and information from women and vulnerable groups in assessment activities	The number of women and members of vulnerable groups who becomes respondents / informants / resource persons in assessment activities.
	Ensure the involvement of women and vulnerable groups in assessment activities.	Number of women and members of vulnerable groups involved in participatory assessment.
	Conduct a special assessment of local knowledge regarding the dynamics of tidal areas and estuaries, agriculture and climate aspects, as well as land aspects and biodiversity.	The amount of collected local knowledge and a consideration in determining policies in the program.
2. Government Capacity	Ensure the involvement of women and vulnerable groups in participatory village mapping.	Number of women and vulnerable groups involved in participatory village mapping.
	Ensure the involvement of women and vulnerable groups in training and *Focus Group Discussion* at the village level	Number of women and vulnerable groups involved in training and *Focus Group Discussion* at the village level
	Ensuring the involvement of women and vulnerable groups in the participatory campaign.	Number of women and vulnerable groups involved in the participatory campaign.
3. Community Engagement	Digging data and information from women and vulnerable groups in KAP survey activities.	The number of women and vulnerable groups who become respondents in the KAP survey.
	Ensure the involvement of women and vulnerable groups in climate change and conservation adaptation training.	Number of women and members of vulnerable groups involved in climate change and conservation adaptation training
	Ensuring the involvement of women and vulnerable groups in village meetings related to sustainable-use of natural resources and climate change adaptation.	Number of women and vulnerable groups involved in village meetings related to sustainable-use of natural resources and climate change adaptation.
	Ensure the involvement of women and vulnerable groups in making decisions related to revitalizing irrigation infrastructure.	Number of women and vulnerable groups involved in decision making related to revitalizing irrigation infrastructure.
	Ensure the involvement of women and vulnerable groups in activities to revitalize irrigation infrastructure.	Number of women and vulnerable groups involved in revitalizing irrigation infrastructure.
	Ensuring the involvement of women and vulnerable groups in workshops and implementation of community-based and integrated irrigation management systems.	Number of women and members of vulnerable groups involved in community-based and integrated irrigation management systems.

Component	Gender Equality and Social Inclusion Plan	Measurement
4. Community Livelihood	Ensuring the involvement of women and vulnerable groups in integrated and adaptive agriculture practices training that are integrating the crop, livestock and fisheries.	Number of women and members of vulnerable groups involved in integrated and adaptive agriculture practices training that are integrating the crop, livestock and fisheries
	Ensure the involvement of women and vulnerable groups in skill improvement skills of agrosilvofisheries system in mangrove area and agroforestry system in terrestrial.	Number of women and vulnerable groups involved in skills improvement training of agrosilvofisheries system in mangrove area and agroforestry system in terrestrial.
	Ensure the involvement of women and vulnerable groups in post-harvest business.	Number of women and vulnerable groups involved in post-harvest business.
5. Ecosystem Resilience	Ensure the involvement of women and vulnerable groups in decision making related to community-based conservation areas.	Number of women and vulnerable groups involved in decision making related to community-based conservation areas
	Ensure the involvement of women and vulnerable groups in participatory area mapping.	Number of women and vulnerable groups involved in participatory area mapping.
	Ensuring the involvement of women and vulnerable groups in village training and workshops related to community-based conservation areas.	Number of women and vulnerable groups involved in village training and workshop community-based conservation areas.
	Ensure the involvement of women and vulnerable groups in decision making related to Restoration and plants enrichment of degraded upstream and watershed areas.	Number of women and vulnerable groups involved in decision making related to the Restoration and plant enrichment of degraded upstream and watershed areas.
6. Policy and Governance	Ensuring the interests of women and vulnerable groups are taken into consideration in the formulation of policies and regulations related to climate change.	Policies and regulations related to climate change have accommodated the interests of women and vulnerable groups.

C. COST-EFFECTIVENESS

Cost effectiveness of Project will be calculated using the Economic Rates of Return (ERRs) method that will provide a single metric showing how the Project's economic benefits compare to its costs. ERR will provide a convenient metric, produced from a cost benefit analysis comparing the economic costs and benefits of a Project and/or policy measure. Cost benefit analyses, the costs of a Project include all necessary economic costs—financial expenses covered by Adaptation Fund and other parties, as well as opportunity costs of non-financial resources expended. Benefits include the increased income of a country's population or the increased value-added generated by producers (firms and households) that can be attributed to the proposed Project. Value-added is defined as the value of gross production (or sales) minus the cost of intermediate inputs produced (and purchased from) outside the firm.

Projects target ERR **should passes a 10 percent hurdle rate with a 10-year scenario calculation after the Project ends** to be accountable for support by the Adaptation Fund. The ERR will be calculated upon the preparation of the full proposal. ERR spreadsheets will calculate each of the Project's interventions and will include: the Project description, including its economic rationale; the expected impacts, including detailed cost and benefit estimates; the key assumptions and study the effects of those assumption into the Project's returns and cost-benefit analysis. ERR calculation considers two scenarios: (a) the expected outcome with the Project; and (b) the expected outcome without the Project.

D. ALIGNMENT WITH NATIONAL/SUB-NATIONAL SUSTAINABLE DEVELOPMENT STRATEGIES

This proposed Project is appropriate with the following institutional policy and commitment framework at **National Level**:

1. **Nationally Determined Contributions (NDC) of Indonesia:** The document stated how the Government of Indonesia (GoI) will implement enhanced actions to study and map regional vulnerabilities as the basis of adaptation information system, strengthening institutional capacity, and dissemination sensitive policy and regulation of climate change. Furthermore, it is emphasized for local capacity strengthening, knowledge management improvement, convergent policy concerning climate change adaptation and disaster risks reduction, and also implementation of adaptive technology; to achieve the medium-term goal of climate change adaptation strategy of Indonesia which aims to reduce risks in all development sectors. The proposed approach of this Project is in line with the NDC document by focusing on mapping vulnerability and risk area, fostering public and institutional capacity building and also advocating relevant policy. Climate Risk and Climate Impact Assessment that will be conducted at village and city will provide vulnerability and risk map which will then be used to develop adaptation plans. The adaptation plan will be integrated into local development plan and advocated to the higher governance level to ensure synergize of climate-sensitive development plan from local to national. This sequence is appropriate with the First NDC of GoI where they see regional vulnerabilities as the basis of adaptation information system and foster climate-responsive policies.

2. **National Action Plan for Climate Change Adaptation (RAN-API):** RAN API is divided into five (5) sectors with Particular Areas Resilience as one of them. The particular sector is divided into 2 sub-sectors; these are Coastal Area Sub-Sector and Small Islands. There are five (5) developed strategies for sub-sector, which are: (a) Life stability of coastal and small islands communities over climate change threat; (b) Environmental quality improvement of coastal areas and small islands; (c) Adaptation structures development in coastal areas and small islands; (d) Adjustment of urban spatial plan by considering the risk of climate change; and (e) Development and optimization of research and information system on climate change in coastal areas and small islands. This Project will deliver these strategies in different Project components and outputs, including developing and implementing adaptation plan, mainstreaming process into local development and spatial plan, and also developing platform of knowledge management.

3. **Government Regulation No. 2/2015 on National Mid-Term Development Plan (RPJMN) 2015 – 2019:** In part 1.2.2 about Climate Change and sub-section 1.2.2.1 about Problems and Strategic Issues of RPJMN, decrease of Greenhouse Gas (GHG) emission (climate change mitigation) and community resilience improvement (climate change adaptation) were stated. The development of resilience coastal villages and communities that aims to be done by this Project is in line with the content of RPJMN. Furthermore, in RPJMN 2015-2019, the central government also set a target of Universal Access of Sanitation facilities in 2019; where the term of Universal Access means every population will be served with adequate sanitation facilities. Construction of individual and communal latrine for coastal communities with no adequate access to sanitation facilities that will be done under the Project will support the government target.

4. **Vulnerability Index Data Information System (2015) developed by Adaptation Directorate, Directorate General of Climate Change Control, Ministry of Environment and Forestry:** Based on the standards of this document, concluded that South Sumatra is an area with a very high level of vulnerability at the national level. Banyuasin and Ogan Komering Ilir District are the highest number of vulnerable villages in South Sumatera Province.

5. **Government Regulation No. 68/2002 on Food Security:** Food security is very important for national development to create qualified, independent, and prosperous Indonesian people through realization of food availability, safe, quality, nutritious, diverse and spread evenly throughout Indonesia and affordable for people's purchasing power. Government Regulation No. 68/2002 concerning Food Security is the implementation of Law 7/1996 on Food Security, article 50,that is defined Food Security as food for household is reflected in availability of adequate food, both quantity and quality, safe and affordable. The role of Provincial Government, District/City Government and/or the Village Government in food security is to carry out policies and be responsible for the implementation of food security in their respective territories, by considering the guidelines, norms, standards and criteria that is set by the Central Government. In addition, Provincial Government, District/City Government and/or Village Government encourage community participation in the food security implementation.

6. **Government Regulation No.20/2006 on Irrigation, especially in community participation on irrigation management:** Participatory Irrigation System Development and Management is a mandate of institutional empowerment of farmers' groups based on the participation of members in irrigation management is expected to be implemented well in order to address the main issues in irrigation utilization especially in areas with rice harvest failure risk which is caused by the lack of water supply in its agricultural system. The district/city governments are expected to establish strategies and programs for empowerment of water use farmers associations based on district/city policies in development and management of irrigation systems where on the other hand, central and provincial governments can provide technical assistance in accordance with the needs.

While in the other side, this proposed Project is appropriate with the following institutional and policy framework and commitment at **Provincial Level**:

1. **Regional Mid-Term Development Plan of South Sumatera Province (RPJMD Sumatera Selatan 2019-2023):** The Project is well suited to mission one (1) in RPJMD of South Sumatra Province in 2018-2023 that is, "Building South Sumatra based on community economic-based supported by strong agricultural, industrial, and UKM (Small and Medium Enterprises) sectors to overcome unemployment and poverty in urban and rural areas". In addition, it is also in line with some development targets in RPJMD of South Sumatera Province. 1) **Goals 3**: Increase agriculture, plantation, livestock, fishery and food sovereignty, 2) **Goal 4**: Decrease number of poor and underdeveloped villages, 3) **Goal 12**: Increase environmental quality.

2. **Risk Review and Adaptation of South Sumatra Climate Change 2012:** A study of susceptibility and adaptation capacity to climate change in South Sumatra Province has been conducted through Climate Risk and Adaptation Assessment (KRAPI) in 2012. KRAPI is one of the most active approaches developed by the Indonesian Ministry of Environment supported by GIZ (Deutsche GesellschaftfürInternationaleZusammenarbeit). One of the activities is coastal sector, with adaptation options of lowland maintenance and restoration, sediments transport management and so on. The result of study has become one of the bases for drafting a climate change adaptation program in Banyuasin and Ogan Komering Ilir regencies.

E. COMPLIANCE WITH RELEVANCY WITH NATIONAL TECHNICAL STANDARDS

1. **Ministry of Environment and Forestry Regulation No. 33/2016 on Guidance for Development of Climate Change Adaptation Action:** The regulation is a reference for national and local government to develop their climate change adaptation action plan and subsequently mainstreaming the plan into corresponding development plan. The regulation stated area/sector identification that will be the subject should be followed by climate vulnerability and risk assessment before developing climate change adaptation actions and its implementation priorities. The actions should be mainstreamed to the corresponding development plan, program and policy. As explained on this proposal, general approach and activities of this Project are referring to and in line with the steps that is mentioned above; ensuring Project suitability to the regulation.

2. **Directorate General of Watershed Management and Protected Forest (PDASHL), Ministry of Environment and Forestry No. 8/2016 concerning Technical Guidelines for Implementing Forest and Land Rehabilitation Activities:** This Technical Guidelines are intended to provide technical direction to all parties in conducting RHL (Rehabilitation of Protected Areas) activities so that can be carried out properly. The aim is recovery of watershed carrying capacity and increasing public welfare.

3. **Standard Irrigation Planning Criteria, Ministry of Public Works 2013:** The Directorate General of Irrigation has succeeded in developing Irrigation Planning Standard for obtaining efficiency and uniformity in irrigation development planning. After the implementation for almost two decades, it was deemed necessary to conduct a review by paying attention to shortcomings and difficulties in implementing these standards, the development of agricultural technology, environmental issues (such as global warming and climate change), participatory policies, water-saving irrigation, and preparation for irrigation modern (effective, efficient and sustainable).

4. **Ministry of Marine and Fisheries Regulation No. 23/2016 concerning Management Plan of Coastal Area and Small Islands:** The regulation is developed to foster cross-level and cross-sector synergy in managing coastal area and small islands. It is stated that the relevant strategic plan should consist of cross-level and cross-sector policy directive for dedicated development plan area through the development of objectives, targets, and broader strategy, as well as implementation targets that equipped with appropriate indicators to monitor the plan. It further states that the management plan should contain policy framework, procedure and responsibilities in decision-making process among stakeholders regarding agreement on resource use or development activity in the designated zone. The Project supports the regulation by fostering cross-sector coordination in its approach; involving not only government actors but also non-government institutions including common public, driving multi-stakeholder involvement and coordination at any steps. Formation and operation of village and city climate working group as well as implementation of the arranged coordination line under the Project is the example of this cross-level and cross-sector synergy. The development process of city development plan that considers vertical approach and results of Project further demonstrate how the city policy directives are made with a synergized process across different level and sector.

F. PROJECT DUPLICATION

Currently, **there is no duplication** of this Project with other funding sources. No other program/project is currently working on the same issue and at the same target location as proposed by the Project, both regional government, corporations and other development agencies/CSOs programs/projects.

G. LEARNING AND KNOWLEDGE MANAGEMENT

This Project will produce a lot of knowledge about the process of developing community adaptability, especially in coastal areas. This knowledge can be built through the assessment and research process and also through the process of reporting and making documentation of each activity. Development and management in this Project can be explained as follows:

1. **Assessment and Participatory Research:** This Project will begin with an in-depth assessment of conditions and situation of the implementation area both socially and biophysically. More specifically, this assessment is oriented to explore various data and information about the impacts and forms of vulnerability to climate change. Through this process, specific and actual information and knowledge will be explored related to the field conditions (Project area). It is also explored about the community knowledge related to their adaptation strategies to climate change effects that had occurred.

2. **Reporting, Documentation, and monitoring Process:** In addition to assessment and research, throughout the Project implementation a reporting, documentation and monitoring process will be carried out in accordance with the plans that have been prepared. The process of reporting, documentation and results of supervision will produce a lot of data and information which if processed will be a knowledge source that is very important as a learning source. From the two components above, a lot of data and information will be produced as an initial source of knowledge and learning. Therefore it is necessary to process data and information to produce knowledge. In addition, this Project will also develop various dissemination processes so that knowledge and learning can be utilized by the wider community. The dissemination process will be carried out through:

    - **Capacity Building Process:** Capacity building will involve many parties outside the community and local government. Various speakers from the government, academics and practitioners both at the provincial and national and maybe international levels will join and work together to share knowledge about adaptation strategies to climate change. The target group can also convey the results of field learning to experts so it will create an inclusive knowledge creation.

    - **Media Placement and Publication:** The process of dissemination can also be done by utilizing communication technology that has been highly developed at this time. Information, data, knowledge and learning will be disseminated through the following communication media: community bulletins handled by the village youth group, documentary movie, workshop in district and province level, publication through the Penabulu website and **p**ublications through local newspapers and television.

H. CONSULTATION PROCESS

During proposal preparation, a consultation process with the government of South Sumatra Province and Banyuasin District Government was carried out. Consultation in the Province is carried out with the Regional Development Planning Board (Bappeda) of South Sumatra, specifically *the Infrastructure and Regional Development Sector* and *the Economic and Development Funding Sector*. Consultation in district was carried out with the Regional Development Planning Board (Bappeda) of Banyuasin District.

The Regional Development Planning Board of South Sumatra recommends that this program has to refer to the 2012 Climate Risk and Adaptation Assessment (KRAPI) document. In addition, the provincial government will also support the program as part of the Poverty Alleviation program. The provincial government recommends that location selection be related with the status of poor villages in South Sumatra, while the Bappeda of Banyuasin District provides advice on the importance of strengthening community groups and coordination between the central, provincial and district governments.

I. JUSTIFICATION FOR FUNDING REQUESTED

The justification for Adaptation Funding request is built on the logical benchmarking between the existing (baseline) condition and the trend that will occur if there is no Adaptation Fund support through the Project, compared to the expected condition if the Project is implemented with Adaptation Fund support. The pairing can be illustrated in the table on the following pages.

J. SUSTAINABILITY

Several sustainability plans developed since the inception of the Project which are expected to ensure continuity of the climate change adaptation program after the completion of the Project are as follows:

1. Financial Sustainability

There are important questions about the financial sustainability of the Regional Government funding mechanism to promote climate change adaptation programs when funding from this Project has been completed, as well as the initiatives financial sustainability at the community level, are there any financial benefits sustained if the Project funding is over. Funding related to climate change adaptation programs will be encouraged through regional regulations and multi-stakeholder forums that will contain cross-regional Regional Device Organization (OPD), private sectors, and representatives of village governments and communities. Hopefully, the existence of regional regulations at both district and provincial levels can become a legal umbrella for strategic programs implementation and climate change adaptation action programs for related OPD. The Forum has a role in developing a cross-sectoral climate change adaptation action plan where it can be used as input for planning and budgeting each member both OPD through APBD funding, village government through budgeting village funds, and companies through internal funding schemes.

Financial sustainability at beneficiary level will be carried out through several schemes. Management of community-based conservation areas will be facilitated through a partnership scheme between companies and managers. This is expected to be a sustainable alternative for community-based conservation area management. For environmental rehabilitation activities at the local level, financial sustainability will be encouraged through the planting of either mangrove perennials or other types of forest plants that are integrated with agricultural activities through agroforestry and agrosilvofisheries practices in combination with either mangrove or multipurpose tree species (MPTS) such as fruit or carpentry wood producer with short-term plants. Through this scheme, it is expected that the community will be motivated to carry out perennials planting activities because besides having conservation values, they also have economic value that can be obtained.

Financial sustainability of beneficiaries will also be encouraged through the development of processing technology in agricultural products, training in potential commodity business management, and facilitation of business and marketing formation. It is expected that this scheme will produce a sustainable financially business unit so that it can become an alternative income for the community and motivate other businesses growth in the Project area.

Table 8: Justification for Funding Requested

Component/Expected Outcome		Database Condition	Without AF Scenario	Additionality AF
Component 1: Database and Knowledge				
Outcome 1.1.	**Assessing and mapping risk and vulnerabilities caused by climate-related hazards and threats.**	Lack of data and maps regarding disaster risk and vulnerability to disasters and threats caused by climate change,	Without AF support, weak data will cause difficulties in determining appropriate actions in disaster mitigation and adaptation caused by climate change	After the Project with AF support is running, data and maps on disaster risk and vulnerability to disasters and threats caused by climate change will be available and updated.
Outcome 1.2.	**Assessing the levels of climate change adaptive capacity, including the availability of early warning systems.**	Lack of data related to the level of climate change adaptation, including the availability of an early warning system.	Without AF support, there is no adequate data available regarding the level of climate change adaptation, including the availability of an early warning system.	After the Project with AF support is running, adequate data will be available regarding the level of climate change adaptation, including the availability of an early warning system.
Outcome 1.3.	**Climate-related data are well managed and socialized to the wider community**	Poor management of climate-related data and lack of data socialization to the wider community	Without AF support, there is insufficient data related to climate and data socialization.	After the Project with AF support is running, climate related data will be managed and data will be socialized to the wider community.
Component 2: Government Capacity				
Outcome 2.1.	**Developing strategy of climate change adaptation and adopting into a regular government planning cycle.**	Weak development of climate change adaptation strategies and lack of adoption in government planning circles.	Without AF support, the climate change adaptation and adoption strategies in the government planning circle will be weak.	After the Project with AF support is running, the climate change adaptation strategies in the government planning circle will increase.
Outcome 2.2.	**Strengthening capacity of village, sub-district and district government apparatus to reduce risks related to climate socio-economic and environmental losses.**	Weak capacity of village, sub-district and district apparatus to reduce the risks related to socio-economic and environmental losses caused by climate change.	Without AF support, the capacity of village, sub-district and district apparatus to reduce the risks related to socio-economic and environmental losses caused by climate change is not strong enough.	After the Project with AF support is running, the capacity of village, sub-district and district apparatus to reduce the risks related to socio-economic and environmental losses caused by climate change will increase.
Component 3: Community Engagement				
Outcome 3.1.	**Strengthening community awareness and participation in adaptation and climate risk reduction measures.**	Weak awareness and community participation in adaptation actions and reducing the risk of climate change.	Without AF support, the community is less aware and less participates in adaptation actions and risk reduction in climate change.	After the Project with AF support is running, community awareness and participation in climate change adaptation and risk reduction actions will increase.
Outcome 3.2.	**Strengthening community adaptive capacity in climate**	Lack of community capacity to carry out climate change risk	Without AF support, the capacity of communities to carry out	After the Project with AF support is running, the capacity of the

Component/Expected Outcome		Database Condition	Without AF Scenario	Additionality AF
	risk reduction measures.	reduction actions.	climate change risk reduction actions is inadequate.	community to carry out climate change risk reduction measures will increase.
Component 4: Community Livelihood				
Outcome 4.1.	**Strengthening livelihoods of vulnerable communities in relation to climate change impacts, including variability.**	Weak livelihoods of vulnerable groups related to climate change effects.	Without AF support, the livelihoods of vulnerable groups will be threatened by the negative impacts of climate change.	After the Project with AF support is running, the livelihood of vulnerable groups related to the impact of climate change will be more resilient to face the negative impacts of climate change.
Outcome 4.2.	**Diversified and enhanced livelihoods of vulnerable communities**	The livelihoods of vulnerable groups are less diverse and need improvement.	Without AF support, the livelihoods of vulnerable groups are less diverse and need improvement to deal with climate change.	After the Project with AF support is running, the livelihood of vulnerable groups will vary and increase income.
Component 5: Ecosystem Resilience				
Outcome 5.1.	**Conserving the essential areas in order to maintain the ecosystem services and carrying capacity.**	Weak protection efforts for important areas that must be protected to maintain carrying capacity and environmental services.	Without AF support, the important areas that must be protected will be threatened.	After the Project with AF support is running, the important area will be protected from the damage threat.
Outcome 5.2.	**Improving ecosystem condition affected by climate change.**	Lack of improvement efforts, the condition of the ecosystem decreases caused by climate change.	Without the support of AF, the ecosystem condition will decrease caused by climate change.	After the Project with AF support is running, the ecosystem condition will be more residence.
Component 6: Policy and Governance				
Outcome 6.1.	**Improving policies and regulations and enforcing climate resilience.**	Lack of policies and regulations that encourage efforts to realize climate resilience.	Without the support of AF, policies and regulations that encourage efforts to realize climate resilience are still lacking.	After the Project with AF support is running, there will be policies and regulations that encourage efforts to realize climate resilience so as to support adaptation actions in the field.
Outcome 6.2.	**Developing climate change monitoring system which enforces climate resilience.**	Weak climate change monitoring systems that strengthen climate resilience.	Without AF support, a climate change monitoring system that strengthens climate resilience is inadequate.	After the Project with AF support is running, there will be a strong system for monitoring climate change that strengthens climate resilience.

2. Institutional Sustainability

Institutional sustainability will be carried out by forming a multi-stakeholder forum at the landscape level (2 districts) where this forum will act as a cross-sectoral institution related to climate change adaptation programs at the regional level. Forum members will be facilitated for capacity building related to climate change adaptation and climate data management. It is expected that the forum coordinator will get approval through a Governor's Decree (SK Governor) so that the validity and legality of forum are recognized as aligned with the relevant OPD institutions. Institutional sustainability will also be carried out by establishing a group of Farmer Management and water User (P3A) and the Association Farmer Management and water User (GP3A), which is an irrigation management container at the local level. In addition, it was also encouraged the establishment of a multi-stakeholders forum related to integrated irrigation management that contained related OPD and P3A.

3. System Sustainability

To ensure the sustainability of the system developed at village level, including the space management system, it must be based on community needs assessment. It should also be studied who will benefit and be disadvantaged by the development of this system. All society elements are certain to be heard by their aspirations and then steps are prepared with the lowest social risks, likewise, the development of irrigation management systems in tidal swamp ecosystems. Meanwhile, for system development at the cross-village level, it should linkage with the cycle of planning and implementing development in the government. It is also necessary to ensure that the system to be developed and implemented can be managed by existing human resource capabilities. It is also necessary to develop a system that is simple, cheap but effective for existing problems.

K. ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS

Some environmental risks that are likely arising in this Project implementation are the potential of natural disasters such as floods that can obstruct Project execution. It will also occur during the revitalization process of irrigation infrastructures which have the potential to temporary stop the supply and drainage systems during development. While some potential social risks can be estimated are as follows: (a) the gap between the villages being accompanied and not accompanied in one district, due to funding constraints; (b) communities rejection in efforts to protect the environment and conservation that are contrary to short-term interests; (c) lack of motivation from the community in developing community or farmer institutional capacity and prefer physical approaches in the form of infrastructure development.

Table 9: Checklist of Environmental and Social Principles

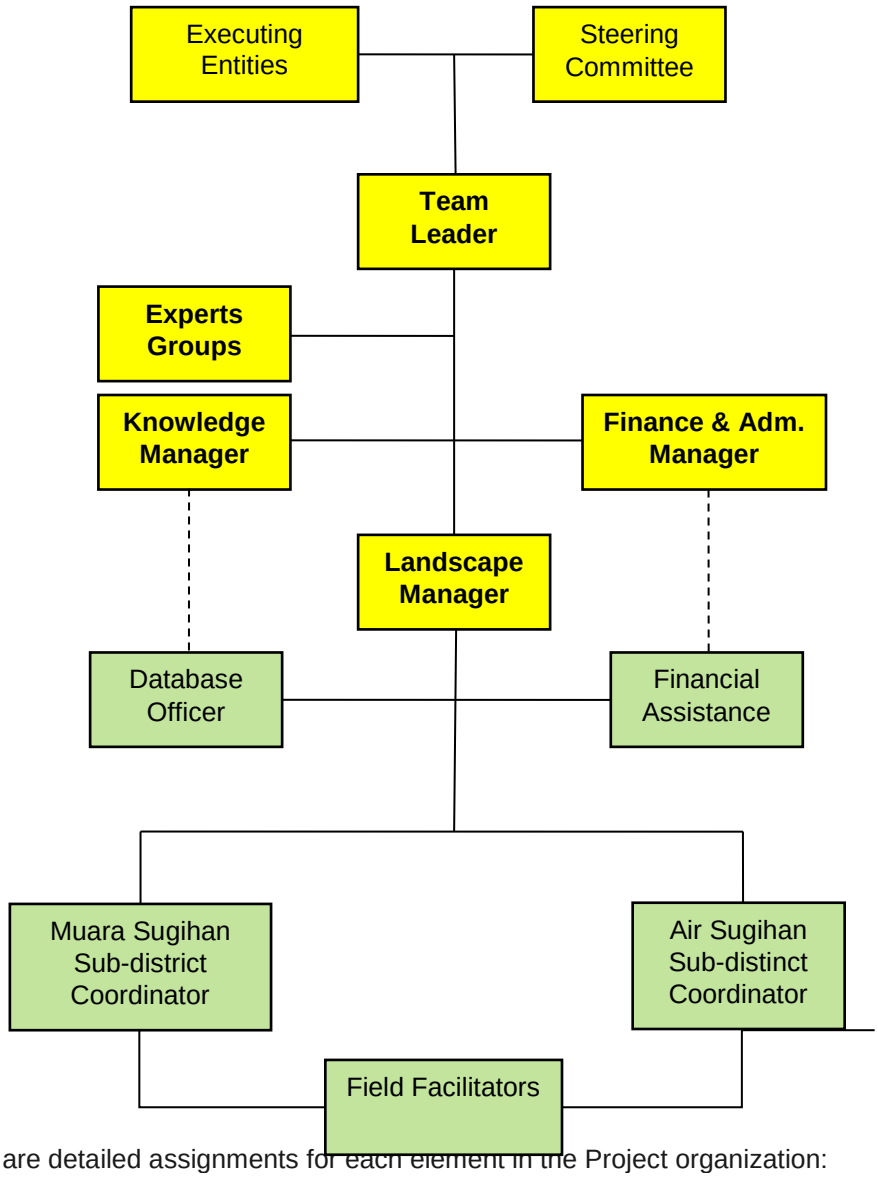
Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		
Access and Equity		
Marginalized and Vulnerable Groups		
Human Rights		
Gender Equality and Women's Empowerment		
Core Labor Rights		
Indigenous Peoples		
Involuntary Resettlement		
Protection of Natural Habitats		
Conservation of Biological Diversity		
Climate Change		
Pollution Prevention and Resource Efficiency		
Public Health		
Physical and Cultural Heritage		
Lands and Soil Conservation		

PART III: IMPLEMENTATION ARRANGEMENTS

A. PROJECT ARRANGEMENTS

Project will be led by a **Team Leader**. In carrying out its duties, the Team Leader will be assisted by 3 managers, namely: **Knowledge Management Manager**, **Finance and Administration Manager**, and **Landscape Manager**. **Expert Groups** will assist the Team Leader in technical considerations. The Project will be run using an organizational structure such as the following:

Figure 4: Project Organizational Structure



The following are detailed assignments for each element in the Project organization:

Table 10: Project Arrangements

Position	Task and Responsibilities
Steering Committee	The Steering Committee (SC) will oversee the entire Project implementation to ensure that the facilities and mechanisms have run the Project effectively so as to achieve the

Position	Task and Responsibilities
	desired results, while also representing the voices of stakeholders who are not directly responsible for the Project. In the process of Project, SC will provide technical guidance for each PMU for the Project implementation, including guidance on the policy advocacy process at the national level. The frequency of meetings will be scheduled for each quarter of the activity. Steering Committees that will be involved include: National Governments, Provincial Governments, Local Governments, Village Governments, Academics, and civil society.
Executing Entities	Consortium will be responsible for supervising, supporting and providing technical guidelines for the following activities: 1. Project preparation, including selecting PMU and linking the Steering Committee to the Project 2. Project implementation, including communication and coordination with the Steering Committee, 3. Project monitoring evaluation of PMU, 4. Financial monitoring and assessment of Project implementation,
Team Leader	The Team Leader will direct PMU in implementing the Project: 1. Together with PMU, the Project Implementation Plan will be prepared as a guide for implementing the Project, 2. Ensure that the Project in accordance with the objectives, 3. Together with the Partnership in monitoring progress and achievement results, 4. Coordination Project progress and Project problems to the Steering Committee.
Expert Groups	1. Provide technical analysis related to Project implementation, 2. Making technical reports on Project implementation, 3. Make reports on research / assessment results, 4. Risk and impact analysis of Project implementation,
Finance and administration Manager	The Finance Manager will be responsible for financial and administrative management for overall Project implementation. 1. Ensure that the Project budget is managed according to the agreement in terms of budget line and cash flow 2. Prepare accounting reports and financial statements in accordance with generally accepted standards 3. Accompanying the financial audit process by an independent party
Project Manager	Will lead the PMU in implementing the Project as a whole in day-today basis. Among the specific responsibilities are: 1. Coordination with Outcome Leader Forest Social and Outcome Leader Coastal in preparing the Project Implementation Plan as a guide in implementing the Project, 2. coordination with provincial and district governments, 3. Ensuring the course of Project is in accordance with the goals and results to be achieved, and 4. Report the Project results in the Team Leader.
Knowledge Management Manager	1. Responsible for managing all data and information produced by the Project, 2. Develop and manage Project media publication, 3. Develop the lesson learned dissemination strategy produced by the Project,
Landscape Manager	1. Make a work plan per 3 months, 2. Supervise the performance of the Sub-District Coordinator, 3. Prepare reports on Project progress every 3 months, 4. Coordinate with government institution at the sub-district and district level, 5. Carry out the capacity building process at the district and provincial level.
Sub-district Coordinator	1. Create a monthly work plan together with village facilitator, 2. Supervise the performance of village facilitators, 3. Carry out a capacity building process at the sub-district level.
Village Facilitator	1. Carry out field work plans, 2. Carry out capacity building at the village and community level, 3. Develop institutional systems at the village level.

B. PROJECT RISK MANAGEMENT

All risks in the Project implementation are analyzed during design process with all relevant stakeholders' participation. A mitigation strategy is established to ensure the risk is well managed. The table below presents the types, description, and level of risk and the strategies that have been and will be done to minimize the risks.

Table 11: Project Risk Management

Type of Risk	Description of Risk	Category (H/M/L)	Risk Mitigation Strategy
Institutional	Not all sectors in the local government have supported the Project implementation.	Medium	To ensure Project achievement will be achieved, PMU will continue to build active coordination and communication with all sectors in the local government.
	Project implementers have unequal knowledge about program implementation.	Low	Before the program implementation, a workshop process will be carried out to dissect all Project work plans.
Financial	Late disbursement of funds, procurement and institutional efficiency (long approval process and others) that delay Project implementation	Medium	Building active communication with the grantor and fulfilling all forms of financial procedures in budget disbursement.
Social	Communities are less aware of climate change and have lack of enthusiasm to respond disasters. If beneficiaries are not fully aware of climate change impacts, it is difficult to gain their commitment in forest food development and climate change adaptation.	Low	This Project will implement and introduce participatory methods to the community, so that they can be provided with understanding on climate change impacts. In addition, the mentoring process will be undertaken at the village level by utilizing field facilitators in each of Project target village.
	Lack of community (direct beneficiaries) support to the Project.	Low	1. Building good relationships with local government (village level), community and community leaders (direct beneficiaries) before start the Project. **2.** The group's formation at the village level can gather all people/levels that are in target community.

C. ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT

To overcome the risks and negative impacts of the Project, the actions taken are:

a. conduct a self-screening and self-assessment process in order to determine compliance with the ESP
b. review compliance of Project proposals with the ESP through its environmental and social management system (ESMS)
c. to screen Project proposals to identify potential adverse impacts and risks early in the Project cycle. This process begins with assessing a Project according to Principle 1 (compliance with the law), which is to screen against applicable domestic and international laws. The process continues with screening against the 14 other principles to determine which are applicable to the Project.

Based on the results of preliminary identification of possible environmental and social risks, the following measures will be taken:

Table 12: Environmental and Social Risk Management

No.	Risk/ Impact	Measures
1.	The community of prospective beneficiaries involved in the assessment will get information that is earlier than others. There is a risk of jealousy and confusion regarding information on planned activities.	Planning to complete consultations at the village level before the activities are carried out
2.	Recruitment of workers for activities will cause public unrest	Give priority to local communities to be involved in work that does not need special skills
3.	Main road damage due to land preparation and plant poly-bag waste in agroforestry activities	Maintenance of the main road being passed, handling waste, counseling to farmers and the community on handling waste
4.	Determining the location of revitalization of irrigation will cause public restlessness	Conduct consultation with village officials and community leaders in determining irrigation revitalization locations
5.	Determination of pilot locations for community livelihood development will cause community restlessness	Conduct consultation with village officials and community leaders in determining pilot locations for community livelihood development
6.	Development of cross-sectoral policy / regulation / institutional arrangements for optimizing existing irrigation infrastructure / facilities will get bureaucratic challenges that work in a sectoral manner	Conduct a series of cross-sectoral discussions to build collective perceptions and understanding

D. MONITORING AND EVALUATION

The framework of Project monitoring and evaluation per Project component/objectives can be presented in the following table:

Table 13: Monitoring and Evaluation Framework

Project Result	Indicators	Target	Sort by	Method and Tools	Freq.
Component 1: Data and Knowledge **Objective:** Assessment and mapping of risk and vulnerabilities caused by climate-related hazards and threats in estuary area of Musi River and Sugihan River in sub-district of Muara Sugihan and Air Sugihan.					
Outcome 1.1. Risk and vulnerabilities caused by climate-related hazards and threats are assessed and mapped.	2 detail report document on CC risk and vulnerability in sub-district level	18th month	Vulnerability context	Assessment and Research progress report review	Quarterly
Outcome 1.2. The levels of adaptive capacity of climate change, including the availability of early warning systems are assessed.	2 detail analytic document on community capacity in CC adaptation in sub district level	6th month	Community capacity	Assessment and Research progress report review	Quarterly
Outcome 1.3. Climate-related data are well managed and socialized to the wider community.	50% of 77,000 residents and related government agency received information on assessment results.	24th month	None	Capacity building and awareness report review	Quarterly
Output 1.1.1. Risk and vulnerabilities caused by climate change, including socio-economic and environmental aspects of vulnerability are participatory assessed.	41 report on risk and vulnerable report in village level	3rd month	Vulnerability context	Assessment and Research progress report review	Quarterly
Output 1.1.2. Action research of the impact of CC on irrigation infrastructures, management system and agriculture practices are conducted.	41 reports on Participatory Action Research in village level	18th month	Impact	Assessment and Research progress report review	Quarterly

Project Result	Indicators	Target	Sort by	Method and Tools	Freq.
Output 1.2.1. Policy and regulation at village, sub-district, district, and province level related to climate change adaption are assessed and mapped.	41 report in village level, 2 report in sub district and district, 1 report in province level	3rd month	Policy	Assessment and Research progress report review	Quarterly
Output 1.2.2. Climate-related of local/indigenous knowledge and community-based monitoring system of risk and vulnerabilities caused by climate-change are assessed.	41 report in village level	6th month	Community capacity	Assessment and Research progress report review	Quarterly
Output 1.3.1. Climate related data management systems are developed in coordination with other key stakeholder	A platform on area data management developed and managed by key stakeholders	21st month	Coordination	Publication and dissemination report review	Quarterly
Output 1.3.2. Project best practices and lesson learned are documented, published and disseminated.	All media (Village Bulletin, documentary movie, assessment report) published and disseminated	24th month	Awareness	Publication and dissemination report review	Quarterly
Component 2: Government Capacity **Objective:** Strengthening the adaptive capacity of village, sub-district and district government in targeted area in South Sumatera to reduce risks associated with climate-induced socio-economic and environmental losses.					
Outcome 2.1. Developed strategy of climate change adaptation and adopted into a regular government planning cycle	41 villages in the Project area adopt CC strategy in their yearly and midterm planning; District and province government adopt CC strategy in yearly planning and mid-term planning	24th month	Policy	Policy and regulation improvement report review	Quarterly
Outcome 2.2. Strengthened capacity of village, sub-district and district government apparatus to reduce risks associated with climate-induced socio-economic and environmental losses.	100 government staff from related agency and village government involved in the capacity building process.	24th month	Awareness	Capacity building and awareness report review	Quarterly
Output 2.1.1. Sub-district and village level of spatial map and governance system are developed.	41 spatial planning document in village level include spatial map in each village	9th month	Village regulation	Policy and regulation improvement report review	Quarterly
Output 2.1.2. Landscape and sub-district level of climate change adaptation strategy and action plan are developed.	2 documents of Adaptation Strategy in Sub District level	12th month	Landscape approach	Policy and regulation improvement report review	Quarterly
Output 2.1.3. Increased quality of village planning, which consider the aspects of disaster risk reduction, food security and sustainable agriculture, and water management.	41 midterm planning in village level improved with disaster risk reduction, food security and sustainable agriculture, and water management aspect	24th month	Village regulation	Policy and regulation improvement report review	Quarterly
Component 3: Community Engagement **Objective:** Strengthening the community awareness and participation in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in adaptation and climate risk reduction measures.					
Outcome 3.1. Strengthened community awareness and participation in adaptation and climate risk reduction measures.	50% from 77.000 people in Project area involved in community awareness activities	24th month	Risk reduction	Capacity building and awareness report review	Quarterly

Project Result	Indicators	Target	Sort by	Method and Tools	Freq.
Outcome 3.2. Strengthened community adaptive capacity in climate risk reduction measures.	20% from 77.000 people in Project area reduced their risk from climate change impact	24th month	Risk reduction	Capacity building and awareness report review	Quarterly
Output 3.1.1. Developed the Climate Change Adaption Multi-stakeholder Forum at landscape level, covering 2 sub-districts of Project targeted area.	Involvement of 41 village government, 2 sub districts and districts government, 4 private sectors in the forum	24th month	Landscape approach	Capacity building and awareness report review	Quarterly
Output 3.1.2. Community participation in landscape and sub-district level of climate change adaptation strategy and action plan	5% people in Project area involved actively in formulating and planning process	6th month	Landscape approach	Policy and regulation improvement report review	Quarterly
Output 3.2.1. Village regulation on sustainable-use of natural resources and climate change adaptation are developed.	41 village regulation/policy developed	12th month	Village regulation	Policy and regulation improvement report review	Quarterly
Output 3.2.2. Increased capacity of farmer institution, in the aspect of management, good and adaptive agriculture practices, access to finance and sustainable market.	41 farmer organization in 41 village improved related to good and adaptive agriculture practices, access to finance and sustainable market	21th month	Farmer institution	Capacity building and awareness report review	Quarterly
Output 3.2.3. Irrigation infrastructures are revitalized through community-based cash for work mechanism.	50% of damaged facilities improved by the Project	12th month	Irrigation revitalization	Environment and infrastructure improvement report review	Quarterly
Output 3.2.4. Community-based and integrated irrigation management systems are developed	41 Community-Based SOP on integrated irrigation system established in village level	24th month	Irrigation revitalization	Policy and regulation improvement report review	Quarterly
Component 4: Community Livelihood **Objective:** Diversification and strengthening livelihoods of vulnerable communities in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in relation to climate change impacts, including variability.					
Outcome 4.1. Strengthened livelihoods of vulnerable communities in relation to climate change impacts, including variability.	50% of vulnerable communities improved their livelihood in relation to climate change impacts	12th month	Livelihood	Livelihood improvement report review	Quarterly
Outcome 4.2. Diversified and enhanced livelihoods of vulnerable communities.	5 new type of livelihoods source developed	24th month	Livelihood	Livelihood improvement report review	Quarterly
Output 4.1.1. Developed integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries.	41 piloting area in each village of Integrated and Adaptive Agriculture Practices developed	12th month	Integrated agriculture	Livelihood improvement report review	Quarterly
Output 4.1.2. Developed agrosilvofisheries system in mangrove area and agroforestry system in terrestrial	10 ha of agrosilvofisheries system piloting area developed in potential area	12th month	Integrated agriculture	Livelihood improvement report review	Quarterly
Output 4.2.1. Developed new models of community livelihood of post harvesting/processing stages, particularly for women and youth group.	10 unit of small-scale post harvesting /processing business developed	24th month	Livelihood	Livelihood improvement report review	Quarterly
Output 4.2.2. Developed community or village-owned enterprises and cooperatives.	10 unit of community or village-owned enterprises and cooperatives well operated	24th month	Livelihood	Livelihood improvement report review	Quarterly

Project Result	Indicators	Target	Sort by	Method and Tools	Freq.
Component 5: Ecosystem Resilience **Objective:** Increasing the resilience of lowland and coastal ecosystem in estuary area of Musi River and Sugihan River in response to climate change and variability-induced stress.					
Outcome 5.1. The essential areas are conserved in order to maintain the ecosystem services and ecosystem carrying capacity.	The remaining ecosystems are mapped and formally agreed to be maintained by the community and village government	21st month	Conservation	Environment & infrastructure improvement report review	Quarterly
Outcome 5.2. Improved ecosystem condition affected by climate change.	1000 ha of degraded ecosystem improved or rehabilitated	24th month	Conservation	Environment & infrastructure improvement report review	Quarterly
Output 5.1.1. Delineated and developed community-based conservation area.	75% potential conservation/ protected area in delineated and developed	18th month	Conservation	Environment & infrastructure improvement report review	
Output 5.1.2. Developed village regulation of community-based conservation area.	75 % villages in the potential conservation area develop conservation regulation	18th month	Conservation	Policy and regulation improvement report review	Quarterly
Output 5.1.3. Developed conservation partnership schemes between corporation and village/communities	4 partnership models	21th month	Conservation	Policy and regulation improvement report review	Quarterly
Output 5.2.1. Restoration of degraded mangrove and coastal forest area are conducted.	500 ha of degraded mangrove and coastal forest restored/rehabilitated	24th month	Conservation	Environment & infrastructure improvement report review	Quarterly
Output 5.2.2. Restoration and plant enrichment of degraded upstream and watershed areas are conducted.	Restoration and plant enrichment of 500 ha degraded upstream and watershed areas	24th month	Conservation	Environment & infrastructure improvement report review	Quarterly
Component 6: Policy and Governance **Objective**: Improving the policies and regulations related to irrigation management system and agricultural practices in South Sumatera that promote and enforce climate resilience.					
Outcome 6.1. Improved policies and regulations & enforce climate resilience.	Policy and regulation in district and level improved related to climate resilience	9th month	Policy	Policy and regulation improvement report review	Quarterly
Outcome 6.2. Developed climate change monitoring system which enforces climate resilience.	Monitoring system established in sub district and district level	24th month	Monitoring system	Policy and regulation improvement report review	Quarterly
Output 6.1.1. Improved capacity of related institution to develop climate change adaptation policies, strategies and activities.	Staffs from related institution involved actively in the process of developing CC adaptation policy and strategy	9th month	Coordination Landscape approach	Policy and regulation improvement report review	Quarterly
Output 6.1.2. Developed cross-sectoral governance to optimize the irrigation infrastructures system.	Establishment of o coordination platform/regulation in district level among related institution (Bappeda, Dinas PU, Dinas Pertanian)	9th month		Policy and regulation improvement report review	Quarterly
Output 6.2.1. Promoted and established climate change monitoring system at district and provincial level.	agreement between the provincial and district governments regarding climate change monitoring systems	12th month		Policy and regulation improvement report review	Quarterly
Output 6.2.2. Established community-based climate change adaptation learning system at sub-district and village level.	Agreement and *Standard Operating Procedure* between the provincial and district governments regarding climate change monitoring systems	24th month		Capacity building and awareness report review	Quarterly

E. RESULT FRAMEWORK

The table showing the Project's logical framework, accompanied by a baseline benchmarking and expected result that the Project would like to achieve in year 1 and year 2, accompanied by the means of verification and the assumptions used are presented on the following pages.

Table 14: Result Framework

Outcome/output	Indicator	Base line	Target		Sources of Verification	Risk and Assumption
			Y1	Y2		
Component 1: Data and Knowledge **Objective: Assessment and mapping of risk and vulnerabilities caused by climate-related hazards and threats in estuary area of Musi River and Sugihan River in sub-district of Muara Sugihan and Air Sugihan.**						
Outcome 1.1. Risk and vulnerabilities caused by climate-related hazards and threats are assessed and mapped.	2 detail report document on CC risk and vulnerability in sub-district level	0	1	1	Activity report and documentation	There are no social barriers during the assessment process
Outcome 1.2. The levels of adaptive capacity of climate change, including the availability of early warning systems are assessed.	2 detail analytic document on community capacity in CC adaptation in sub district level	0	2		Activity report and documentation	There are no social barriers during the assessment process
Outcome 1.3. Climate-related data are well managed and socialized to the wider community.	50% of 77,000 people received information on the results of the assessment. and 50 personnel at district and province levels can understand the data well	5%	20%	30%	Media publication	Data collection and media management run smoothly
Output 1.1.1. Risk and vulnerabilities caused by climate change, including socio-economic and environmental aspects of vulnerability are participatory assessed.	41 report on risk and vulnerable report in village level	0	41		Assessment report	There are no social, accessibility and disaster barriers during the process
Output 1.1.2. Action research of the impact of climate change on irrigation infrastructures, irrigation management system and agriculture practices are conducted.	41 reports on Participatory Action Research in village level	0	21	20	Activity report and documentation	There are no social, accessibility and disaster barriers during the process
Output 1.2.1. Policy and regulation at village, sub-district, district, and province level related to climate change adaption are assessed and mapped.	41 report in village level,	0	10	31		There are no social, accessibility and disaster barriers during the process -
	2 report in sub district and district,	0		2		
	1 report in province level			1		
Output 1.2.2. Climate-related of local/indigenous knowledge and community-based monitoring system of risk and vulnerabilities caused by climate-change are assessed.	41 report in village level	0	41		Activity report and documentation	There are no social, accessibility and disaster barriers during the process

Outcome/output	Indicator	Base line	Target		Sources of Verification	Risk and Assumption
			Y1	Y2		
Output 1.3.1. Climate related data management systems are developed in coordination with other key stakeholder	A platform on area data management developed and managed by key stakeholders	0		1	Activity report and documentation	Good coordination occurs among key stakeholders
Output 1.3.2. Project best practices and lesson learned are documented, published and disseminated.	All media (Village Bulletin, documentary movie, assessment report) published and disseminated	0	30%	70%	Activity report documentation	-
Component 2: Government Capacity **Objective: Strengthening the adaptive capacity of village, sub-district and district government in targeted area in South Sumatera to reduce risks associated with climate-induced socio-economic and environmental losses.**						
Outcome 2.1.Developed strategy of climate change adaptation and adopted into a regular government planning cycle	41 villages in the Project area adopt CC strategy in their yearly and midterm planning; District and province govt. adopt CC strategy in yearly planning and mid-term planning	0	10	31	Content of government regular planning	Good governance occurs in local government cycle
Outcome 2.2. Strengthened capacity of village, sub-district and district government apparatus to reduce risks associated with climate-induced socio-economic and environmental losses.	100 government staff from related agency and village government involved in the capacity building process.	0	30	70	Pre and post questionnaire	Good governance occurs in local government cycle
Output 2.1.1. Sub-district and village level of spatial map and governance system are developed.	41 spatial planning document in village level include spatial map in each village	0	10	31	Mapping process review Village policy draft	There are no social, accessibility and disaster barriers during the process Capacity and ability of village apparatus
Output 2.1.2. Landscape and sub-district level of climate change adaptation strategy and action plan are developed.	2 documents of Adaptation Strategy in Sub District level	0		2	Sub district government involvement	There are no social, accessibility and disaster barriers during the process
Output 2.1.3. Increased quality of village planning, which consider the aspects of disaster risk reduction, food security and sustainable agriculture, and water management.	41 midterm planning in village level improved with disaster risk reduction, food security and sustainable agriculture, and water management aspect	0	10	31	Village planning document review	Capacity and ability of village apparatus
Component 3: Community Engagement **Objective: Strengthening the community awareness and participation in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in adaptation and climate risk reduction measures.**						
Outcome 3.1. Strengthened community awareness and participation in adaptation and climate risk reduction measures.	50% from 77.000 people in Project area involved in community awareness activities	0	20%	30%	Activity report: Number of community involved in activity	The reasons and drivers offered by the Project could be understood by the community

Outcome/output	Indicator	Base line	Target		Sources of Verification	Risk and Assumption
			Y1	Y2		
Outcome 3.2. Strengthened community adaptive capacity in climate risk reduction measures.	20% from 77.000 people in Project area reduced their risk from climate change impact	0	5%	15%	Activity report: Number of community involved in activity	The reasons and drivers offered by the Project could be understood by the community
Output 3.1.1. Developed the Climate Change Adaption Multi-stakeholder Forum at landscape level, covering 2 sub-districts of Project targeted area.	Involvement of 41 village government, 2 sub districts and districts government, 4 private sectors in the forum	0		100%	Activity report: Stakeholders involvement in Project activates	There is no significant conflict between stakeholders
Output 3.1.2. Community participation in landscape and sub-district level of climate change adaptation strategy and action plan	5% people in Project area involved actively in formulating and planning process	0		5%	Activity report: community involvement action plan development process	Good relationship between government and community
Output 3.2.1. Village regulation on sustainable-use of natural resources and climate change adaptation are developed.	41 village regulation/policy developed	0	10	31	Regulation/policy draft review	Capacity and ability of village apparatus
Output 3.2.2. Increased capacity of farmer institution, in the aspect of management, good and adaptive agriculture practices, access to finance and sustainable market.	41 farmer organization in 41 village improved related to good and adaptive agriculture practices, access to finance and sustainable market	0	10	31	Activity report: community involvement action plan development process	The reasons and drivers offered by the Project could be understood by the community and farmer
Output 3.2.3. Irrigation infrastructures are revitalized through community-based cash for work mechanism.	50% of damaged facilities improved by the Project		10%	40%	Productive area influenced by revitalization process	Accuracy in choosing a revitalized area
Output 3.2.4. Community-based and integrated irrigation management systems are developed	41 Community-Based Standard Operating Procedure on integrated irrigation system established in village level		10	31	Activity report: community involvement action plan development process	
Component 4: Community Livelihood **Objective: Diversification and strengthening livelihoods of vulnerable communities in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in relation to climate change impacts, including variability.**						
Outcome 4.1. Strengthened livelihoods of vulnerable communities in relation to climate change impacts, including variability.	50% of vulnerable communities improved their livelihood in relation to climate change impacts		50%		Household economic assessment	It may take longer to see the results of the program
Outcome 4.2. Diversified and enhanced livelihoods of vulnerable communities.	5 new type of livelihoods source developed in the Project area		1	4	Activity report	Accuracy in choosing the business unit/model
Output 4.1.1. Developed integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries.	41 piloting area in each village of Integrated and Adaptive Agriculture Practices developed		10	31	Activity report: productivity and benefit report	Depends on the ability of the farmer and the accuracy of the techniques chosen in the application of integrated agriculture

Outcome/output	Indicator	Base line	Target		Sources of Verification	Risk and Assumption
			Y1	Y2		
Output 4.1.2. Developed agrosilvofisheries system in mangrove area and agroforestry system in terrestrial	10 ha of agrosilvofisheries system piloting area developed in potential area		10		Activity report: productivity and benefit report	Depends on the ability of the farmer and the accuracy of the techniques chosen
Output 4.2.1. Developed new models of community livelihood of post harvesting/processing stages, particularly for women and youth group.	10 unit of small-scale post harvesting /processing business developed		2	8	Activity report: productivity and benefit report	Ability, motivation of community especially women and youth and access to markets is important to be consider
Output 4.2.2. Developed community or village-owned enterprises and cooperatives.	10 unit of community or village-owned enterprises and cooperatives well operated		5	5	Legality of institution establishment and statute	Depends on the village governance and the social conditions of the community
Component 5: Ecosystem Resilience **Objective: Increasing the resilience of lowland and coastal ecosystem in estuary area of Musi River and Sugihan River in response to climate change and variability-induced stress.**						
Outcome 5.1. The essential areas are conserved in order to maintain the ecosystem services and ecosystem carrying capacity.	The remaining ecosystems are mapped and formally agreed to be maintained by the community and village government		50%	50%	Activity report: participatory mapping report	Community willingness and awareness are sufficient to develop the conservation agenda
Outcome 5.2. Improved ecosystem condition affected by climate change.	1000 ha of degraded ecosystem improved or rehabilitated	0		1000	Activity report and documentation of planting area	The success of planting and rehabilitation is determined by the post-planting maintenance system
Output 5.1.1. Delineated and developed community-based conservation area.	75% potential conservation /protected area in delineated and developed	0	30%	45%	Mapping process and result review	Community willingness and awareness are sufficient to develop the conservation agenda
Output 5.1.2. Developed village regulation of community-based conservation area.	75 % Villages in the potential conservation area able to develop conservation regulation	0	30%	45%	Village regulation review	
Output 5.1.3. Developed conservation partnership schemes between corporation and village/communities	4 partnership models		1	3	MoU or collaboration action plan between community and corporation	Communities and companies are not involved in meaningful conflicts
Output 5.2.1. Restoration of degraded mangrove and coastal forest area are conducted.	500 ha of degraded mangrove and coastal forest restored/rehabilitated		100	400	Activity report and documentation: planting process and result	Community willingness and awareness are sufficient to develop the conservation agenda
Output 5.2.2. Restoration and plant enrichment of degraded upstream and watershed areas are conducted.	Restoration and plant enrichment of 500 ha degraded upstream and watershed areas		100	400	Activity report and documentation: planting process and result	
Component 6: Policy and Governance **Objective: Improving the policies and regulations related to irrigation management system and agricultural practices in South Sumatera that promote and enforce climate resilience.**						

Outcome/output	Indicator	Base line	Target		Sources of Verification	Risk and Assumption
			Y1	Y2		
Outcome 6.1. Improved policies and regulations and enforce climate resilience.	Policy and regulation in district and level improved related to climate resilience	0	100 %		Policy draft review	The condition of governance enables improvement process conducted
Outcome 6.2. Developed climate change monitoring system which enforces climate resilience.	Monitoring system established in sub district and district level	0		100%	progress report of system development	Monitoring system can meet people's needs
Output 6.1.1. Improved capacity of related institution to develop climate change adaptation policies, strategies and activities.	Staffs from related institution (Bappeda, Dinas PU, Pertanian) involved actively in the process of developing CC adaptation policy and strategy	0	100 %		Policy draft review	
Output 6.1.2. Developed cross-sectoral governance to optimize the irrigation infrastructures system.	Establishment of coordination platform/regulation in district level among related institution (Bappeda, Dinas PU, Dinas Pertanian)	0	100 %		Agreement on coordination system among institution	The condition of governance enables improvement process conducted
Output 6.2.1. Promoted and established climate change monitoring system at district and provincial level.	agreement between the provincial and district governments regarding climate change monitoring systems	0	100 %		progress report of system development	Monitoring system can meet development cycle needs
Output 6.2.2. Established community-based climate change adaptation learning system at sub-district and village level.	Agreement and *Standard Operating Procedure* between the provincial and district governments regarding climate change monitoring systems	0		100%	progress report of system development	The system can meet people's needs

F. ALIGNMENT WITH ADAPTATION FUND

The table below showing the alignment between Project Component/Objective and the Adaptation Fund Outcome:

Table 15: Alignment the Project Objectives with Adaptation Fund Outcomes (Objective Level)

Project Objective(s)	Project Objective(s) Indicator	Fund Outcome	Fund Outcome Indicator	Grant (USD)
1. Assessment and mapping of risk and vulnerabilities caused by climate-related hazards and threats in estuary area of Musi River and Sugihan River in sub-district of Muara Sugihan and Air	Two sub-districts have climate change adaptation plans based on the latest climate change vulnerability and risk data	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risk	$82,808
	Two sub-districts have detail analytic document on community capacity in CC adaptation in sub district levels a basis for increasing capacity for the community	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors	4.1. Development sectors' services responsive to evolving needs from changing and variable climate	

Project Objective(s)	Project Objective(s) Indicator	Fund Outcome	Fund Outcome Indicator	Grant (USD)
Sugihan *(Baseline Data and Knowledge)*	50% of 77,000 and Government staff from agency at the regional level have increased awareness of the importance of risk reduction and climate change adaptation actions.	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
2. Strengthening the adaptive capacity of village, sub-district and district government in targeted area in South Sumatera to reduce risks associated with climate-induced socio-economic and environmental losses *(Government Capacity)*	41 villages in the Project area adopt CC strategy in their yearly and midterm planning, District and province govt. adopt CC strategy in yearly planning and mid-term planning	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.2. Number of people with reduced risk to extreme weather events	$62,106
	100 government staff from related agency and village government involved in the capacity building process.	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks	
3. Strengthening the community awareness and participation in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in adaptation and climate risk reduction measures *(Community Engagement)*	50% from 77.000 people in Project area aware of predicted adverse impacts of climate change, and of appropriate responses	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	$227,721
	20% from 77.000 people in Project area are change their behavior and reduce their risk from climate change impact	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.2. Modification in behavior of targeted population	
4. Diversification and strengthening livelihoods of vulnerable communities in lowland and coastal area in sub-district of Muara Sugihan and Air Sugihan in relation to climate change impacts, including variability *(Community Livelihood)*	50% of vulnerable communities improved their livelihood in relation to climate change impacts	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1.2. Type of income sources for households generated under climate change scenario	$186,317
	5 new type of livelihoods source developed in the Project area	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1.1.No. and type of adaptation assets (physical as well as knowledge) created in support of individual or community-livelihood strategies	
5. Increasing the resilience of lowland and coastal ecosystem in estuary area of Musi River and Sugihan River in response to climate change and variability-induced stress *(Ecosystem Resilience)*	The remaining ecosystems are mapped and formally agreed to be maintained by the community and village government	Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress	$144,913
	1000 ha of degraded ecosystem improved or rehabilitated	Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress	

Project Objective(s)	Project Objective(s) Indicator	Fund Outcome	Fund Outcome Indicator	Grant (USD)
6. Improving the policies and regulations related to irrigation management system and agricultural practices in South Sumatera that promote and enforce climate resilience *(Policy and Governance)*	Policy and regulation in district and level improved related to climate resilience	Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy	$124,211
	Monitoring system established in sub district and district level	Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy	

Table 16: Alignment the Project Outcomes with Adaptation Fund Output (Outcome Level)

Project Outcome(s)	Project Outcome(s) Indicator	Fund Output	Fund Output Indicator	Grant (USD)
1.1. Risk and vulnerabilities caused by climate-related hazards and threats are assessed and mapped	2 detail report document on CC risk and vulnerability in sub-district level	Output 2.2: Targeted population groups covered by adequate risk reduction systems	2.2.1. Percentage of population covered by adequate risk-reduction systems	$20,000
1.2. The levels of adaptive capacity of climate change, including the availability of early warning systems are assessed	2 detail analytic document on community capacity in CC adaptation in sub district level	Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	4.1.1. No. and type of health or social infrastructure developed or modified to respond to new conditions resulting from climate variability and change (by type)	$30,000
1.3. Climate-related data are well managed and socialized to the wider community	50% of 77,000 residents received information on assessment results; Government staff from related agency at the regional level (district and province) using the data for their assignment	Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	4.1.1. No. and type of health or social infrastructure developed or modified to respond to new conditions resulting from climate variability and change (by type)	$32,808
2.1. Developed strategy of climate change adaptation and adopted into a regular government planning cycle	41 villages in the Project area adopt CC strategy in their yearly and midterm planning District and province govt. adopt CC strategy in yearly planning and mid-term planning	Output 2.2: Targeted population groups covered by adequate risk reduction systems	2.2.1. Percentage of population covered by adequate risk-reduction systems	$25,106
2.2. Strengthened capacity of village, sub-district and district government apparatus to reduce risks associated with climate-induced socio-economic and environmental losses	100 government staff from related agency and village government involved in the capacity building process.	Output 2.1: Strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events	$37,000
3.1. Strengthened community awareness and participation in	50% from 77.000 people in Project area involved in	Output 3: Targeted population groups participating in adaptation and risk	3.1.1 No. and type of risk reduction actions or strategies introduced at	$52,000

Project Outcome(s)	Project Outcome(s) Indicator	Fund Output	Fund Output Indicator	Grant (USD)
adaptation and climate risk reduction measures	community awareness activities	reduction awareness activities	local level	
3.2. Strengthened community adaptive capacity in climate risk reduction measures.	20% from 77.000 people in Project area reduced their risk from climate change impact	Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 No. and type of risk reduction actions or strategies introduced at local level	$175,721
4.1. Strengthened livelihoods of vulnerable communities in relation to climate change impacts, including variability	50% of vulnerable communities improved their livelihood in relation to climate change impacts	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1.No. and type of adaptation assets (physical as well as knowledge) created in support of individual or community-livelihood strategies	$96,317
4.2. Diversified and enhanced livelihoods of vulnerable communities	5 new type of livelihoods source developed in the Project area	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.2. Type of income sources for households generated under climate change scenario	$90,000
5.1. The essential areas are conserved in order to maintain the ecosystem services and ecosystem carrying capacity	The remaining ecosystems are mapped and formally agreed to be maintained by the community and village government	Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	$74,913
5.2. Improved ecosystem condition affected by climate change	1000 ha of degraded ecosystem improved or rehabilitated	Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	$70,000
6.1. Improved policies and regulations and enforce climate resilience	Policy and regulation in district and level improved related to climate resilience	Output 7: Improved integration of climate-resilience strategies into country development plans	7.1. No., type, and sector of policies introduced or adjusted to address climate change risks	$84,211
6.2. Developed climate change monitoring system which enforces climate resilience	Monitoring system established in sub district and district level	Output 7: Improved integration of climate-resilience strategies into country development plans	7.2. No. or targeted development strategies with incorporated climate change priorities enforced	$40,000

G. PROJECT BUDGET

Table 17: Project Budget

Description Item			Cost
Total Project Cost			**$915,000**
Component 1: Baseline Data and Knowledge			**$82,808**
Outcome	**1.1**	**Risk and vulnerabilities caused by climate-related hazards and threats are assessed and mapped.**	**$20,000**
Output	**1.1.1**	**Risk and vulnerabilities caused by climate change, including socio-economic and environmental aspects of vulnerability are participatory assessed.**	**$10,000**
Activity	1.1.1.1	Participatory socio-economic assessment (5 village in Muara Sugihan, 5 villages in Air Sugihan)	$7,500
	1.1.1.2.	Environmental aspects assessment (5 village in Muara Sugihan, 5 villages in Air Sugihan)	$2,500
Output	**1.1.2**	**Action research of the impact of climate change on irrigation infrastructures, irrigation management system and agriculture practices are conducted.**	**$10,000**
Activity	1.1.2.1	action research of CC impact on irrigation infrastructure management	$7,500
	1.1.2.2.	Action research of CC impact on agriculture practice	$2,500
Outcome	**1.2**	**The levels of adaptive capacity of climate change, including the availability of early warning systems are assessed**	**$30,000**
Output	**1.2.1**	**Policy and regulation at village, sub-district, district, and province level related to climate change adaption are assessed and mapped.**	**$16,000**
Activity	1.2.1.1.	Policy and regulation assessment in village and sub district level (10 village, 2 sub district)	$5,000
	1.2.1.2.	Policy and regulation assessment in district level (2 district: Banyuasin and Ogan Komering Ilir)	$6,000
	1.2.1.3.	Policy and regulation assessment in province level	$5,000
Output	**1.2.2**	**Climate-related of local/indigenous knowledge and community-based monitoring system of risk and vulnerabilities caused by climate-change are assessed.**	**$14,000**
Activity	1.2.2.1.	Assessment of local/indigenous knowledge on estuary and tidal dynamic	$3,500
	1.2.2.2.	Assessment of local/indigenous knowledge on climatic and agriculture aspect	$3,500
	1.2.2.3.	Assessment of local/indigenous knowledge on land and biodiversity aspect	$3,500
	1.2.2.4.	Assessment of community-based early warning system	$3,500
Outcome	**1.3.**	**Climate-related data are well managed and socialized to the wider community**	**$32,808**
Output	**1.3.1**	**Climate related data management system are developed in coordination with other key stakeholder**	**$5,808**
Activity	1.3.1.1.	Data compilation and analysis (expert consultation)	$2,808
	1.3.1.2	Discussion and coordination with key stakeholders	$3,000
Output	**1.3.2.**	**Project best practices and lesson learned are documented, published and disseminated**	**$27,000**
Activity	1.3.2.1	Making and distribution of village bulletin	$3,000
	1.3.2.2.	Producing and dissemination of documentary movie	$12,000
	1.3.2.3.	Workshop on district level	$5,000
	1.3.2.4	Workshop on province and national level	$7,000
Component 2: Government Capacity			**$62,106**
Outcome	**2.1**	**Developed strategy of climate change adaptation and adopted into a regular government planning cycle.**	**$25,106**
Output	**2.1.1**	**Sub-district and village level of spatial map and governance system are developed**	**$4,500**
Activity	2.1.1.1.	Participatory village mapping	$3,000
	2.1.1.2.	Legal aspect coordination on mapping result	$1,500
Output	**2.1.2**	**Landscape and sub-district level of climate change adaptation strategy and action plan are developed.**	**$14,106**

Description Item			Cost
Activity	2.1.2.1.	Training on climate change in village level	$9,606
	2.1.2.2	FGDs in village level to explore ideas	$1,000
	2.1.2.3	Document making on adaptation strategy in village level	$2,000
	2.1.2.4	Facilitating village government to improve their village policy related to CC adaptation strategy	$1,500
Output	**2.1.3**	**Increased quality of village planning, which consider the aspects of disaster risk reduction, food security and sustainable agriculture, and water management.**	**$6,500**
Activity	2.1.3.1	Capacity building on village government staff on sustainable lowland ecosystem management	$3,500
	2.1.3.2	Participatory campaign led by village government on sustainable lowland ecosystem management	$2,000
	2.1.3.3	Facilitating village government and community to improve their mid-term planning document (RPJMDes) related to lowland ecosystem management	$1,000
Outcome	**2.2**	**Strengthened capacity of village, sub-district and district government apparatus to reduce risks associated with climate-induced socio-economic and environmental losses**	**$37,000**
Output	**2.2.1**	**Improved capacity of village and sub-district apparatus in the formulation of policy and regulation related to climate change adaptation**	**$18,500**
Activity	2.2.1.1	Training on village and sub district apparatus about climate change policy and program in Indonesia	$9,500
	2.2.1.2	Training on improving policy and regulation in village level and sub district related to climate change adaptation	$9,000
Output	**2.2.2**	**Improved capacity of village and sub-district apparatus in the budget allocation/resource management and mobilization related to climate change adaptation.**	**$18,500**
Activity	2.2.2.1	Training on budgeting/budget planning policy in village level for village and sub district apparatus	$9,500
	2.2.2.2	Facilitating village government to improve their development budget plan related to climate change adaptation in coordination with sub district policy	$9,000
Component 3:Community Engagement			**$227,721**
Outcome	**3.1**	**Strengthened community awareness and participation in adaptation and climate risk reduction measures.**	**$52,000**
Output	**3.1.1**	**Developed the Climate Change Adaption Multi-stakeholder Forum at landscape level, covering 2 sub-districts of Project targeted area**	**$30,000**
Activity	3.1.1.1	Organizing seminars on Climate Change Vulnerability and Adaptation	$6,000
	3.1.1.2	Increase the capacity of stakeholders related to climate change adaptation through serial discussions	$4,000
	3.1.1.3	Workshop Formation and Compilation of Multi-stakeholder Forum Work Plans	$12,000
	3.1.1.4	Facilitation of multi stakeholder forums	$8,000
Output	**3.1.2**	**Community participation in landscape and sub-district level of climate change adaptation strategy and action plan (see 2.1.2.).**	**$22,000**
Activity	3.1.2.1	Conduct a KAP survey of the community regarding climate change	$10,000
	3.1.2.2	Conducting adaptation change conservation training for the community	$10,000
Outcome	**3.2**	**Strengthened community adaptive capacity in climate risk reduction measures.**	**$175,721**
Output	**3.2.1**	**Village regulation on sustainable-use of natural resources and climate change adaptation are developed**	**$23,000**
Activity	3.2.1.1	Conducting village meeting on sustainable-use of natural resources and climate change adaptation are developed	$18,000
	3.2.1.2	Facilitate the process of preparing village regulations	$5,000
Output	**3.2.2**	**Increased capacity of farmer institution, in the aspect of management, good and adaptive agriculture practices, access to finance and sustainable market**	**$23,000**
Activity	3.2.2.1	Conducting farmer institutional training for management, good and adaptive agriculture practices, access to finance and sustainable market	$18,000
	3.2.2.2	Facilitating the process of accessing financing and sustainable markets	$5,000

Description Item			Cost
Output	**3.2.3**	**Irrigation infrastructures are revitalized through community-based cash for work mechanism.**	**$117,721**
Activity `	3.2.3.1	Collect data on irrigation infrastructure conditions	$7,500
	3.2.3.2	Prepare a revitalization plan for irrigation infrastructure with a community-based cash for work mechanism	$7,500
	3.2.3.3	Implementation of revitalization of irrigation infrastructure with a community-based cash for work mechanism	$102,721
Output	**3.2.4**	**Community-based and integrated irrigation management systems are developed.**	**$12,000**
Activity	3.2.4.1	Conducting workshop of community-based and integrated irrigation management systems	$9,000
	3.2.4.2	Signing of a community-based and integrated irrigation management systems agreement	$1,000
	3.2.4.3	Facilitating the implementation of community-based and integrated irrigation management systems	$2,000
Component 4: Community Livelihood			**$186,317**
Outcome	**4.1**	**Strengthened livelihoods of vulnerable communities in relation to climate change impacts, including variability.**	**$96,317**
Output	**4.1.1**	**Developed integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries**	**$48,317**
Activity	4.1.1.1	Training on integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries	$18,000
	4.1.1.2	Demonstration plot of integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries	$30,317
Output	**4.1.2**	**Developed agrosilvofisheries system in mangrove area and agroforestry system in terrestrial.**	**$48,000**
Activity	4.1.2.1	Training to improve skills in integrated and adaptive agriculture practices that are integrating the crop, livestock and fisheries	$18,000
	4.1.2.2	Establishment of an integrated and adaptive agriculture demonstration scheme that integrates the crop, livestock and fisheries	$30,000
Outcome	**4.2**	**Diversified and enhanced livelihoods of vulnerable communities**	**$90,000**
Output	**4.2.1**	**Developed new models of community livelihood of post harvesting/processing stages, particularly for women and youth group;**	**$65,000**
Activity	4.2.1.1	Collecting data about potential products that can be done post-harvest business development	$5,000
	4.2.1.2	Conduct post-harvest product business training for women and youth groups	$40,000
	4.2.1.3	Assistance to post-harvest product businesses for women and youth groups	$20,000
Output	**4.2.2**	**Developed community or village-owned enterprises and cooperatives.**	**$25,000**
Activity	4.2.2.1	Training of business institutions, cooperatives and village-owned enterprises	$15,000
	4.2.2.2	Assistance for business institutions, cooperatives, and village-owned enterprises	$10,000
Component 5: Ecosystem Resilience			**$144,913**
Outcome	**5.1.**	**The essential areas are conserved in order to maintain the ecosystem services and ecosystem carrying capacity.**	**$74,913**
Output	**5.1.1**	**Delineated and developed community-based conservation area**	**$27,413**
Activity	5.1.1.1	Community workshop on community-based conservation area	$8,413
	5.1.1.2	Participatory area mapping	$10,000
	5.1.1.3	Community-based conservation area establishment	$9,000
Output	**5.2.1**	**Developed village regulation of community-based conservation area**	**$27,500**
Activity	5.2.1.1	Training on community based conservation management	$11,000
	5.2.1.2	Community by-laws identification	$3,500
	5.2.1.3	Village workshop for CBCA regulation drafting	$11,000
	5.2.1,4	Legalization and dissemination	$2,000
Output	**5.2.2**	**Developed conservation partnership schemes between corporation and village/communities**	**$20,000**
Activity	5.2.2.1	Arranging partnership schemes planning	$3,000
	5.2.2.2	Workshop on conservation partnership	$15,000
	5.2.2.3	MoU on conservation partnership schemes between corporation and village/communities	$2,000

Description Item			Cost
Outcome	**5.2.**	**Improved ecosystem condition affected by climate change.**	**$70,000**
Output	**5.2.1**	**Restoration of degraded mangrove and coastal forest area are conducted**	**$35,000**
Activity	5.2.1.1	Participatory Field Observation Study: Vegetation, substrate, hydrology	$3,000
	5.2.1.2	Participatory Land Status and Allocation Study	$3,000
	5.2.1.3	Participatory Land suitability and Feasibility study	$3,000
	5.2.1.4	Community Capacity building on Forest Rehabilitation	$12,000
	5.2.1.5	Forest Rehabilitation Plan (stakeholders mapping, technical design, infrastructure preparation, budget, etc.)	$2,000
	5.2.1.6	Planting and maintenance	$12,000
Output	**5.2.2**	**Restoration and plant enrichment of degraded upstream and watershed area are conducted**	**$35,000**
Activity	5.2.2.1	Participatory Field Observation Study: Vegetation, substrate, hydrology	$3,000
	5.2.2.2	Participatory Land Status and Allocation Study	$3,000
	5.2.2.3	Participatory Land suitability and Feasibility study	$3,000
	5.2.2.4	Community Capacity building on Forest Rehabilitation	$12,000
	5.2.2.5	Forest Rehabilitation Plan (stakeholders mapping, technical design, infrastructure preparation, budget, etc.)	$2,000
	5.2.2.6	Planting and maintenance	$12,000
Component 6: Policy and Governance			**$124,211**
Outcome	**6.1**	**Improved policies and regulations and enforce climate resilience**	**$84,211**
Output	**6.1.1**	**Improved capacity of related institution to develop climate change adaptation policies, strategies and activities**	**$54,211**
Activity	6.1.1.1	Institution mapping	$17,211
	6.1.1.2	Training on climate change mainstreaming and on multiple technical aspects linked to the response to climate change	$18,500
	6.1.1.3	Training workshops on mainstreaming climate change in development planning and budgeting	$18,500
Output	**6.1.2**	**Developed cross-sectoral governance to optimize the irrigation infrastructures system**	**$30,000**
Activity	6.1.2.1	Desk study :(identification of Role of governance systems in promoting efficient and equitable water resources management; type of legal instruments, policies and institutions that are required to encourage stakeholder participation in decision making)	$17,500
	6.1.2.2	Workshop on cross sectoral governance to optimize the irrigation infrastructures system	$7,500
	6.1.2.3	Establishing a cross sectoral irrigation optimization forum	$5,000
Outcome	**6.2**	**Developed climate change monitoring system which enforces climate resilience**	**$40,000**
Output	**6.2.1**	**Promoted and established climate change monitoring system at district and provincial level**	**$20,000**
Activity	6.2.1.1	Workshop for climate change monitoring system of district and provincial level	$10,000
	6.2.1.2	Developed forum for climate change monitoring system for district and provincial level	$10,000
Output	**6.2.2**	**Established community-based climate change adaptation learning system at sub-district and village level.**	**$20,000**
Activity	6.2.2.1	Serial Workshop for climate change adaptation learning in sub-district and village level	$10,000
	6.2.2.2	Publish a Book of experiential learning	$10,000
Project Execution Cost			**$86,925**
	7.1	Team Leader	$20,000
	7.2	Knowledge Management Manager	$8,000
	7.3	Database Officer	$5,300
	7.4	Finance and Administration Manager	$8,000
	7.5	Landscape Manager	$18,000
	7.6	Sub-district Coordinator	$18,000
	7.7	Integrated Agriculture Specialist	$750

Description Item			Cost
	7.8	Fishery Specialist	$750
	7.9	GESI Specialist	$750
	7.10	Office Rent	$1,000
	7.11	Stationery	$500
	7.12	Communication	$500
	7.13	Electricity	$500
	7.14	Audit Fee	$4,875
Project Cycle Management Fee charged by the Implementing Entity			**$85,000**
	8.1	Project identification and Development	$3,500
	8.2	Project Implementation and Supervision	$58,500
	8.3	Evaluation	$23,000
Amount of Financing Requested (USD)			**$1,000,000**

H. DISBURSEMENT SCHEDULE

1. Disbursement Milestones

Table 18: Disbursement Milestones

Upon signature of Agreement	Upon signature of Agreement	One Year after Project Start	Total
Scheduled Date	1 January 20X1	1 January 20X2	
Project Fund	$388,875	$526,125	$915,000
Implementing Entity Fees	$36,125	$48,875	$85,000
Total	**$425,000**	**$ 575,000**	**$1,000,000**

2. Time-bound Project Activities

The Project is planned to be implemented for 2 calendar years (24 months), with details of the Implementation schedule of each quarter (8 quarters) as follows:

Table 19: Time-bound Project Activities

Description Item			Quarter							
			1	2	3	4	5	6	7	8
COMPONENT 1: BASELINE DATA AND KNOWLEDGE										
Outcome	**1.1.**	**Risk and vulnerabilities caused by climate-related hazards and threats are assessed and mapped.**								
Output	**1.1.1.**	**Risk and vulnerabilities caused by climate change, including socio-economic and environmental aspects of vulnerability are participatory assessed.**								
Activity	1.1.1.1.	Participatory socio-economic assessment (5 village in Muara Sugihan, 5 villages in Air Sugihan)								
	1.1.1.2.	Environmental aspects assessment (5 village in Muara Sugihan, 5 villages in Air Sugihan)								
Output	**1.1.2.**	**Action research of the impact of climate change on irrigation infrastructures, irrigation management system and agriculture practices are conducted.**								
Activity	1.1.2.1.	Action research of climate change impact on irrigation infrastructure management								

Description Item			Quarter							
			1	2	3	4	5	6	7	8
	1.1.2.2.	Action research of climate change impact on agriculture practice								
Outcome	**1.2.**	**The levels of adaptive capacity of climate change, including the availability of early warning systems are assessed**								
Output	**1.2.1.**	**Policy and regulation at village, sub-district, district, and province level related to climate change adaption are assessed and mapped.**								
Activity	1.2.1.1.	Policy and regulation assessment in village and sub district level (10 village, 2 sub district)								
	1.2.1.2.	Policy and regulation assessment in district level (2 district: Banyuasin and Ogan Komering Ilir)								
	1.2.1.3.	Policy and regulation assessment in province level								
Output	**1.2.2.**	**Climate-related of local/indigenous knowledge and community-based monitoring system of risk and vulnerabilities caused by climate-change are assessed.**								
Activity	1.2.2.1.	Assessment of local/indigenous knowledge on estuary and tidal dynamic								
	1.2.2.2.	Assessment of local/indigenous knowledge on climatic and agriculture aspect								
	1.2.2.3.	Assessment of local/indigenous knowledge on land and biodiversity aspect								
	1.2.2.4.	Assessment of community-based early warning system								
Outcome	**1.3.**	**Climate-related data are well managed and socialized to the wider community**								
Output	**1.3.1.**	**Climate related data management system are developed in coordination with other key stakeholder**								
Activity	1.3.1.1.	Data compilation and analysis (expert consultation)								
	1.3.1.2.	Discussion and coordination with key stakeholders								
Output	**1.3.2.**	**Project best practices and lesson learned are documented, published and disseminated**								
Activity	1.3.2.1.	Making and distribution of village bulletin								
	1.3.2.2.	Producing and dissemination of documentary movie								
	1.3.2.3.	Workshop on district level								
	1.3.2.4.	Workshop on province and national level								
COMPONENT 2: GOVERNMENT CAPACITY										
Outcome	**2.1.**	**Developed strategy of climate change adaptation and adopted into a regular government planning cycle.**								
Output	**2.1.1.**	**Sub-district and village level of spatial map and governance system are developed**								
Activity	2.1.1.1.	Participatory village mapping								
	2.1.1.2.	Legal aspect coordination on mapping result								
Output	**2.1.2.**	**Landscape and sub-district level of climate change adaptation strategy and action plan are developed.**								
Activity	2.1.2.1.	Training on climate change in village level								
	2.1.2.2.	FGDs in village level to explore ideas								
	2.1.2.3.	Document making on adaptation strategy in village level								
	2.1.2.4.	Facilitating village government to improve their village policy related to CC adaptation strategy								
Output	**2.1.3.**	**Increased quality of village planning, which consider the aspects of disaster risk reduction, food security and sustainable agriculture, and water management.**								
Activity	2.1.3.1.	Capacity building on village government staff on sustainable lowland ecosystem management								
	2.1.3.2.	Participatory campaign led by village government on sustainable lowland ecosystem management								
	2.1.3.3.	Facilitating village government and community to improve their mid-term planning document (RPJMDes) related to lowland ecosystem management								
Outcome	**2.2.**	**Strengthened capacity of village, sub-district and district government apparatus to reduce risks**								

Description Item			Quarter							
			1	2	3	4	5	6	7	8
		associated with climate-induced socio-economic and environmental losses								
Output	**2.2.1.**	**Improved capacity of village and sub-district apparatus in the formulation of policy and regulation related to climate change adaptation**								
Activity	2.2.1.1.	Training on village and sub district apparatus about climate change policy and program in Indonesia								
	2.2.1.2.	Training on improving policy and regulation in village level and sub district related to climate change adaptation								
Output	**2.2.2.**	**Improved capacity of village and sub-district apparatus in the budget allocation/resource management and mobilization related to climate change adaptation.**								
Activity	2.2.2.1.	Training on budgeting/budget planning policy in village level for village and sub district apparatus								
	2.2.2.2.	Facilitating village government to improve their development budget plan related to climate change adaptation in coordination with sub district policy								
COMPONENT 3: COMMUNITY ENGAGEMENT										
Outcome	**3. 1.**	**Strengthened community awareness and participation in adaptation and climate risk reduction measures.**								
Output	**3.1.1.**	**Developed the Climate Change Adaption Multi-stakeholder Forum at landscape level, covering 2 sub-districts of Project targeted area**								
Activity	3.1.1.1.	Organizing seminars on Climate Change Vulnerability and Adaptation								
	3.1.1.2.	Increase the capacity of stakeholders related to climate change adaptation through serial discussions								
	3.1.1.3.	Workshop Formation and Compilation of Multi-stakeholder Forum Work Plans								
	3.1.1.4.	Facilitation of multi stakeholder forums								
Output	**3.1.2.**	**Community participation in landscape and sub-district level of climate change adaptation strategy and action plan (see 2.1.2.).**								
Activity	3.1.2.1.	Conduct a KAP survey of the community regarding climate change								
	3.1.2.2.	Conducting adaptation change conservation training for the community								
Outcome	**3.2.**	**Strengthened community adaptive capacity in climate risk reduction measures.**								
Output	**3.2.1.**	**Village regulation on sustainable-use of natural resources and climate change adaptation are developed**								
Activity	3.2.1.1.	Conducting village meeting on sustainable-use of natural resources and climate change adaptation								
	3.2.1.2.	Facilitate the process of preparing village regulations								
Output	**3.2.2.**	**Increased capacity of farmer institution, in the aspect of management, good and adaptive agriculture practices, access to finance and sustainable market**								
Activity	3.2.2.1.	Conducting farmer institutional training for management, good and adaptive agriculture practices, access to finance and sustainable market								
	3.2.2.2.	Facilitating the process of accessing financing and sustainable markets								
Output	**3.2.3.**	**Irrigation infrastructures are revitalized through community-based cash for work mechanism.**								
Activity	3.2.3.1.	Collect data on irrigation infrastructure conditions								
	3.2.3.2.	Prepare a revitalization plan for irrigation infrastructure with a community-based cash for work mechanism								
	3.2.3.3.	Implementation of revitalization of irrigation infrastructure with a community-based cash for work mechanism								
Output	**3.2.4.**	**Community-based and integrated irrigation management systems are developed.**								
Activity	3.2.4.1.	Conducting workshop of community-based and integrated irrigation management systems								
	3.2.4.2.	Signing of a community-based and integrated irrigation management systems agreement								
	3.2.4.3.	Facilitating the implementation of community-based and integrated irrigation management systems								
COMPONENT 4: COMMUNITY LIVELIHOOD										

Description Item			Quarter							
			1	2	3	4	5	6	7	8
Outcome	**4.1.**	**Strengthened livelihoods of vulnerable communities in relation to climate change impacts, including variability.**								
Output	**4.1.1.**	**Developed integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries**								
Activity	4.1.1.1.	Training integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries								
	4.1.1.2.	Establishment of an integrated and adaptive agriculture practices which integrating the crop, livestock and fisheries								
Output	**4.1.2.**	**Developed agrosilvofisheries system in mangrove area and agroforestry system in terrestrial.**								
Activity	4.1.2.1.	Training to improve skills in agrosilvofisheries system in mangrove area and agroforestry system in terrestrial.								
	4.1.2.2.	Establishment of an agrosilvofisheries system in mangrove area and agroforestry system in terrestrial								
Outcome	**4.2.**	**Diversified and enhanced livelihoods of vulnerable communities**								
Output	**4.2.1.**	**Developed new models of community livelihood of post harvesting/processing stages, particularly for women and youth group**								
Activity	4.2.1.1.	Collecting data about potential products that can be done post-harvest business development								
	4.2.1.2.	Conduct post-harvest product business training for women and youth groups								
	4.2.1.3.	Assistance to post-harvest product businesses for women and youth groups								
Output	**4.2.2.**	**Companies and cooperatives belonging to the community or village developed**								
Activity	4.2.2.1.	Training of business institutions, cooperatives and village-owned enterprises								
	4.2.2.2.	Assistance for business institutions, cooperatives, and village-owned enterprises								
COMPONENT 5: ECOSYSTEM RESILIENCE										
Outcome	**5.1.**	**The essential areas are conserved in order to maintain the ecosystem services and ecosystem carrying capacity.**								
Output	**5.1.1.**	**Delineated and developed community-based conservation area**								
Activity	5.1.1.1.	Community workshop on community-based conservation area								
	5.1.1.2.	Participatory area mapping								
	5.1.1.3.	Community-based conservation area establishment								
Output	**5.1.2.**	**Developed village regulation of community-based conservation area**								
Activity	5.1.2.1.	Training on community based conservation management								
	5.1.2.2.	Identify rules and norms in the community in managing natural resources								
	5.1.2.3.	Village workshop for CBCA regulation drafting								
	5.1.2.4.	Legalization and dissemination								
Output	**5.1.3.**	**Developed conservation partnership schemes between corporation and village/communities**								
Activity	5.1.3.1.	Arranging partnership schemes planning								
	5.1.3.2.	Workshop on conservation partnership								
	5.1.3.3.	MoU on conservation partnership schemes between corporation and village/communities								
Outcome	**5.2.**	**Improved ecosystem condition affected by climate change.**								
Output	**5.2.1.**	**Restoration of degraded mangrove and coastal forest area are conducted**								
Activity	5.2.1.1.	Participatory Field Observation Study: Vegetation, substrate, hydrology								
	5.2.1.2.	Participatory Land Status and Allocation Study								
	5.2.1.3.	Participatory Land suitability and Feasibility study								

Description Item			Quarter							
			1	2	3	4	5	6	7	8
	5.2.1.4.	Community Capacity building on Forest Rehabilitation								
	5.2.1.5.	Forest Rehabilitation Plan (stakeholders mapping, technical design, infrastructure preparation, budget, etc.)								
	5.2.1.6.	Planting and maintenance								
Output	**5.2.2.**	**Restoration and plant enrichment of degraded upstream and watershed area are conducted**								
Activity	5.2.2.1.	Participatory Field Observation Study: Vegetation, substrate, hydrology								
	5.2.2.2.	Participatory Land Status and Allocation Study								
	5.2.2.3.	Participatory Land suitability and Feasibility study								
	5.2.2.4.	Community Capacity building on Forest Rehabilitation								
	5.2.2.5.	Forest Rehabilitation Plan (stakeholders mapping, technical design, infrastructure preparation, budget, etc.)								
	5.2.2.6.	Planting and maintenance								
COMPONENT 6: POLICY AND GOVERNANCE										
Outcome	**6.1.**	**Improved policies and regulations and enforce climate resilience**								
Output	**6.1.1.**	**Improved capacity of related institution to develop climate change adaptation policies, strategies and activities**								
Activity	6.1.1.1.	Institution mapping								
	6.1.1.2.	Training on climate change mainstreaming and on multiple technical aspects linked to the response to climate change								
	6.1.1.3.	Training workshops on mainstreaming climate change in development planning and budgeting								
Output	**6.1.2.**	**Developed cross-sectoral governance to optimize the irrigation infrastructures system**								
Activity	6.1.2.1.	Desk study :(identification of Role of governance systems in promoting efficient and equitable water resources management; type of legal instruments, policies and institutions that are required to encourage stakeholder participation in decision making)								
	6.1.2.2.	Workshop on cross sectoral governance to optimize the irrigation infrastructures system								
	6.1.2.3.	Establishing a cross sectoral irrigation optimization forum								
Outcome	**6.2.**	**Developed climate change monitoring system which enforces climate resilience**								
Output	**6.2.1.**	**Promoted and established climate change monitoring system at district and provincial level**								
Activity	6.2.1.1.	Workshop for climate change monitoring system at district and provincial level								
	6.2.1.2.	Developed forum for climate change monitoring system for district and provincial level								
Output	**6.2.2.**	**Established community-based climate change adaptation learning system at sub-district and village level.**								
Activity	6.2.2.1.	Serial Workshop for climate change adaptation learning in sub-district and village level								
	6.2.2.2.	Publish a Book of experiential learning								

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT

During the concept of the Project, the proponent organizations conduct several consultations with local officials with details as follows:

Table 20: Record of Endorsement on behalf of the Government

Name and Position	Date
Yanuar Suhartono, S.T Head of Sub Division of Development Funding in Agency for Regional Development Planning of South Sumatera Province	December 15, 2018
H. Dwiva Putra, SP. MSE. Head of Division of Economy and Development Funding in Agency for Regional Development Planning of South Sumatera Province	January 9, 2019
Regina Ariyanti, S.T Head of Division of Infrastructure and Regional Development in Agency for Regional Development Planning of South Sumatera Province	January 9, 2019
Iwan Adi Ratmoko, S.Hut. MSc. Agency for Regional Development Planning of Banyuasin Regency	January 14, 2019
Dr. Ekowati Retnaningsih, SKM. M.Kes. Head of Agency for Regional Development Planning of South Sumatera Province	January 18, 2019

Endorsement and support letter for proponent organization in order to submit proposal to Adaptation Fund obtained from **Dr. Ekowati Retnaningsih, SKM. M.Kes.; Head of Agency for Regional Development Planning of South Sumatera Province**, with letter No 050/0083/Bappeda/2019 dated January 17, 2019 *(Attached).*

PEMERINTAH PROVINSI SUMATERA SELATAN
BADAN PERENCANAAN PEMBANGUNAN DAERAH
Jalan Kapten A. Rivai No. 23 Palembang Telp. (0711) 356018 - 321181 Fax. (0711) 314586 - 356118
Website : www.bappeda.sumselprov.go.id E-mail : info@bappeda.sumselprov.go.id

Palembang, January 17th, 2019

To

Number : 050 /0083/Bappeda/2019
Attachment : -
Subject : Endorsement for Submit Funding Proposals to Adaptation Funds for Climate Adaptation Programme

Yth. The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat

One of the targets of South Sumatra development planning (RPJMD 2018-2023) is to improve the adaptation of people's agriculture and food sovereignty (advanced people's agriculture and food sovereignty), which is have impact to reduce poverty index. Air Sugihan and Sungai Sugihan sub-districts are areas that are vulnerable to climate change and have 41 villages prioritized for poverty reducation.

Accordingly, we provide recommendations to the Penabulu Foundation to submit funding proposals to Adaptation Funds in the ***Reducing vulnerability and increasing the adaptation capacity of community through improvement of irrigation management system and sustainable agricultural practices in responding to climate change impacts in lowland and estuary in sub-district of Muara Sugihan and Air Sugihan, South Sumatera Programme.***
Thank you for your attention.

Sincerely,

Dr. Ekowati Retnaningsih, SKM., M.Kes.
Head of Development Planning Agency
of South Sumatera Province

B. IMPLEMENTING ENTITY CERTIFICATION

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (President Decree No. 16/2015; P.13/MENLHK/Setjen/OTL.0/1/2016; P.33/MENLHK/Setjen/Kum.1/3/2016; Indonesia Intended Nationally Determined Contribution/INDC; COP 21; Paris Agreement signed by Government of Indonesia; Book and Map of Information System of Vulnerability Index Data (SIDIK); Permen-KP No. 2 year 2013; Climate Change Adaptation National Action Plan)and subject to the approval by the Adaptation Fund Board commit to implementing the Project in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this Project..
 **Monica Tanuhandaru** **Executive Director of Partnership for Governance Reform in Indonesia (Kemitraan)** Implementing Entity Coordinator

Date: 5 August 2019	Tel. and email: +62-21-7279 9566; Monica.Tanuhandaru@kemitraan.or.id
Project Contact Person: **Dewi Rizki**	
Tel. and Email: +62-21-7279 9566; Dewi.Rizki@kemitraan.or.id	

Annex 1. Bibliography

BPS. (2018). *Air Sugihan dalam Angka 2017.* Ogan Komering Ilir: BPS.

BPS. (2018). *Muara Sugihan dalam Angka 2017.* Banyuasin: BPS.

Directorate General of PPI-Ministry of Environment and Forestry. (2015). *SIDIK – Sistem Informasi Data Indeks Kerentanan.* Jakarta: Directorate General of PPI-Ministry of Environment and Forestry.

Eko, S. (2015). *Regulasi Baru, Desa Baru - Ide, Misi, dan Semaangat UU Desa.* Jakarta Pusat: Ministry of Village Underdeveloped Regions and Transmigration.

Hillman, M., Fawcett, T., & Rajan, S. C. (2008). *How We Can Save the Planet: Preventing Global Climate Catastrophe*. Macmillan.

Luntungan, A. Y. (2012). Analisis Tingkat Pendapatan Usaha Tani Tomat dan Apel di Kecamatan Tompaso Kabupaten Minahasa. *Jurnal Pembangunan Ekonomi dan Keuangan Daerah (PEKD)*, 1-25.

Ministry of Environment. (2012). *Kajian Risiko dan Adaptasi Perubahan Iklim – Tarakan, Sumatra Selatan, Malang Raya – Ringkasan untuk Pembuat Kebijakan..* Jakarta: Ministry of Environment.

Ministry of Public Works and Public Housing. (2015). Ministry of Public Works and Public Housing Regulation No. 14/PRT/M/2015 Concerning Criteria and Determination of Irrigation Area Status.

Ruiz-Mallen, I., et al. (2015). Meanings, Drivers, and Motivations for Community-Based Conservation in Latin America. *Ecology and Society*.

Widjaja-Adhi, I P. G. (1997). *Developing Tropical Peatlands for Agriculture.* Cardigan: Samara Publishing Ltd.

Annex 2. Project Background and Context

Indonesia is very vulnerable to climate change effects. With 17.504 islands, the impact of sea level rise, rainfall patterns changes and extreme climate are the main problems. The intensity and frequency of extreme climate, the risk of floods during the rainy season and drought during the dry season will increase. This will have an impact on the sectors of water resources, agriculture and forestry, fisheries, health and infrastructure. Land subsidence, sea level rise, floods, droughts, avalanche and forest fires have been felt as a destructive and detrimental disaster for Indonesia. To avoid multiple impacts of natural disasters, adaptation actions at national and regional levels become very necessary.

The level of climate change vulnerability is determined by indicators that affect exposure, sensitivity, and adaptive capacity of a system. These three factors change according to time in line with the implementation of development activities and adaptation. The level of exposure and sensitivity can be reflected by biophysical and environmental conditions, as well as socio-economic conditions.

Based on SIDIK data (Source of 2011 PODES data), from 77,961 villages in Indonesia, 2.507 (3%) were categorized as Very Vulnerable, 2.433 (3%) are Vulnerable, 31,875 (41%) are quite vulnerable, 32,999 (42%) are rather vulnerable, and 8,146 (8%) are not vulnerable. From these data it can be concluded that almost half of the villages in Indonesia have a high risk of vulnerability.[1]

1. Vulnerability Caused by Climate Change in South Sumatra

Climate change causes increased vulnerability to lowland and coastal areas. Upstream areas and degraded watersheds coupled with extreme rainfall have caused lowland and coastal areas experiencing severe flooding. This is compounded by the rise in sea level which causes the lowlands and coastal areas become more vulnerable to flood puddle. The province of South Sumatra has specific characteristics, where most of its territory is lowland and has a high degree of exposure to climate change, in particular the threat of water-logging in coastal areas caused by the combination of rising sea levels, sea waves, and La-Nina phenomena at the maximum tide.

Vulnerability to ecological disasters caused by climate change approaches the South Sumatra region at each season change. Flooding is the most important problem to immediately find a solution and prevention because the impact in several districts and cities is starting to worry. This certainly needs attention so that the development process can continue by considering the possibility of ecological disasters caused by climate change.

Climate change as a global warming implication caused in two main things, namely high rainfall fluctuations and sea level rise. As an archipelagic country, Indonesia is most vulnerable to sea level rise. Climate change projections for the Indonesian region show sea level rise cause the loss of coastal areas and small islands.

South Sumatra Province has a coastal area that has a high extent of vulnerability to sea level rise. Based on projection that is carried out using 3 scenarios, namely a combination of extreme waves, La Nina, and storm surge; sea level can reach a height of 276.9 cm in 2030.The change in sea level will certainly have consequences on many things that lead to economic, social and environmental losses. If we look at the RTRW Space Pattern of South Sumatra, it can be seen that spatial planning is still not adaptive to the potential possibility of sea level rise caused by climate change.

If it is projected on the Spatial Plan Space Pattern, sea level rise will cause some areas to be submerged by sea, especially in lowland areas which dominate the South Sumatra. There are risks in some spatial patterns such as Plantation, Wetland Agriculture, Nature Reserve Forests, Protection Forests, Dryland Agriculture, Production Forests, Land Fisheries, Settlements, Tanjung Api-api Area, Other Usage Areas and road infrastructure will be submerged by sea. The spatial pattern requires re-planning by estimating danger of sea level rise to avoid the potential considerable losses in South Sumatra Province.

[1] Data Information System Vulnerability Index: Jakarta. Directorate General of PPI-Ministry of Environment and Forestry 2015

According to the SIDIK data, South Sumatra is a relatively vulnerable province with the highest number of villages among other provinces (349 villages). The condition of villages in South Sumatra Province based on the vulnerability level can be seen in the graph[2]:

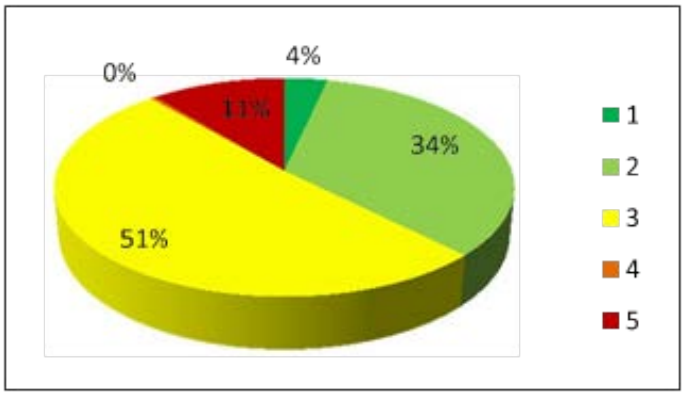
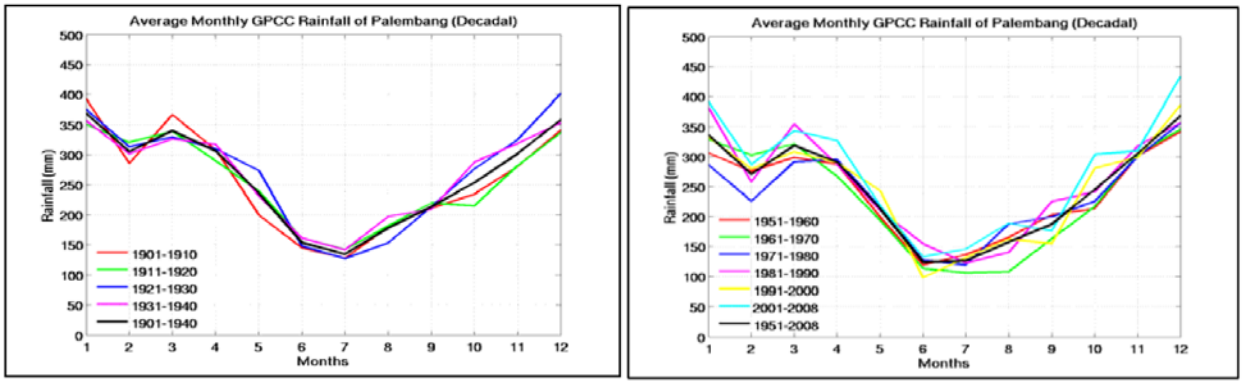


Figure A1: Village Vulnerability Percentage of South Sumatra Province

2. Climatology Conditions of South Sumatra

Analysis results generally show that South Sumatra has a wet climate, where the area is boundary between monsoon patterns characterized by one rainy period peak and an equatorial pattern characterized by two rainy period peaks. Data around Palembang shows two rain peaks that differ in magnitude, namely in December-January (around 300-450 mm) and in March (250-350 mm). The data also shows that rainfall in the last 50 years (1951-2008) has a more varied magnitude than the previous period.

Figure A2: Rainfall Patterns around Palembang 1901–2008



Geographically, the rainfall pattern is generally same for the entire South Sumatra region. There is little difference in mountainous areas in the Northwest region where rainfall is relatively high throughout the year, so the dry season becomes less apparent. On the other hand, the average air temperature is around 27°C for Palembang and around 26°C for the average in the entire South Sumatra region. The global warming impact in South Sumatra can be caused by an upward trend over the past 25 years of 0.31°C around Palembang and 0.67°C on average across South Sumatra. Nevertheless, this number may be influenced by various factors such as systematic errors in measurement and local changes such as the effects of urban heat islands and regional climate shifts, because if seen in the 50 and 100 years period, the increase is very small only counted around -0.12-12.03°C/century. This rainfall pattern is confirmed by data around Singapore.

[2] Data Information System Vulnerability Index: Jakarta. Directorate General of PPI-Ministry of Environment and Forestry 2015

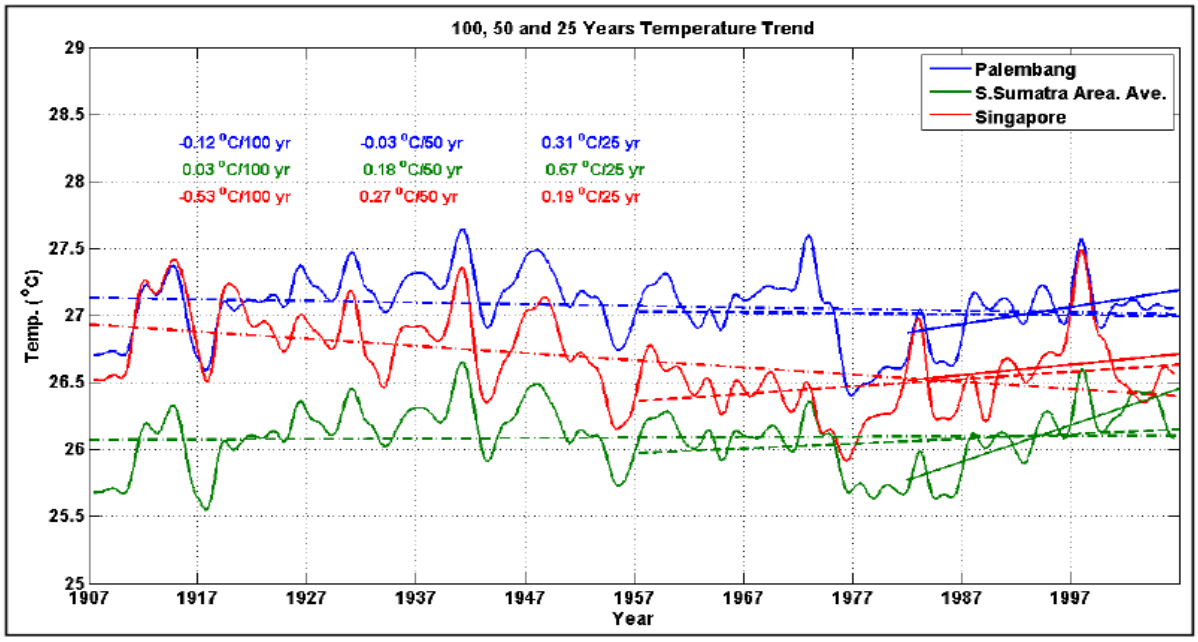


Figure A3: Temperature Trends in South Sumatra: around Palembang (blue line), South Sumatra average (green line), and around Singapore as a comparison (red line)

Thus the study of climate change in the South Sumatra region is more focused on rainfall variability patterns. But different from temperature, changes in rainfall cannot be approached in a linear trend. The inter-decadal study of variability from 1951 to the present shows that around 1965-1970 was a relatively very wet period, while the 1990s were least rainfall period. The variability trend of inter-decade rainfall has been tried to be predicted until 2020 with an empirical model. Judging from variation components between decades, the average rainfall of this decade is not classified as extreme conditions. However, the current hazard climate is more due to inter-annual climate variability and extreme rainfall.

Rainfall change projection shows an insignificant change of rainfall patterns until the 2050s although fluctuations still occur for several times. These results also show that the potential threat of climate hazards until 2030s is still dominated by climate uncertainty caused by inter-annual variability of rainfall.

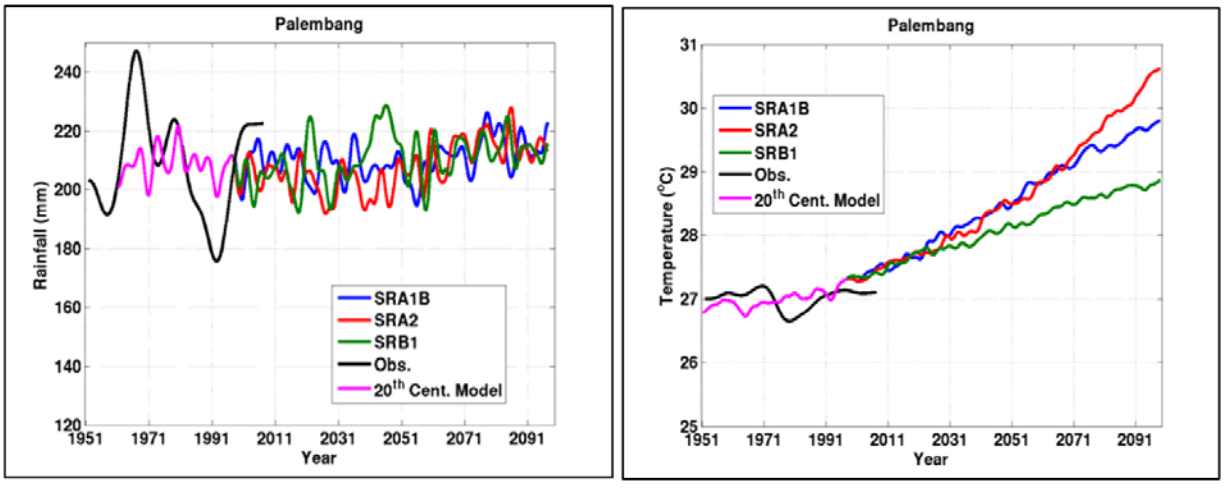


Figure A4: Rainfall (left) and Temperature (right) Projections around Palembang through Several Climate Change Scenarios

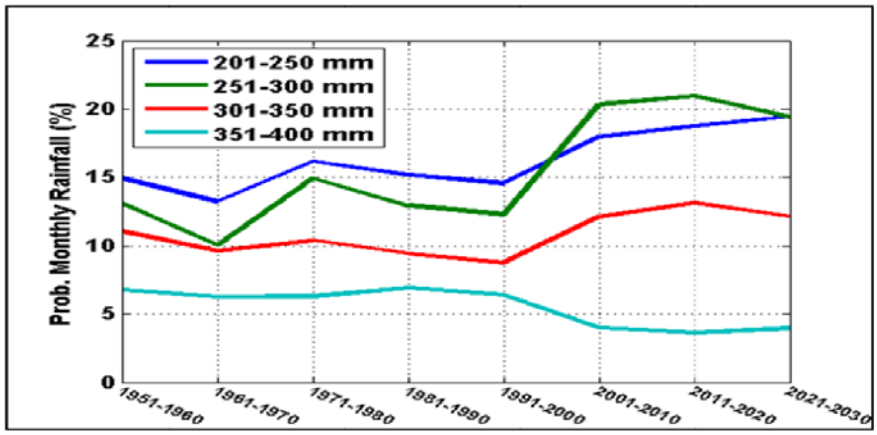


Figure A5: Changing the Extreme Rainfall Change which is deduced from a Strong Correlation with Rainfall

In South Sumatra, extreme rainfalls on daily scale are also a danger threat that needs to be analyzed. In this case, the probability of accidence is very dense (the definition of BMKG: more than 100 mm/day) can be calculated. Although the rainfall projection from the IPCC-AR4 model is only done for monthly data, from the correlation analysis between daily and monthly rainfall it can be seen that the months with accumulated rainfall between 250-400 mm have the highest chance of extreme rainfall. The projection results show that the odds of extreme rainfall on average are relatively unchanged in 2020-2030s period relative to current conditions (2010s), but actually increased compared to previous period (1991-2000s).

3. Oceanographic Conditions in South Sumatra

The dynamic general conditions of sea levels and currents on the east coast of South Sumatra (including the Bangka Strait) are analyzed from several oceanographic models such as HYCOM and FVCOM. During the Asian monsoon, the current of sea surface is heading south, with a maximum of 30 cm/second in January; on the contrary, during the Australian monsoon, the surface currents turned northward at lower speeds. While the influence of currently tidal is quite significant in the Bangka Strait, especially the rising functions at the Musi River mouth/estuary when the water is heading down. As a result of the monsoon pattern, sea surface temperatures have a seasonal cycle, where up to maximum increases occur in May given the intense solar warming and low surface wind, and vice versa run into a decline towards the minimum in January. The factor that a lot of influences sea surface temperature is transport of sea water masses from the Pacific Ocean through the South China Sea.

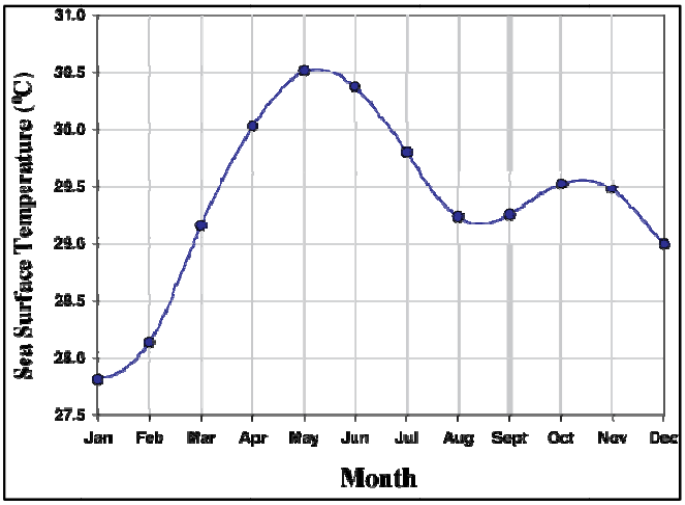


Figure A6: Annual Cycle of Sea Surface Temperature in the Eastern Waters of South Sumatra

The trend of rising sea surface temperatures around the east coast of South Sumatra ranges from 0.02oC/year which is equivalent to the average value in all Indonesian waters.

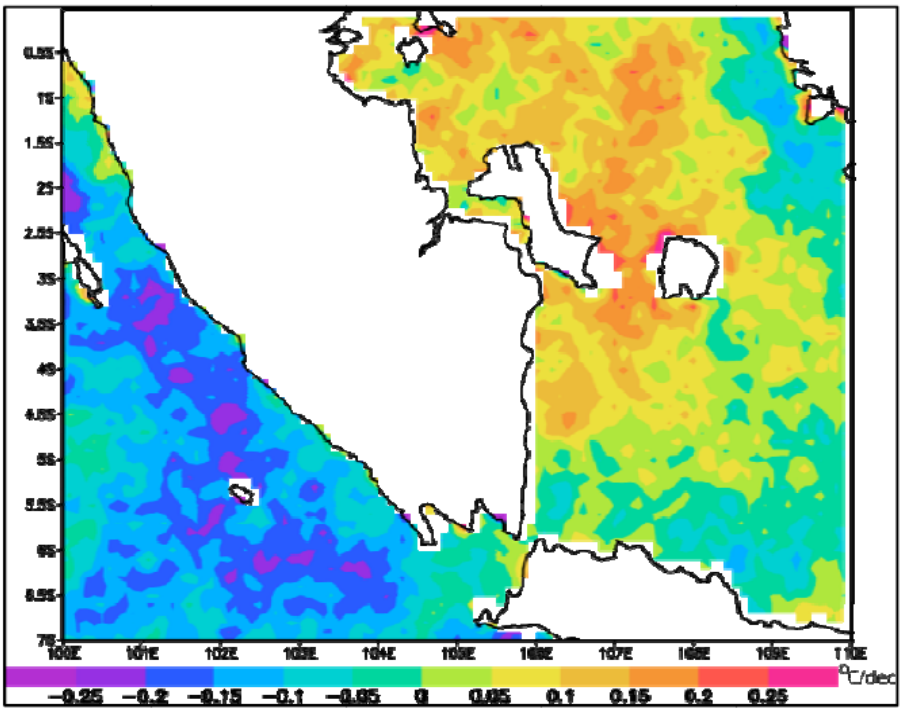


Figure A7: The Distribution Rate of Increasing of Sea Surface Temperature based on Pathfinder SST Resolution of 4 km.

The sea level rise is reconstructed using the SODA (Simple Ocean Data Assimilation) model, where the increase rate on the east coast of South Sumatra ranged 0.3 mm/year between 1871 and 2008. Through a combination of ROMS (Regional Ocean Modeling Systems) and SODA models, in the period 1960-2008 the rate of sea level rise became 1mm/year. The next satellite altimeter observes the rate of sea level rise of 4.1 mm/year since 1993.

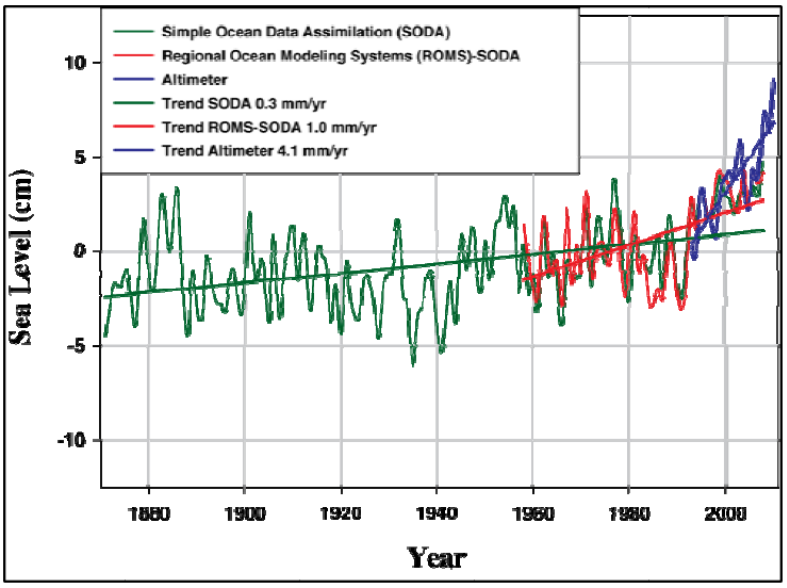


Figure A8: Reconstruction of Sea Level Rise in the East Coast Region of South Sumatra 1871–2008

Forward estimation, the rate of sea level rise based on the altimeter, model, and tidal data ranges between 0.5-0.7 cm/year. The projection of sea level rise in 2030 is 13.5 ± 6.15 cm relative to sea level in 2000. Among these values, 6-15 cm is the result of ice melting contributions estimated by the HYCOM and ECCO models. Extreme events also influence sea level rise such as the occurrence of the La-Nina phenomenon (influence of the Pacific Ocean) which can cause an increase of 15 cm to the sea level under normal conditions. In the future, the La-Nina phenomenon is predicted to be longer and often occur which can result in higher sea waves, greater wind speed, besides increasing sea level. ENSO projections which include the phenomenon of El-Nino and La-Nina based on SRES a1b scenario show that both will occur almost every year interspersed with normal conditions in 2013/2014, 2021/2022 and 2027/2028. The occurrence probability of La-Nina, El-Nino, and normal conditions is about 55%, 30% and 15%. Significant waves on the east coast of South Sumatra rises in the Asian monsoon around December-January, and declined in the Australian monsoon in May. According to satellite altimeter records, high waves that have occurred around 2.5 m in 2000, 2001 and 2007 are estimated to be caused by the strengthening of La-Nina and El-Nino, which is accompanied by a lack of influence on IOD (Dipole Mode from the Indian Ocean).

4. Project Targeted Location

Among 15 districts/cities in South Sumatra Province, only two districts have coastlines or are bordered by sea water, namely **Ogan Komering Ilir (OKI)** and **Banyuasin**. However, the danger of coastal flooding triggered by climate change stimuli can reach six districts/cities by 2030, namely Banyuasin, Muara Enim, Musi Banyuasin, Ogan Ilir, OKI, and Palembang[3]. The Project will located around **the estuary of Musi River and Sugihan River,** in Muara Sugihan sub-district, Banyuasin District and Air Sugihan sub-district, Ogan Komering Ilir District which is one of the areas with high to very high vulnerability to the effects of climate change in South Sumatra referring to the results of study conducted by the Ministry of Environment 2012.

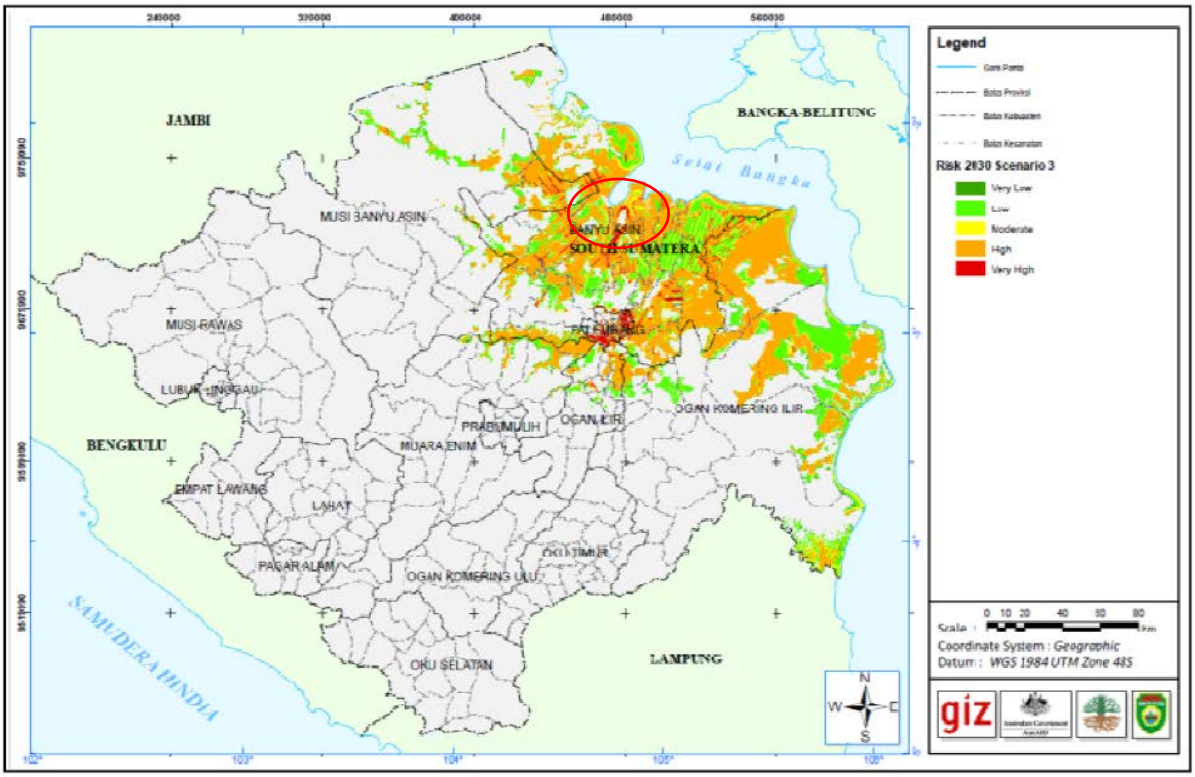


Figure A9: Project Location and Risk Map for Coastal Flooding due to Climate Change until 2030

[3] Risk Assessment and Adaptation to Climate Change: Tarakan City, South Sumatra and Malang Raya, Ministry of Environment 2012

The study above is in accordance with SIDIK data where Banyuasin and Ogan Komering Ilir (OKI) are the districts with the most number of vulnerable villages among other districts in South Sumatra Province. Complete data on village classification based on vulnerability level in South Sumatra Province by District can be seen in the table below[4]:

Table A1: Number of Vulnerable Villages in South Sumatra Province

No	District	Vulnerability Level					Total Villages
		1	2	3	4	5	
1	District of Banyu Asin	3	76	151	1	73	304
2	District of Empat Lawang		57	79		20	156
3	City of Lubuklinggau	7	12	53			72
4	City of Pagar Alam		16	18		1	35
5	City of Palembang	13	4	82	6	2	107
6	City of Prabumulih	1	12	24			37
7	District of Lahat	12	234	119		11	376
8	District of Muara Enim	4	97	206		19	326
9	District of Musi Banyuasin	19	37	164	3	13	236
10	District of Musi Rawas	10	111	132		24	277
11	District of Ogan Ilir	5	113	68		55	241
12	District of Ogan Komering Ilir	9	102	142	1	56	310
13	District of Ogan Komering Ulu	6	51	88		9	154
14	District of Ogan Komering Ulu Selatan	4	84	116	2	53	259
15	District of Ogan Komering Ulu Timur	19	77	187		13	296
	Total	112	1083	1629	13	349	3186

Source: Indicative Vulnerability Data Information System (SIDIK), 2015

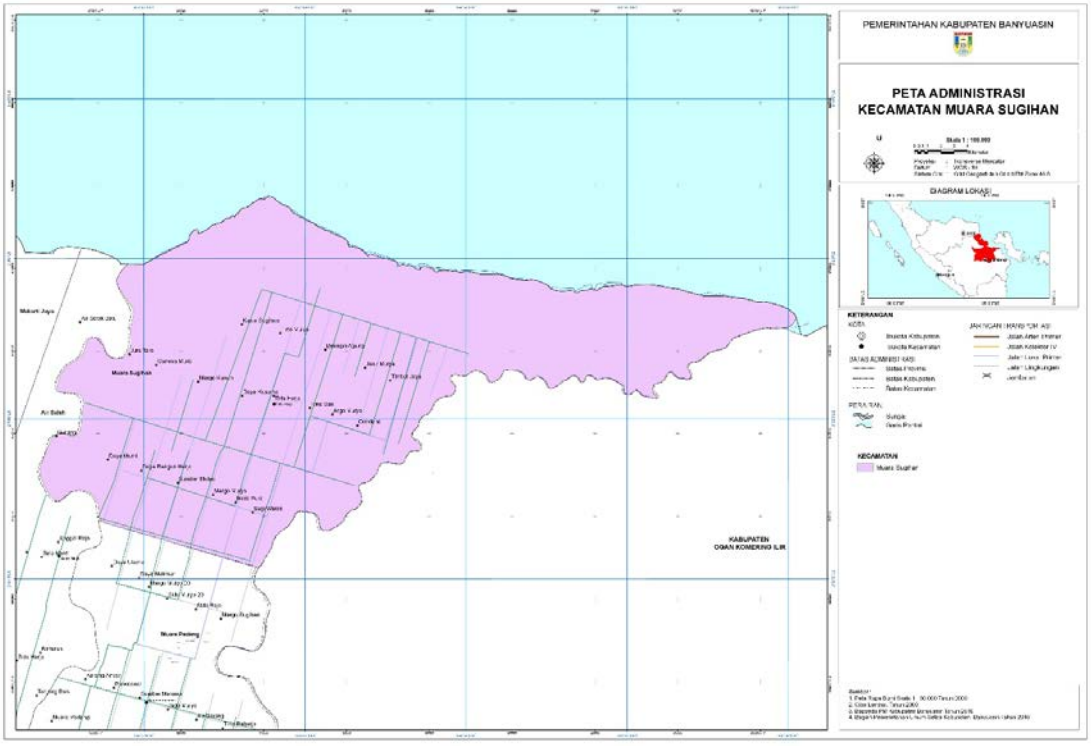
Based on the conditions consideration above, the Project location is determined in 2 locations, **Muara Sugihan sub-district (Banyuasin District)** and **Air Sugihan sub-district (Ogan Komering Ilir District)**.

Muara Sugihan sub-district has 71,956.55 km2 areas, consisting of 22 villages and has a population of 41,085 people, 21,255 men and 19,830 women. Whereas Air Sugihan sub-district has 2593.51 Km2 areas and consists of 19 villages with a population in 2017 around of 36,098 people consisting 18,706 men and 17,392 women. The population in this area works as farmers and planters and some work as employees in factories or industries. The composition of the population is dominated by young and productive age groups and few are elderly. Wetland agriculture is the main potential of community's economy.

In Air Sugihan sub-district there are 22,170 km2 areas of rice fields (BPS, 2017). Besides agricultural crops, the community also cultivates a variety of vegetable crops; the types of vegetables grown are beans, chili, cucumber and eggplant.

[4] Data Information System Vulnerability Index: Jakarta. Directorate General of PPI-Ministry of Environment and Forestry 2015

Figure A10: Village-based Map of Muara Sugihan Sub-district



Muara Sugihan sub-district in Banyuasin District consists of 22 villages namely: (1) Daya Murni, (2) Daya Bangun Harjo, (3) Sumber Mulyo, (4) Margo Mulyo, (5) Sugih Waras, (6) Indrapura, (7) Cendana, (8) Argo Mulyo, (9) Rejosari, (10) Tirto Harjo, (11) Daya Kusuma, (12) Margo Rukun, (13) Ganesha Mukti, (14) Gilirang, (15) Tirta Mulyo, (16) Beringin Agung, (17) Jalur Mulya, (18) Timbul Jaya, (19) Juru Taroh, (20) Kuala Sugihan, (21) Sido Makmur And (22) Mekar Jaya.

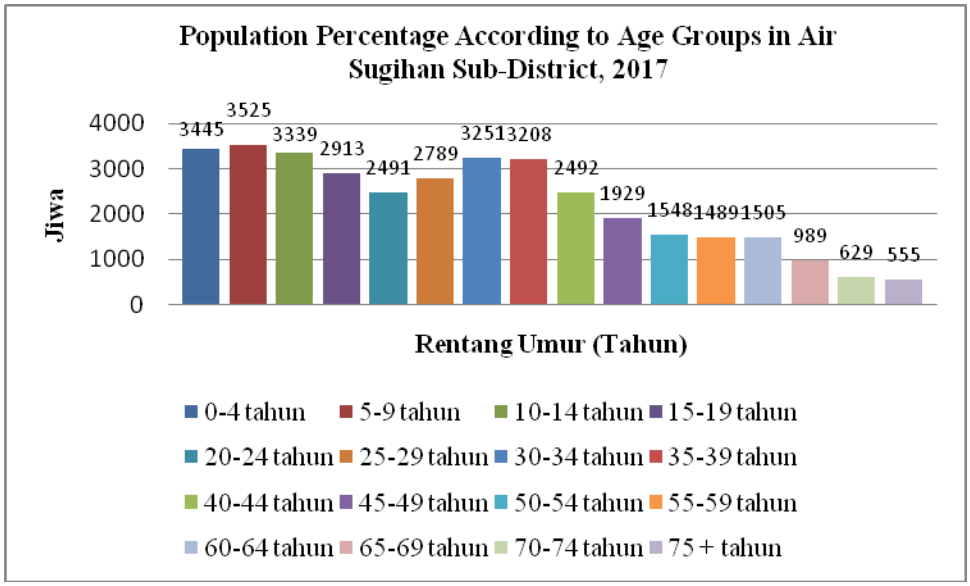


Figure A11: Population Percentage according to Age Groups in Air Sugihan Sub-District, 2017
Source: BPS (Air Sugihan on Number), 2018

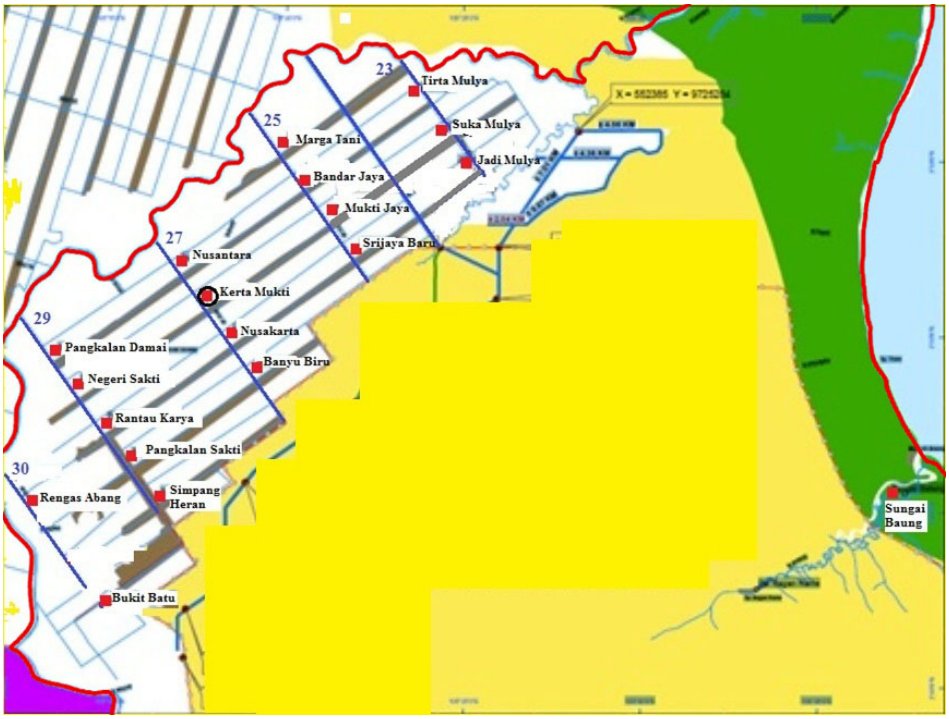


Figure A12: Village-based Map of Air Sugihan Sub-district

Air Sugihan sub-district in Ogan Komering Ilir District consists of 19 villages namely: (1) Sungai Batang, (2) Bukit Batu, (3) Rengas Abang, (4) Simpang Heran, (5) Banyu Biru, (6) Pangkalan Sakti, (7) Rantau Karya, (8) Nusakarta, (9) Srijaya Baru, (10) Jadi Mulya, (11) Suka Mulya, (12) Mukti Jaya, (13) Kertamukti, (14) Negeri Sakti, (15) Pangkalan Damai, (16) Nusantara, (17) Bandar Jaya, (18) Tirta Mulya, And (19) Marga Tani.

Figure A13: Situation of Kuala Sugihan Village, Muara Sugihan Sub-district

Figure A14: Situation of Gilirang Village, Muara Sugihan Sub-district

In the plantation cultivation activities, there are 4 main types of commodities, namely rubber, coconut, oil palm, and coffee. Production results from BPS 2017 data, rubber can produce (256 tons), coffee (108 tons), and palm oil can produce the largest yield (18,434 tons). In addition, the community also cultivates livestock such as cattle, goats, chickens and ducks. In its development the community also penetrated the mangrove forest area for fish farming activities with a pond system.

The Project targeted area borders the eastern coast of Sumatra (Bangka Strait) in the northeastern part. It is very wide lowland with an average height of 7 meters above sea level. The real effect of this climate change impact is disruption of community's livelihood system. Most of people in this area are wetland farmers (swamps) who are very at flooding risk in rainy season and drought in dry season. The current system and irrigation infrastructure have not been able to meet the community's irrigation needs. The existing irrigation infrastructure has been built since the 1980s, but caused by changes in hydrology; the infrastructure and facilities cannot function optimally.

The management of swamp irrigation in this area is the authority of the central government authority, the provincial government, and also the district government. Until now, this authority division has not been followed by adequate coordination in managing the potential of existing wetlands. The following is an irrigation map and its area.

The farming system on tidal land is very different from other agricultural land. Farming is an attempt to allocate resources such as land, labor, capital, and management effectively and efficiently with the aim to produce output greater than input (Luntungan, 2012).Production on tidal farms is highly dependent on land and water management systems. Farming systems in wetlands require integrated farming, especially for land management and micro-governance which are the success determinants of farming in wetlands.

The character of wetland processing is also very different from the irrigated land in Java and Bali. Wetland fertility rates are lower compared to irrigated rice fields. This land typology has a water source that can influence on management techniques.

Figure A15: Characteristics of Project Locations and Swamp/Tidal Irrigation Networks

According to Widjaja et al (1997), the character of soil and water in wetlands are related to acid sulphate soils with pyrite compounds, peat soils, large and small tides, into groundwater, and acidity of water that inundates the land. Therefore, wetland management must pay attention to soil and water management. The purpose of it is to regulate the optimization of land resource utilization (Widjaja et al., 1997).

Maximizing the wetland agricultural production results must be supported by maintaining the sustainability of the land ecosystem itself. Conservation is carried out by implementing a sustainable farming system using organic materials. The use of organic fertilizers and pesticides is expected to reduce the use of chemical fertilizers and pesticides. Many farmers are only able to harvest once a year and are even at risk of falling on crop failure caused by flooding. As a result, many people have switched to pond fisheries sector by cutting down mangrove forests which has resulted in mangrove ecosystems destruction. It is also increases vulnerability to sea level rise, coastal abrasion and tsunami risk.

The context of climate change vulnerability in this region can be described in the following scheme:

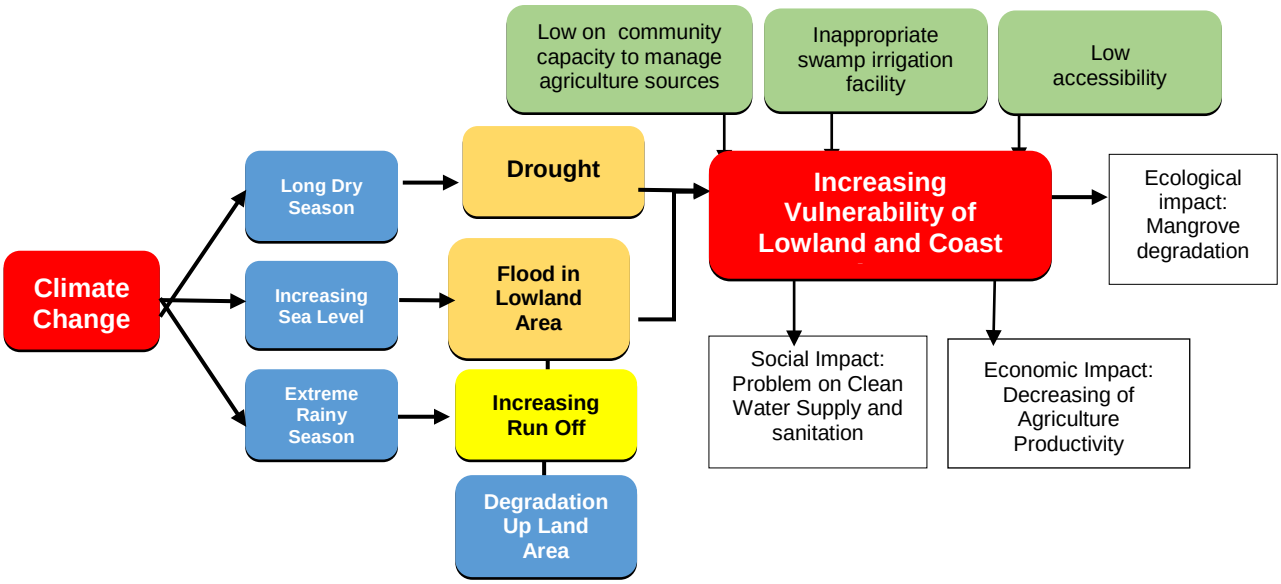
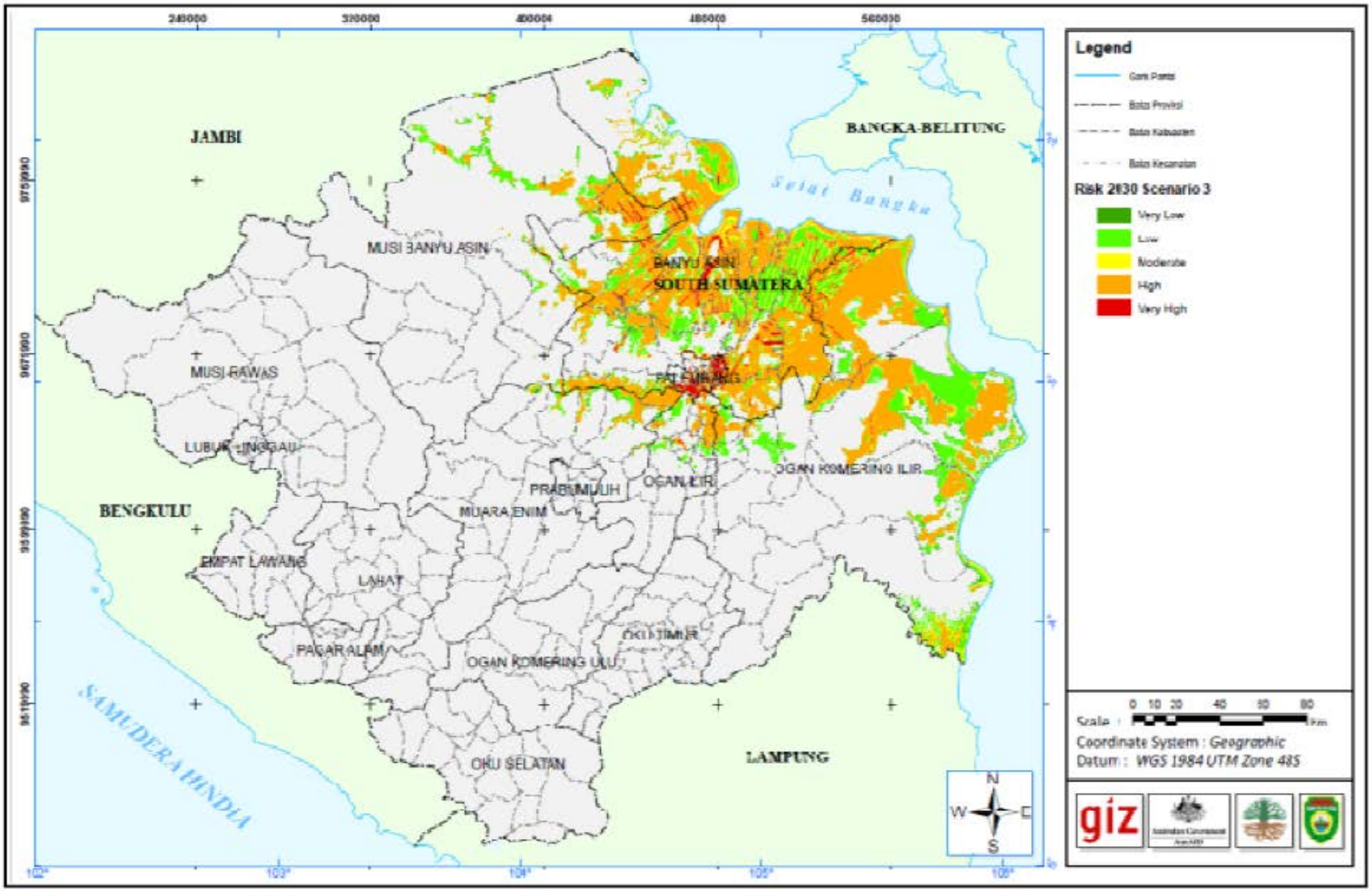


Figure A16: Vulnerability schemes to climate change that exist at the project site

Based on the scheme above, vulnerability at the project location are multidimensional. Strengthening from the community and also the government is needed. In addition, to help the community in technical matters, institutional strengthening is also needed, especially related to the management of irrigation networks.

Support is also needed physically related to the repair of irrigation facilities. In addition, policy support from the regional government and the central government is also needed to optimize existing potential. Mangrove forests that are undergoing degradation also need to be considered to maintain natural protection systems and this can be combined by increasing the variety of community income sources through a sustainable agriculture development scheme.

Annex 3. Project Location and Risk Map for Coastal Flooding due to Climate Change until 2030



Annex 4. Overview of the Situation on the Project Location

Figure A17: Non-functioning irrigation gate in Rejosari Village, Muara Sugihan Sub-district

Figure A18: Non-maintained irrigation channels in Daya Murni Village, Muara Sugihan Sub-district

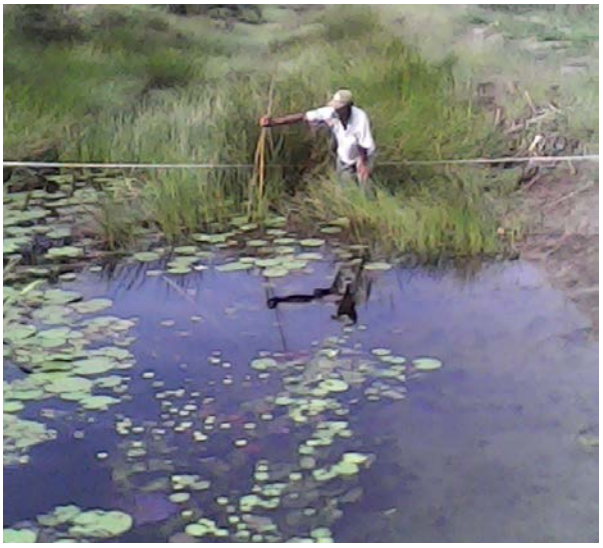


Figure A19: Non-maintained irrigation channels in Daya Murni Village, Muara Sugihan Sub-district

Figure A20: Degraded mangrove forests in the Juru Taro Village, Muara Sugihan Sub-district

Figure A21: Unproductive ponds in Gilirang Village, Muara Sugihan Sub-district

Figure A22: Rice field that failed to harvest in Daya Murni Village, Muara Sugihan Sub-district

Annex 5. Compilation of Economic, Social and Environmental Benefits

Project Components	Expected Outcomes	Benefit Aspect	
1. Baseline Data and Knowledge	**1.1. Assessing and Mapping risk and vulnerabilities caused by climate-related hazards and threats.**	Economic	Economically, the assessment and mapping of disaster risk and vulnerability at the village level will provide benefits for village government to be able to anticipate economic losses by adjusting village policies related to the risks already mapped. Generally, the community gets economic benefits in the form of higher opportunities to avoid losses caused by loss/damage of assets and livelihoods. Identification of irrigation conditions will also provide input for technical improvements in agricultural cultivation and vital agricultural infrastructure at the project location so that the opportunity to increase agricultural production in the future will lead to community welfare improvement.
		Social	One result of this assessment and mapping is identifying social conditions and vulnerabilities related to the existing social situation. This is expected to provide input to the community as a reference for making changes and adjustments needed. This mapping will also provide input for adjustments to the irrigation network management system which is expected to increase community participation and authority to regulate their collective interests.
		Environmental	The database and knowledge program will provide a lot of information about the actual environmental conditions in the village so that the improvements needed to overcome vulnerabilities and possible risks can be identified, monitored continuously as part of the village policy input.
	1.2. Assessing adaptive capacity level of climate change, including the availability of early warning systems.	Economic	Assessment of adaptation capacity to climate change will provide an overview of the government readiness and the community to deal with possible economic shocks, both from the readiness of regulations and rules and local knowledge that is beneficial for improving community welfare in adaptation efforts undertaken.
		Social	Socially, this program will reward local knowledge that grows and develops through a series of spontaneous adaptation processes to their environmental conditions and changes.
		Environmental	This program will identify local knowledge about the environmental conditions in which they live and earn a living. Hopefully, the understanding that arises as a result of long-term interactions can provide deep understanding related to the system and how the environment works around them. This will be very useful as an input for development policies and plans to ensure its sustainability.

Project Components	Expected Outcomes	Benefit Aspect	
	1.3. Climate-related data are well managed and socialized to the wider community.	Economic	Valid data on climate will provide adequate information for policy and regulation making, so that it is able to provide a regulatory framework to ensure the minimization of climate change effects.
		Social	Dissemination of learning outcomes and best practices of project is expected to be able to provide sufficient information for community to know the importance of climate change impacts and the need to carry out adaptation processes at various levels and sectors.
		Environmental	The management of climate data that is well coordinated in all relevant sectors will ensure the direction and design of development adjusts to environmental conditions and dynamics that may occur.
2. Government Capacity	**2.1. Developing strategy of climate change adaptation and adopted into a regular government planning cycle.**	Economic	Integration of climate change adaptation into government planning systems at various levels will ensure the capacity and readiness of development schemes in facing the impact of existing changes, especially in terms of the economy. A good spatial planning process will also have an impact on the certainty of spatial development which leads to an increase in investment attractiveness. Improving planning capacity at the village level by considering climate change factors will have an impact on improving village development planning documents so that development investments related to community livelihoods will provide more effective economic benefits.
		Social	This program provides an opportunity for the community to explore ideas about adaptation strategies that will be realized in adaptation strategy document at village level.
		Environmental	Village level spatial mapping will present detailed spatial data so that it is able to visualize existing conditions and it is easier to project environmental conditions in the future and to direct expected environmental investment. Increasing understanding of wetland ecosystems management will be the principle for projecting sustainable development that will be directed through village development plan document. The combination of above factors will increase the village capacity to deal with the impacts of climate change by ensuring the development orientation that is in accordance with the ecosystem characteristics of living area.

Project Components	Expected Outcomes	Benefit Aspect	
	2.2. Strengthening the capacity of village, sub-district and district government apparatus to reduce risks related to climate socio-economic and environmental losses.	Economic	Integration of climate change adaptation through development planning and budgeting will ensure development initiatives that encourage sustainable regional economic growth.
		Social	Strengthening government capacity at various levels will ensure that all existing policies and regulations relating to climate change adaptation will be synchronized so that they will influence existing social conditions.
		Environmental	Strengthening planning capacity at the village, sub-district and district levels will increase the ability to anticipate the climate change effects so that the risks of environmental damage can be minimized.
3. Community Engagement	**3.1. Strengthening community awareness and participation in adaptation and climate risk reduction measures.**	Social	This process will encourage greater stakeholder involvement through multistakeholder forums at the landscape level so that the social benefits of climate change adaptation strategies will increase along with strengthening resilience at the landscape level.
		Environmental	The expansion of stakeholders involvement who take area focus through a landscape approach, besides to considering the region's socio-economic factors is also related to the context of ecosystems where the landscape itself depicts a various types of spatial patterns that influence each other. Strengthening the stakeholder's capacity at the landscape level will provide benefits for environmental conditions where inter-sectoral planning that represents the pillars of production, livelihood and conservation can be integrated with climate change adaptation strategies as one of the key factors.
	3.2. Strengthening community adaptive capacity in climate risk reduction measures.	Economic	This program will provide opportunities for farmer groups and their members to improve welfare through facilitation of capital and market access for their products, along with strengthening business management capacity and improving cultivation techniques that are more adaptive to environmental changes. Improving irrigation infrastructure in cash for work mechanism provides financial and economic benefits to the community. The financial benefits obtained are through paid employment opportunities, while improving irrigation itself will increase economic opportunities through increased productivity potential of agricultural land.
		Social	The management of community-based integrated irrigation systems will place the community as the main actor in the management of vital economic infrastructure on local scale. This will provide an opportunity for community to be able to organize their collective interests in a system that they compile.

Project Components	Expected Outcomes	Benefit Aspect	
		Environmental	The formulation of village regulations on sustainable use of natural resources and adaptation to climate change will ensure that the use of existing resources does not exceed the carrying capacity of environment.
4. Community Livelihood	**4.1. Strengthening livelihoods of vulnerable communities related to climate change impacts, including variability.**	Economic	This program will develop integrated farming schemes through agroforestry and agrosilvofisheries where product diversification in land area will increase farmers' economic stability related to fluctuations of commodity prices and environmental conditions. Silvofishery will provide additional income alternatives for the community in sustainable use of mangrove areas.
		Social	Changes in monoculture cultivation systems into mixed plants through agroforestry will result in relation modification between farmers and their land such as maintenance intensity, number of workers, input facilities, and the number of products; overall it will lead to social changes.
		Environmental	Agroforestry and silvofishery will cause to the complexity of ecological system in a land area rather than a monoculture system. The system complexity will increase the carrying capacity so that the power of environmental resilience will improve.
	4.2. Diversified and enhanced livelihoods of vulnerable communities.	Economic	Increasing raw products to semi-finished or processed products will increase the added value of commodities so that it will increase the amount of profits obtained by the community. Encouragement of youth and women's groups will provide additional income to families apart from the head of family. The growth of processed business units will also correlate with the absorption of raw materials so that farmers producing raw materials will also enjoy the benefits of increasing product selling value by assuming local product sales will reduce transportation costs which are usually charged at the selling price.
		Social	The growth of processed business units at the village level will increase the absorption of labor, thereby increasing social stability in the community.
		Environmental	The initiative to develop diversification of livelihoods will reduce pressure on the environment by assuming that the level of community economic dependence through extractive and extensive systems will decrease.
5. Ecosystem Resilience	**5.1. Conserving the essential areas in order to maintain the ecosystem services and**	Economic	The development of partnership scheme for community-based conservation area management with the private sector will create economic income opportunities for area managers and the community in general depending on agreed upon scheme.
		Social	Communities as the main actors related to conservation area management will have the opportunity to manage strategic assets in the context of collective interests.

Project Components	Expected Outcomes	Benefit Aspect	
	ecosystem carrying capacity.	Environmental	The development of community-based conservation areas will ensure the preservation of existing important ecosystems and their functions.
	5.2. Improving ecosystem condition affected by climate change.	Economic	Protecting the area of occupancy and livelihood from the climate change impacts and natural disasters through forest rehabilitation in both mangrove and coastal areas, riparian and upstream. The community also has the opportunity to obtain financial benefits through the supply of goods and services needed.
		Social	The community has the ability and experience to carry out forest rehabilitation activities.
		Environmental	Improvement of degraded ecosystems will increase resilience to the climate change shock.
6. Policy and Governance	**6.1. Improving policies and regulations and enforcing climate resilience.**	Economic	Improvement of integrated irrigation management systems will create opportunities to improve irrigation services for agricultural areas, thus enabling efforts to increase agricultural production which has been disrupted caused by the lack of existing irrigation systems effectiveness.
		Social	Integrated irrigation management will enhance cross-sectoral cooperation.
		Environmental	Improving the quality of policies and rules regarding resilience to climate change will encourage a long-term development-oriented scheme that promotes environmental carrying capacity.
	6.2. Developing climate change monitoring system which enforces climate resilience.	Economic	The climate change monitoring system will provide adequate input for regional economic development projections and planning.
		Social	
		Environmental	The climate change monitoring system will provide input for improving environmental conditions needed as a climate change adaptation strategy.

Annex 6. Roles of Key Stakeholder in Consultative Process

Based on the results of the consultation process and in accordance with the design of Project implementation, the role of each key stakeholder in the further consultative process of Project implementation are as follows:

Government	Communities	Other stakeholder
Village Government: • Develop priority strategies and Project to overcome the climate change impacts and include them in village planning documents Village Mid-Term Development Plan (RPJMDes). • Encourage community participation, community groups and institutions at the village level in implementing the Project. **Sub-district Government:** • Coordinating village governments in implementing climate change adaptation Project. • Bridging the relationship between local government and village government. **Regional Development Planning Board (Bappeda):** • The main partner in the Project. • Develop priority strategies and Project to overcome the climate change impacts and include them in regional planning documents. • Facilitating the process of Project integration and cross-sector collaboration. Provide advice and recommendations in Project planning, implementation and evaluation. **Spatial Public Works Office:** • Integrate Project with official work plans, so that the Project complies with the objectives and supports the Main Performance Indicators (IKU) of the office. • Provide advice and recommendations in planning, implementing and evaluating Project related to Spatial Planning. **Irrigation Public Works Office:** • Integrate Project with official work plans, so that the Project complies with the objectives and supports the Main Performance Indicators (IKU) of the office. • Provide advice and recommendations in planning, implementing and evaluating Project related to irrigation.	**Farmers Groups:** Encourage the members to actively participate in program implementation. Improving its performance in climate change adaptation by involving its administrators and representatives to play an active role in assessment, discussion, planning, and implementation and Project monitoring and evaluation. **Cooperative:** Encourage members to actively participate in program implementation. Improving its performance in business development, especially post-harvest processing, by involving its administrator and representatives to play an active role in assessment, discussion, planning, and implementation and Project monitoring and evaluation.	**Industrial Plantation (HTI) Companies:** • Acting actively in multistakeholder forums. • Communicate the CSR Project that it runs. • Collaborating with local governments in developing their CSR Project. **Pulp and Paper Companies:** • Take an active role in multistakeholder forums. • Communicate the CSR Project that it runs. • Cooperating with local governments in developing their CSR Project. **P3-TGAI Companion Team:** Growing community participation of Water User Farmers (P3A) in activities to repair, rehabilitate and improve irrigation networks in accordance with the needs and principles of independence. **Local Non Government Organization:** Provide support to encourage community participation and empowerment.

Government	Communities	Other stakeholder
Office of Agriculture for Food Crops and Horticulture: • Integrate Project with official work plans, so that the Project complies with the objectives and supports the Main Performance Indicators (IKU) of the office. • Provide advice and recommendations in planning, implementing and evaluating Project related to agricultural business strategies in the context of climate change adaptation. **Forestry Office:** • Integrate Project with official work plans, so that the Project complies with the objectives and supports the Main Performance Indicators (IKU). • Provide advice and recommendations in planning, implementing and evaluating Project related to rehabilitation of land and mangrove forests. Environment and Land Office • Integrate Project with official work plans, so that the Project complies with the objectives and supports the Main Performance Indicators (IKU) of the office. • Provide advice and recommendations in planning, implementing and evaluating Project related to environmental management for climate change adaptation. **Office of Livestock and Food Security:** • Integrate Project with official work plans, so that the Project complies with the objectives and supports the Main Performance Indicators (IKU) of the office. • Provide advice and recommendations in planning, implementing, evaluating Project related to livestock and food security. **Office of Community and Village Empowerment** • Integrate Project with official work plans, so that the Project complies with the objectives and supports the Main Performance Indicators (IKU) of the office. • Provide advice and recommendations in planning, implementing and evaluating Project related to increasing the capacity and participation of the community and village government in climate change adaptation.		

Government	Communities	Other stakeholder
Sumatra River Region Center (BBWSS) VIII: • Integrate the Project with the board's work plan, so that the Project is on target. • Provide direction, advice and recommendations in Project planning, implementation and evaluation especially related to water resources management. Water Resources Management Coordination Team of Musi-Sugihan-Banyuasin and Lemau River Territory (TKPSDA WS. MSBL): Region Provides direction regarding water resources policies and various other policy tools needed in the water resources sector. Watershed Management Center (BP DAS): • Integrate the Project with the board's work plan, so that the Project is on target. • Provide direction, advice and recommendations in Project planning, implementation and evaluation especially related to the implementation of forest and land rehabilitation and soil and water conservation.		